Dell XC430 Web-Scale Hyperconverged Appliance
Owner's Manual

Notes, cautions, and warnings

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

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

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

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About your system

The Dell XC430 system is web-scale converged appliance based on the Dell PowerEdge R430 that supports two Intel Xeon E5-2600 v3 processors, up to 12 DIMMs, and four hard drives or solid-state drives (SSDs).

Supported configuration

Table 1. Supported configuration

Systems	Configurations
Four hard-drive systems	Up to four 3.5-inch hot-swappable hard drives with non-redundant or redundant PSU

Front-panel features and indicators

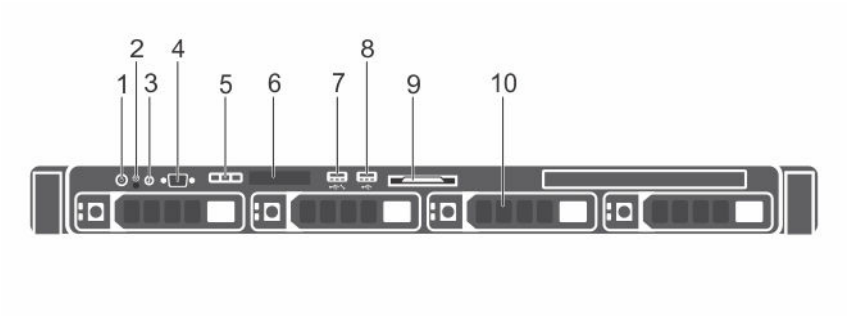

Figure 1. Front-panel features and indicators

Table 2. Front-panel features and indicators

Item	Indicator, Button, or Connector	Icon	Description
1	Power-on indicator, power button	⏻	The power-on indicator glows when the system power is on. The power button controls the power supply output to the system.

Item	Indicator, Button, or Connector	Icon	Description
			NOTE: On ACPI-compliant operating systems, turning off the system by using the power button causes the system to perform a graceful shutdown before power to the system is turned off.
2	NMI button		Used to troubleshoot software and device driver errors when running certain operating systems. This button can be pressed using the end of a paper clip. Use this button only if directed to do so by qualified support personnel or by the operating system's documentation.
3	System identification button		The identification buttons on the front and back panels can be used to locate a particular system within a rack. When one of these buttons is pressed, the LCD panel on the front and the system status indicator on the back flashes until one of the buttons is pressed again. Press to toggle the system ID on and off. If the system stops responding during POST, press and hold the system ID button for more than five seconds to enter BIOS progress mode. To reset iDRAC (if not disabled in F2 iDRAC setup) press and hold the button for more than 15 seconds.
4	Video connector		Allows you to connect a display to the system.
5	LCD menu buttons		Allows you to navigate the control panel LCD menu.
6	LCD panel		Displays system ID, status information, and system error messages. See LCD panel features.
7	USB management port or iDRAC managed USB port		The USB management port can function as a regular USB port or provide access to the iDRAC features. For more information, see the *iDRAC User's Guide* available at **Dell.com/idracmanuals**.
8	USB connector		Allows you to connect USB devices to the system. The port is USB 2.0-compliant.
9	Information tag		A slide-out label panel which contains system information such as Service Tag, NIC, and MAC address for your reference.
10	Hard drives		Up to four 3.5-inch hot-swappable hard drives or SSDs.

LCD panel features

The system's LCD panel provides system information and status and error messages to indicate if the system is operating correctly or if the system needs attention. For more information about error messages, see the Dell Event and Error Messages Reference Guide at **dell.com/esmmanuals**.

- The LCD backlight gows blue during normal operating conditions.
- When the system needs attention, the LCD glows 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 glows amber regardless of whether the system is turned on or off.
- The LCD backlight turns off when the system is in standby mode and can be turned on by pressing either the Select, Left, or Right button on the LCD panel.
- The LCD backlight remains off if LCD messaging is turned off through the iDRAC utility, the LCD panel, or other tools.

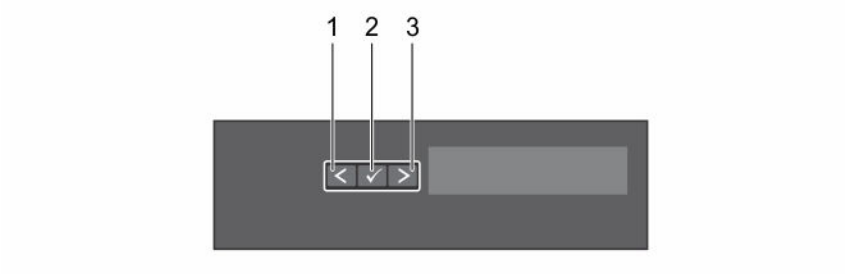

Figure 2. LCD panel features

Table 3. LCD panel features

Item	Button	Description
1	Left	Moves the cursor back in one-step increments.
2	Select	Selects the menu item highlighted by the cursor.
3	Right	Moves the cursor forward in one-step increments. During message scrolling: • Press once to increase scrolling speed • Press again to stop • Press again to return to the default scrolling speed • Press again to repeat the cycle

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 is in standby mode, the LCD backlight turns off after five minutes of inactivity if there are no error messages. Press one of the three navigation buttons (Select, Left, or Right) to view the Home screen.

To navigate to the **Home** screen from another menu, complete the following steps:

1. Press and hold the up arrow until the **Home** icon is displayed.
2. Select the **Home** icon.
3. On the **Home** screen, press the **Select** button to enter the main menu.

Setup menu

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 display LCD error messages in a format that matches the IPMI description in the SEL. This is useful when trying to match an LCD message with an SEL entry. Select **Simple** to display LCD error messages in a simplified user-friendly description. For more information about error messages, see the *Dell Event and Error Messages Reference Guide* at **Dell.com/idracmanuals**.
Set home	Select the default information to be displayed on the LCD Home screen. For more information to see the options and option items that can be set as the default on the Home screen, see View menu.

View menu

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 iDRAC8. 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 Watt. 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.

Diagnostic indicators

The diagnostic indicators on the system front-panel display error status during system startup.

NOTE: The diagnostic indicators are not present if the system is equipped with an LCD display.

NOTE: No diagnostic indicators are lit when the system is switched off. To start the system, plug it in to a working power source and press the power button.

Table 4. Diagnostic indicators

Icon	Description	Condition	Corrective action
	Health indicator	If the system is turned on, and in good health, glows solid blue.	None required.
		Blinks amber if the system is turned on or in standby, and if any error exists (for example, a failed fan or hard drive).	See the system event log or system messages for the specific issue. For more information about the error messages, see the *Dell Event and Error Messages Reference Guide* at **Dell.com/openmanagemanuals > OpenManage software**. Invalid memory configurations can cause the system to stop functioning at startup without any video output. SeeGetting help.
	Hard drive indicator	Blinks amber if a hard drive experiences an error.	See the system event log to determine the Hard drive that has an error. Run the appropriate online diagnostics test. Restart system and run embedded diagnostics (ePSA).
	Electrical indicator	Blinks amber if the system experiences an electrical error (for example, voltage out of range, or a failed power supply unit or voltage regulator).	See the system event log or system messages for the specific issue. If it is because of a problem with the power supply unit (PSU), check the LED on the PSU. Reseat the PSU by removing and reinstalling it. If the issue persists, seeGetting help.
	Temperature indicator	Blinks amber if the system experiences a thermal error (for example, a temperature out of range or fan failure).	Ensure that none of the following conditions exist: • A cooling fan is removed or has failed. • System cover, cooling shroud, EMI filler panel, memory-module blank, or back-filler bracket is removed. • Ambient temperature is too high. • External airflow is obstructed. SeeGetting help.
	Memory indicator	Blinks amber if a memory error occurs.	See the system event log or system messages for the location of the failed memory. Reinstall the memory device. If the issue persists, seeGetting help.
	PCIe indicator	Blinks amber if a PCIe card experiences an error.	Restart the system. Update any required drivers for the PCIe card.

Icon	Description	Condition	Corrective action
			Reinstall the card. If the issue persists, seeGetting help. NOTE: For more information about supported PCIe cards, seeExpansion card installation guidelines.

Hard drive indicator codes

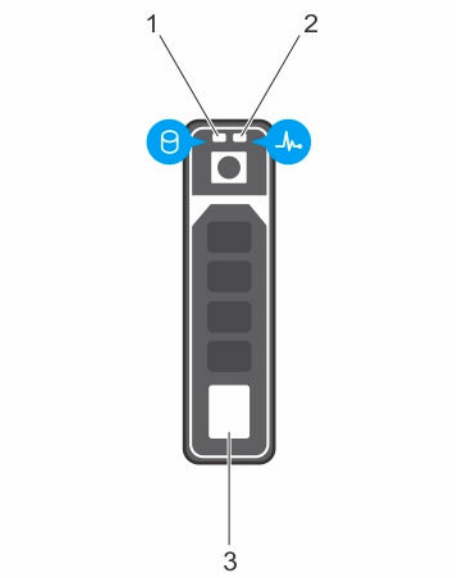

Figure 3. Hard drive indicators

1. Hard drive activity indicator
2. Hard drive status indicator
3. Hard drive

NOTE: If the hard drive is in Advanced Host Controller Interface (AHCI) mode, the status indicator (on the right side) does not function and remains off.

Table 5. Drive-status indicator pattern

Drive-status indicator pattern	Condition
Blinks green two times per second	Identifying drive or preparing for removal.
Off	Drive ready for insertion or removal. NOTE: The drive status indicator remains off until all hard drives are initialized after the system is turned on. Drives are not ready for insertion or removal during this time.
Blinks green, amber, and turns off	Predicted drive failure

Drive-status indicator pattern	Condition
Blinks amber four times per second	Drive failed
Blinks green slowly	Drive rebuilding
Steady green	Drive online
Blinks green three seconds, amber three seconds, and turns off six seconds	Rebuild aborted

iDRAC Direct LED indicator codes

This topic describes about the iDRAC Direct LED indicator codes.

NOTE: The iDRAC Direct LED indicator does not glow for the USB mode.

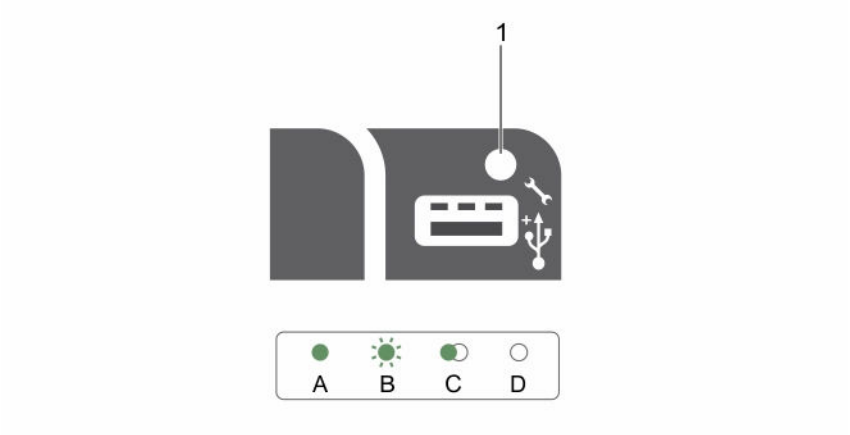

Figure 4. iDRAC Direct LED indicator

1. iDRAC Direct status indicator

The following table displays iDRAC Direct activity when configuring iDRAC Direct by using the management port (USB XML Import).

Table 6. iDRAC Direct by using the management port (USB XML Import).

Convention	iDRAC Direct LED indicator pattern	Condition
A	Green	Glows green for a minimum of two seconds at the beginning and end of a file transfer.
B	Flashing green	Indicates file transfer or any operation tasks.
C	Green and turns off	Indicates that the file transfer is complete.
D	Not lit	Indicates that the USB is ready to be removed or that a task is complete.

The following table describes about iDRAC Direct activity when configuring iDRAC Direct using your laptop and cable (Laptop connect).

Table 7.

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

Back-panel features and indicators

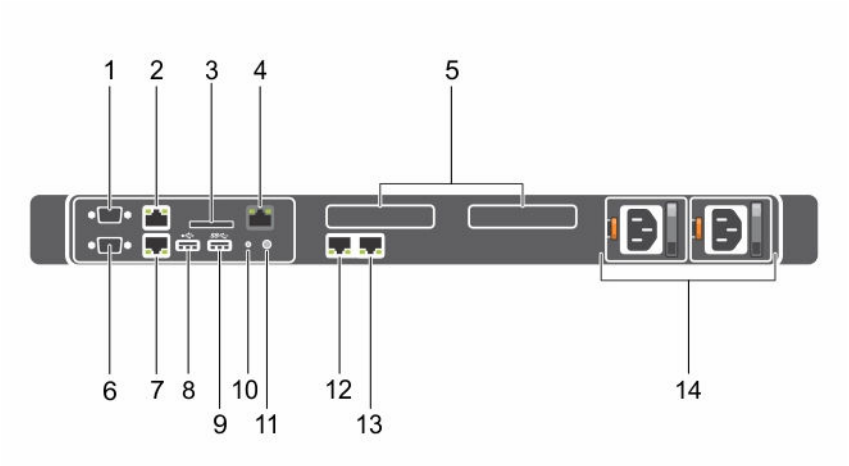

Figure 5. Back-panel features and indicators

Table 8. Back-panel features and indicators

Item	Indicator, Button, or Connector	Icon	Description
1	Serial connector		Allows you to connect a serial device to the system.
2	Ethernet connector 1		Integrated 10/100/1000 Mbps NIC connector.
3	vFlash card slot (optional)		Allows you to connect the vFlash card.
4	iDRAC port (optional)		Dedicated management port on the iDRAC ports card.
5	PCIe expansion card slots (2)		Allows you to connect a PCI Express expansion card.
6	Video connector		Allows you to connect a VGA display to the system.
7	Ethernet connector 2		Integrated 10/100/1000 Mbps NIC connector.

Item	Indicator, Button, or Connector	Icon	Description
8	USB connector		Allow you to connect USB devices to the system. The port is USB 2.0-compliant.
9	USB connector		Allow you to connect USB devices to the system. The port is USB 3.0-compliant.
10	System identification button		The identification buttons on the front and back panels can be used to locate a particular system within a rack. When one of these buttons is pressed, the system status indicator on the back flashes until one of the buttons is pressed again. Press to toggle the system ID on and off. If the system stops responding during POST, press and hold the system ID button for more than five seconds to enter BIOS progress mode. To reset the iDRAC (if not disabled in F2 iDRAC setup) press and hold the button for more than 15 seconds.
11	System identification connector		Connects the optional system status indicator assembly through the optional cable management arm.
12	Ethernet connector 3		Integrated 10/100/1000 Mbps NIC connector.
13	Ethernet connector 4		
14	Power supply unit (PSU1 and PSU2)		**Redundant PSU** Up to two 550 W redundant AC PSUs.

NIC indicator codes

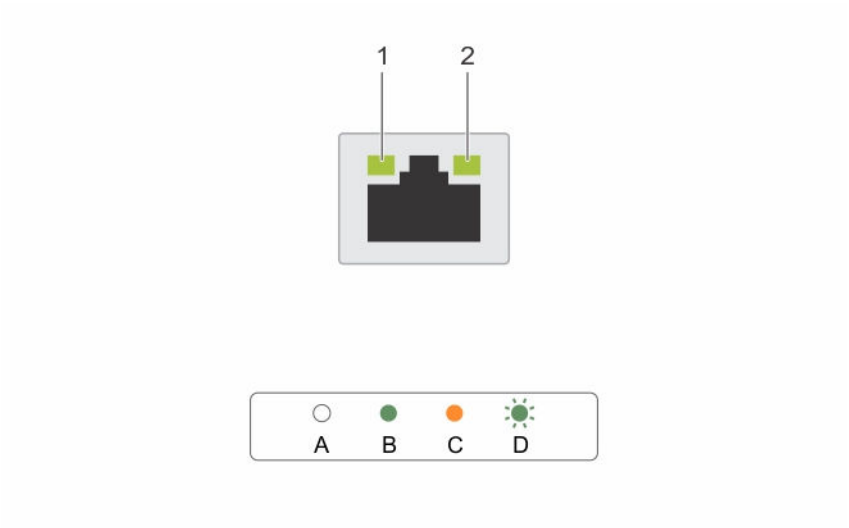

Figure 6. NIC indicators

1. link indicator
2. activity indicator

Table 9. NIC indicators

Convention	Indicator	Indicator code
A	Link and activity indicators are off	The NIC (network interface card) is not connected to the network.
B	Link indicator is green	The NIC is connected to a valid network at its maximum port speed (1 Gbps).
C	Link indicator is amber	The NIC is connected to a valid network at less than its maximum port speed.
D	Activity indicator is blinking green	Network data is being sent or received.

Redundant power supply unit indicator codes

Each AC power supply unit (PSU) has an illuminated translucent handle that indicates whether power is present or whether a power fault has occurred.

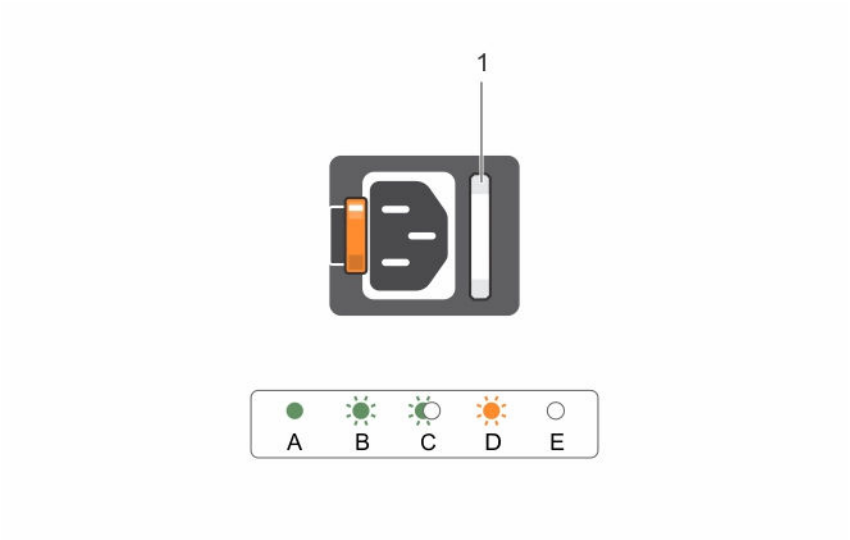

Figure 7. AC PSU status indicator

1. AC PSU status indicator or handle

Table 10. Redundant AC PSU status indicator

Convention	Power Indicator Pattern	Condition
A	Green	A valid power source is connected to the PSU and the PSU is operational.
B	Flashing green	When the PSU firmware is being updated, the PSU handle flashes green. **CAUTION: Do not disconnect the power cord or unplug the PSU when updating firmware. If firmware update is interrupted, the PSUs will not function. You must roll back the PSU firmware by using Dell Lifecycle Controller. For more information, see Dell Lifecycle Controller User's Guide at Dell.com/idracmanuals.**
C	Flashing green and turns off	When hot-adding a PSU, the PSU handle flashes green five times at 4 Hz rate and turns off. This indicates that there is a PSU mismatch with respect to efficiency, feature set, health status, and supported voltage. Ensure that both the PSUs are the same. **NOTE:** For AC PSUs, use only PSUs with the Extended Power Performance (EPP) label on the back. Mixing PSUs from previous generations of Dell PowerEdge servers can result in a PSU mismatch condition or failure to turn on.
D	Flashing amber	Indicates a problem in the PSU.

Convention	Power Indicator Pattern	Condition
		CAUTION: When correcting a PSU mismatch, replace only the PSU with the flashing indicator. Swapping the other 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 vice versa, you must turn off the system. **CAUTION: AC PSUs support both 220 V and 110 V input voltages with the exception of Titanium PSUs, which support only 220 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.**
E	Not lit	Power is not connected.

Documentation references

For information about the Dell documents, see the Support Matrix specific for your product.

For information about the Nutanix documents that applies to a specific release of Nutanix solution software, see the Support Matrix specific for your product.

2

Performing initial system configuration

After you receive your system, you must set up your system, install the operating system if it is not pre-installed, and set up and configure the system iDRAC IP address.

Setting up your system

1. Unpack the server.
2. Install the server into the rack. For more information about installing the server into the rack, see your system *Rack Installation Placemat* at **Dell.com/xcseriesmanuals**.
3. Connect the peripherals to the system.
4. Connect the system to its electrical outlet.
5. Turn on the system by pressing the Power button or by using iDRAC.
6. Turn on the attached peripherals.

Methods of setting up and configuring the iDRAC IP address

You can set up the iDRAC IP address by using one of the following interfaces:

- iDRAC Settings utility
- Lifecycle Controller
- Dell Deployment Toolkit
- Server LCD panel

You can configure iDRAC IP by using:

1. iDRAC Web Interface.

   For more information about setting up and configuring iDRAC, see the *Integrated Dell Remote Access Controller User's Guide* at **Dell.com/idracmanuals**.

2. Remote Access Controller ADMin (RACADM).

   For more information, see the *RACADM Command Line Interface Reference Guide* and the *Integrated Dell Remote Access Controller User's Guide* at **Dell.com/idracmanuals**.

3. Remote Services that includes Web Services Management (WS-Man). For more information, see the *Lifecycle Controller Remote Services Quick Start Guide* at **Dell.com/idracmanuals**.

Logging in to iDRAC

You can log in to iDRAC as an iDRAC local user, a Microsoft Active Directory user, or a Lightweight Directory Access Protocol (LDAP) user. You can also log in by using Single Sign-On or a Smart Card. The

default user name is `root` and password is `calvin`. For more information about logging in to iDRAC and iDRAC licenses, see the *Integrated Dell Remote Access Controller User's Guide* at **Dell.com/idracmanuals**.

You can also access iDRAC by using RACADM. For more information, see the *RACADM Command Line Interface Reference Guide* and the *Integrated Dell Remote Access Controller User's Guide* at **Dell.com/idracmanuals**.

Remote management

To perform out-of-band systems management by using iDRAC, you must configure iDRAC for remote accessibility, set up the management station and managed system, and configure the supported Web browsers. For more information, see the *Integrated Dell Remote Access Controller User's Guide* at **Dell.com/idracmanuals**.

You can also remotely monitor and manage the server by using the Dell OpenManage Server Administrator software application and OpenManage Essentials systems management console. For more information, go to **Dell.com/openmanagemanuals**.

Downloading and installing drivers and firmware

Dell 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.

Steps

1. Go to **Dell.com/support/home**.
2. Under Support in the Customized support section type your Service Tag into the **Enter your Service Tag** or **Express Service code** box.

   NOTE: If you do not have the Service Tag, select **Detect My Product** to allow the system to automatically detect your Service Tag, or under **General support** select your product page.
3. Click **Drivers & downloads**.

   The drivers that are applicable to your selection are displayed.
4. Download the drivers you require to a diskette drive, USB drive, CD, or DVD.

3

Pre-operating system management applications

The pre-operating system management applications for your system helps you manage different settings and features of your system without booting to the operating system.

Your system has the following pre-operating system management applications:

- System Setup
- Boot Manager
- Dell Lifecycle Controller

Dell Lifecycle Controller allows you to perform useful tasks such as configuring BIOS and hardware settings, deploying operating system, updating drivers, and saving hardware profiles. For more information about Dell Lifecycle Controller, see the documentation at **Dell.com/idracmanuals**.

Navigation keys

The navigation keys can help you access the pre-operating system management applications.

Page Up	Moves to the previous screen.
Page Down	Moves to the next screen.
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
Enter	Enables you to type a value in the selected field (if applicable) or follow the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
Tab	Moves to the next focus area. NOTE: This feature is applicable for the standard graphical browser only.
Esc	Moves to the previous page until you view the main screen. Pressing Esc in the main screen exits System BIOS/iDRAC Settings/Device Settings/Service Tag Settings and proceeds with system boot.
F1	Displays the System Setup help.
F2	Enables you to enter **System Setup**
F10	Enables you to enter **Dell Lifecycle Controller**
F11	Enables you to enter **Boot Manager**

F12	Enables you to enter **PXE boot**

About System Setup

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

NOTE: There are a several generic server settings that appear during system setup that do not apply to this system, such as RAID or UEFI.

You can access System Setup in two methods:

- Standard Graphical Browser — This is enabled by default.
- Text Browser — This is enabled by using Console Redirection.

To enable Console Redirection:

- On the **System Setup** page, click **System BIOS**.
- On the **Serial Communications** page, click **Serial Communication**, and then select **On with Console Redirection**.

NOTE: By default, help text for the selected field is displayed in the graphical browser. To view the help text in the text browser, press F1.

From System Setup, you can:

- Change the NVRAM settings after you add or remove hardware
- View the system hardware configuration
- Enable or disable integrated devices
- Set performance and power management thresholds
- Manage system security

Entering System Setup

1. Turn on or restart your system.
2. Press F2 immediately after you see the following message:

   ```
   F2 = System Setup
   ```

   If your operating system begins to load before you press F2, allow the system to finish booting, and then restart your system and try again.

   NOTE: If an error message is displayed while the system is starting, make a note of the message. For more information, see System messages.

   NOTE: After installing a memory upgrade, it is normal for your system to display a message the first time you start your system.

System Setup details

The **System Setup Main Menu** screen details are explained as follows:

System BIOS	Enables you to configure BIOS settings.

iDRAC Settings	Enables you to configure iDRAC settings. The iDRAC settings utility is an interface to set up and configure the iDRAC parameters by using UEFI (Unified Extensible Firmware Interface). You can enable or disable various iDRAC parameters by using the iDRAC settings utility. For more information about this utility, see *Integrated Dell Remote Access Controller User's Guide* at **Dell.com/idracmanuals**.
Device Settings	Enables you to configure device settings.

System BIOS Settings details

The **System BIOS Settings** screen details are explained as follows:

System Information	Specifies information about the system such as the system model name, BIOS version, and Service Tag.
Memory Settings	Specifies information and options related to the installed memory.
Processor Settings	Specifies information and options related to the processor such as speed and cache size.
SATA Settings	Specifies options to enable or disable the integrated SATA controller and ports.
Boot Settings	Specifies options to specify the boot mode (BIOS or UEFI). Enables you to modify UEFI and BIOS boot settings.
Network Settings	Specifies options to change the network settings.
Integrated Devices	Specifies options to manage integrated device controllers and ports and specify related features and options.
Serial Communication	Specifies options to manage the serial ports and specify related features and options.
System Profile Settings	Specifies options to change the processor power management settings, memory frequency, and so on.
System Security	Specifies options to configure the system security settings, such as system password, setup password, Trusted Platform Module (TPM) security. It also manages the power and NMI buttons on the system.
Miscellaneous Settings	Specifies options to change the system date, time, and so on.

System Information details

The **System Information** screen details are explained as follows:

System Model Name	Specifies the system model name.
System BIOS Version	Specifies the BIOS version installed on the system.
System Management Engine Version	Specifies the current version of the Management Engine firmware.

System Service Tag	Specifies the system Service Tag.
System Manufacturer	Specifies the name of the system manufacturer.
System Manufacturer Contact Information	Specifies the contact information of the system manufacturer.
System CPLD Version	Specifies the current version of the system complex programmable logic device (CPLD) firmware.
UEFI Compliance Version	Specifies the UEFI compliance level of the system firmware.

Memory Settings details

The **Memory Settings** screen details are explained as follows:

System Memory Size	Specifies the memory size in the system.
System Memory Type	Specifies the type of memory installed in the system.
System Memory Speed	Specifies the system memory speed.
System Memory Voltage	Specifies the system memory voltage.
Video Memory	Specifies the amount of video memory.
System Memory Testing	Specifies whether the system memory tests are run during system boot. Options are **Enabled** and **Disabled**. This option is set to **Disabled** by default.
Memory Operating Mode	Specifies the memory operating mode. The options available are **Optimizer Mode**, **Advanced ECC Mode**, **Mirror Mode**, **Spare Mode**, **Spare with Advanced ECC Mode**, **Dell Fault Resilient Mode** and **Dell NUMA Fault Resilient Mode**. This option is set to **Optimizer Mode** by default. NOTE: The **Memory Operating Mode** option can have different default and available options based on the memory configuration of your system. NOTE: The **Dell Fault Resilient Mode** option establishes an area of memory that is fault resilient. This mode can be used by an operating system that supports the feature to load critical applications or enables the operating system kernel to maximize system availability.
Node Interleaving	Specifies if Non-Uniform Memory architecture (NUMA) is supported. If this field is set to **Enabled**, memory interleaving is supported if a symmetric memory configuration is installed. If the field is set to **Disabled**, the system supports NUMA (asymmetric) memory configurations. This option is set to **Disabled** by default.
Snoop Mode	Specifies the Snoop Mode options. The Snoop Mode options available are **Home Snoop**, **Early Snoop**, and **Cluster on Die**. This option is set to **Early Snoop** by default. This field is available only when the **Node Interleaving** is set to **Disabled**.

Processor Settings details

The **Processor Settings** screen details are explained as follows:

Logical Processor	Enables or disables the logical processors and displays the number of logical processors. If this option is set to **Enabled**, the BIOS displays all the logical processors. If this option is set to **Disabled**, the BIOS displays only one logical processor per core. This option is set to **Enabled** by default.
QPI Speed	Enables you to control QuickPath Interconnect data rate settings.
Alternate RTID (Requestor Transaction ID) Setting	Modifies Requestor Transaction IDs, which are QPI resources. This option is set to **Disabled** by default. NOTE: Enabling this option may negatively impact the overall system performance.
Virtualization Technology	Enables or disables the additional hardware capabilities provided for virtualization. This option is set to **Enabled** by default.
Address Translation Service (ATS)	Defines the Address Translation Cache (ATC) for devices to cache the DMA transactions. This option provides an interface between CPU and DMA Memory Management to a chipset's Address Translation and Protection Table to translate DMA addresses to host addresses. This option is set to **Enabled** by default.
Adjacent Cache Line Prefetch	Optimizes the system for applications that need high utilization of sequential memory access. This option is set to **Enabled** by default. You can disable this option for applications that need high utilization of random memory access.
Hardware Prefetcher	Enables or disables the hardware prefetcher. This option is set to **Enabled** by default.
DCU Streamer Prefetcher	Enables or disables the Data Cache Unit (DCU) streamer prefetcher. This option is set to **Enabled** by default.
DCU IP Prefetcher	Enables or disables the Data Cache Unit (DCU) IP prefetcher. This option is set to **Enabled** by default.
Execute Disable	Enables you to run the disable memory protection technology. This option is set to **Enabled** by default.
Logical Processor Idling	Enables you to improve the energy efficiency of a system. It uses the operating system core parking algorithm and parks some of the logical processors in the system which in turn allows the corresponding processor cores to transition into a lower power idle state. This option can only be enabled if the operating system supports it. It is set to **Disabled** by default.
Configurable TDP	Enables you to reconfigure the processor Thermal Design Power (TDP) levels during POST based on the power and thermal delivery capabilities of the system. TDP verifies the maximum heat the cooling system is needed to dissipate. This option is set to **Nominal** by default. NOTE: This option is only available on certain stock keeping units (SKUs) of the processors.
X2Apic Mode	Enables or disables the X2Apic mode.
Dell Controlled Turbo	Controls the turbo engagement. Enable this option only when **System Profile** is set to **Performance**.

NOTE: Depending on the number of installed CPUs, there may be up to four processor listings.

Number of Cores per Processor	Controls the number of enabled cores in each processor. This option is set to **All** by default.
Processor 64-bit Support	Specifies if the processor(s) support 64-bit extensions.
Processor Core Speed	Specifies the maximum core frequency of the processor.
Processor 1	NOTE: Depending on the number of CPUs, there may be up to four processors listed. The following settings are displayed for each processor installed in the system:

Family-Model-Stepping	Specifies the family, model, and stepping of the processor as defined by Intel.
Brand	Specifies the brand name.
Level 2 Cache	Specifies the total L2 cache.
Level 3 Cache	Specifies the total L3 cache.
Number of Cores	Specifies the number of cores per processor.

SATA Settings details

The **SATA Settings** screen details are explained as follows:

Embedded SATA	Enables the embedded SATA option to be set to **Off**, **ATA**, **AHCI**, or **RAID** modes. This option is set to **AHCI** by default.
Security Freeze Lock	Sends Security Freeze Lock command to the Embedded SATA drives during POST. This option is applicable only for ATA and AHCI modes.
Write Cache	Enables or disables the command for Embedded SATA drives during POST.
Port A	Sets the drive type of the selected device. For **Embedded SATA settings** in **ATA** mode, set this field to **Auto** to enable BIOS support. Set it to **OFF** to turn off BIOS support. For **AHCI** or **RAID** mode, BIOS support is always enabled.

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

Port B	Sets the drive type of the selected device. For **Embedded SATA settings** in **ATA** mode, set this field to **Auto** to enable BIOS support. Set it to **OFF** to turn off BIOS support. For **AHCI** or **RAID** mode, BIOS support is always enabled.

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

Port C

Sets the drive type of the selected device. For **Embedded SATA settings** in **ATA** mode, set this field to **Auto** to enable BIOS support. Set it to **OFF** to turn off BIOS support.

For **AHCI** or **RAID** mode, BIOS support is always enabled.

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

Port D

Sets the drive type of the selected device. For **Embedded SATA settings** in **ATA** mode, set this field to **Auto** to enable BIOS support. Set it to **OFF** to turn off BIOS support.

For **AHCI** or **RAID** mode, BIOS support is always enabled.

Port E

Sets the drive type of the selected device. For **Embedded SATA settings** in **ATA** mode, set this field to **Auto** to enable BIOS support. Set it to **OFF** to turn off BIOS support.

For **AHCI** or **RAID** mode, BIOS support is always enabled.

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

Port F

Sets the drive type of the selected device. For **Embedded SATA settings** in **ATA** mode, set this field to **Auto** to enable BIOS support. Set it to **OFF** to turn off BIOS support.

For **AHCI** or **RAID** mode, BIOS support is always enabled.

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

Port G

Sets the drive type of the selected device. For **Embedded SATA settings** in **ATA** mode, set this field to **Auto** to enable BIOS support. Set it to **OFF** to turn off BIOS support.

For **AHCI** or **RAID** mode, BIOS support is always enabled.

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

Port H

Sets the drive type of the selected device. For **Embedded SATA settings** in **ATA** mode, set this field to **Auto** to enable BIOS support. Set it to **OFF** to turn off BIOS support.

For **AHCI** or **RAID** mode, BIOS support is always enabled.

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

Port I

Sets the drive type of the selected device. For **Embedded SATA settings** in **ATA** mode, set this field to **Auto** to enable BIOS support. Set it to **OFF** to turn off BIOS support.

For **AHCI** or **RAID** mode, BIOS support is always enabled.

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

Port J

Sets the drive type of the selected device. For **Embedded SATA settings** in **ATA** mode, set this field to **Auto** to enable BIOS support. Set it to **OFF** to turn off BIOS support.

For **AHCI** or **RAID** mode, BIOS support is always enabled.

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

Boot Settings details

The **Boot Settings** screen details are explained as follows:

Boot Mode	Enables you to set the boot mode of the system.

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

If the operating system supports UEFI, you can set this option to **UEFI**. Setting this field to **BIOS** allows compatibility with non-UEFI operating systems. This option is set to **BIOS** by default.

NOTE: Setting this field to **UEFI** disables the **BIOS Boot Settings** menu. Setting this field to **BIOS** disables the **UEFI Boot Settings** menu.

Boot Sequence Retry	Enables or disables the Boot Sequence Retry feature. If this option is set to **Enabled** and the system fails to boot, the system reattempts the boot sequence after 30 seconds. This option is set to **Enabled** by default.
Hard-Disk Failover	Specifies the hard drive that is booted in the event of a hard drive failure. The devices are selected in the **Hard-Disk Drive Sequence** on the **Boot Option Setting** menu. When this option is set to **Disabled**, only the first hard drive in the list is attempted to boot. When this option is set to **Enabled**, all hard drives are attempted to boot in the order selected in the **Hard-Disk Drive Sequence**. This option is not enabled for UEFI Boot Mode.
Boot Option Settings	Configures the boot sequence and the boot devices.
BIOS Boot Settings	Enables or disables BIOS boot options. NOTE: This option is enabled only if the boot mode is BIOS.
UEFI Boot Settings	Enables or disables UEFI Boot options. The Boot options include **IPv4 PXE** and **IPv6 PXE**. This option is set to **IPv4** by default. NOTE: This option is enabled only if the boot mode is UEFI.

Network Settings screen details

The **Network Settings** screen details are explained as follows:

PXE Device n (n = 1 to 4)	Enables or disables the device. When enabled, a UEFI boot option is created for the device.
PXE Device n Settings (n = 1 to 4)	Enables you to control the configuration of the PXE device.

UEFI iSCSI Settings screen details

You can use the iSCSI Settings screen to modify iSCSI device settings. The iSCSI Settings option is available only in the UEFI boot mode. BIOS does not control network settings in the BIOS boot mode. For BIOS boot mode, the option ROM of the network controller handles the network settings.

To view the **UEFI ISCSI Settings** screen, click **System Setup Main Menu → System BIOS → Network Settings → UEFI ISCSI Settings**.

The **UEFI ISCSI Settings** screen details are explained as follows:

ISCSI Initiator Name	Specifies the name of the iSCSI initiator (iqn format).

ISCSI Device n (n = 1 to 4)	Enables or disables the iSCSI device. When disabled, a UEFI boot option is created for the iSCSI device automatically.

Integrated Devices details

The **Integrated Devices** screen details are explained as follows:

USB 3.0 Setting	Enables or disables the USB 3.0 support. Enable this option only if your operating system supports USB 3.0. If you disable this option, devices operate at USB 2.0 speed. USB 3.0 is enabled by default.
User Accessible USB Ports	Enables or disables the USB ports. Selecting **Only Back Ports On** disables the front USB ports, selecting **All Ports Off** disables all USB ports. The USB keyboard and mouse operate during boot process in certain operating systems. After the boot process is complete, the USB keyboard and mouse do not work if the ports are disabled. NOTE: Selecting **Only Back Ports On** and **All Ports Off** disables the USB management port and also restricts access to iDRAC features.
Internal USB Port	Enables or disables the internal USB port. This option is set to **Enabled** by default.
Integrated RAID Controller	Enables or disables the integrated RAID controller. This option is set to **Enabled** by default.
Integrated Network Card 1	Enables or disables the integrated network card.
Embedded NIC1 and NIC2	NOTE: The Embedded NIC1 and NIC2 options are only available on systems that do not have **Integrated Network Card 1**. Enables or disables the Embedded NIC1 and NIC2 options. If set to **Disabled**, the NIC may still be available for shared network access by the embedded management controller. The embedded NIC1 and NIC2 options are only available on systems that do not have Network Daughter Cards (NDCs). The Embedded NIC1 and NIC2 option is mutually exclusive with the Integrated Network Card 1 option. Configure the Embedded NIC1 and NIC2 option by using the NIC management utilities of the system.
I/OAT DMA Engine	Enables or disables the I/OAT option. Enable only if the hardware and software support the feature.
Embedded Video Controller	Enables or disables the **Embedded Video Controller** option. This option is set to **Enabled** by default.
Current State of Embedded Video Controller	Displays the current state of the embedded video controller. The **Current State of Embedded Video Controller** option is a read-only field. If the Embedded Video Controller is the only display capability in the system (that is, no add-in graphics card is installed), then the Embedded Video Controller is automatically used as the primary display even if the **Embedded Video Controller** setting is set to **Disabled**.
SR-IOV Global Enable	Enables or disables the BIOS configuration of Single Root I/O Virtualization (SR-IOV) devices. This option is set to **Disabled** by default.
OS Watchdog Timer	If your system stops responding, this watchdog timer aids in the recovery of your operating system. When this option is set to **Enabled**, the operating system initializes the timer. When this option is set to **Disabled** (the default), the timer does not have any effect on the system.

Memory Mapped I/O above 4 GB	Enables or disables the support for PCIe devices that need large amounts of memory. This option is set to **Enabled** by default.
Slot Disablement	Enables or disables the available PCIe slots on your system. The slot disablement feature controls the configuration of PCIe cards installed in the specified slot. Slots must be disabled only when the installed peripheral card prevents booting into the operating system or causes delays in system startup. If the slot is disabled, both the Option ROM and UEFI drivers are disabled.

Serial Communication details

The **Serial Communication** screen details are explained as follows:

Serial Communication	Selects serial communication devices (Serial Device 1 and Serial Device 2) in BIOS. BIOS console redirection can also be enabled and the port address can be specified. This option is set to **Auto** by default.
Serial Port Address	Enables you to set the port address for serial devices. This option is set to **Serial Device 1=COM2, Serial Device 2=COM1** by default. NOTE: You can use only Serial Device 2 for the Serial Over LAN (SOL) feature. To use console redirection by SOL, configure the same port address for console redirection and the serial device. NOTE: Every time the system boots, the BIOS syncs the serial MUX setting saved in iDRAC. The serial MUX setting can independently be changed in iDRAC. Loading the BIOS default settings from within the BIOS setup utility may not always revert the serial MUX setting to the default setting of Serial Device 1.
External Serial Connector	Enables you to associate the External Serial Connector to Serial Device 1, Serial Device 2, or the Remote Access Device by using this option. NOTE: Only Serial Device 2 can be used for Serial Over LAN (SOL). To use console redirection by SOL, configure the same port address for console redirection and the serial device. NOTE: Every time the system boots, the BIOS syncs the serial MUX setting saved in iDRAC. The serial MUX setting can independently be changed in iDRAC. Loading the BIOS default settings from within the BIOS setup utility may not always revert this setting to the default setting of Serial Device 1.
Failsafe Baud Rate	Specifies the failsafe baud rate for console redirection. The BIOS attempts to determine the baud rate automatically. This failsafe baud rate is used only if the attempt fails, and the value must not be changed. This option is set to `115200` by default.
Remote Terminal Type	Sets the remote console terminal type. This option is set to `VT 100/VT 220` by default.
Redirection After Boot	Enables or disables the BIOS console redirection when the operating system is loaded. This option is set to **Enabled** by default.

System Profile Settings details

The **System Profile Settings** screen details are explained as follows:

System Profile	Sets the system profile. If you set the **System Profile** option to a mode other than **Custom**, the BIOS automatically sets the rest of the options. You can only change the rest of the options if the mode is set to **Custom**. This option is set to **Performance Per Watt Optimized (DAPC)** by default. DAPC is Dell Active Power Controller. NOTE: All the parameters on the system profile setting screen are available only when the **System Profile** option is set to **Custom**.
CPU Power Management	Sets the CPU power management. This option is set to **System DBPM (DAPC)** by default. DBPM is Demand-Based Power Management.
Memory Frequency	Sets the speed of the system memory. You can select **Maximum Performance**, **Maximum Reliability**, or a specific speed.
Turbo Boost	Enables or disables the processor to operate in the turbo boost mode. This option is set to **Enabled** by default.
Energy Efficient Turbo	Enables or disables the **Energy Efficient Turbo** option. Energy Efficient Turbo (EET) is a mode of operation where a processor's core frequency is adjusted to be within the turbo range based on workload.
C1E	Enables or disables the processor to switch to a minimum performance state when it is idle. This option is set to **Enabled** by default.
C States	Enables or disables the processor to operate in all available power states. This option is set to **Enabled** by default.
Collaborative CPU Performance Control	Enables or disables the CPU power management option. When set to **Enabled**, the CPU power management is controlled by the OS DBPM and the System DBPM (DAPC). This option is set to **Disabled** by default.
Memory Patrol Scrub	Sets the memory patrol scrub frequency. This option is set to **Standard** by default.
Memory Refresh Rate	Sets the memory refresh rate to either 1x or 2x. This option is set to **1x** by default.
Uncore Frequency	Enables you to select the **Processor Uncore Frequency** option. Dynamic mode enables the processor to optimize power resources across the cores and uncore during runtime. The optimization of the uncore frequency to either save power or optimize performance is influenced by the setting of the **Energy Efficiency Policy** option.
Energy Efficient Policy	Enables you to select the **Energy Efficient Policy** option. The CPU uses the setting to manipulate the internal behavior of the processor and determines whether to target higher performance or better power savings.
Number of Turbo Boot Enabled Cores for Processor 1	NOTE: If there are two processors installed in the system, you see an entry for **Number of Turbo Boost Enabled Cores for Processor 2**. Controls the number of turbo boost enabled cores for processor 1. The maximum number of cores is enabled by default.
Monitor/Mwait	Enables the Monitor/Mwait instructions in the processor. This option is set to **Enabled** for all system profiles, except **Custom** by default.

NOTE: This option can be disabled only if the **C States** option in the **Custom** mode is set to **disabled**.

NOTE: When **C States** is set to **Enabled** in the **Custom** mode, changing the Monitor/Mwait setting does not impact the system power or performance.

System Security Settings details

The **System Security Settings** screen details are explained as follows:

Intel AES-NI	Improves the speed of applications by performing encryption and decryption by using the Advanced Encryption Standard Instruction Set (AES-NI). This option is set to **Enabled** by default.
System Password	Sets the system password. This option is set to **Enabled** by default and is read-only if the password jumper is not installed in the system.
Setup Password	Sets the setup password. This option is read-only if the password jumper is not installed in the system.
Password Status	Locks the system password. This option is set to **Unlocked** by default.
TPM Security	NOTE: The TPM menu is available only when the TPM module is installed. Enables you to control the reporting mode of the TPM. The **TPM Security** option is set to **Off** by default. You can only modify the TPM Status, TPM Activation, and Intel TXT fields if the **TPM Status** field is set to either **On with Pre-boot Measurements** or **On without Pre-boot Measurements**.
TPM Information	Changes the operational state of the TPM. This option is set to **No Change** by default.
TPM Status	Specifies the TPM status.
TPM Command	**CAUTION: Clearing the TPM results in the loss of all keys in the TPM. The loss of TPM keys may affect booting to the operating system.** Clears all the contents of the TPM. The **TPM Clear** option is set to **No** by default.
Intel TXT	Enables or disables the Intel Trusted Execution Technology (TXT) option. To enable the **Intel TXT** option, virtualization technology and TPM Security must be enabled with Pre-boot measurements. This option is set to **Off** by default.
Power Button	Enables or disables the power button on the front of the system. This option is set to **Enabled** by default.
NMI Button	Enables or disables the NMI button on the front of the system. This option is set to **Disabled** by default.
AC Power Recovery	Sets how the system behaves after AC power is restored to the system. This option is set to **Last** by default.
AC Power Recovery Delay	Sets the time delay for the system to power up after AC power is restored to the system. This option is set to **Immediate** by default.
User Defined Delay (60s to 240s)	Sets the **User Defined Delay** option when the **User Defined** option for **AC Power Recovery Delay** is selected.
UEFI Variable Access	Provides varying degrees of securing UEFI variables. When set to **Standard** (the default), UEFI variables are accessible in the operating system per the UEFI

	specification. When set to **Controlled**, selected UEFI variables are protected in the environment and new UEFI boot entries are forced to be at the end of the current boot order.
Secure Boot	Enables Secure Boot, where the BIOS authenticates each pre-boot image by using the certificates in the Secure Boot Policy. Secure Boot is disabled by default.
Secure Boot Policy	When Secure Boot policy is set to **Standard**, the BIOS uses the system manufacturer's key and certificates to authenticate pre-boot images. When Secure Boot policy is set to **Custom**, the BIOS uses the user-defined key and certificates. Secure Boot policy is set to **Standard** by default.
Secure Boot Policy Summary	Specifies the list of certificates and hashes that secure boot uses to authenticate images.

Secure Boot Custom Policy Settings screen details

Secure Boot Custom Policy Settings is displayed only when the **Secure Boot Policy** option is set to **Custom**.
To view the **Secure Boot Custom Policy Settings** screen, click **System Setup Main Menu → System BIOS → System Security → Secure Boot Custom Policy Settings**.

The **Secure Boot Custom Policy Settings** screen details are explained as follows:

Platform Key	Imports, exports, deletes, or restores the platform key (PK).
Key Exchange Key Database	Enables you to import, export, delete, or restore entries in the Key Exchange Key (KEK) Database.
Authorized Signature Database	Imports, exports, deletes, or restores entries in the Authorized Signature Database (db).
Forbidden Signature Database	Imports, exports, deletes, or restores entries in the Forbidden Signature Database (dbx).

Miscellaneous Settings details

The **Miscellaneous Settings** screen details are explained as follows:

System Time	Enables you to set the time on the system.
System Date	Enables you to set the date on the system.
Asset Tag	Specifies the asset tag and enables you to modify it for security and tracking purposes.
Keyboard NumLock	Enables you to set whether the system boots with the NumLock enabled or disabled. This option is set to **On** by default. NOTE: This option does not apply to 84-key keyboards.
F1/F2 Prompt on Error	Enables or disables the F1/F2 prompt on error. This option is set to **Enabled** by default. The F1/F2 prompt also includes keyboard errors.
Load Legacy Video Option ROM	Enables you to determine whether the system BIOS loads the legacy video (INT 10H) option ROM from the video controller. Selecting **Enabled** in the operating system does not support UEFI video output standards. This field is available only for UEFI boot mode. You cannot set the option to **Enabled** if **UEFI Secure Boot** mode is enabled.

In-System Characterization	Enables or disables **In-System Characterization**. This option is set to **Disabled** by default. The two other options are **Enabled** and **Enabled - No Reboot**. NOTE: The default setting for **In-System Characterization** is subject to change in future BIOS releases. When enabled, In-System Characterization (ISC) executes during POST upon detecting relevant change(s) in system configuration to optimize system power and performance. ISC takes about 20 seconds to execute, and system reset is needed for ISC results to be applied. The **Enabled - No Reboot** option executes ISC and continues without applying ISC results until the next time system reset occurs. The **Enabled** option executes ISC and forces an immediate system reset so that ISC results can be applied. It takes the system longer to be ready due to the forced system reset. When disabled, ISC does not execute.

About Boot Manager

With Boot Manager you can add, delete, and arrange boot options. You can also access System Setup and boot options without restarting the system.

Entering Boot Manager

The **Boot Manager** screen allows you to select boot options and diagnostic utilities.

1. Turn on or restart your system.
2. Press F11 when you see the message `F11 = Boot Manager`.

   If your operating system begins to load before you press F11, allow the system to finish booting, and then restart your system and try again.

Boot Manager main menu

Continue Normal Boot	The system attempts to boot to devices starting with the first item in the boot order. If the boot attempt fails, the system continues with the next item in the boot order until the boot is successful or no more boot options are found.
One Shot Boot Menu	Displays the boot menu where you can select a one time boot device to boot from.
Launch System Setup	Allows you to access the System Setup.
Launch Lifecycle Controller	Closes the Boot Manager and invokes the Dell Lifecycle Controller program.
System Utilities	Opens system utilities menu such as system diagnostics and UEFI shell.

Changing the boot order

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

1. On the **System Setup Main Menu** screen, click **System BIOS** → **Boot Settings**.
2. Click **Boot Option Settings** → **Boot Sequence**.

3. Use the arrow keys to select a boot device, and use the + and - keys to move the device down-or up in the order.
4. Click **Exit**, and then click **Yes** to save the settings on exit.

Choosing the system boot mode

With System Setup, you can to specify the boot mode for installing your operating system:

- BIOS boot mode (the default) is the standard BIOS-level boot interface.
- UEFI boot mode is an enhanced 64-bit boot interface based on Unified Extensible Firmware Interface (UEFI) specifications that overlays the system BIOS.

You must select the boot mode in the **Boot Mode** field of the **Boot Settings** screen of System Setup. Once you specify the boot mode, the system boots in the specified boot mode and you then proceed to install your operating system from that mode. Thereafter, you must boot the system in the same boot mode (BIOS or UEFI) to access the installed operating system. Trying to boot the operating system from the other boot mode causes the system to halt at startup.

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

NOTE: For the latest information on supported operating systems, go to **Dell.com/ossupport**.

Assigning a system and setup password

Prerequisites

NOTE: The password jumper enables or disables the System Password and Setup Password features. For more information about the password jumper settings, see System board connectors.

You can assign a new **System Password** and **Setup Password** or change an existing **System Password** and **Setup Password** only when the password jumper setting is **enabled** and **Password Status** is **Unlocked**.

If the password jumper setting is disabled, the existing **System Password** and **Setup Password** are deleted and you need not provide the system password to boot the system.

About this task

To assign a **System Password** and **Setup Password**, follow the steps below:

Steps

1. To go to system setup, press F2 immediately after a power-on or reboot.
2. On the **System Setup Main Menu** screen, select **System BIOS**, and then press Enter.
3. On the **System BIOS** screen, select **System Security**, and then press Enter.
4. On the **System Security** screen, verify that **Password Status** is **Unlocked**.
5. Select **System Password**, enter your system password, and then press Enter or Tab.

   Use the following guidelines to assign the system password:

   - A password can have up to 32 characters.
   - The password can contain the numbers 0 through 9.

- Only the following special characters are allowed: white space, ("), (+), (,), (-), (.), (/), (;), ([), (\), (]), (`).

A message prompts you to reenter the system password.

6. Reenter the system password and click **OK**.
7. Select **Setup Password**, enter your system password and press Enter or Tab.

   A message prompts you to re-enter the setup password.
8. Reenter the setup password and click **OK**.
9. Press Esc to return to the **System BIOS** screen. Press Esc again.

   A message prompts you to save the changes.

   NOTE: Password protection does not take effect until the system reboots.

Using your system password to secure your system

If you have assigned a setup password, the system accepts your setup password as an alternate system password.

Steps

1. Turn on or reboot your system.
2. Type the system password and press Enter.

Next steps

When **Password Status** is set to **Locked**, type the system password and press Enter when prompted at reboot.

NOTE: If an incorrect system password is typed, the system displays a message and prompts you to reenter your password. You have three attempts to type the correct password. After the third unsuccessful attempt, the system displays an error message that the system has stopped functioning and must be turned off. Even after you turn off and restart the system, the error message is displayed until the correct password is entered.

Deleting or changing an existing system password and setup password

Prerequisites

Ensure that the Password jumper is set to enabled and the **Password Status** is **Unlocked** before attempting to delete or change the existing System and/or Setup password. You cannot delete or change an existing System or Setup password if the **Password Status** is **Locked**.

Steps

1. To go to system setup, press F2 immediately after a power on or restart.
2. On the **System Setup Main Menu** screen, select **System BIOS**, and then press Enter.

   The **System BIOS** screen is displayed.
3. On the **System BIOS** screen, select **System Security**, and then press Enter.

   The **System Security** screen is displayed.
4. On the **System Security** screen, verify that **Password Status** is **Unlocked**.
5. Select **System Password**, alter or delete the existing system password and press Enter or Tab.
6. Select **Setup Password**, alter or delete the existing setup password and press Enter or Tab.

If you change the System and Setup password a message prompts you to reenter the new password. If you delete the System and Setup password, a message prompts you to confirm the deletion.

7. Press Esc to return to the **System BIOS** screen. Press Esc again, and a message prompts you to save the changes.

Operating with a setup password enabled

If **Setup Password** is set to **Enabled**, type the correct setup password before modifying the system setup options.

If you do not type the correct password in three attempts, the system displays the following message:

```
Invalid Password! Number of unsuccessful password attempts: <x> System Halted!
Must power down.
```

Even after you turn off and restart the system, the error message is displayed until the correct password is typed. The following options are exceptions:

- If **System Password** is not set to **Enabled** and is not locked through the **Password Status** option, you can assign a system password. For more information, see the System Security Settings screen section.
- You cannot disable or change an existing system password.

NOTE: You can use the password status option with the setup password option to protect the system password from unauthorized changes.

Embedded system management

The Dell Lifecycle Controller provides advanced embedded systems management throughout the system's lifecycle. The Dell Lifecycle Controller can be started during the boot sequence and can function independently of the operating system.

NOTE: Certain platform configurations may not support the full set of features provided by the Dell Lifecycle Controller.

For more information about setting up the Dell Lifecycle Controller, configuring hardware and firmware, and deploying the operating system, see the Dell Lifecycle Controller documentation at **Dell.com/idracmanuals**.

iDRAC Settings utility

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

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

For more information about using iDRAC, see *Dell Integrated Dell Remote Access Controller User's Guide* at **Dell.com/idracmanuals**.

Entering the iDRAC Settings utility

1. Turn on or restart the managed system.
2. Press F2 during Power-on Self-test (POST).

3. On the **System Setup Main Menu** page, click **iDRAC Settings**.
   The **iDRAC Settings** screen is displayed.

Changing the Thermal settings

The iDRAC Settings utility enables you to select and customize the thermal control settings for your system.

1. Enter the iDRAC Settings utility.
2. Under **iDRAC Settings → Thermal → User Option**, select between the following options:
   - Default
   - Maximum Exhaust Temperature
   - Fan Speed Offset

   NOTE: When the **User Option** is set to the default **Auto** setting, the user option cannot be modified.
3. Set the **Maximum Air Exhaust Temperature** or the **Fan Speed Offset** fields.
4. Click **Back → Finish → Yes**.

4

Installing and removing system components

This section provides information about installing and removing the system components.

Safety instructions

WARNING: Whenever you need to lift the system, get others to assist you. To avoid injury, do not attempt to lift the system by yourself.

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

CAUTION: Do not operate the system without the cover for a duration exceeding five minutes.

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.

CAUTION: Operating the system without the system cover can result in component damage.

NOTE: Dell recommends that you always use a static mat and static strap while working on components inside the system.

NOTE: To ensure proper operation and cooling, all bays in the system and system fans must be populated always with either a component or with a blank.

Before working inside your system

1. Ensure that you follow the Safety instructions.
2. Turn off the system, including any attached peripherals.
3. Disconnect the system from the electrical outlet and disconnect the peripherals.
4. If applicable, remove the system from the rack. For more information, see the *Rack Installation* placemat at **Dell.com/poweredgemanuals**.
5. If installed, remove the front bezel.
6. Remove the system cover.

After working inside your system

Prerequisites
Follow the safety guidelines listed in the Safety instructions section.

Steps

1. Install the system cover.
2. If removed, install the optional front bezel.
3. Reconnect the peripherals and connect the system to the electrical outlet.
4. Turn on the system, including any attached peripherals.

Recommended tools

You will need the following items to perform the procedures in this section:

- Key to the system keylock
- #1 and #2 Phillips screwdriver
- Wrist grounding strap connected to ground

Front bezel

Installing the optional front bezel

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions section.

Steps

1. Locate and remove the bezel key.

   NOTE: The bezel key is attached to the back of the bezel.
2. Hook the right end of the bezel onto the chassis.
3. Fit the free end of the bezel onto the system.
4. Lock the bezel by using the key.

Removing the optional front bezel

1. Unlock the keylock at the left end of the bezel.
2. Lift the release latch next to the keylock.
3. Rotate the left end of the bezel away from the front panel.
4. Unhook the right end of the bezel and pull the bezel away from the system.

System cover

Removing the system cover

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions section.
2. If installed, remove the optional bezel. For more information, see the Removing the optional front bezel section.
3. If installed, remove the front bezel.

Steps

1. Rotate the latch release lock counter clockwise to the unlocked position.
2. Lift the latch toward the back of the system.

   The system cover slides back and the tabs on the system cover disengage from the slots on the chassis.

   NOTE: The position of the latch may vary depending on the configuration of your system.
3. Hold the cover on both sides, and lift the cover away from the system.

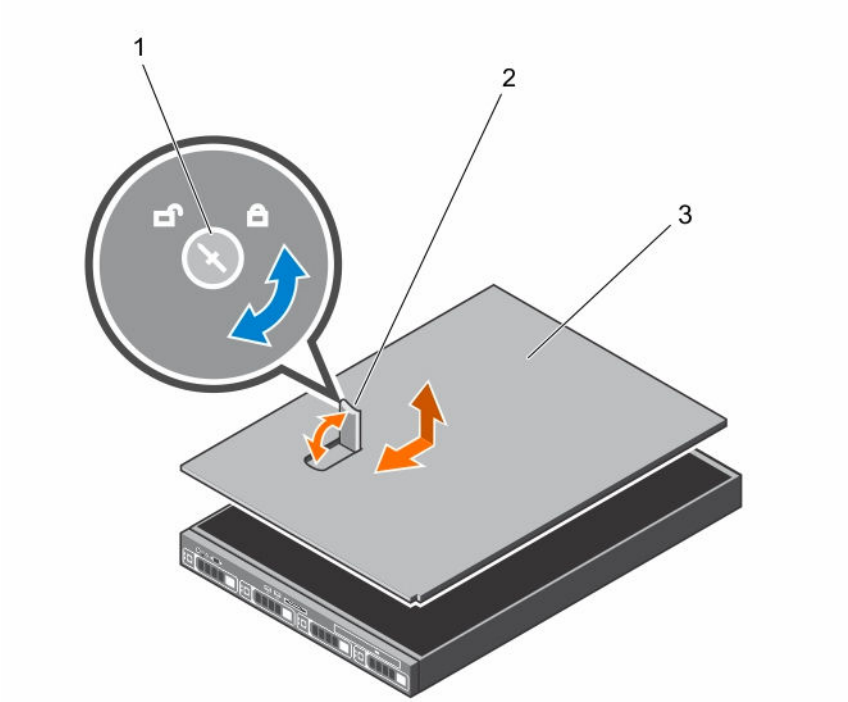

Figure 8. Removing and installing the system cover

1. latch release lock
2. latch
3. system cover

Next steps

1. Install the system cover.

Installing the system cover

Prerequisites

Ensure that you read the Safety instructions..

Steps

1. Align the slots of the system cover with the tabs on the chassis.
2. Press the cover release latch, and push the cover toward the front of the chassis until the latch locks into place.
3. Turn the latch release lock clockwise to the locked position.

4. Install the optional bezel.
5. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

Inside the system

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 came with the product.

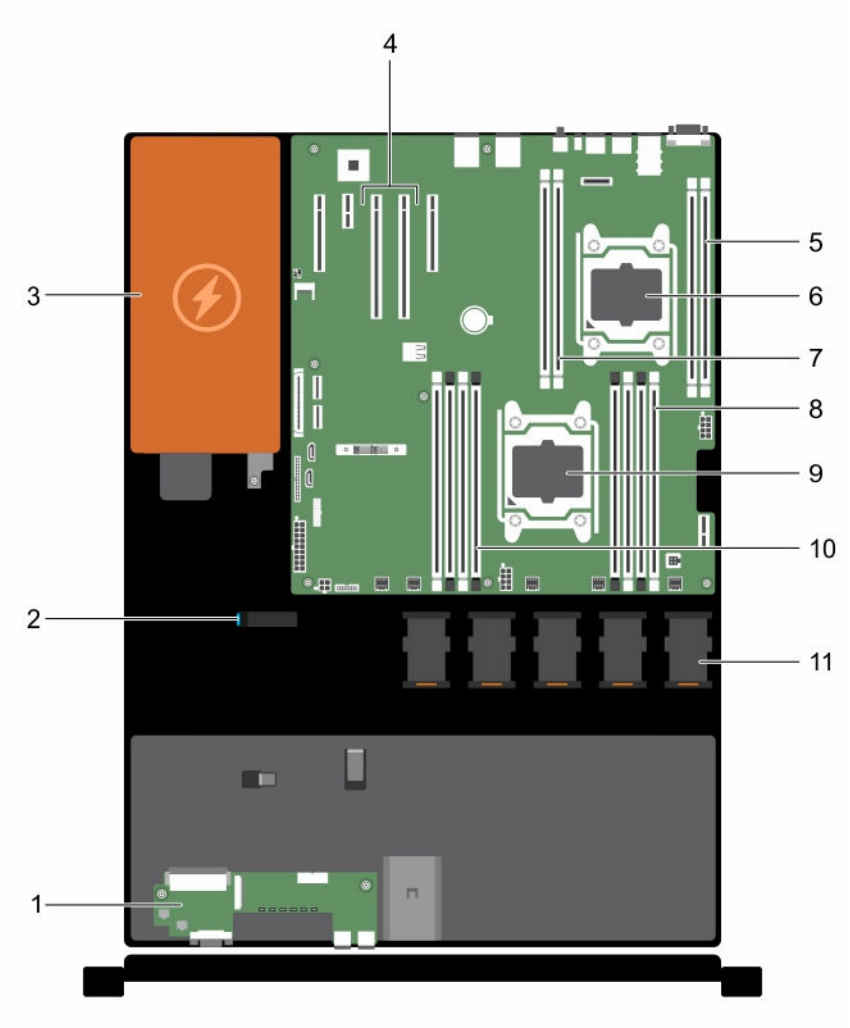

Figure 9. Inside the system—with a non-redundant power supply unit

1. control panel
2. cable routing latch
3. power supply unit
4. expansion-card riser connector (2)

5. memory-module socket (B3, B4)
6. processor 2
7. memory-module socket (B1, B2)
8. memory-module socket (A1, A5, A2, A6)
9. processor 1
10. memory-module socket (A3, A7, A4, A8)
11. cooling fan (5)

Cooling shroud

The cooling shroud has aerodynamically placed openings that direct the airflow across the entire system. The airflow passes through all the critical parts of the system, where the vacuum pulls air across the entire surface area of the heat sink, thus allowing increased cooling.

Removing the cooling shroud

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.

1. Ensure that you read the Safety instructions.
2. Follow the procedure listed in Before working inside your system.

CAUTION: Never operate your system with the cooling shroud removed. The system may get overheated quickly, resulting in shutdown of the system and loss of data.

Steps

Hold the touch points and lift the shroud away from the system.

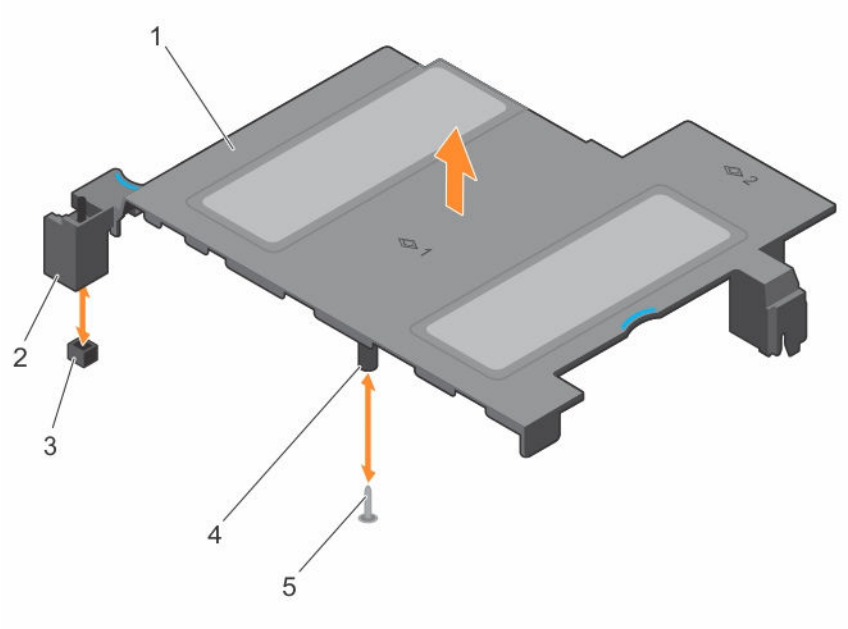

Figure 10. Removing and installing the cooling shroud

1. cooling shroud
2. intrusion switch
3. intrusion switch connector on the system board
4. guide on the cooling shroud
5. guide pin

Installing the cooling shroud

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.

1. Ensure that you read the Safety instructions.
2. Follow the procedure listed in Before working inside your system.

Steps

1. Align the following:
   a. guide on the cooling shroud with the guide pin on the system board.
   b. intrusion switch with the intrusion switch connector on the system board.
2. Lower the cooling shroud into the chassis until it is firmly seated.

   When firmly seated, the memory socket numbers marked on the cooling shroud align with the respective memory sockets.

Next steps

Follow the procedure listed in After working inside your system.

System memory

Your system supports DDR4 registered DIMMs (RDIMMs).

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

Memory bus operating frequency can be 2133 MT/s, 1866 MT/s, 1600 MT/s, or 1333 MT/s depending on the following factors:

- System profile selected (for example, Performance Optimized, Custom, or Dense Configuration Optimized)
- Maximum supported DIMM frequency of the processors

The system contains 12 memory sockets split into four sets—two sets of 4 sockets and two sets of 2 sockets each. Each 4-socket set is organized into two channels and each 2–socket set is organized into one channel. In each channel of the 4-socket set, the release levers of the first socket are marked white and the second socket black. In the 2-socket set, each release lever is marked white.

NOTE: DIMMs in sockets A1 to A8 are assigned to processor 1 and DIMMs in sockets B1 to B4 are assigned to processor 2.

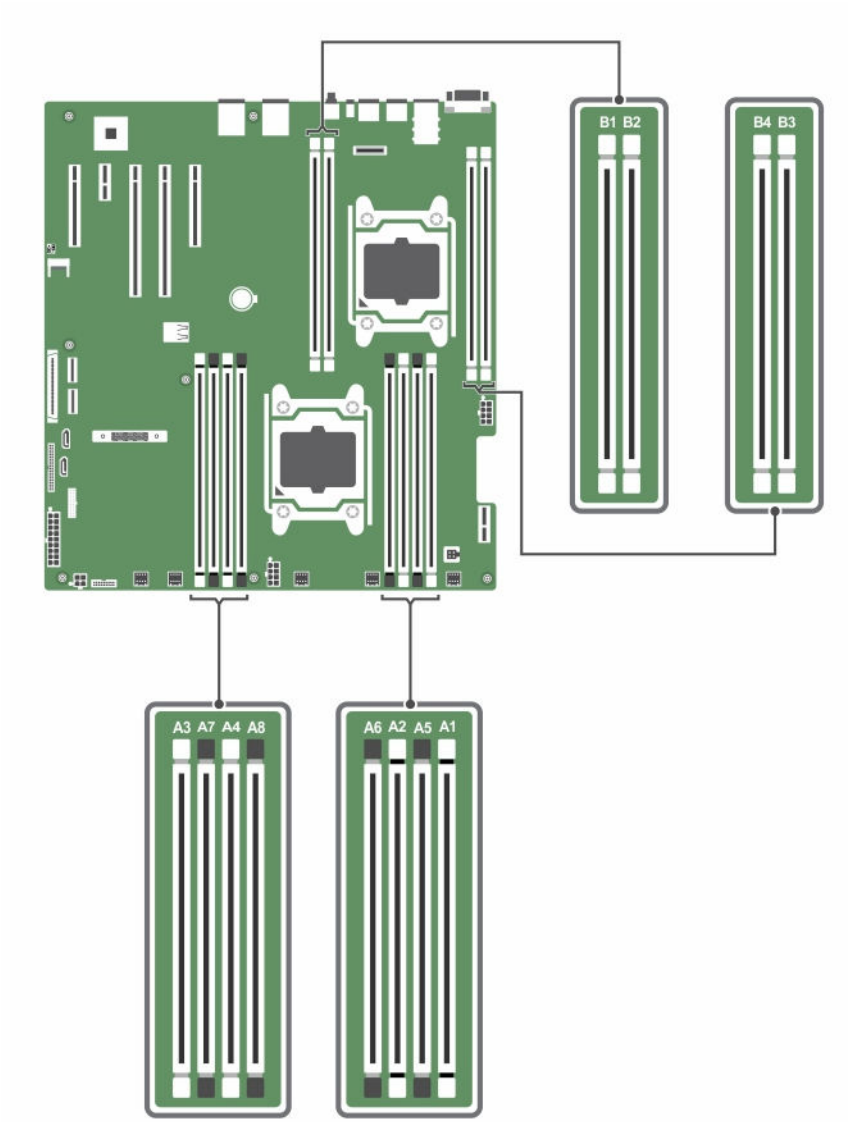

Figure 11. System memory

Memory channels are organized as follows:

Processor 1	channel 0: memory sockets A1 and A5
	channel 1: memory sockets A2 and A6
	channel 2: memory sockets A3 and A7
	channel 3: memory sockets A4 and A8
Processor 2	channel 0: memory sockets B1

channel 1: memory sockets B2

channel 2: memory sockets B3

channel 3: memory sockets B4

The following table shows the memory populations and operating frequencies for the supported configurations.

Table 11. System memory

DIMM Type	DIMMs Populated/ Channel	Operating Frequency (in MT/s)	Maximum DIMM Rank/ Channel	Voltage
RDIMM	1	2133	Dual rank or single rank	1.2 V
	2	2133	Dual rank or single rank	1.2 V

General memory module installation guidelines

Your system supports Flexible Memory Configuration, enabling the system to be configured and run in any valid chipset architectural configuration. The following are the recommended guidelines for installing memory modules:

- x4 and x8 DRAM based DIMMs can be mixed. For more information, see Mode-specific guidelines.
- Up to two dual- or single-rank RDIMMs can be populated per channel.
- Populate DIMM sockets only if a processor is installed. For single-processor systems, sockets A1 to A8 are available. For dual-processor systems, sockets A1 to A8 and sockets B1 to B4 are available.
- Populate all sockets with white release levers first, and then all the sockets with black release levers.
- When mixing memory modules with different capacities, populate the sockets with memory modules with highest capacity first. For example, if you want to mix 4 GB and 8 GB DIMMs, populate 8 GB DIMMs in the sockets with white release levers and 4 GB DIMMs in the sockets with black release levers.
- In a dual-processor configuration, the memory configuration for each processor should be identical through the first eight slots. For example, if you populate socket A1 for processor 1, then populate socket B1 for processor 2, and so on.
- Memory modules of different capacities can be mixed provided other memory population rules are followed (for example, 4 GB and 8 GB memory modules can be mixed).
- Mixing of more than two DIMM capacities in a system is not supported.
- Populate two DIMMs per processor (one DIMM per channel) at a time to maximize performance.

Mode-specific guidelines

Four memory channels are allocated to each processor. The allowable configurations depend on the memory mode selected.

NOTE: You can mix x4 and x8 DRAM based DIMMs to support RAS features. However, all guidelines for specific RAS features must be followed. x4 DRAM based DIMMs retain Single Device Data Correction (SDDC) in memory optimized (independent channel) mode. x8 DRAM based DIMMs require Advanced ECC mode to gain SDDC.

The following section provide additional slot population guidelines for each mode:

Memory optimized (independent channel) mode

This mode supports Single Device Data Correction (SDDC) only for memory modules that use x4 device width. It does not impose any specific slot population requirements.

Sample memory configurations

The following tables show sample memory configurations for one and two processor configurations that follow the appropriate memory guidelines.

NOTE: 1R and 2R in the following tables indicate single- and dual-rank DIMMs respectively.

Table 12. Memory configurations—single processor

System Capacity (in GB)	DIMM Size (in GB)	Number of DIMMs	DIMM Rank, Organization, and Frequency	DIMM Slot Population
64	16	4	2R, x8, 2133 MT/s,	A1, A2, A3, A4
128	16	8	2R, x4, 2133 MT/s,	A1, A2, A3, A4, A5, A6, A7, A8
192	32	6	RDIMM, 2R, x4, 2133 MT/s	A1, A2, A3, A4, A5, A6

Table 13. Memory configurations—two processors

System Capacity (in GB)	DIMM Size (in GB)	Number of DIMMs	DIMM Rank, Organization, and Frequency	DIMM Slot Population
64	16	4	2R, x8, 2133 MT/s,	A1, A2, B1, B2
128	16	8	2R, x4, 2133 MT/s,	A1, A2, A3, A4, B1, B2, B3, B4
192	16	12	2R, x4, 2133 MT/s,	A1, A2, A3, A4, A5, A6,A7,A8, B1, B2, B3, B4
384	32	12	RDIMM, 2R, x4, 2133 MT/s	A1, A2, A3, A4, A5, A6,A7,A8, B1, B2, B3, B4

Removing a memory module

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.

1. Ensure that you follow the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the cooling shroud.

WARNING: The memory modules are hot to touch for some time after the system has been powered down. Allow the memory modules to cool before handling them. Handle the memory modules by the card edges and avoid touching the components or metallic contacts on the memory module.

CAUTION: To ensure proper system cooling, memory module blanks must be installed in any memory socket that is not occupied. Remove memory module blanks only if you intend to install memory modules in those sockets.

Steps

1. Locate the appropriate memory module socket.
2. To release the memory module from the socket, simultaneously press the ejectors on both ends of the memory module socket.

   CAUTION: Handle each memory module only by the card edges, ensuring not to touch the middle of the memory module or metallic contacts.
3. Lift the memory module away from the chassis.

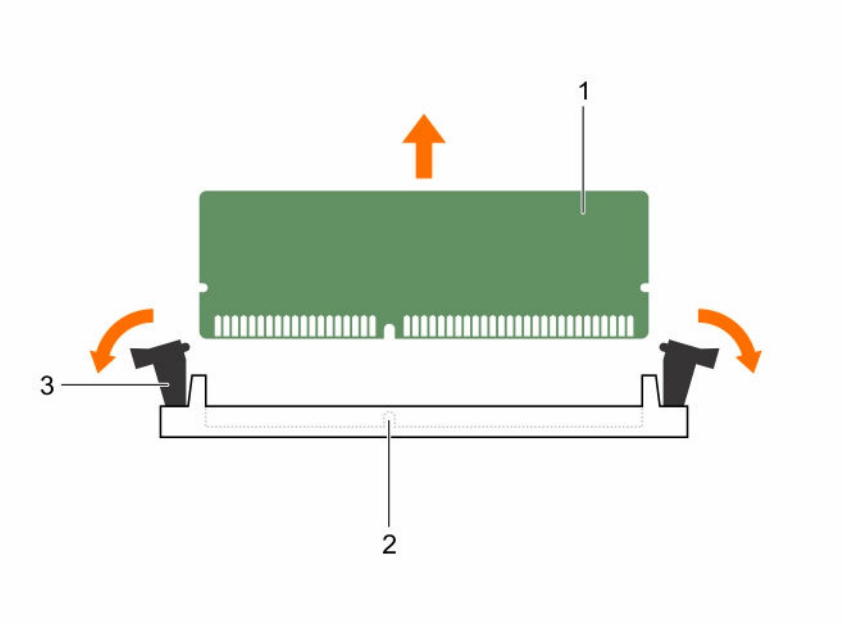

Figure 12. Removing the memory module

1. memory module
2. memory module socket
3. memory module ejector (2)

Next steps

1. Install the memory module.
2. If you are removing a memory module permanently, install a memory module blank.

   NOTE: The procedure to install a memory module blank is similar to the procedure to install a memory module.
3. Install the cooling shroud.

Installing a memory module

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.

1. Ensure that you read the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the cooling shroud.

WARNING: The memory modules are hot to touch for some time after the system has been powered down. Allow the memory modules to cool before handling them. Handle the memory modules by the card edges and avoid touching the components or metallic contacts on the memory module.

Steps

1. Locate the appropriate memory module socket.

   CAUTION: Handle each memory module only by the card edges, ensuring not to touch the middle of the memory module or metallic contacts.

   CAUTION: To prevent damage to the memory module or the memory module socket during installation, do not bend or flex the memory module; insert both ends of the memory module simultaneously.

2. If a memory module or a memory module blank is installed in the socket, remove it.

   NOTE: The procedure to remove a memory module blank is similar to the procedure to remove a memory module.

   NOTE: Retain the removed memory module blank(s) for future use.

3. Align the edge connector of the memory module with the alignment key of the memory module socket, and insert the memory module in the socket.

   NOTE: The memory module socket has an alignment key that enables you to install the memory module in the socket in only one orientation.

   CAUTION: Do not apply pressure at the center of the memory module; apply pressure at both ends of the memory module evenly.

4. Press the memory module with your thumbs until the socket levers firmly click into place.

   When the memory module is properly seated in the socket, the levers on the memory module socket align with the levers on the other sockets that have memory modules installed.

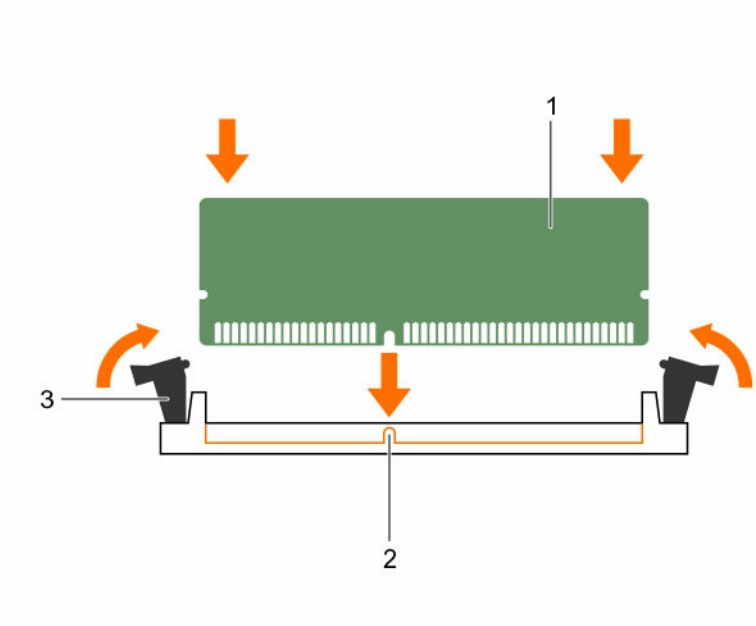

Figure 13. Installing the memory module

1. memory module
2. alignment key
3. memory module socket ejector (2)

Next steps

1. Install the cooling shroud.
2. Follow the procedure listed in After working inside your system.
3. Press F2 to enter System Setup, and check the **System Memory** setting.
   The **System Memory Size** indicates the installed memory.
4. If the **System Memory Size** is incorrect, one or more of the memory modules may not be installed properly. Ensure that the memory modules are firmly seated in their sockets.
5. Run the system memory test in the system diagnostics.

SATADOM

A SATADOM is a disk-on-module (DOM) form factor with an incorporated standard SATA data connection. By default, the SATADOM comes with a power cable installed and is set in a Read/Write position.

The SATADOM uses an onboard SATA controller and does not require an additional controller.

With Nutanix, you can locate the boot device on a separate controller from the data drives, which improves system disk performance.

Important information about SATADOM

The SATA Disk-On-Motherboard (SATADOM) shipped with XC Series appliances is intended as an appliance boot device.

NOTE: Write intensive activities and processes leveraged by XC appliances, are intended to take place on the SSDs and HDDs and not the boot device.

The hypervisor boot device is not intended for application use.

WARNING: Adding additional write intensive software to the SATADOM boot disk results in heavy wear on the device beyond design specifications resulting in premature hardware failure.

You should not run applications on the hypervisor operating system.

Examples of write intensive applications

Following are the examples of write intensive applications:

- System Center Agents.
  - System Center Configuration Manager (CCMExec.exe).
  - System Center Operations Manager (MonitoringHost.exe).
- Write-intensive Agents.
- Databases.
- Disk management utilities (third-party disk defragmentation or partitioning tools).
- Additional roles outside of the appliance's intended use (web server, domain controller, RDS, and so on.).
- Client-based Antivirus.
- Run Virtual Machines directly on the SATADOM. Ensure that the Virtual Machines run on Solid State Drives (SSDs) and Hard Disk Drives (HDDs).

Removing the SATADOM

Prerequisites

1. Ensure that you read the Safety instructions.
2. Follow the procedure listed in Before working inside your system.

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 came with the product.

Steps

1. Unplug the power cable from the SATADOM J_TBU connector.
2. Press the lock release on the SATADOM and pull it up and away from the system.

NOTE: After removing the SATADOM, place it in an anti-static container for reuse, return, or temporary storage.

NOTE: Dell recommends that you do not modify the SATADOM Read/Write default setting.

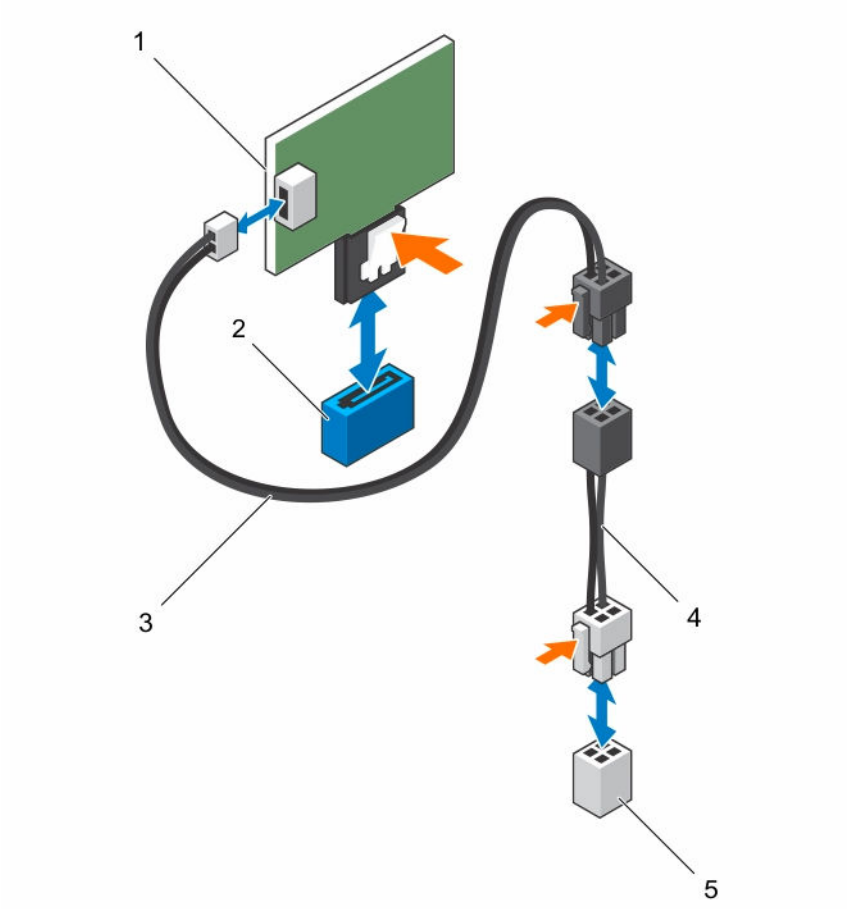

Figure 14. Removing and installing SATADOM

1. SATADOM
2. SATA connector
3. power cable
4. power adapter
5. SATADOM TBU power connector

Next steps

Follow the procedure listed in After working inside your system.

Installing the SATADOM

Prerequisites

1. Ensure that you read the Safety instructions.
2. Follow the procedure listed in Before working inside your system.

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 came with the product.

NOTE: Dell recommends that you do not modify the SATADOM Read/Write default setting.

Steps

1. Press the lock release on the SATADOM and plug the SATADOM into the preferred SATADOM connector on the system board.

   NOTE: The preferred SATADOM connector is SATA9 and is indicated in blue. You can also use SATA8 connector that is indicated in black.

2. Plug the power cable into the SATADOM TBU power connector on the system board.

Next steps

Follow the procedure listed in After working inside your system.

Hard drives

Your system supports the following:

Four hard-drive systems	Up to four 3.5 inch hot-swappable SAS HDD, SATA HDD, or SATA SSD

The hot-swappable hard drives connect to the system board through the hard-drive backplane. Hot-swappable hard drives are supplied in hot-swappable hard-drive carriers that fit in the hard-drive slots.

CAUTION: Before attempting to remove or install a hot-swappable hard drive while the system is running, see the documentation for the storage controller card to ensure that the host adapter is configured correctly to support hot-swap hard drive removal and insertion.

CAUTION: Do not turn off or reboot your system while the hard drive is being formatted. Doing so can cause a hard drive failure.

NOTE: Use only hard drives that have been tested and approved for use with the hard-drive backplane.

When you format a hard drive, allow enough time for the formatting to be completed. Be aware that high-capacity hard drives can take a number of hours to format.

Removing a 3.5-inch hot swappable hard drive carrier blank

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 came with the product.

CAUTION: To maintain proper system cooling, all empty hard drive slots must have drive carrier blanks installed.

1. Follow the safety guidelines listed in Safety instructions section.
2. If installed, remove the front bezel.

Steps

Press the release button and slide the hard drive carrier blank out of the hard drive slot.

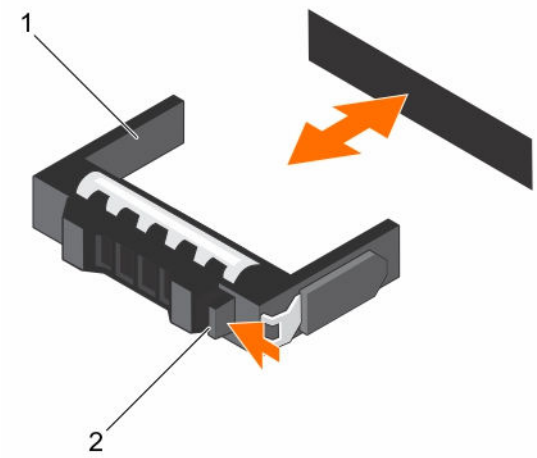

Figure 15. Removing and installing a 3.5-inch hot swappable hard drive carrier blank

1. hard drive carrier blank
2. release button

Next steps

If removed, install the front bezel.

Installing a 3.5-inch hot swappable hard drive carrier blank

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 came with the product.

1. Follow the safety guidelines listed in Safety instructions section.
2. If installed, remove the front bezel.

Steps

Insert the hard drive carrier blank into the hard drive slot, and push the hard drive carrier blank until the release button clicks into place.

Next steps

If removed, install the front bezel.

Removing a hot swappable hard drive carrier

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 came with the product.

1. Follow the safety guidelines listed in Safety instructions section.
2. If installed, remove the front bezel.

3. Using the management software, prepare the hard drive for removal. For more information, see the documentation for the storage controller.

   If the hard drive is online, the green activity or fault indicator flashes when the hard drive is turned off. You can remove the hard drive when the hard drive indicators turn off.

CAUTION: To prevent data loss, ensure that your operating system supports hot-swap drive installation. See the documentation supplied with your operating system.

NOTE: Hot swappable hard drives are supplied in hot swappable hard drive carriers that fit in the hard drive slots.

Steps

1. Press the release button to open the hard drive carrier release handle.
2. Slide the hard drive carrier out of the hard drive slot.

   CAUTION: To maintain proper system cooling, all empty hard drive slots must have hard drive carrier blanks installed.

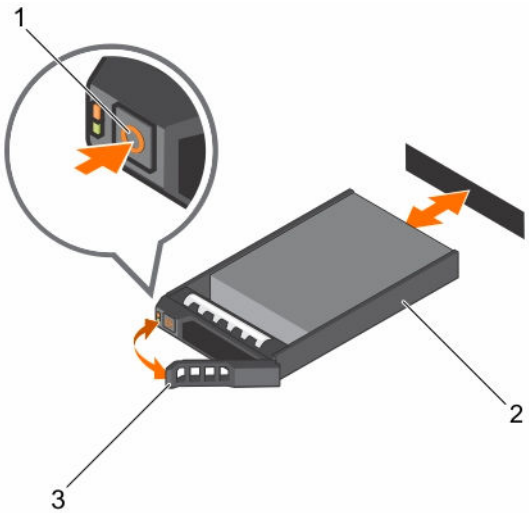

Figure 16. Removing and installing a hot swappable hard drive carrier

1. release button
2. hard drive carrier
3. hard drive carrier handle

Next steps

If you are not replacing the hard drive immediately, insert a hard drive carrier blank in the empty hard drive slot, or install a hard drive carrier.

Installing a hot swappable hard drive carrier

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.

CAUTION: Use only hard drives that have been tested and approved for use with the hard drive backplane.

CAUTION: Combining SAS and SATA hard drives in the same RAID volume is not supported.

CAUTION: When installing a hard drive, ensure that the adjacent drives are fully installed. Inserting a hard drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier's shield spring and make it unusable.

CAUTION: To prevent data loss, ensure that your operating system supports hot-swap drive installation. See the documentation supplied with your operating system.

CAUTION: When a replacement hot swappable hard drive is installed and the system is powered on, the hard drive automatically begins to rebuild. Make absolutely sure that the replacement hard drive is blank or contains data that you wish to have over-written. Any data on the replacement hard drive is immediately lost after the hard drive is installed.

NOTE: Hot swappable hard drives are supplied in hot swappable hard drive carriers that fit in the hard drive slots.

1. If installed, remove the hard drive carrier blank.
2. Install a hot swappable hard drive into the hot swappable hard drive carrier.

Steps

1. Press the release button on the front of the hot swappable hard drive carrier and open the hot swappable hard drive carrier handle.
2. Insert the hot swappable hard drive carrier into the hard drive slot, and push the hot swappable hard drive carrier until it comes in contact with the backplane.
3. Close the hot swappable hard drive carrier handle to lock the hot swappable hard drive carrier in place.

Next steps

If removed, install the front bezel.

Removing a hot swappable hard drive from a hard drive carrier

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.

NOTE: Hot swappable hard drives are supplied in hot swappable hard drive carriers that fit in the hard drive slots.

1. Keep the Phillips #2 screwdriver ready.
2. Remove the hard drive carrier from the system.

Steps

1. Remove the screws from the side rails on the hard drive carrier.
2. Lift the hard drive out of the hard drive carrier.

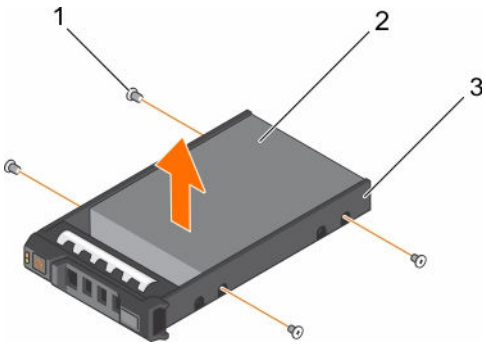

Figure 17. Removing and installing a hot swappable hard drive into a hard drive carrier

1. screw (4)
2. hard drive
3. hard drive carrier

Next steps

1. Install the hot swappable hard drive into the hard drive carrier.
2. Install the hot swappable hard drive carrier into the system.

Installing a hot swappable hard drive into a hot swappable hard drive carrier

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.

NOTE: Hot swappable hard drives are supplied in hot swappable hard drive carriers that fit in the hard drive slots.

1. Keep the Phillips #2 screwdriver ready.
2. Remove the hot swappable hard drive carrier.

Steps

1. Insert the hot swappable hard drive into the hard drive carrier with the connector end of the hard drive toward the back.
2. Align the screw holes on the hard drive with the set of screw holes on the hard drive carrier.

   When aligned correctly, the back of the hard drive is flush with the back of the hard drive carrier.
3. Attach the screws to secure the hard drive to the hard drive carrier.

Next steps

Install the hard drive carrier into the system.

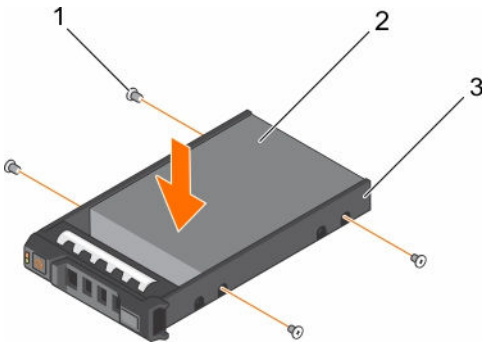

Figure 18. Installing a hot swappable hard drive into a hot swappable hard drive carrier

1. screw (4)
2. hard drive
3. hard drive carrier

Cooling fans

Your system supports:

- Up to six cooling fans in a redundant PSU configuration.

NOTE: Fan 1 must be installed in a redundant PSU configuration.

NOTE: Hot-swap removal or installation of the fans is not supported.

NOTE: 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 numbers on the cooling fan assembly.

Removing a cooling fan

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.

NOTE: The procedure for removing each fan is identical.

1. Follow the safety guidelines listed in Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Remove the cooling shroud.

Steps

1. Disconnect the power cable from the power connector on the system board or power interposer board.
2. Lift the fan out of the cooling fan bracket.

Next steps

1. Install the cooling fan.
2. Follow the procedure listed in the After working inside your system section.

Installing a cooling fan

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.

NOTE: The procedure for installing each fan is identical.

1. Follow the safety guidelines listed in safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Remove the cooling shroud.
4. If installed, remove the cooling fan blank.

Steps

1. Lower the fan into the cooling fan bracket.
2. Connect the power cable to the power cable connector on the system board.

Next steps

1. Install the cooling shroud.
2. Follow the procedure listed in the After working inside your system section.

Expansion cards and expansion card riser

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

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

Expansion card installation guidelines

Your system supports Generation 1, Generation 2, and Generation 3 cards. The following table provides riser configurations for Dell XC430 systems:

Table 14. Expansion card slots available on the expansion-card riser

Expansion-card riser	PCIe slot on the expansion-card riser	Processor connection	Height	Length	Link width	Slot width
PCIE_G3_X16	1	Processor 1	Half Height	Half Length	x16	x16
	2	Processor 1	Half Height	Half Length	x16	x16
PCIE_G3_X8	1	Processor 1	Full Height	Half Length	x8	x16
	2	Processor 1	Half Height	Half Height	x8	x16

NOTE: The PCIE_G3_X8 and PCIE_G3_X16 are the two different types of risers supported on Dell XC430 systems. You can install an expansion card on the system board only using expansion-card riser.

NOTE: The expansion cards are not hot-swappable.

The following table provides a guide for installing expansion cards to ensure proper cooling and mechanical fit. The expansion cards with the highest priority must be installed first using the slot priority indicated. All other expansion cards must be installed in card priority and slot priority order.

Table 15. Expansion card installation order

Card priority	Card type	Slot priority	Maximum allowed
1	10 Gb NICs	1, 2	2
2	1 Gb NICs	1, 2	2

Removing the expansion card riser

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.

1. Follow the safety guidelines listed in Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.

Steps

Holding the touch points, lift the expansion card riser from the riser connector on the system board.

Next steps

Install the expansion card riser.

Installing the expansion card riser

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.

1. Follow the safety guidelines listed in Safety instructions section.
2. Install the expansion card into the expansion card riser.

Steps

Lower the expansion card riser until the expansion card riser is firmly seated in the connector on the system board.

Next steps

Follow the procedure listed in After working inside your system.

Removing an expansion card

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.

1. Follow the safety guidelines listed in Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Disconnect any cables connected to the expansion card or expansion card riser.
4. If installed, remove the expansion card riser.

Steps

1. Hold the expansion card by its edges and remove it from the expansion card riser connector.
2. If you are removing the card permanently, install a filler bracket in the empty expansion card slot and close the expansion card latch.

   NOTE: You must install a filler bracket over an empty expansion card slot to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

Next steps

1. Install the expansion card.
2. Install the expansion card riser
3. Follow the procedure listed in the After working inside your system section.

Installing an expansion card

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.

1. Follow the safety guidelines listed in Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Remove the expansion card riser.

Steps

1. Locate the expansion card connector on the riser.
2. Holding the expansion card by its edges, position the card so that the card connector aligns with the connector on the expansion card riser.
3. Align the expansion card bracket with the hooks on the chassis.
4. Insert the card connector into the expansion card riser connector until the card is firmly seated.

   NOTE: Ensure that the expansion card is properly seated along the chassis, so that expansion card latch can be closed.
5. If required, connect the cables to the expansion card.

Next steps

1. Install the expansion card riser.
2. Follow the procedure listed in the After working inside your system section.

iDRAC ports card

The iDRAC ports card consists of the SD vFlash card slot and an iDRAC port. The iDRAC ports card is used for advanced management of the system.

An SD vFlash card is a Secure Digital (SD) card that plugs into the SD vFlash card slot in the system. It provides persistent on-demand local storage and a custom deployment environment that allows automation of server configuration, scripts, and imaging. It emulates USB devices(s). For more information, see the *Integrated Dell Remote Access Controller User's Guide* at **Dell.com/idracmanuals**.

Removing the optional iDRAC port card

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.

1. Follow the safety guidelines listed in Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Keep the Phillips #2 screwdriver ready.

4. If connected, disconnect the network cable from the iDRAC port card.

Steps

1. Loosen the securing the iDRAC port card holder to the system board.
2. Pull the iDRAC port card to disengage it from the iDRAC port card connector on the system board, and remove the card from the chassis.

Next steps

1. Install the iDRAC port card.
2. If disconnected, reconnect the network cable.
3. Follow the procedure listed in the After working inside your system section.

Installing the optional iDRAC port card

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.

1. Ensure that you follow the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Keep the Phillips #2 screwdriver ready.

Steps

1. Align and insert the tabs on the iDRAC port card into the slots on the chassis.
2. Insert the iDRAC port card into the connector on the system board.
3. Tighten the that the iDRAC port card holder to the system board.

Next steps

1. If disconnected, reconnect the network cable.
2. Follow the procedure listed in After working inside your system.

Internal dual SD module (optional)

The Internal Dual SD Module (IDSDM) card provides two SD card slots. This card offers the following features:

- Dual card operation — maintains a mirrored configuration by using SD cards in both the slots and provides redundancy.

  NOTE: When the **Redundancy** option is set to **Mirror Mode** in the **Integrated Devices** screen of System Setup, the information is replicated from one SD card to another.
- Single card operation — single card operation is supported, but without redundancy.

Removing an internal SD card

Prerequisites

1. Ensure that you read the Safety instructions.
2. Follow the procedure listed in Before working inside your system.

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 came with the product.

Steps

Locate the SD card slot on the internal dual SD module and press the card to release it from the slot.

Next steps

Follow the procedure listed in After working inside your system.

Installing an optional internal SD card

Prerequisites

1. Follow the safety guidelines listed in Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Ensure that the **Internal SD Card Port** option is set to enabled in System Setup.

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. Locate the SD card connector on the Internal Dual SD Module (IDSDM).
2. Orient the SD card appropriately and insert the contact-pin end of the card into the slot.

   NOTE: The slot is keyed to ensure correct insertion of the card.
3. Press the card into the card slot to lock it into place.

Next steps

Follow the procedure listed in the After working inside your system section.

Removing the internal dual SD module

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.

1. Ensure that you read the Safety instructions.

2. Follow the procedure listed in Before working inside your system..

Steps

1. Locate the internal dual SD module on the system board.
2. If installed, remove the SD cards.
3. Hold the plastic pull tab and pull the dual SD module out of the system board.

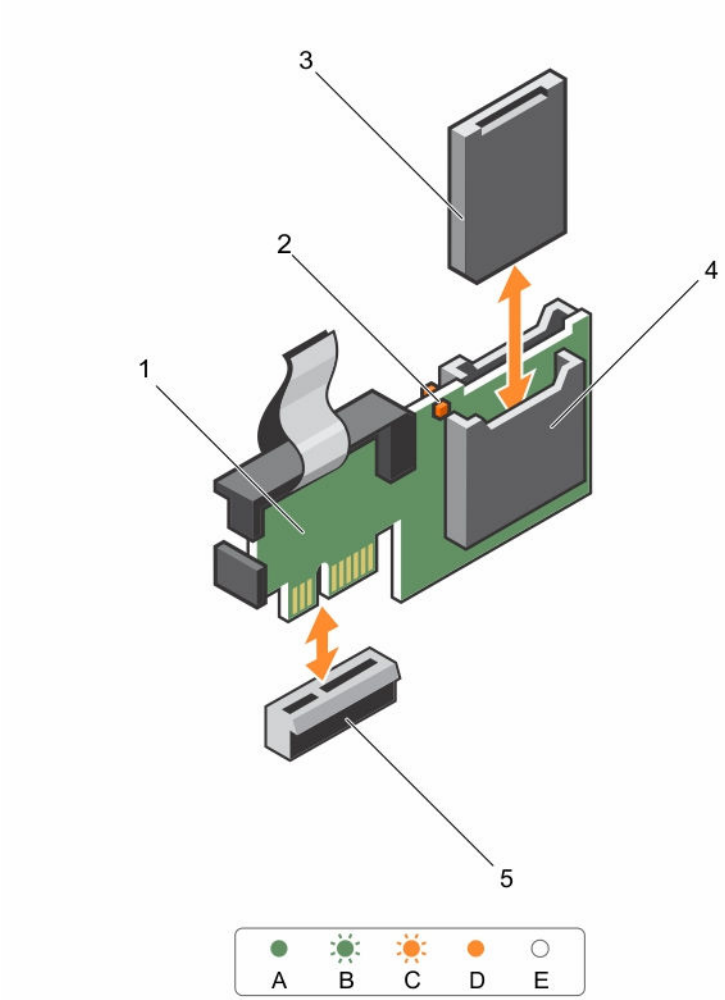

Figure 19. Removing and installing the Internal Dual SD Module (IDSDM)

1. Internal Dual SD module
2. LED status indicator (2)
3. SD card
4. SD card slot 2
5. SD card slot 1
6. IDSDM connector

Table 16. IDSDM indicator codes

Convention	IDSDM indicator code	Description
A	Green	Indicates that the card is online
B	Flashing green	Indicates rebuild or activity

Convention	IDSDM indicator code	Description
C	Flashing amber	Indicates card mismatch or that the card has failed
D	Amber	Indicates that the card is offline, has failed, or is write protected
E	Not lit	Indicates that the card is missing or booting

Next steps

Follow the procedure listed in After working inside your system.

Installing the internal dual SD module

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.

1. Ensure that you read the Safety instructions.
2. Follow the procedure listed in Before working inside your system.

Steps

1. Locate the IDSDM connector on the system board. To locate the IDSDM connector, see System board connectors.
2. Align the connectors on the system board and the dual SD module.
3. Push the dual SD module until it is firmly seated on the system board.

Next steps

1. Install the SD vFlash media card(s).

   NOTE: Temporarily label each SD card with its corresponding slot before removal. Replace the SD card(s) into the same slots.
2. Follow the procedure listed in After working inside your system.

Integrated storage controller card

Your system includes a dedicated expansion-card slot on the system board for an integrated controller card. The integrated storage controller card provides the integrated storage subsystem for your system's internal hard drives. The controller supports SAS and SATA hard drives as supported by the version of the storage controller included with your system.

Removing the integrated storage controller card

Prerequisites

1. Ensure that you read the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the cooling shroud.

4. Keep the #2 Phillips screwdriver handy.

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. Loosen the screws that secure the integrated storage controller cable to the integrated storage-controller card connector on the system board.
2. Lift the integrated storage controller cable out.
3. Lift one end of the card and angle it to disengage the card from the integrated storage-controller card holder on system board.
4. Lift the card out of the chassis.

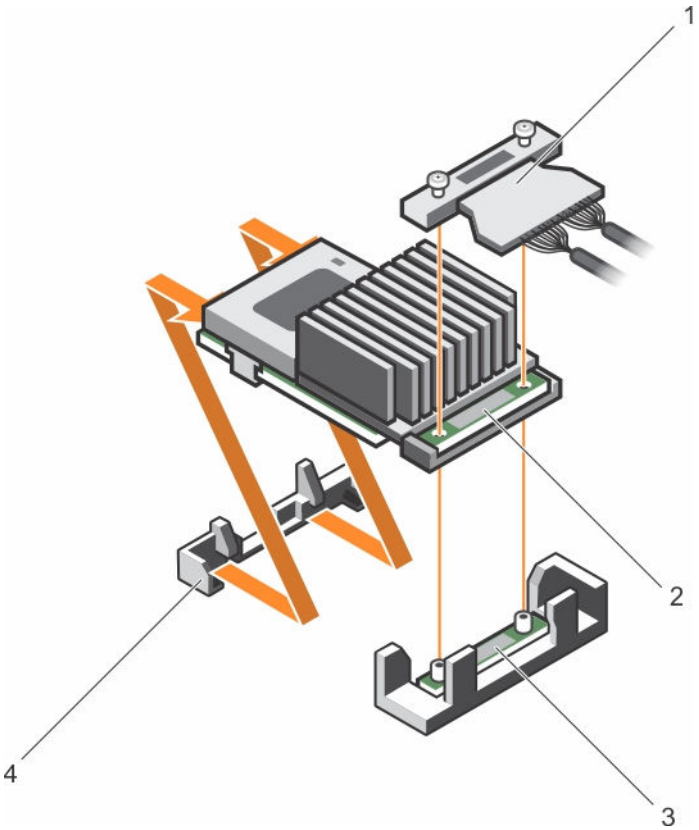

Figure 20. Removing and installing the integrated storage controller card

1. integrated storage controller cable
2. integrated storage controller card
3. integrated storage-controller card connector on the system board
4. integrated storage controller card holder

Next steps

1. Replace the cooling shroud.
2. Follow the procedure listed in After working inside your system.

Installing the integrated storage controller card

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.

1. Ensure that you read the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the cooling shroud.
4. Keep the #2 Phillips screwdriver ready.

Steps

1. Align the end of the integrated storage-controller card with the integrated storage-controller card holder.
2. Lower the connector side of the integrated storage-controller card into the integrated storage-controller card connector on the system board.

   Ensure that the tabs on the system board align with the screw holes on the integrated storage-controller card.
3. Align the screws on the integrated storage-controller card cable with the screw holes on the connector.
4. Tighten the screws to secure the integrated storage-controller card cable with the integrated storage-controller card connector on the system board.

Next steps

1. Replace the cooling shroud.
2. Follow the procedure listed in After working inside your system.

Heat sinks and processors

Use the following procedure when:

- Installing an additional processor
- Replacing a processor

NOTE: To ensure proper system cooling, you must install a processor blank in any empty processor socket.

Removing a processor

Prerequisites

WARNING: The heat sink and processor are too hot to touch for some time after the system has been powered down. Allow the heat sink and processor to cool down before handling them.

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.

CAUTION: Never remove the heat sink from a processor unless you intend to remove the processor. The heat sink is necessary to maintain proper thermal conditions.

1. Ensure that you read the Safety instructions.
2. Keep the #2 Phillips screwdriver handy.
3. Before upgrading your system, download the latest system BIOS version from **dell.com/support** and follow the instructions included in the compressed download file to install the update on your system.

   NOTE: You can update the system BIOS using the Lifecycle Controller. For more information about Dell Lifecycle controller, see **dell.com/esmmanuals**.
4. Follow the procedure listed in Before working inside your system.
5. Remove the cooling shroud.

Steps

1. Loosen one of the screws that secures the heat sink to the system board.

   Wait 30 seconds for the heat sink to loosen from the processor.
2. Remove the screw diagonally opposite the screw you first removed.
3. Repeat the procedure for the remaining two screws.
4. Remove the heat sink.

CAUTION: The processor is held in its socket under strong pressure. Be aware that the release lever can spring up suddenly if not firmly grasped.

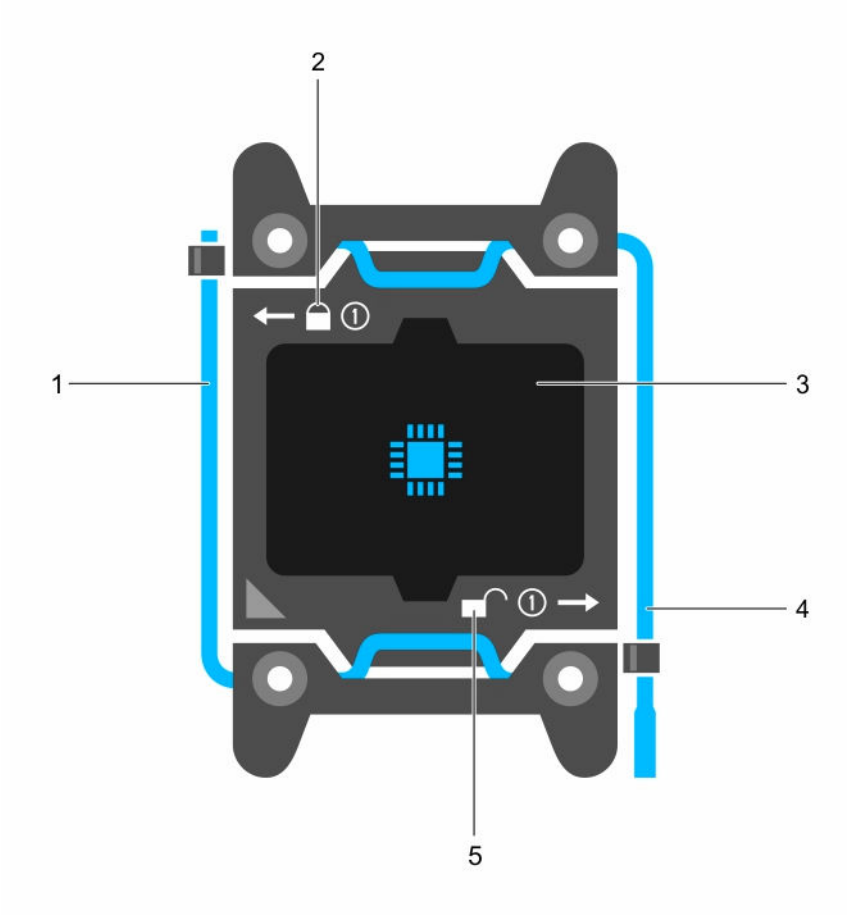

Figure 21. Processor shield opening and closing lever sequence

1. *close first* socket release lever
2. lock icon
3. processor
4. *open first* socket release lever
5. unlock icon

5. Position your thumb firmly over the processor *open first* socket-release lever near the unlock icon and release the lever from the locked position by pushing down and out from under the tab.
6. Similarly, position your thumb firmly over the processor *close first* socket-release lever near the lock icon and release the lever from the locked position by pushing down and out from under the tab. Rotate the lever 90 degrees upward.
7. Lower the *open first* socket-release lever to lift the processor shield.

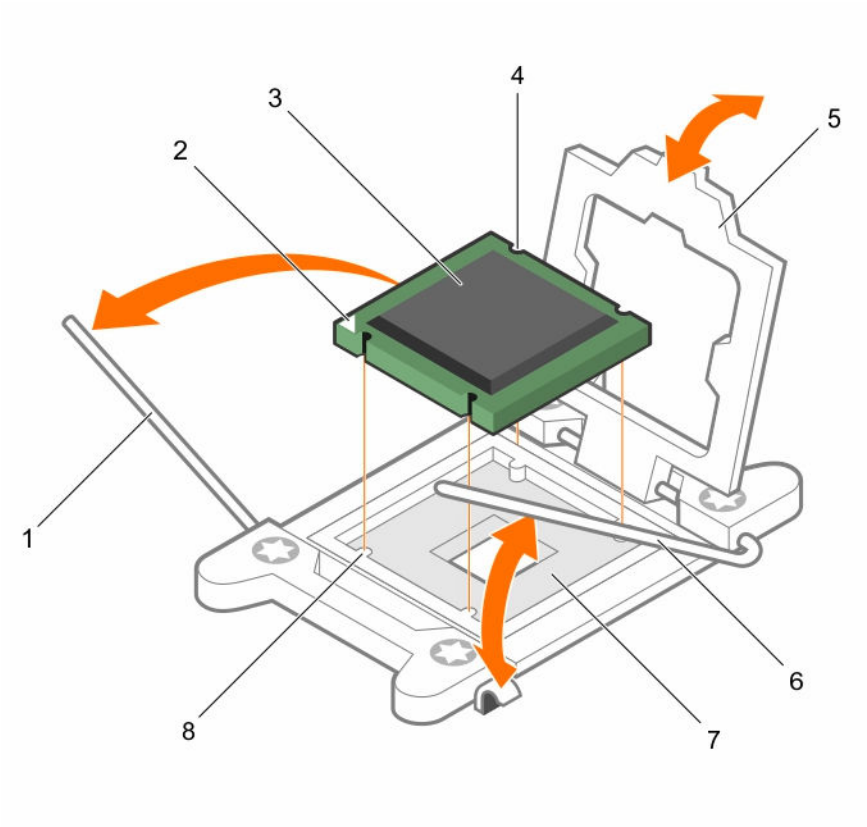

Figure 22. Removing and installing a processor

1. *close first* socket-release lever
2. pin-1 indicator of processor
3. processor
4. slot (4)
5. processor shield
6. *open first* socket-release lever
7. socket
8. socket keys (4)

8. Hold the tab on the processor shield and rotate the processor shield upward until the *open first* socket-release lever lifts up.
9. Lift the processor out of the socket and leave the *open first* socket-release lever up so that the socket is ready for the new processor.

CAUTION: The socket pins are fragile and can be permanently damaged. Be careful not to bend the pins in the socket when removing the processor out of the socket.

NOTE: If you are permanently removing the processor, you must install a socket protective cap in the vacant socket to protect the socket pins and keep the socket free of dust.

NOTE: After removing the processor, place it in an antistatic container for reuse, return, or temporary storage. Do not touch the bottom of the processor. Touch only the side edges of the processor.

Installing a processor

Prerequisites

1. Ensure that you read the Safety instructions.
2. Keep the #2 Phillips screwdriver handy.
3. Before upgrading your system, download the latest system BIOS version from **Dell.com/support** and follow the instructions included in the compressed download file to install the update on your system.

   NOTE: You can update the system BIOS by using the Dell Lifecycle Controller.
4. Follow the procedure listed in Before working inside your system.
5. Remove the cooling shroud.

   WARNING: The heat sink and processor are hot to the touch for some time after the system has been powered down. Allow the heat sink and processor to cool before handling them.

   CAUTION: Never remove the heat sink from a processor unless you intend to remove the processor. The heat sink is necessary to maintain proper thermal conditions.

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 came with the product.

NOTE: If you are installing a single processor, it must be installed in socket CPU1.

Steps

1. Remove the heat sink.
2. Unpack the new processor

   If the processor has previously been used in a system, remove any remaining thermal grease from the processor using a lint-free cloth.
3. Locate the processor socket.
4. If applicable, remove the socket protective cap.
5. Position your thumb firmly over the *open first* socket-release lever near the unlock icon and release the lever from the locked position by pushing down and in from under the tab.
6. Similarly, release the *close first* socket-release lever near the lock icon from the locked position. Rotate the lever 90 degrees upward.
7. Hold the tab near the lock symbol on the processor shield and rotate it upward and out of the way.
8. To install the processor in the socket:

   CAUTION: Positioning the processor incorrectly can permanently damage the system board or the processor. Be careful not to bend the pins in the socket.

   CAUTION: While removing or reinstalling the processor, wipe your hands of any contaminants. Contaminants on the processor pins such as thermal grease or oil can damage the processor.

   a. Align the processor with the socket keys on the socket.

CAUTION: Do not use force to seat the processor. When the processor is positioned correctly, it engages easily into the socket.

b. Align the pin-1 indicator of the processor with the triangle on the socket.

c. Place the processor on the socket such that the slots on the processor aligns with the socket keys on the socket.

CAUTION: Do not use force to seat the processor. When the processor is positioned correctly, it engages easily into the socket.

d. Close the processor shield.

e. Rotate the *close first* socket-release lever near the lock icon until it is locked in position.

f. Similarly, rotate the *open first* socket-release lever near the unlock icon to the unlocked position.

9. To install the heat sink:

a. If applicable, remove the existing thermal grease from the heat sink using a clean lint-free cloth.

b. Apply thermal grease on the top of the processor. Use the thermal-grease syringe included with your processor kit to apply the grease in a thin spiral on top of the processor as shown in the figure.

CAUTION: Applying too much thermal grease can result in excess grease coming in contact with and contaminating the processor socket.

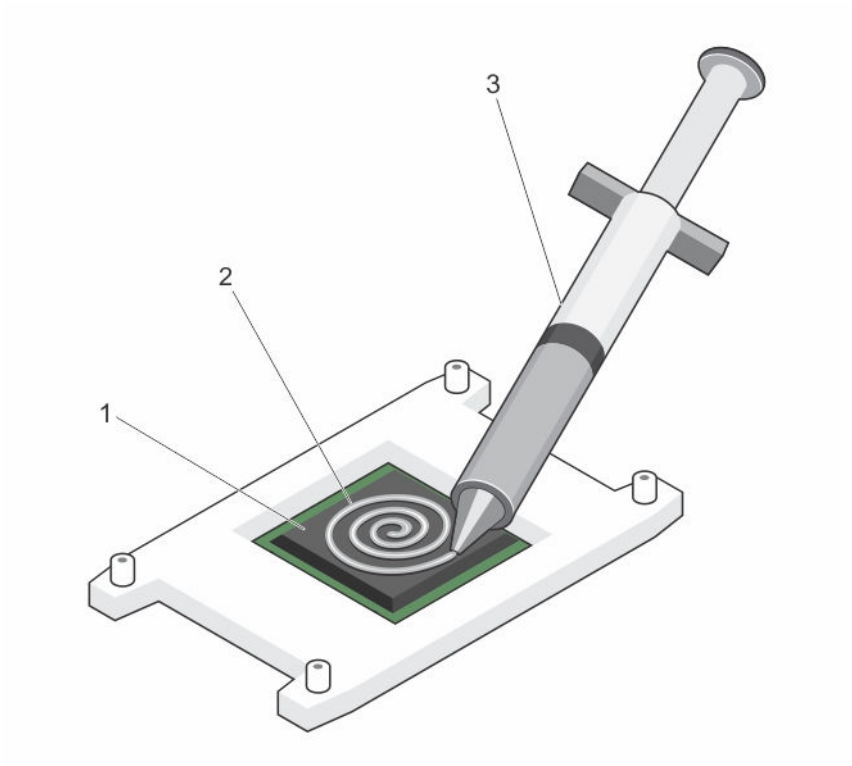

Figure 23. Applying thermal grease on the top of the processor

1. processor
2. thermal grease
3. thermal-grease syringe

NOTE: The thermal-grease is intended for one-time use only. Dispose of the syringe after you use it.

c. Place the heat sink onto the processor.
d. Tighten the four screws to secure the heat sink to the system board.

NOTE: Tighten the screws diagonally opposite to each other. Do not over-tighten the heat sink retention screws when installing the heat sink. To prevent over-tightening, tighten the retention screw until resistance is felt, and stop once the screw is seated. The screw tension should be no more than 6 in-lb (6.9 kg-cm).

Next steps

1. Install the cooling shroud.
2. Follow the procedure listed in After working inside your system.
3. While booting, press F2 to enter the System Setup page and check that the processor information matches the new system configuration.
4. Run the system diagnostics to verify that the new processor operates correctly.

Power supply units

Your system supports the following power supply units (PSU):

- 550 W AC (redundant)

When two identical PSUs are installed, the power supply configuration is redundant (1 + 1). In redundant mode, power is supplied to the system equally from both PSUs to maximize efficiency.

NOTE: The PSUs must be of the same type and have the same maximum output power.

NOTE: For AC PSUs, use only PSUs with the Extended Power Performance (EPP) label on the back. Mixing PSUs from previous generations of Dell PowerEdge servers can result in a PSU mismatch condition or failure to turn on.

Hot Spare feature

Your system supports the Hot Spare feature that significantly reduces the power overhead associated with PSU redundancy.

When the Hot Spare feature is enabled, one of the redundant power supplies is switched to a sleep state. The active PSU supports 100 percent of the load, thus operating at higher efficiency. The PSU in the sleep state monitors output voltage of the active PSU. If the output voltage of the active PSU drops, the PSU in the sleep state returns to an active output state.

If having both power supplies active is more efficient than having one PSU in a sleep state, the active PSU can also activate a sleeping PSU.

The default PSU settings are as follows:

- If the load on the active PSU is more than 50 percent, then the redundant PSU is switched to the active state.
- If the load on the active PSU is less than 20 percent, then the redundant PSU is switched to the sleep state

You can configure the Hot Spare feature by using the iDRAC settings. For more information about iDRAC settings, see the *Integrated Dell Remote Access Controller User's Guide* at **Dell.com/support/home**.

Removing a redundant power supply unit

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.

CAUTION: The system requires one power supply unit (PSU) for normal operation. On power-redundant systems, remove and replace only one PSU at a time in a system that is powered on.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Disconnect the power cable from the power source.
3. Disconnect the power cable from the PSU and remove the straps that bundle and secure the system cables.
4. Unlatch and lift the optional cable management arm if it interferes with PSU removal. For information about the cable management arm, see the system's rack documentation.

Steps

Press the release latch and pull the PSU out of the chassis.

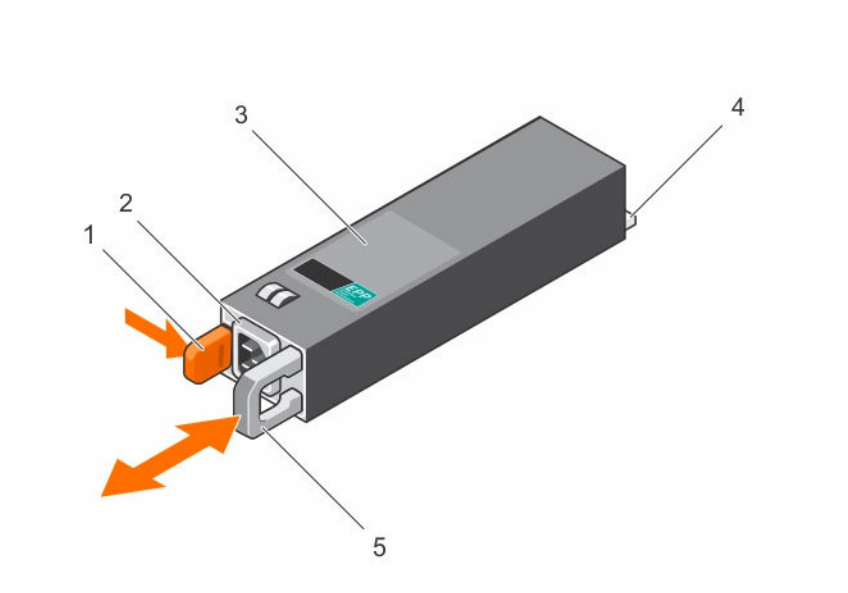

Figure 24. Removing and installing a redundant PSU

1. release latch
2. PSU connector
3. PSU
4. power connector

5. PSU handle

Next steps

1. Install the PSU.
2. If you are not immediately installing a PSU, install the PSU blank.

Installing a redundant power supply unit

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.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Verify that both power supply units (PSUs) are of the same type and have the same maximum output power.

   NOTE: The maximum output power (shown in Watt) is listed on the PSU label.
3. If installed, remove the PSU blank.

Steps

Slide the new PSU into the chassis until the PSU is fully seated and the release latch snaps into place.

Next steps

1. If you have unlatched the cable management arm, relatch it. For information about the cable management arm, see the rack documentation of the system.
2. Connect the power cable to the PSU and plug the cable into a power outlet.

   CAUTION: When connecting the power cable, secure the cable with the strap.

   NOTE: When installing, hot-swapping, or hot-adding a new PSU in a system with two PSUs, allow several seconds for the system to recognize the PSU and determine its status. The PSU status indicator turns green to signify that the PSU is functioning properly.

System battery

Replacing the system battery

Prerequisites

WARNING: There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. See your safety information for additional information.

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 came with the product.

1. Ensure that you follow the Safety instructions.

2. Follow the procedure listed in Before working inside your system.
3. Remove the expansion-card riser.

Steps

1. Locate the battery socket, see System board connectors.

   CAUTION: To avoid damage to the battery connector, you must firmly support the connector while installing or removing a battery.

2. To eject the battery, press firmly on the edge of the positive side of the battery in the direction of the arrow as shown in the figure here.

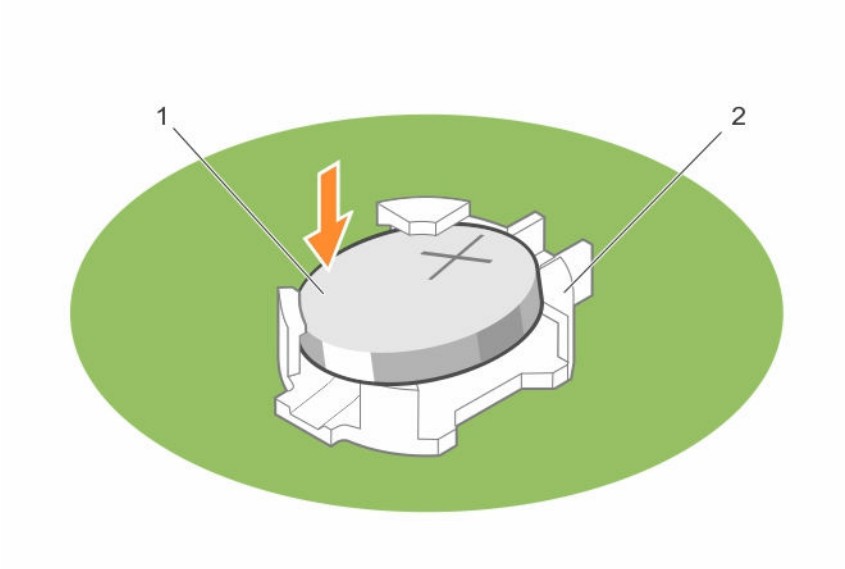

Figure 25. Replacing the system battery

1. positive side of battery
2. socket

3. To install a new system battery, hold the battery with the positive facing up and slide it under the securing tabs.
4. Press the battery into the connector until it snaps into place.

Next steps

1. Install the expansion-card riser.
2. Follow the procedure listed in After working inside your system.
3. While booting, press F2 to enter the System Setup and ensure the battery is operating properly.
4. Enter the correct time and date in the System Setup **Time** and **Date** fields.
5. Close the System Setup page.

Hard-drive backplane

Dell XC430 system configuration supports 3.5-inch (x4) SAS/SATA backplane.

Removing the hard-drive backplane

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 came with the product.

CAUTION: To prevent damage to the drives and backplane, you must remove the hard drives from the system before removing the backplane.

CAUTION: You must note the number of each hard drive and temporarily label them before removal so that you can replace them in the same locations.

1. Ensure that you read the 3.5 inch or 2.5 inch (x4) SAS/SATA backplane Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove all hard drives.

Steps

1. Disconnect the SAS/SATA data, signal, and power cable(s) from the backplane.
2. Press the release tabs and lift the backplane upward and slide it toward the back of the chassis.

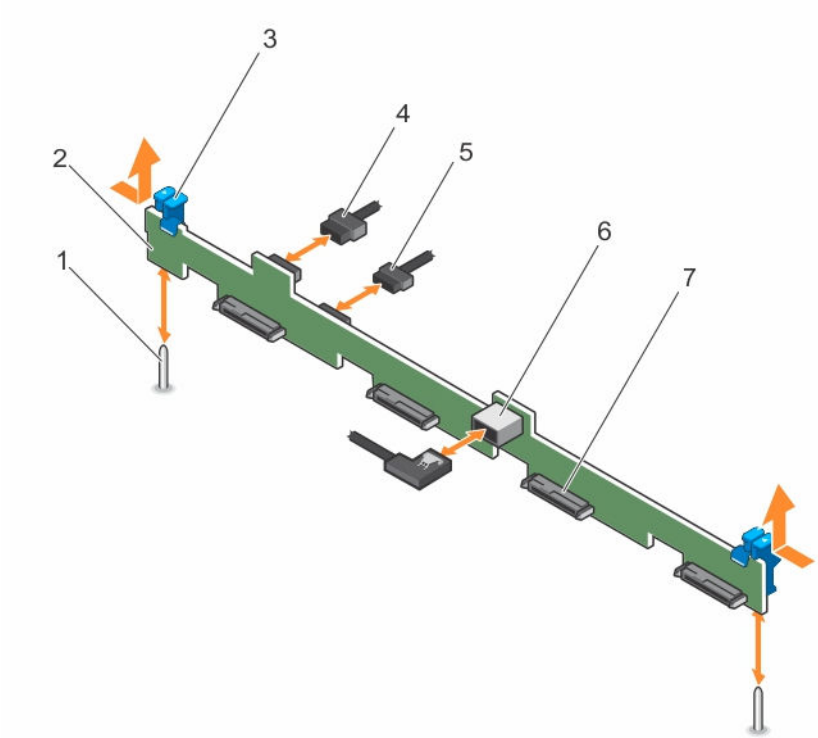

Figure 26. Removing and Installing the 3.5-inch (x4) SAS/SATA backplane

1. guide (2)
2. hard drive or SSD backplane
3. release tab (2)
4. backplane power cable

5. backplane signal cable
6. SAS_A connector on the backplane
7. hard drive or SSD connector (4)

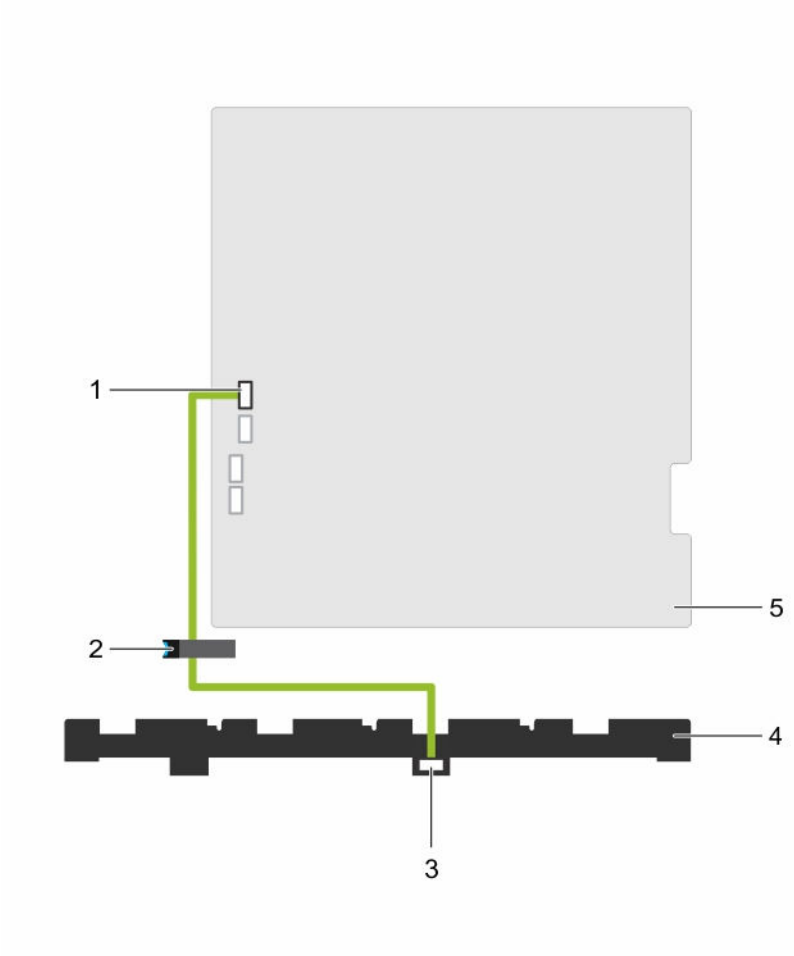

Figure 27. Cabling diagram—3.5-inch (x4) SAS/SATA backplane

1. SW_RAID_A connector on the system board
2. cable routing latch
3. SAS_A connector on the backplane
4. hard-drive backplane
5. system board

Installing the hard drive backplane

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.

CAUTION: To prevent damage to the control panel flex cable, do not bend the control panel flex cable after it is inserted into the connector.

1. Follow the safety guidelines listed in Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.

Steps

1. Align the slots on the hard drive backplane with the hooks on the chassis.
2. Press down the hard drive backplane until the release tabs snap into place.
3. Connect the SAS/SATA/SSD data, signal, and power cables to the backplane.

Next steps

1. Install the hard drives in their original locations.
2. Follow the procedure listed in the After working inside your system section.

Control panel assembly

Removing the control panel

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 came with the product.

1. Ensure that you read the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Keep the #2 Phillips screwdriver handy.

Steps

1. Using a #2 Phillips screwdriver, remove the screw(s) securing the control panel to the chassis.

   CAUTION: Do not use excessive force when removing the control panel as it can damage the connectors.
2. Release the locking tabs of the control panel by angling the control panel up and away from the system.
3. Remove all the cables connecting the control panel to the chassis.

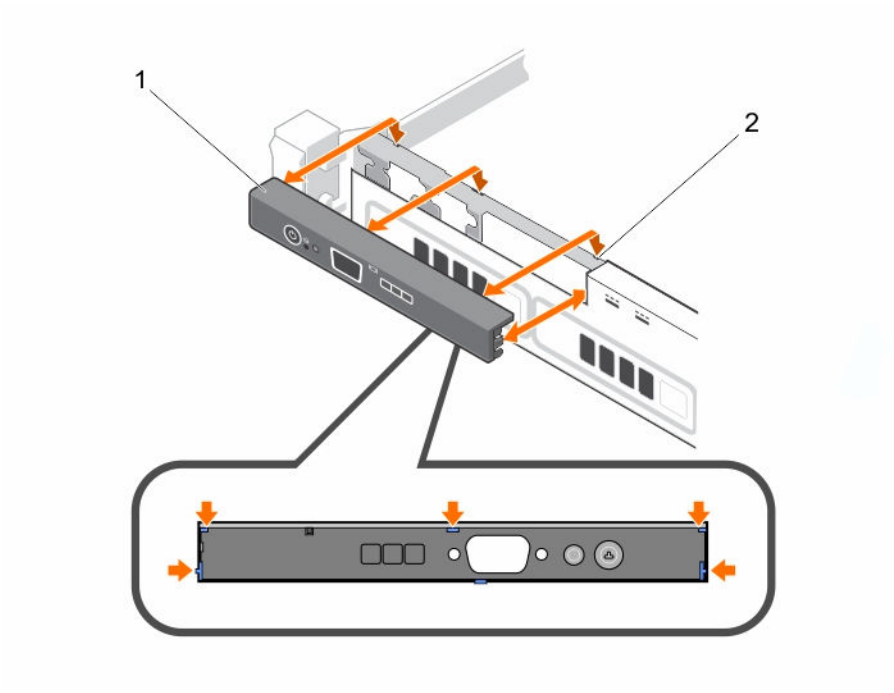

Figure 28. Removing and installing the control panel—four 3.5 inch hard-drives chassis

1. control panel
2. notches (6)

Next steps

1. Replace the control panel.
2. Follow the procedure listed in After working inside your system.

Installing the control panel

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 came with the product.

1. Ensure that you read the Safety instructions.
2. Keep the #2 Phillips screwdriver handy.

Steps

Align the locking tabs on the control panel with the notches on the chassis and angle the control panel until it snaps into place.

When properly seated, the control panel will be flush with the front panel.

Next steps

Follow the procedure listed in After working inside your system.

Removing the control-panel module

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 came with the product.

1. Ensure that you read the Safety instructions.
2. Follow the procedure listed in Before working inside your system.

CAUTION: Do not use excessive force when removing the control panel as it can damage the connectors.

Steps

1. Remove the screw(s) securing the control-panel module to the chassis.
2. Remove all the cables connecting the control-panel module to the chassis.

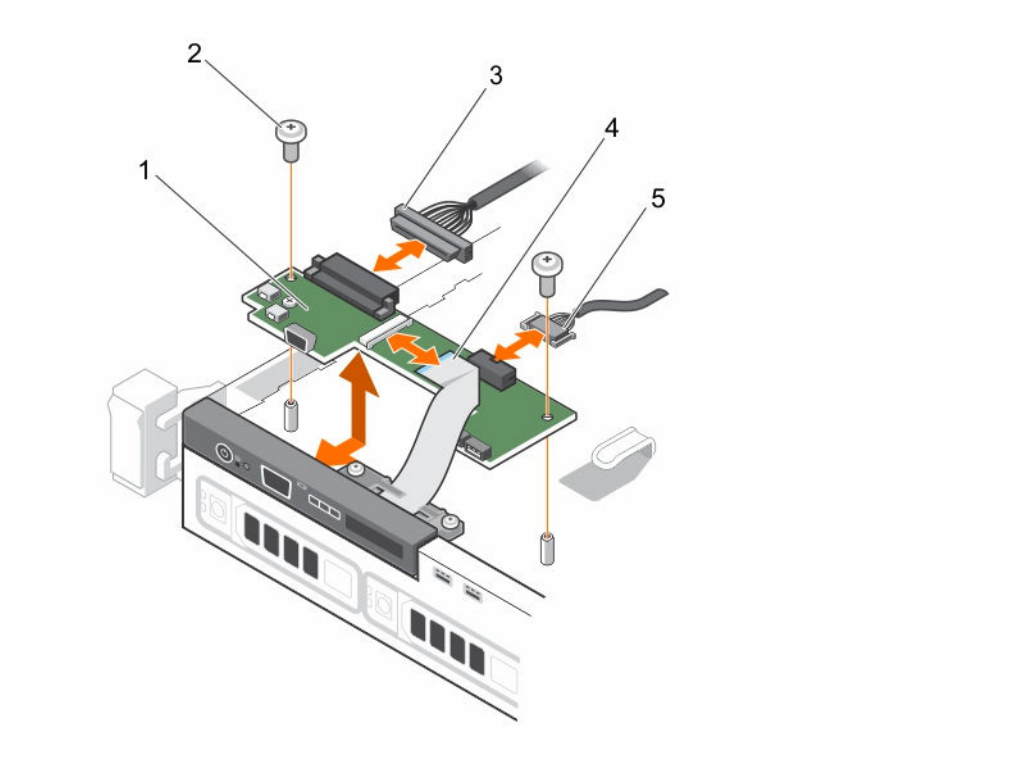

Figure 29. Removing and installing the control panel module—four hard-drive chassis

1. control-panel module
2. control-panel module screws (2)
3. control-panel module connector cable
4. display module cable
5. USB connector cable

Installing the control-panel module

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 came with the product.

1. Ensure that you read the Safety instructions.
2. Follow the procedure listed in Before working inside your system.

Steps

1. Insert the control-panel module into the slot in the chassis and align the two screw holes on the control-panel module with the corresponding holes on the chassis.
2. Secure the control-panel module with the screws.
3. Connect all the applicable cables to the control-panel module.

Next steps

Follow the procedure listed in After working inside your system.

Power interposer board

The power interposer board is a board that connects the redundant power supplies to the system board. The power interposer board (PIB) is only supported in systems with redundant power supplies.

Removing the power interposer board

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.

NOTE: The power interposer board is present only in systems that support redundant power supplies.

1. Ensure that you read the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the power supplies from the system.

Steps

1. Disconnect the power distribution cables from the system board.
2. Disconnect the fan cable.
3. Remove the two screws securing the power interposer board to the chassis and lift the board out of the chassis.

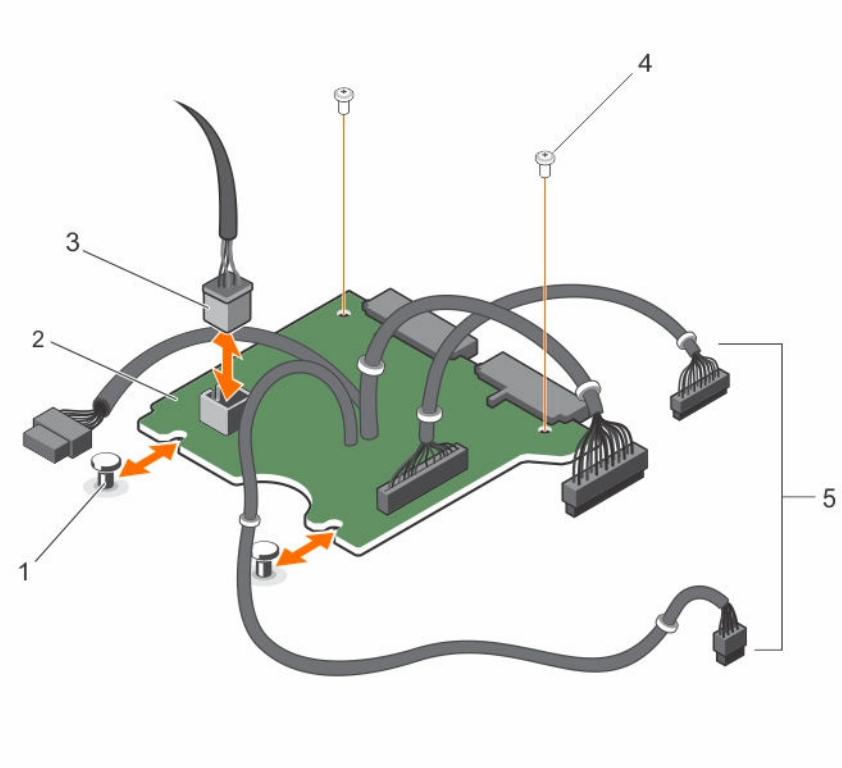

Figure 30. Removing and installing the power interposer board

1. standoffs (2)
2. power interposer board
3. fan cable connector
4. screw (2)
5. power supply cables to the system board (3)

Installing the power interposer board

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.

1. Follow the safety guidelines listed in the Safety instructions section.

Steps

1. Align the power interposer board (PIB) with the standoffs on the chassis.
2. Install the two screws that secure the PIB to the chassis.
3. Connect the power distribution cables to the system board and fan cable connector to PIB.

Next steps

1. Follow the procedure listed in After working inside your system section.

System board

Removing the system board

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.

CAUTION: If you are using the Trusted Program Module (TPM) with an encryption key, you may be prompted to create a recovery key during program or System Setup. Be sure to 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: Do not attempt to remove the TPM plug-in module from the system board. Once 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, and it cannot be re-installed or installed on another system board.

1. Ensure that you read the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the following:
   a. cooling shroud
   b. memory modules
   c. cooling fan cables
   d. expansion cards
   e. expansion-card riser
   f. integrated storage controller card
   g. heat sink and processor
   h. internal dual SD module

Steps

1. Disconnect all other cables from the system board.

   CAUTION: Take care not to damage the system identification button while removing the system board from the chassis.

2. Remove the nine screws on the system board and slide the system board toward the front of the system.
3. Hold the system board t-handle and lift the system board out of the chassis.

   NOTE: To prevent damage to the system board, ensure that you hold the system board by its edges only.

   CAUTION: Do not lift the system board by holding a memory module, processor, or other components.

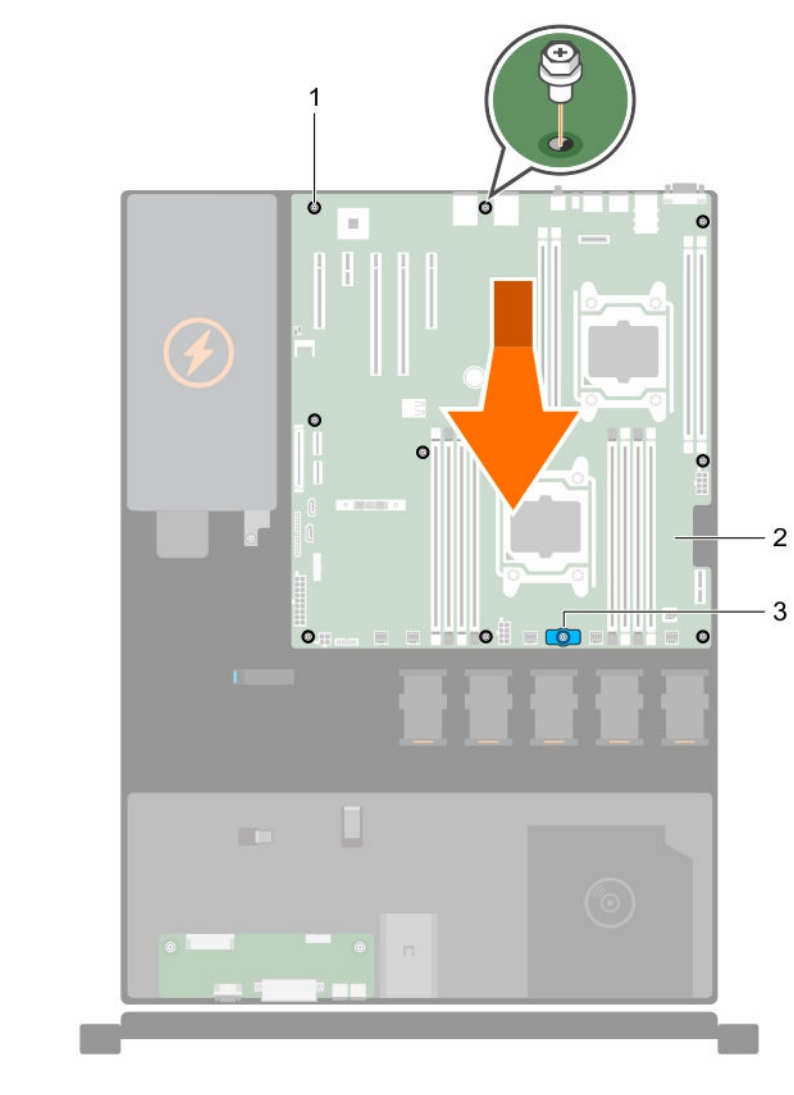

Figure 31. Removing and installing the system board

1. screw (9)
2. system board
3. system board t-handle

Installing the system board

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 came with the product.

CAUTION: Do not lift the system board assembly by holding a memory module, processor, or other components.

CAUTION: Take care not to damage the system identification button while placing the system board into the chassis.

1. Ensure that you read the Safety instructions.
2. Unpack the new system board assembly.

Steps

1. Hold the system board by its edges and the system board t-handle, and angle it toward the back of the chassis.
2. Lower the system board into the chassis till the connectors at the back of the system board align with the slots on the rear wall of the chassis, and the screw holes on the system board align with the standoffs on the chassis.
3. Tighten the nine screws that secure the system board to the chassis.

Next steps

1. Install the Trusted Platform Module (TPM). See, Installing the Trusted Platform Module .
2. Replace the following:
   a. internal dual SD module
   b. heat sink or heat-sink blank and processor or processor blank
   c. expansion-card riser
   d. expansion cards
   e. integrated storage controller card
   f. cooling fan cables
   g. memory modules
   h. cooling shroud
3. Reconnect all cables to the system board.

   NOTE: Ensure that the cables inside the system are routed through the cable routing latch.
4. Follow the procedure listed in After working inside your system.
5. Import your new or existing iDRAC Enterprise license. For more information, see the *Integrated Dell Remote Access Controller User's Guide* available at **Dell.com/support/home**.
6. Ensure that you:
   a. Use the Easy Restore feature to restore the service tag. See Restoring the Service Tag using Easy Restore.
   b. If the Service Tag is not backed up in the backup flash device, enter the system service tag manually. See Entering the system Service Tag using System Setup.
   c. Update the BIOS and iDRAC versions.
   d. Re-enable the Trusted Platform Module (TPM). See Re-enabling the TPM for BitLocker users or Re-enabling the TPM for TXT users.

Entering the system Service Tag using System Setup

If you know the system Service Tag, use the System Setup menu to enter the Service Tag.

1. Turn on the system.
2. Press F2 to go to the System Setup.
3. Click **Service Tag Settings**.
4. Type the Service Tag.

   NOTE: You can type the only when the **Service Tag** field is empty. Ensure that you enter the correct Service Tag. Once the Service Tag is entered, it cannot be updated or changed.
5. Click **Ok**.
6. Import your new or existing iDRAC Enterprise license.

   For more information, see *Integrated Dell Remote Access Controller User's Guide*, at **Dell.com/idracmanuals**.

Restoring the Service Tag using Easy Restore

Use the Easy Restore feature if you do not know the Service Tag of your system. The Easy Restore feature allows you to restore your system's Service Tag, license, UEFI configuration, and the system configuration data after replacing the system board. All data is backed up in a backup flash device automatically. If BIOS detects a new system board and the Service Tag in the backup flash device, BIOS prompts the user to restore the backup information.

1. Turn on the system.

   If BIOS detects a new system board, and if the Service Tag is present in the backup flash device, BIOS displays the Service Tag, the status of the license, and the **UEFI Diagnostics** version.
2. Do one of the following:
   - To restore the Service Tag, license, and diagnostics information, press Y.
   - To navigate to the Lifecycle Controller based restore options, press N.
   - To restore data from a previously created **Hardware Server Profile,** press F10.

   After the restore process is complete, BIOS prompts to restore the system configuration data.
3. Do one of the following:
   - Press Y to restore the system configuration data.
   - Press N to use the default configuration settings.

   After the restore process is complete, the system restarts.

Trusted Platform Module

The Trusted Platform Module (TPM) is used to generate/store keys, protect/authenticate passwords, and create/store digital certificates. TPM can also be used to enable the BitLocker hard drive encryption feature in Windows Server.

CAUTION: Do not attempt to remove the Trusted Platform Module (TPM) from the system board. After the TPM is installed, it is cryptographically bound to that specific system board. Any attempt to remove an installed TPM breaks the cryptographic binding, and it cannot be re-installed or installed on another system board.

Installing the Trusted Platform Module

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.

Ensure that you read the Safety instructions.

Steps

1. Locate the TPM connector on the system board.
2. Align the edge connectors on the TPM with the slot on the TPM connector.
3. Insert the TPM into the TPM connector such that the plastic bolt aligns with the slot on the system board.
4. Press the plastic bolt until the bolt snaps into place.

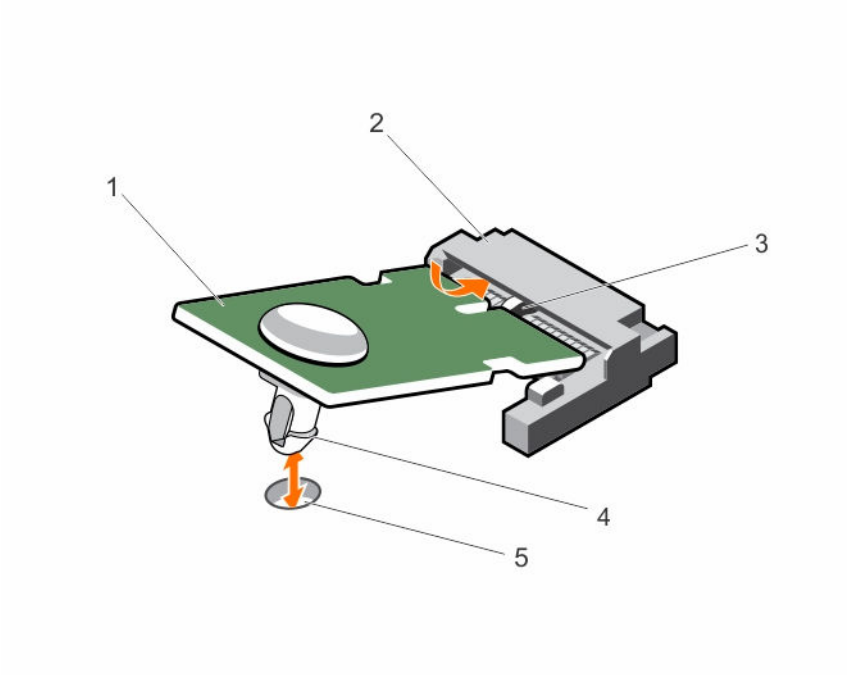

Figure 32. Installing the TPM

1. TPM
2. TPM connector
3. slot on the TPM connector
4. plastic bolt
5. slot on the system board

Re-enabling the TPM for BitLocker users

Initialize the TPM.

For more information on initializing the TPM, go to **http://technet.microsoft.com/en-us/library/cc753140.aspx**.

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

Re-enabling the TPM for TXT users

1. While booting your system, press F2 to go to **System Setup**.
2. On the **System Setup Main Menu** screen, click **System BIOS → System Security** .
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 your system.
7. Go to **System Setup**.
8. On the **System Setup Main Menu** screen, click **System BIOS → System Security**.
9. From the **Intel TXT** option, select **On**.

5

Troubleshooting your system

Safety first—for you and your system

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.

Troubleshooting system startup failure

If you boot the system to the BIOS boot mode after installing an operating system from the UEFI Boot Manager, the system stops responding. The vice-versa is also true. You must boot to the same boot mode in which you installed the operating system.

For all other startup issues, note the system messages that appear on the screen.

Troubleshooting external connections

Ensure that all external cables are securely attached to the external connectors on your system before troubleshooting any external devices.

Troubleshooting the video subsystem

1. Check the system and power connections to the monitor.
2. Check the video interface cabling from the system to the monitor.
3. Run the appropriate diagnostic test.

If the tests run successfully, the problem is not related to video hardware.

If the tests fail, see Getting Help.

Troubleshooting a USB device

About this task

Use the following steps to troubleshoot a USB keyboard/mouse. For other USB devices, go to step 7.

Steps

1. Disconnect the keyboard and mouse cables from the system and reconnect them.
2. If the problem persists, connect the keyboard/mouse to the USB ports on the opposite side of the system.

3. If the problem is resolved, restart the system, enter the System Setup, and check if the non-functioning USB ports are enabled.

   Check if USB 3.0 is enabled in System Setup. If enabled, disable it and see if the issue is resolved (older operating systems may not support USB 3.0).
4. On the **IDRAC Settings Utility** screen, ensure that the **USB Management Port Mode** is configured as **Automatic** or **Standard OS Use**.
5. Replace the keyboard/mouse with a working keyboard/mouse.

   If the problem is not resolved, proceed to the next step to begin troubleshooting other USB devices attached to the system.
6. Power down all attached USB devices and disconnect them from the system.
7. Restart the system and if your keyboard is functioning, go to the System Setup.
8. Verify that all USB ports are enabled on the **Integrated Devices** screen, in the System Setup options.
9. Check if USB 3.0 is enabled in System Setup. If it is enabled, disable it and restart your system.

   If your keyboard is not functioning, you can also use remote access.
10. If the system is not accessible, reset the NVRAM_CLR jumper inside your system and restore the BIOS to the default settings.
11. On the **IDRAC Settings Utility** screen, ensure that the **USB Management Port Mode** is configured as **Automatic** or **Standard OS Use**.
12. Reconnect and power on each USB device one at a time.
13. If a USB device causes the same problem, power down the device, replace the USB cable with a known good cable, and power up the device.

Next steps

If all troubleshooting fails, see Getting Help.

Troubleshooting a serial I/O device

Steps

1. Turn off the system and any peripheral devices connected to the serial port.
2. Swap the serial interface cable with a working cable, and turn on the system and the serial device.

   If the problem is resolved, replace the interface cable with a known good cable.
3. Turn off the system and the serial device, and swap the serial device with a comparable device.
4. Turn on the system and the serial device.

Next steps

If the issue persists, see Getting Help.

Troubleshooting a NIC

Steps

1. Run the appropriate diagnostic test. See Using system diagnostics for available diagnostic tests.
2. Restart the system and check for any system messages pertaining to the NIC controller.
3. Check the appropriate indicator on the NIC connector:
   - If the link indicator does not light, check all cable connections.
   - If the activity indicator does not light, the network driver files might be damaged or missing.

Remove and reinstall the drivers if applicable. See the NIC documentation.

- If applicable, change the autonegotiation setting.
- Use another connector on the switch or hub.

4. Ensure that the appropriate drivers are installed and the protocols are bound. See the NIC documentation.
5. Enter the System Setup and confirm that the NIC ports are enabled on the **Integrated Devices** screen.
6. Ensure that the NICs, hubs, and switches on the network are all set to the same data transmission speed and duplex. See the documentation for each network device.
7. Ensure that all network cables are of the proper type and do not exceed the maximum length.

Next steps

If all troubleshooting fails, see Getting Help.

Troubleshooting a wet system

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. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover.
3. Remove the following components from the system:
   - hard drives
   - hard-drive backplane
   - USB memory key
   - hard-drive tray
   - cooling shroud
   - expansion-card risers (if present)
   - expansion cards
   - power supply unit(s)
   - cooling-fan assembly (if present)
   - cooling fans
   - processor(s) and heat sink(s)
   - memory modules
4. Let the system dry thoroughly for at least 24 hours.
5. Reinstall the components you removed in step 3.
6. Install the system cover.
7. Turn on the system and attached peripherals.

   If the system does not start properly, see Getting Help.
8. If the system starts properly, shut down the system, and reinstall all the expansion cards that you removed.

9. Run the appropriate diagnostic test. For more information, see Using system diagnostics.

Next steps

If the tests fail, see Getting Help.

Troubleshooting a damaged system

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. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover.
3. Ensure that the following components are properly installed:
   - Cooling shroud
   - Expansion-card risers (if present)
   - Expansion cards
   - Power supply(s)
   - Cooling-fan assembly (if present)
   - Cooling fans
   - Processor(s) and heat sink(s)
   - Memory modules
   - Hard-drive carriers
   - Hard-drive backplane
4. Ensure that all cables are properly connected.
5. Install the system cover.
6. Run the appropriate diagnostic test. For more information, see Using system diagnostics.

Next steps

If the tests fail, see Getting Help.

Troubleshooting the system battery

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.

NOTE: If the system is turned off for long periods of time (for weeks or months), the NVRAM may lose its system configuration information. This situation is caused by a defective battery.

NOTE: Some software may cause the system time to speed up or slow down. If the system seems to operate normally except for the time kept in the System Setup, the problem may be caused by software rather than by a defective battery.

Steps

1. Reenter the time and date in the System Setup.
2. Turn off the system and disconnect it from the electrical outlet for at least one hour.
3. Reconnect the system to the electrical outlet and turn on the system.
4. Go to the System Setup.

   If the date and time are not correct in the System Setup, check the SEL for system battery messages.

Next steps

If the problem persists, see Getting Help.

Troubleshooting power supply units

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.

Power source problems

1. Press the power button to ensure that your system is turned on. If the power indicator does not light up when the power button is pressed, press the power-on button firmly.
2. Plug in another working device to ensure that the system board is not faulty.
3. Ensure that no loose connections exist.

   For example, loose power cables.
4. Ensure that the power source meets applicable standards.
5. Ensure that there are no short circuits.
6. Have a qualified electrician check the line voltage to ensure that it meets the required specifications.

PSU problems

1. Ensure that no loose connections exist.

   For example, loose power cables.
2. Ensure that the PSU handle or LED indicates that the PSU is working properly.
3. If you have recently upgraded your system, ensure that the PSU has enough power to support the new system.
4. If you have a redundant power supply configuration, ensure that both the PSUs are of the same type and wattage.

   You may have to upgrade to a higher wattage PSU.
5. Ensure that you use only PSUs with the Extended Power Performance (EPP) label on the back.
6. Reseat the PSU.

   NOTE: After installing a PSU, allow several seconds for the system to recognize the PSU and determine if it is working properly.

   If the issue persists, see Getting Help.

Troubleshooting cooling problems

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.

Ensure that the following conditions exist:

- System cover, cooling shroud, EMI filler panel, or back-filler bracket is not removed.
- Ambient temperature is not too high.
- External airflow is not obstructed.
- A cooling fan is not removed or has not failed.
- The expansion card installation guidelines have been followed.

Additional cooling can be added by one of the following methods:

On the iDRAC Web GUI:

1. Click **Hardware → Fans → Setup**.
2. From the **Fan Speed Offset** drop-down list, select the cooling level needed or set the minimum fan speed to a custom value.

On F2 System Setup:

1. Select **iDRAC Settings → Thermal**, and set a higher fan speed from the fan speed offset or minimum fan speed.

From RACADM commands

1. Run the command: `racadm help system.thermalsettings`

For more information, see the *Integrated Dell Remote Access Controller User's Guide* at **Dell.com/idracmanuals**.

Troubleshooting cooling fans

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.

NOTE: In the event of a problem with a particular fan, the fan number is referenced by the system's management software, allowing you to easily identify and replace the proper fan by noting the fan numbers on the cooling fan assembly.

Steps

1. Remove the system cover.
2. Reseat the fan or the fan's power cable.

3. Install the system cover.
4. Restart your system.,

Next steps

If the problem persists, see Getting Help.

Troubleshooting system memory

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. If the system is operational, run the appropriate diagnostic test. See Using system diagnostics for available diagnostic tests.

   If diagnostics indicate a fault, follow the corrective actions provided by the diagnostic program.
2. If the system is not operational, turn off the system and attached peripherals, and unplug the system from the power source. Wait for at least 10 seconds and then reconnect the system to the power source.
3. Turn on the system and attached peripherals and note the messages on the screen.

   If an error message is displayed indicating a fault with a specific memory module, go to step 12.
4. Open the System Setup page and check the system memory setting. Make any changes to the memory settings, if required.

   If the memory settings match the installed memory but the issue still persists, go to step 12.
5. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
6. Remove the system cover.
7. Check the memory channels and ensure that they are populated correctly.

   NOTE: See the system event log or system messages for the location of the failed memory module. Reinstall the memory device.
8. Reseat the memory modules in their sockets.
9. Install the system.
10. Open the System Setup page and check the system memory setting.

    If the issue is not resolved, proceed with the next step.
11. Remove the system cover.
12. If a diagnostic test or error message indicates a specific memory module as faulty, swap or replace the module with a known good memory module.
13. To troubleshoot an unspecified faulty memory module, replace the memory module in the first DIMM socket with a module of the same type and capacity.

    If an error message is displayed on the screen, this may indicate a problem with the installed DIMM type(s), incorrect DIMM installation, or defective DIMM(s). Follow the on-screen instructions to resolve the problem.
14. Install the system cover.
15. As the system boots, observe any error message that is displayed and the diagnostic indicators on the front of the system.

16. If the memory issue persists, repeat step 12 through step 15 for each memory module installed.

Next steps

If the issue persists after all memory modules have been checked, see Getting Help.

Troubleshooting an SD card

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.

NOTE: Certain SD cards have a physical write-protect switch on the card. If the write-protect switch is turned on, the SD card is not writeable.

Steps

1. Enter the System Setup and ensure that the **Internal SD Card Port** is enabled.
2. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
3. Remove the system cover.

   NOTE: When an SD card failure occurs, the internal dual SD module controller notifies the system. On the next restart, the system displays a message indicating the failure. If redundancy is enabled at the time of SD card failure, a critical alert is logged and chassis health degrades.
4. Replace the failed SD card with a new SD card.
5. Install the system cover.
6. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.
7. Enter the System Setup and ensure that the **Internal SD Card Port** and **Internal SD Card Redundancy** mode is set to the required mode.

   Verify that correct SD slot is set as **Primary SD Card**.
8. Check if the SD card is functioning properly.
9. If the **Internal SD Card Redundancy** option is set to **Enabled** at the time of the SD card failure, the system prompts you to perform a rebuild.

   NOTE: The rebuild is always be sourced from the primary SD card to the secondary SD card. Perform the rebuild of the SD card as necessary.

Troubleshooting a hard drive

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.

CAUTION: This troubleshooting procedure can erase data stored on the hard drive. Before you proceed, back up all files on the hard drive.

Steps

1. Run the appropriate diagnostic test. For more information, see Using system diagnostics.

   Depending on the results of the diagnostics test, proceed as needed through the following steps.
2. Ensure that the required device drivers for your controller card are installed and are configured correctly. See the operating system documentation for more information.
3. Reboot the system and enter the System Setup.
4. Verify that the controller is enabled and the drives are displayed in the System Setup.

Next steps

If the problem persists, try troubleshooting the expansion cards or see Getting Help.

Troubleshooting a storage controller

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: When troubleshooting a SAS or PERC controller, see the documentation for your operating system and the controller.

1. Run the appropriate diagnostic test. For more information, see Using system diagnostics.
2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
3. Remove the system cover.
4. Verify that the installed expansion cards are compliant with the expansion card installation guidelines.
5. Ensure that each expansion card is firmly seated in its connector.
6. Install the system cover.
7. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
8. If the problem is not resolved, turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
9. Remove the system cover.
10. Remove all expansion cards installed in the system.
11. Install the system cover.
12. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
13. Run the appropriate diagnostic test. For more information, see . If the tests fail, see Getting Help.
14. For each expansion card you removed in step 10, perform the following steps:

    a. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
    b. Remove the system cover.
    c. Reinstall one of the expansion cards.
    d. Install the system cover.
    e. Run the appropriate diagnostic test. For more information, see Using system diagnostics.

If the tests fail, see Getting Help.

Troubleshooting expansion cards

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.

NOTE: When troubleshooting an expansion card, see the documentation for your operating system and the expansion card.

Steps

1. Run the appropriate diagnostic test. For more information, see Using system diagnostics.
2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
3. Remove the system cover.
4. Ensure that each expansion card is firmly seated in its connector.
5. Install the system cover.
6. If the problem is not resolved, turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
7. Remove the system cover.
8. Remove all expansion cards installed in the system.
9. Install the system cover.

   If the tests fail, see Getting Help.
10. For each expansion card you removed in step 8, perform the following steps:
    a. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
    b. Remove the system cover.
    c. Reinstall one of the expansion cards.
    d. Install the system cover.
    e. Run the appropriate diagnostic test. For more information, see Using system diagnostics.

Next steps

If the problem persists, see Getting Help.

Troubleshooting processors

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. Run the appropriate diagnostics test. See Using system diagnostics for available diagnostic tests.
2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
3. Remove the system cover.

4. Ensure that the processor and heat sink are properly installed.
5. Install the system cover.
6. Run the appropriate diagnostic test. For more information, see Using system diagnostics.

Next steps

If the problem persists, see Getting Help.

System messages

For a list of event and error messages generated by the system firmware and agents that monitor system components, see the Dell Event and Error Messages Reference Guide at **Dell.com/idracmanuals**.

Warning messages

A warning message alerts you to a possible problem and prompts you to respond before the system continues a task. For example, before you format a hard drive, a message warns you that you may lose all data on the hard drive. Warning messages usually interrupt the task and require you to respond by typing y (yes) or n (no).

NOTE: Warning messages are generated by either the application or the operating system. For more information, see the documentation that accompanied the operating system or application.

Diagnostic messages

The system diagnostic utilities may issue messages if you run diagnostic tests on your system. See Using system diagnostics for more information about system diagnostics.

Alert messages

The systems management software generates alert messages for your system. Alert messages include information, status, warning, and failure messages for drive, temperature, fan, and power conditions. For more information, see the systems management software documentation.

6

Using system diagnostics

If you experience a problem with your system, run the system diagnostics before contacting Dell for technical assistance. The purpose of running system diagnostics is to test your system hardware without requiring 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

NOTE: The Dell Embedded System Diagnostics is also known as Enhanced Pre-boot System Assessment (ePSA) diagnostics.

The embedded system diagnostics provides a set of options for particular device groups or devices allowing 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

When to use the Embedded System Diagnostics

If a major component or device in the system does not operate properly, running the embedded system diagnostics may indicate component failure.

Running the Embedded System Diagnostics from Boot Manager

1. As the system boots, press **F11**.
2. Use the up-and down arrow keys to select **System Utilities → Launch Diagnostics**.
   The **ePSA Pre-boot System Assessment** window is displayed, listing all devices detected in the system. The diagnostics starts running the tests on all the detected devices.

Running the Embedded System Diagnostics from the Dell Lifecycle Controller

1. As the system boots, press F11.
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 running 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.

For information about embedded system diagnostics, see the *ePSA Diagnostics Guide (Notebooks, Desktops and Servers)* available at **Dell.com/support/home**.

7

Jumpers and connectors

System board jumper settings

For information on resetting the password jumper to disable a password, see Disabling a forgotten password.

Table 17. System board jumper settings

Jumper	Setting	Description
PWRD_EN		The password reset feature is enabled (pins 2–4). BIOS local access is unlocked at the next AC power cycle.
		The password reset feature is disabled (pins 4–6).
NVRAM_CLR		The configuration settings are retained at the next system boot (pins 3–5).
		The configuration settings are cleared at system boot (pins 1–3).

System board connectors

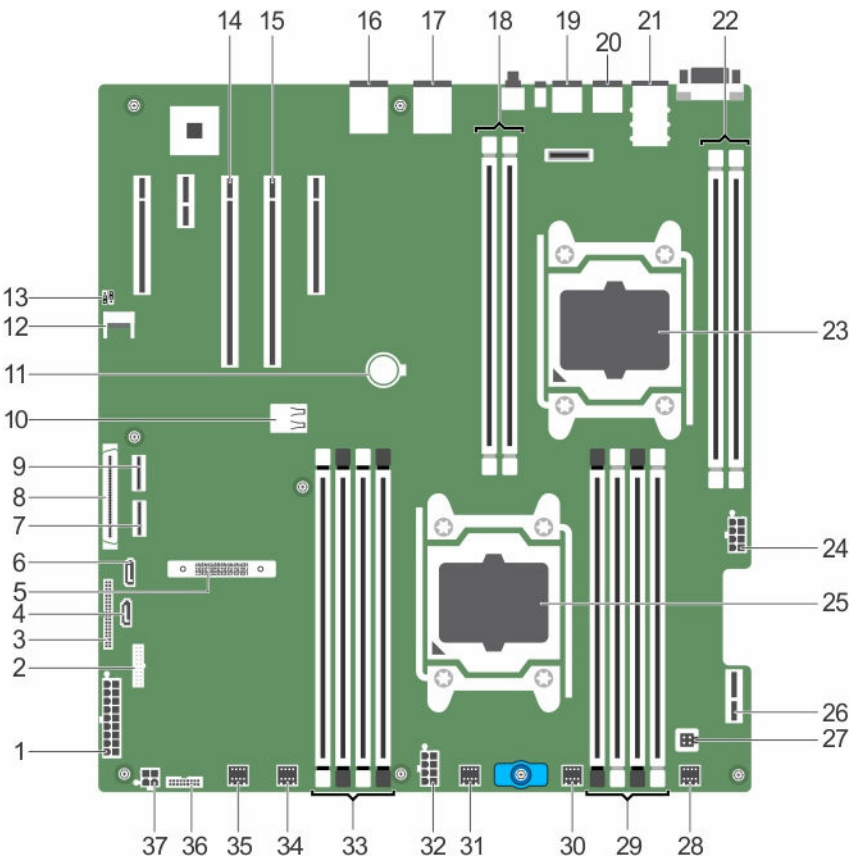

Figure 33. System board jumpers and connectors

Table 18. System board jumpers and connectors

Item	Connector	Description
1	SYS_PWR_CONN (P1)	24-pin power connector
2	FB_USB	Front-panel USB connector
3	PIB_CONN	Power interposer board connector
4	SATA_CDROM	SATA connector CDROM
5	MiniPERC PCIE_G3_X8 (CPU1)	Mini PERC card connector
6	SATA_TBU	SATA connector tape backup unit
7	SW_RAID_B	Software RAID connector B
8	CTRL_PNL	Control panel interface connector
9	SW_RAID_A	Software RAID connector A
10	INT_USB_3.0	Internal USB connector

Item	Connector	Description
11	BATTERY	Battery connector
12	TPM_MODULE	Trusted platform module connector
13	J_PSWD_NVRAM	For more information, see System board jumper settings
14	SLOT3 PCIE_G3_X16(CPU1)	PCIe card connector 3
15	SLOT2 PCIE_G3_X16(CPU1)	PCIe card connector 2 NOTE: This system supports two different types of risers: PCIE_G3_X8 and PCIE_G3_X16. You can install an expansion card on the system board only using expansion-card riser. Form more information about the installation guidelines, see Expansion card installation guidelines.
16	NIC4	Network connector
17	NIC3	Network connector
18	B1, B2	Memory module socket
19	USB2_3.0	USB connector
20	USB1	USB connector
21	NIC1 and NIC2	Network connector
22	B3, B4	Memory module socket
23	CPU2	Processor socket 2
24	PWR_CONN_C(P3)	8-pin power connector
25	CPU1	Processor socket 1
26	IDSDM	Internal Dual SD Module connector
27	INTRUSION	Intrusion switch connector
28	FAN6	Cooling fan connector
29	A1, A5, A2, A6	Memory module socket
30	FAN5	Cooling fan connector
31	FAN4	Cooling fan connector
32	PWR_CONN_B(P2)	8-pin power connector
33	A3, A7, A4, A8	Memory module socket
34	FAN3	Cooling fan connector
35	FAN2	Cooling fan connector
36	BP_SIG	Backplane signal connector

Disabling a forgotten password

The system's software security features include a system password and a setup password. The password jumper enables these password features or disables them and clears any password(s) currently in use.

Prerequisites

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Steps

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system.
3. Move the jumper on the system-board jumper from pins 4 and 6 to pins 2 and 4.
4. Close the system.

   The existing passwords are not disabled (erased) until the system boots with the jumper on pins 2 and 4. However, before you assign a new system and/or setup password, you must move the jumper back to pins 4 and 6.

   NOTE: If you assign a new system and/or setup password with the jumper on pins 2 and 4, the system disables the new password(s) the next time it boots.
5. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.
6. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
7. Open the system.
8. Move the jumper on the system-board jumper from pins 2 and 4 to pins 4 and 6.
9. Close the system.
10. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.
11. Assign a new system and/or setup password.

8

Getting help

Contacting Dell

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

1. Go to **Dell.com/support**.
2. Select your country from the drop-down menu on the bottom 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 Global Technical Support:
   a. Click Global Technical Support.
   b. The **Technical Support** page is displayed with details to call, chat, or e-mail the Dell Global Technical Support team.

Dell SupportAssist

For an enhanced Support Experience, Dell recommends installing and configuring Dell SupportAssist.

Dell SupportAssist is a software application that transparently collects information about your system and automatically creates support cases when issues are detected. Dell SupportAssist helps Dell to provide you an enhanced, personalized, and efficient support experience. Dell uses the data to solve common problem, designs and markets the products.

For more information about installing and configuring Dell SupportAssist, see: http://www.dell.com/en-us/work/learn/supportassist-servers-storage-networking.

Locating Service Tag of your system

Your system is identified by a unique Express Service Code and Service Tag number. The Express Service Code and Service Tag are found on the front of the system by pulling out the information tag.

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

Quick Resource Locator

Use the Quick Resource Locator (QRL) to get immediate access to system information and how-to videos. This can be done by visiting **Dell.com/QRL** or by using your smartphone or tablet and a model specific Quick Resource (QR) code located on your Dell system. To try out the QR code, scan the following image.

Figure 34. Quick Resource Locator