Dell PowerEdge C4130
Owner's Manual

Regulatory Model: E32S Series
Regulatory Type: E32S001

Notes, cautions, and warnings

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

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

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

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1

Dell PowerEdge C4130 overview

The Dell PowerEdge C4130 rack servers support up to:

- Two Intel Xeon E5-2600 v4 processors
- 16 DIMMs
- Two 1.8-inch uSATA solid state drives (SSDs)
- Four 2.5-inch hard drives (optional)
- Two power supply units (PSUs)
- Four graphics processing units (GPUs)

NOTE: All GPU cards must be of the same type and model. Mixing GPUs is not supported.

NOTE: The PSU 2 slot also functions as an optional 2.5 inch hard drive cage slot. If you install the optional 2.5 inch hard drives, your system does not support the PSU redundancy feature.

NOTE: Systems with NVLink board configuration do not support the optional 2.5 inch hard drive cage. Both the PSUs work simultaneously, and your system does not support the PSU redundancy feature.

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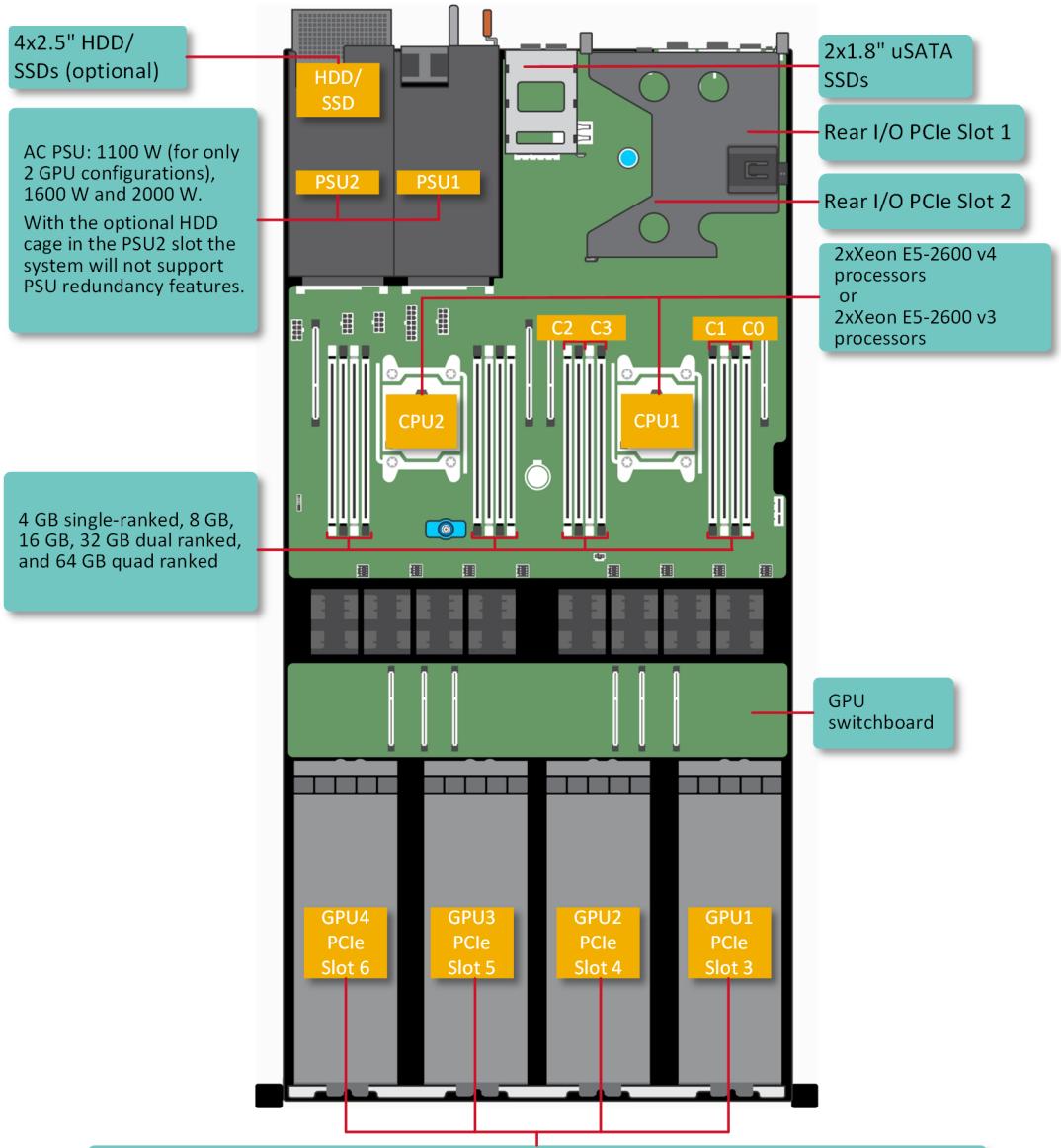
Supported GPU configurations on PowerEdge C4130 systems

NOTE: Incorrect removal and installation of the GPUs will cause operational issues to your system.



Single processor systems:

- Config. **A**; 4xGPUs and switchboard, x8 in slot 1, x16 in slot 2
- Config. **E;** 2xGPUs, no switch board, x8 in slot 1, slot 2 not supported

Dual processor systems:

- Config. **B**; 4xGPUs and switchboard, x8 in slot 1, x16 in slot 2
- Config. **C**; 4xGPUs, no switchboard, x8 in slot 1, x8 in slot 2
- Config. **D**; 2xGPUs. no switchboard, x16 in slot 1, x16 in slot 2
- Config. **G**; 4xGPUs and switchboard with dual GPU virtual mode, x16 in slot 1, x16 in slot 2
- Config. **F**; 2xGPUs, no switchboard, x8 in slot 1, x8 in slot 2
- Config. **H**; 3xGPUs no switchboard, x8 in slot 1, x8 in slot 2
- Config. **I**; 3xGPUs no switchboard, x8 in slot 1, slot 2 not supported

Figure 1. System view with supported configurations for PCIe GPUs

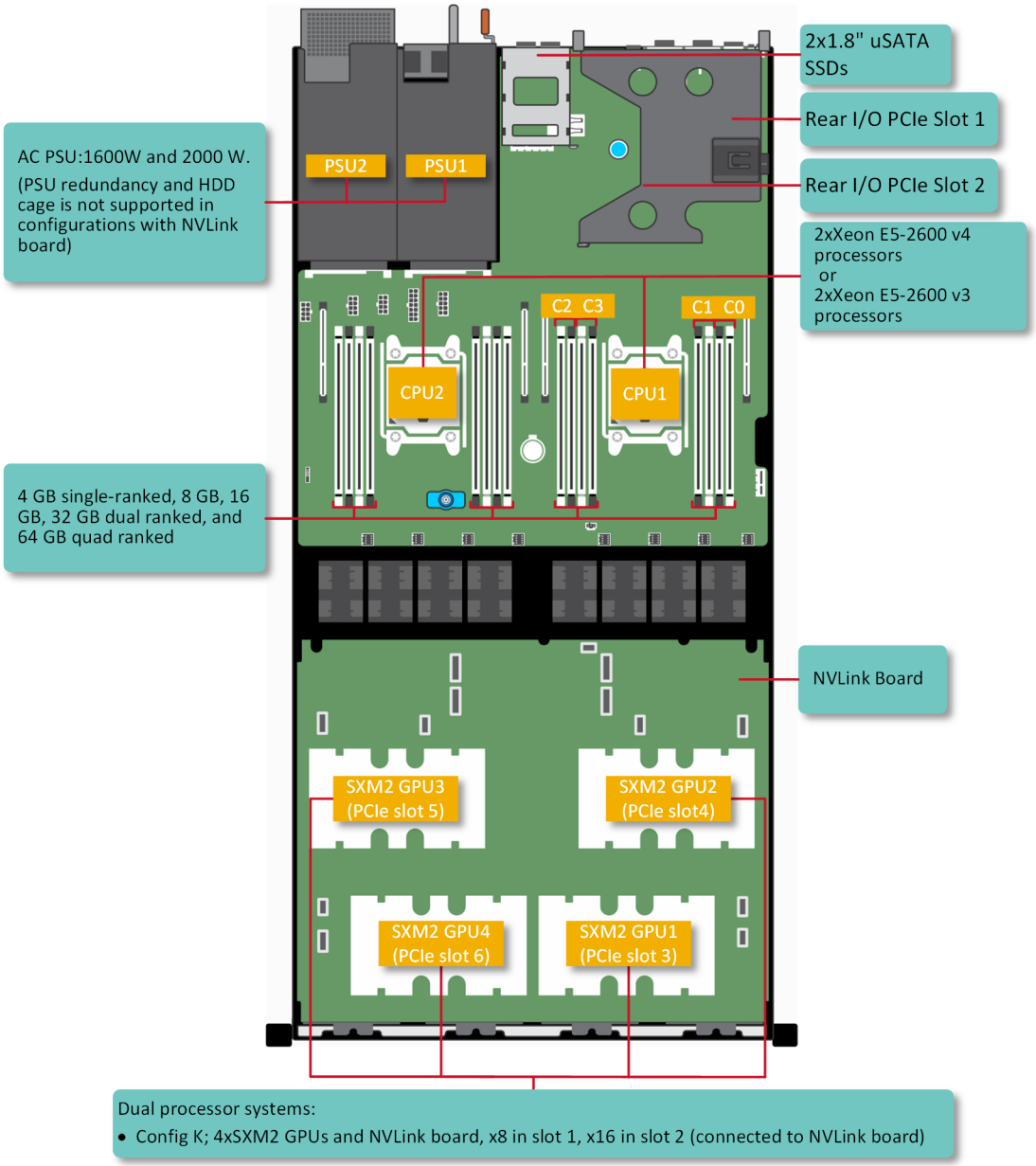


Figure 2. System view with supported configurations for SXM2 GPUs

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Front panel

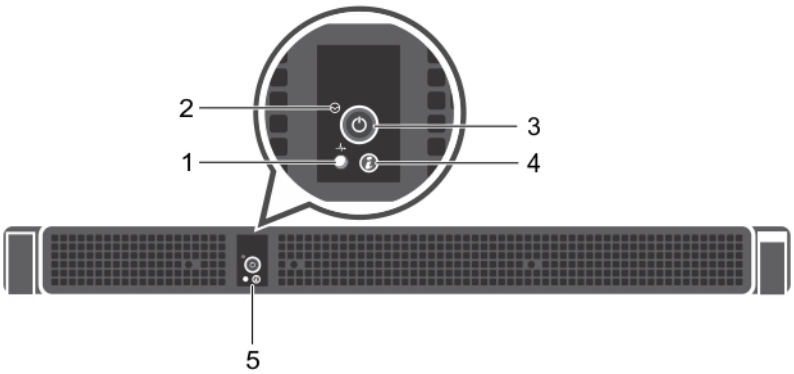

Figure 3. Front panel - PowerEdge C4130

1. System-health indicator
2. Ambient air temperature sensor
3. Power-on indicator/power button
4. System identification button
5. Control panel

Table 1. Front panel features and indicators description of the PowerEdge C4130 system.

Item	Indicator, button, or connector	Icon	Description
1	Health indicator		Indicates the health of the system. • If the system is on and in good health, the indicator lights solid blue. No corrective action is required. • The indicator blinks amber if the system is on or in standby, and if any error exists (for example, a failed fan). See the System Event Log or system messages for the specific issue. For more information on error messages, see the Dell Event and Error Messages Reference Guide at **Dell.com/esmmanuals**. Invalid memory configurations can cause the system to halt at startup without any video output. See the Getting help section.
2	Ambient air temperature sensor		Measures the ambient air temperature.
3	Power-on indicator, power button		The power-on indicator lights when the system power is on. The power button controls the power supply output to the system. **NOTE: On ACPI-compliant operating systems, turning off the system using the power button causes the system to perform a graceful shutdown before power to the system is turned off.**
4	System identification button		The identification button 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 corresponding system identification button on the back flashes until one of the buttons is pressed again. Press the system identification button to turn the system ID on or 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.

Item	Indicator, button, or connector	Icon	Description
			To reset iDRAC (if not disabled in F2 iDRAC setup), press and hold the button for more than 15 seconds.
5	Control panel		Consists of the health indicator, ambient air temperature sensor, power-on indicator, power button, and the system identification button.

Related links

Getting help

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Back panel

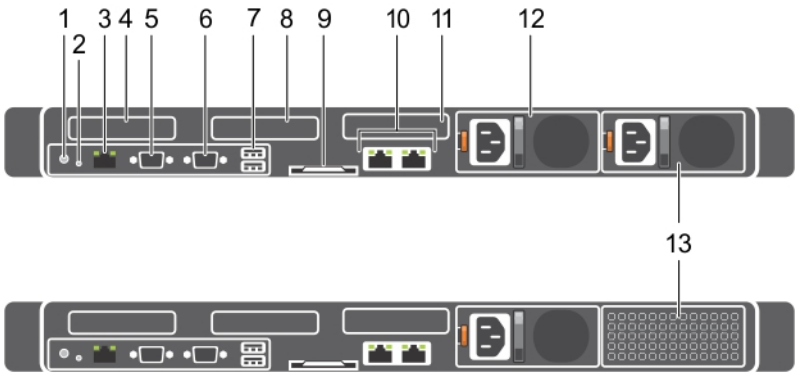

Figure 4. Back panel– PowerEdge C4130

1. System identification button
2. NMI button
3. iDRAC8 Enterprise port
4. Half-height PCIe expansion card slot 1
5. Serial connector
6. Video connector
7. USB connector (2)
8. Half-height PCIe expansion card slot 2
9. Information tag
10. Ethernet connector (2)
11. Hard drive (2)
12. Power supply unit (PSU1)
13. Power supply unit (PSU2)/2.5-inch hard drive cage slot

Table 2. Back panel features and indicators description of the PowerEdge C4130 system

Item	Indicator, button or connector	Icon	Description
1	System identification button		The identification button 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 corresponding system identification button on the back flashes until one of the buttons is pressed again.

Item	Indicator, button or connector	Icon	Description
			Press the system identification button to turn the system ID on or 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.
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 documentation.
3	iDRAC8 Enterprise port		Dedicated management port.
4	Half-height PCIe expansion card slot 1		Allows you to connect half-height, half-length, low profile PCI Express expansion cards.
5	Serial connector		Allows you to connect a serial device to the system.
6	Video connector		Allows you to connect a VGA display to the system.
7	USB connector (2)		Allows you to connect USB devices to the system. The ports are USB 3.0-compliant.
8	Half-height PCIe expansion card slot 2		Allows you to connect half-height, half-length, low profile PCI Express expansion cards.
9	Information tag		A slide-out label panel which allows you to record system information such as Service Tag, NIC, MAC address and so on as per your need.
10	Ethernet connector (2)		Two integrated 10/100/1000/Mbps NIC connectors.
11	Hard drive (2)		Up to two 1.8-inch uSATA SSDs.
12	Power supply unit (PSU1)		One 2000 W, 1600 W or 1100 W PSU.
13	Power supply unit (PSU2)/ 2.5-inch hard drive cage slot		One 2000 W, 1600 W or 1100 W PSU, or up to four 2.5 inches cabled hard drives.

NOTE: Systems with NVLink configurations support either 2000 W or 1600 W dual PSUs.

NOTE: Systems with NVLink configurations do not support the (PSU2)/2.5-inch hard drive cage slot.

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Diagnostic indicators

Table 3. Diagnostic Indicators

Icon	Indicator, button, or connector	Description
	Health indicator	Indicates the health of the system. • If the system is powered on and in good health, the indicator lights solid blue. No corrective action is required. • The indicator blinks amber if the system is on or in standby, and if any error exists (For example, a failed fan). See the System Event Log or system messages for the specific issue. For more information on error messages, see the Dell Event and Error Messages Reference Guide at **Dell.com/esmmanuals**. Invalid memory configurations can cause a blank screen or no video output. See the Getting help section.
	Power-on indicator, power button	The power-on indicator lights when the system powered on. The power button controls the power supply output to the system. **NOTE: On ACPI-compliant operating systems, turning off the system using the power button causes the system to perform a graceful shutdown before power to the system is turned off.**
	System identification button	The identification button 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 corresponding system identification button on the back flashes until one of the buttons is pressed again. Press the system identification button to turn the system ID on or 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.
	NMI button	Used to troubleshoot software and device driver errors when running certain operating systems. Use a paper clip to press this button. Use this button only if directed to do so by qualified support personnel or by the operating system documentation.

Related links

Getting help

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uSATA SSD indicator codes

Figure 5. uSATA SSD indicators

1. uSATA SSD activity indicator
2. uSATA SSD status indicator
3. uSATA SSD

Table 4. Drive status indicator codes

Drive-status indicator pattern	Condition
Flashes green twice 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.**
Flashes green, amber, and turns off	Predicted drive failure
Flashes amber four times per second	Drive failed
Steady green	Drive online
Flashes green for three seconds, amber for three seconds, and turns off after six seconds	Rebuild aborted

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NIC indicator codes

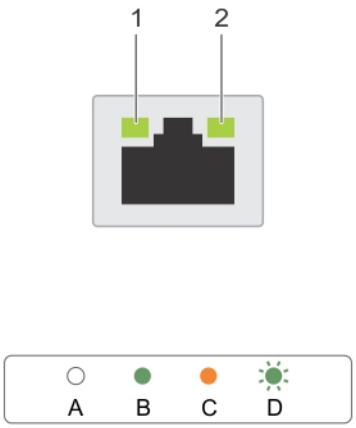

Figure 6. NIC indicators

1. link indicator
2. activity indicator

Table 5. NIC indicators

Convention	Status	Condition
A	Link and activity indicators are off	The NIC 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 or 10 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 flashing green	Network data is being sent or received.

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Power supply unit indicator codes

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

Figure 7. AC PSU status indicator

1. AC PSU status indicator/handle

Table 6. AC PSU status indicators

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 firmware of the PSU is being updated, the PSU handle flashes green.
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 a PSU mismatch with respect to efficiency, feature set, health status, and supported voltage. **NOTE: Ensure that both the PSUs are of the same capacity.** **CAUTION: For AC PSUs, use only PSUs with the Extended Power Performance (EPP) label on the back.** **NOTE: Mixing PSUs from previous generations of Dell PowerEdge servers can result in a PSU mismatch condition or failure to turn the system on.**
D	Flashing amber	Indicates a problem with the PSU. **CAUTION: When correcting a PSU mismatch, replace only the PSU with the flashing indicator. Swapping the PSU to make a matched pair can result in an error condition and unexpected system shutdown. To change from a high output configuration to a low output configuration or vice versa, you must power down 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.**

Convention	Power indicator pattern	Condition
E	Not lit	Power is not connected.

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Customer and field replaceable units

The following components are Customer Replaceable Units (CRUs):

- Cooling fans
- Expansion card riser
- Expansion cards
- Internal dual SD module (IDSDM)
- SD cards
- Internal USB keys
- Power supply units (PSUs)
- 1.8 inch uSATA SSDs
- 1.8 inch uSATA SSD cage
- 1.8 inch uSATA SSD backplane
- 2.5 inch hard drives
- 2.5 inch hard drive cage
- Memory modules
- PCI shroud
- Cooling shroud
- Cable routing clip
- Heat sinks and processors

The following components are Field Replaceable Units (FRUs). Removal and installation procedures should be performed only by Dell certified service technicians.

- PCIe Graphics processing units (GPUs)/ SXM2 GPUs
- GPU switch board/ NVLink board
- GPU riser cable board
- GPU brackets
- GPU blanks
- Intrusion switch
- System board
- Trusted Platform Module (TPM)
- System battery
- Control panel module

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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 back 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.

2

Documentation resources

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

Table 7. Additional documentation resources for your system

Task	Document	Location
Setting up your system	For information about installing the system into a rack, see the Rack documentation included with your rack solution.	Dell.com/poweredgemanuals
	For information about turning on the system and the technical specifications of your system, see the *Getting Started With Your System* document that is shipped with your system.	Dell.com/poweredgemanuals
Configuring your system	For information about the iDRAC features, configuring and logging in to iDRAC, and managing your system remotely, see the Integrated Dell Remote Access Controller User's Guide.	Dell.com/idracmanuals
	For information about installing the operating system, see the operating system documentation.	Dell.com/operatingsystemmanuals
	For information about understanding Remote Access Controller Admin (RACADM) subcommands and supported RACADM interfaces, see the RACADM Command Line Reference Guide for iDRAC.	Dell.com/idracmanuals
	For information about updating drivers and firmware, see the Methods to download firmware and drivers section in this document.	Dell.com/support/drivers
Managing your system	For information about systems management software offered by Dell, see the Dell OpenManage Systems Management Overview Guide.	Dell.com/openmanagemanuals
	For information about setting up, using, and troubleshooting OpenManage, see the Dell OpenManage Server Administrator User's Guide.	Dell.com/openmanagemanuals
	For information about installing, using, and troubleshooting Dell OpenManage Essentials, see the Dell OpenManage Essentials User's Guide.	Dell.com/openmanagemanuals

Task	Document	Location
	For information about installing and using Dell SupportAssist, see the Dell EMC SupportAssist Enterprise User's Guide.	Dell.com/SupportAssist Enterprise
	For information about installing and using Active System Manager (ASM), see the Active System Manager User's Guide.	Dell.com/asmdocs
	For understanding the features of Dell Lifecycle Controller (LCC), see the Dell Lifecycle Controller User's Guide.	Dell.com/idracmanuals
	For information about partner programs enterprise systems management, see the OpenManage Connections Enterprise Systems Management documents.	Dell.com/omconnectionsenterprisesystemsmanagement
	For information about connections and client systems management, see the OpenManage Connections Client Systems Management documentation.	Dell.com/dellclientcommandsuitemanuals
	For information about viewing inventory, performing configuration and monitoring tasks, remotely turning on or off servers, and enabling alerts for events on servers and components using the Dell Chassis Management Controller (CMC), see the CMC User's Guide.	Dell.com/esmmanuals
Understanding event and error messages	For information about checking the event and error messages generated by the system firmware and agents that monitor system components, see the Dell Event and Error Messages Reference Guide.	Dell.com/openmanagemanuals > OpenManage software

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3

Technical specifications

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

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Chassis dimensions

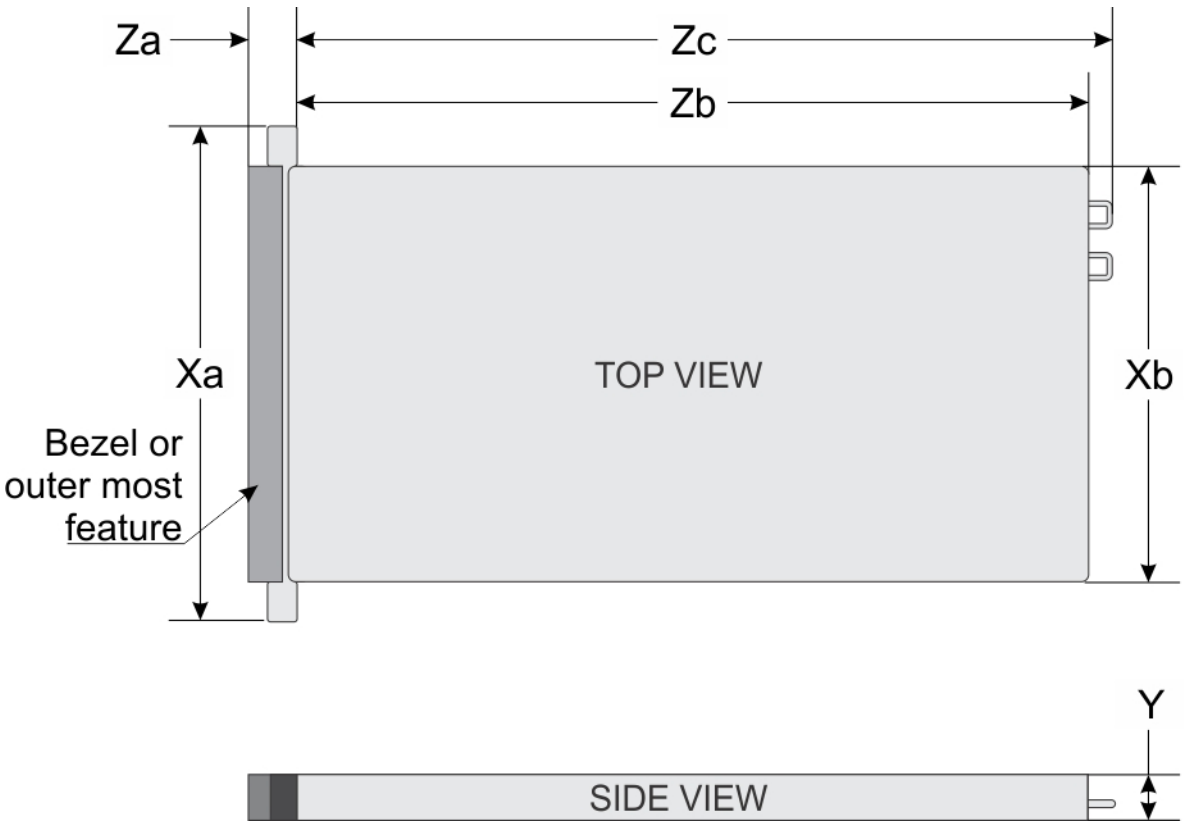

Figure 8. Details the dimensions of Dell PowerEdge C4130 system

Table 8. The dimensions of Dell PowerEdge C4130 system

Xa	Xb	Y	Za	Zb	Zc
482.4 mm	434 mm	43.1 mm	18.0 mm	885.8 mm	924.8 mm

GUID-1F3B6C88-2129-4E99-B278-6F3BE0D46974

Chassis weight

Table 9. Chassis weight

System	Maximum weight
PowerEdge C4130 (with PCIe GPUs)	22.13 kg (48.79 lb)
PowerEdge C4130 (with SXM2 GPUs)	22.73 kg (50.11 lb)

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Processor specifications

The PowerEdge C4130 system supports up to two Intel Xeon E5-2600 v4 product family processors.

GUID-122611CB-2515-4E74-A916-B8A974F2C2A9

PSU specifications

Table 10. PSU specifications

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage
1100 W AC	Platinum	4100 BTU/hr	50/60 Hz	100–240 V AC, autoranging
1600 W AC	Platinum	6000 BTU/hr	50/60 Hz	200–240 V AC, autoranging
2000 W AC	Platinum	7500 BTU/hr	50/60 Hz	200–240 V AC, autoranging

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

NOTE: This system is also designed to connect to the IT power systems with a phase to phase voltage not exceeding 230 V.

GUID-CCEAC57A-5818-4B5C-963D-CFEF6575121E

System battery specifications

The PowerEdge C4130 system supports CR 2032 3.0-V lithium coin cell system battery.

GUID-51B9A18D-B970-474B-B8CE-2CDB33B28F59

Expansion bus specifications

The PowerEdge C4130 system supports PCI express (PCIe) generation 3 expansion cards, which need to be installed on the system board by using expansion card risers. This system supports four expansion card riser configurations. The following table provides detailed information about the expansion card riser configurations:

Table 11. Expansion card riser configurations

Expansion card riser	PCIe slots on the riser	Height	Length	Link
Configuration 1 (System Config: D and G)	Slot 1	half height	half Length	x16
	Slot 2	half height	half Length	x16
Configuration 2 (System Config: A, B, and K)	Slot 1	half height	half Length	x8
	Slot 2	half height	half Length	x16
Configuration 3 (System Config: C, F, and H)	Slot 1	half height	half Length	x8
	Slot 2	half height	half Length	x8
Configuration 4 (System Config: E and I)	Slot 1	half height	half Length	x8
	Slot 2	NA	NA	NA

GUID-FC71BDDC-4668-4BFB-96B2-4F99380558CC

Memory specifications

Table 12. Memory specifications

Memory module sockets	Memory capacity	Minimum RAM	Maximum RAM
Sixteen 288-pin	4 GB single rank, 8 GB, 16 GB, 32 GB dual rank, and 64 GB quad rank	• 4 GB with a single processor • 8 GB with two processors	• Up to 512 GB with a single processor • Up to 1024 GB with dual processors

GUID-799CB166-0E35-4C51-82F7-13B01BEDD473

Drive specifications

The PowerEdge C4130 system supports up to two 1.8 inch uSATA SSDs, and up to four 2.5 inch SAS/SATA cabled hard drives.

NOTE: Systems with NVLink configurations do not support the 2.5-inch SAS/SATA cabled hard drives.

GUID-A146BEE4-836E-4ADC-BE87-2937058A040D

Ports and connectors specifications

Table 13. Ports and connectors specifications

Connectors	
Back	
NIC	Two 1 Gbps
Serial	9-pin, DTE, 16550-compatible
USB	Two 4-pin, USB 3.0-compliant
Video	15-pin VGA
Internal	
USB	One 4-pin, USB 3.0-compliant
Internal dual SD module	Two optional flash memory card slots with the internal dual SD module

NOTE: One card slot is dedicated for redundancy.

GUID-8AE90ED4-72CE-4F51-999B-FF8B7909763D

Video specifications

The PowerEdge C4130 system supports Matrox G200eR2 Integrated VGA controller with 16 MB capacity.

Table 14. Resolution information for Video modes

Resolution	Refresh rate (Hz)	Color depth (bit)
640 X 480	60, 70	8, 16, 32
800 X 600	60, 75, 85	8, 16, 32
1024 X 768	60, 75, 85	8, 16, 32
1152 X 864	60, 75, 85	8, 16, 32
1280 X 1024	60, 75	8, 16, 32
1440 X 900	60	8, 16, 32

GUID-29885A66-54C0-4E92-AD68-AF3DC92BB030

Environmental specifications

NOTE: For additional information about environmental measurements for specific system configurations, see Dell.com/environmental_datasheets.

Table 15. Temperature specifications

Temperature	Specifications
Storage	–40°C to 65°C (–40°F to 149°F)
Continuous operation (for altitude less than 950 m or 3117 ft)	10°C to 25°C (50°F to 77°F) with no direct sunlight on the equipment. **NOTE: Certain system configurations may require reductions in the upper temperature limits.** **NOTE: The performance of the system may be impacted when operating above the upper temperature limit or with a faulty fan.**
Maximum temperature gradient (operating and storage)	20°C/h (36°F/h)

Table 16. Relative humidity specifications

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

Table 17. Maximum vibration specifications

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

Table 18. Maximum shock specifications

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

Table 19. Maximum altitude specifications

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

Table 20. Operating temperature de-rating specifications

Operating temperature de-rating	Specifications
Up to 25°C (77°F)	Maximum temperature is reduced by 1°C/300 m (1°F/547 ft) above 950 m (3,117 ft).

Table 21. Particulate contamination specifications

NOTE: The following table defines the limitations that help avoid any equipment damage or failure from particulates and gaseous contamination. If it is determined that levels of particulates or gaseous pollution are beyond the limits specified below and are the reason for the damage and/or failures to your equipment, it may be necessary for you to re-mediate the environmental conditions that are causing the damage and/or failures. Re-mediation of environmental conditions will be the responsibility of the customer.	
Air filtration **NOTE: Applies to data center environments only. Air filtration requirements do not apply to IT equipment designed to be used outside a data center, in environments such as an office or factory floor.**	Data center air filtration as defined by ISO Class 8 per ISO 14644-1 with a 95% upper confidence limit. **NOTE: Air entering the data center must have MERV11 or MERV13 filtration.**
Conductive dust **NOTE: Applies to data center and non-data center environments.**	Air must be free of conductive dust, zinc whiskers, or other conductive particles.
Corrosive dust **NOTE: Applies to data center and non-data center environments.**	· Air must be free of corrosive dust. · Residual dust present in the air must have a deliquescent point less than 60% relative humidity.

Table 22. Gaseous contamination specifications

	NOTE: Maximum corrosive contaminant levels measured at ≤50% relative humidity.	
	Copper coupon corrosion rate	<300 Å/month per Class G1 as defined by ANSI/ISA71.04-1985.
	Silver coupon corrosion rate	<200 Å/month as defined by AHSRAE TC9.9.

GUID-5748796D-6E9F-4449-ABF4-8D669F585840

4

Initial system setup and configuration

GUID-12906D3A-32E6-44A6-BF6E-3E4B1E522C3C

Setting up your system

Complete the following steps to set up your system:

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

GUID-B7DABD59-D2F1-46E4-9022-6314E97E19D3

iDRAC configuration

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

GUID-F24BAF10-1283-44A5-8E2E-AE1A076D14A8

Options to set up iDRAC IP address

You must configure the initial network settings based on your network infrastructure to enable the communication to and from iDRAC. You can set up the IP address by using one of the following interfaces:

Interfaces	Document/Section
iDRAC Settings utility	See *Dell Integrated Dell Remote Access Controller User's Guide* at **Dell.com/idracmanuals**
Dell Deployment Toolkit	See *Dell Deployment Toolkit User's Guide* at **Dell.com/openmanagemanuals**
Dell Lifecycle Controller	See *Dell Lifecycle Controller User's Guide* at **Dell.com/idracmanuals**

You must use the default iDRAC IP address 192.168.0.120 to configure the initial network settings, including setting up DHCP or a static IP for iDRAC.

NOTE: To access iDRAC connect the network cable to the Ethernet connector on the system board.

NOTE: Ensure that you change the default user name and password after setting up the iDRAC IP address.

GUID-630530B1-28EB-4BC1-BFB0-BA34E4EF576B

Log in to iDRAC

You can log in to iDRAC as:

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

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

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

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

GUID-1AB8E7C1-D279-4356-B543-698D5F784858

Options to install the operating system

If the system is shipped without an operating system, install the supported operating system by using one of the following resources:

Table 23. Resources to install the operating system

Resources	Location
Dell Systems Management Tools and Documentation media	Dell.com/operatingsystemmanuals
Dell Lifecycle Controller	Dell.com/idracmanuals
Dell OpenManage Deployment Toolkit	Dell.com/openmanagemanuals
Dell certified VMware ESXi	Dell.com/virtualizationsolutions
Supported operating systems on Dell PowerEdge systems	Dell.com/ossupport
Installation and How-to videos for supported operating systems on Dell PowerEdge systems	Supported Operating Systems for Dell PowerEdge Systems

GUID-49D232C7-0B7A-4536-B5A0-1629CAACDA0F

Methods to download firmware and drivers

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

Table 24. Firmware and drivers

Methods	Location
From the Dell Support site	Dell.com/support/home
Using Dell Remote Access Controller Lifecycle Controller (iDRAC with LC)	Dell.com/idracmanuals
Using Dell Repository Manager (DRM)	Dell.com/openmanagemanuals
Using Dell OpenManage Essentials (OME)	Dell.com/openmanagemanuals
Using Dell Server Update Utility (SUU)	Dell.com/openmanagemanuals
Using Dell OpenManage Deployment Toolkit (DTK)	Dell.com/openmanagemanuals

GUID-7E37E631-1D4B-4162-AE45-51D94A295730

Downloading the 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 before downloading the drivers and firmware.

Steps

1. Go to **Dell.com/support/drivers**.
2. Under the **Drivers & Downloads** section, type the Service Tag of your system in the **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, navigate to your product.
3. Click **Drivers & Downloads**.

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

GUID-B87B3D21-E8ED-4C2B-A4B2-41206935DB10

5

Pre-operating system management applications

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

GUID-2C97B129-2402-4B05-A77D-F35B679E7E1A

Options to manage the pre-operating system applications

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

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

Related links

System Setup
Boot Manager
Dell Lifecycle Controller
PXE boot

GUID-14F9A24F-3F4E-4510-BAD1-7DF47F366F2A

System Setup

By using the **System Setup** screen, you can configure the BIOS settings, iDRAC settings, and device settings of your system.

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

You can access system setup by using two methods:

- Standard graphical browser—The browser is enabled by default.
- Text browser—The browser is enabled by using Console Redirection.

Related links

System Setup details
Viewing System Setup

GUID-2BB81115-5C50-4E95-9D7B-E438D948FA28

Viewing System Setup

To view the **System Setup** screen, perform the following steps:

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

   ```
   F2 = System Setup
   ```

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

Related links

System Setup
System Setup details

GUID-4A2E1A19-F95D-465A-B120-A108D894BC68

System Setup details

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

Option	Description
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.

Related links

System Setup
Viewing System Setup

GUID-35CD97BF-2FD5-4CCF-8DC1-E7FA89CA394F

System BIOS

You can use the **System BIOS** screen to edit specific functions such as boot order, system password, setup password, set the RAID mode, and enable or disable USB ports.

Related links

System BIOS Settings details
Boot Settings
Network Settings
System Information
Memory Settings
Processor Settings
SATA Settings
Integrated Devices
Serial Communication
System Profile Settings
Miscellaneous Settings
iDRAC Settings utility
Device Settings
Viewing System BIOS

GUID-2F682B1C-8996-4D8A-9C83-56E13EDA6F4A

Viewing System BIOS

To view the **System BIOS** screen, perform the following steps:

1. Turn on, or restart your system.
2. Press F2 immediately after you see the following message:
   `F2 = System Setup`

   NOTE: If your operating system begins to load before you press F2, wait for the system to finish booting, and then restart your system and try again.
3. On the **System Setup Main Menu** screen, click **System BIOS**.

Related links

[System BIOS]
[System BIOS Settings details]

GUID-5E09EEBE-3FEC-4D46-8D4F-25AC0A5765E3

System BIOS Settings details

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

Option	Description
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.

Related links

[System BIOS]
[Viewing System BIOS]

GUID-9F5AF39D-242E-479C-81B5-AA92E8BEE63B

Boot Settings

You can use the **Boot Settings** screen to set the boot mode to either **BIOS** or **UEFI**. It also enables you to specify the boot order.

Related links

[Boot Settings details]
[System BIOS]
[Viewing Boot Settings]
[Choosing the system boot mode]
[Changing the boot order]

GUID-94395C04-ADE7-4BDD-B59F-233605CD7D12

Viewing Boot Settings

To view the **Boot Settings** screen, perform the following steps:

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

   ```
   F2 = System Setup
   ```

   NOTE: If your operating system begins to load before you press F2, wait for the system to finish booting, and then restart your system and try again.
3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Boot Settings**.

Related links

Boot Settings
Boot Settings details
Choosing the system boot mode
Changing the boot order

GUID-2F825DC7-A22A-482F-BBEC-C2C19FE78781

Boot Settings details

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

Option	Description
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.**

Related links

Boot Settings
Viewing Boot Settings
Choosing the system boot mode
Changing the boot order

GUID-12C950B3-B0EF-4089-867E-89277DB2DA6A

Choosing the system boot mode

System Setup enables you to specify one of the following boot modes for installing your operating system:

- BIOS boot mode (the default) is the standard BIOS-level boot interface.
- Unified Extensible Firmware Interface (UEFI) boot mode is an enhanced 64-bit boot interface. If you have configured your system to boot to UEFI mode, it replaces the system BIOS.

1. From the **System Setup Main Menu**, click **Boot Settings**, and select **Boot Mode**.
2. Select the boot mode you want the system to boot into.

   CAUTION: Switching the boot mode may prevent the system from booting if the operating system is not installed in the same boot mode.
3. After the system boots in the specified boot mode, proceed to install your operating system from that mode.

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 about supported operating systems, go to Dell.com/ossupport.

Related links

Boot Settings
Boot Settings details
Viewing Boot Settings

GUID-334369A4-CDAE-4C92-852D-BC139AC4CAB0

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 following instructions 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 plus (+) and minus (-) sign keys to move the device down or up in the order.
4. Click **Exit**, and then click **Yes** to save the settings on exit.

Related links

Boot Settings
Boot Settings details
Viewing Boot Settings

GUID-58701880-7D80-4166-883E-4A38518CF6BC

Network Settings

You can use the **Network Settings** screen to modify PXE device settings. The network settings option is available only in the UEFI mode.

NOTE: The BIOS does not control network settings in the BIOS mode. For the BIOS boot mode, the optional Boot ROM of the network controllers handles the network settings.

Related links

Network Settings screen details
System BIOS
Viewing Network Settings

GUID-F6F46A55-B0A3-46EF-B2B6-724DDF6664DF

Viewing Network Settings

To view the **Network Settings** screen, perform the following steps:

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

   ```
   F2 = System Setup
   ```

   NOTE: If your operating system begins to load before you press F2, wait for the system to finish booting, and then restart your system and try again.
3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Network Settings**.

Related links

Network Settings
Network Settings screen details

GUID-4DFC3EB0-8100-4AFE-99B9-BCC1A8422070

Network Settings screen details

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

Option	Description
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.

Related links

Network Settings
Viewing Network Settings

GUID-1579708F-42D4-4ADD-A311-68559496D27A

System Security

You can use the **System Security** screen to perform specific functions such as setting the system password, setup password and disabling the power button.

Related links

System Security Settings details
Operating with a setup password enabled
System BIOS
Viewing System Security
Creating a system and setup password
Using your system password to secure your system
Deleting or changing system and setup password

GUID-4D392CEA-E5CF-4A4D-A1B0-392246978565

Viewing System Security

To view the **System Security** screen, perform the following steps:

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

   ```
   F2 = System Setup
   ```

   NOTE: If your operating system begins to load before you press F2, wait for the system to finish booting, and then restart your system and try again.
3. On the **System Setup Main Menu** screen, click **System BIOS**.

4. On the **System BIOS** screen, click **System Security**.

Related links

System Security

System Security Settings details

GUID-47D7AC4A-0ECD-49FF-AAF0-2DD1286A7944

System Security Settings details

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

Option	Description
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.

Related links

System Security

Viewing System Security

GUID-A494ECC4-611F-47BD-B842-5A29B1B7991D

Secure Boot Custom Policy Settings

Secure Boot Custom Policy Settings is displayed only when **Secure Boot Policy** is set to **Custom**.

GUID-B37E62BD-932F-41FA-BEAE-5D59CED35342

Viewing Secure Boot Custom Policy Settings

To view the **Secure Boot Custom Policy Settings** screen, perform the following steps:

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

   ```
   F2 = System Setup
   ```

   NOTE: If your operating system begins to load before you press F2, wait for the system to finish booting, and then restart your system and try again.
3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **System Security**.
5. On the **System Security** screen, click **Secure Boot Custom Policy Settings**.

GUID-5A27810F-BDB8-4899-AED3-D4EF4EEE2301

Secure Boot Custom Policy Settings details

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

Option	Description
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).

GUID-2D52DB49-EA19-4039-9646-CE68A05A6501

Creating a system and setup password

Prerequisites

Ensure that the password jumper is enabled. The password jumper enables or disables the system password and setup password features. For more information, see the System board jumper settings section.

NOTE: 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.

Steps

1. To enter System Setup, press F2 immediately after turning on or rebooting your system.
2. On the **System Setup Main Menu** screen, click **System BIOS** → **System Security**.
3. On the **System Security** screen, verify that **Password Status** is set to **Unlocked**.
4. In the **System Password** field, type your system password, and 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: space, (”), (+), (,), (-), (.), (/), (;), ([), (\), (]), (`).

   A message prompts you to reenter the system password.

5. Reenter the system password, and click **OK**.
6. In the **Setup Password** field, type your setup password and press Enter or Tab.
   A message prompts you to reenter the setup password.
7. Reenter the setup password, and click **OK**.
8. 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.

Related links

System Security

GUID-E4B2DF0F-A14A-44FD-880E-BBDB6CD7F72D

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.

Related links

System Security

GUID-E60E41C8-6512-4D01-82C5-15CAE87DEB42

Deleting or changing system and setup password

Prerequisites

NOTE: You cannot delete or change an existing system or setup password if the Password Status is set to Locked.

Steps

1. To enter System Setup, press F2 immediately after turning on or restarting your system.
2. On the **System Setup Main Menu** screen, click **System BIOS** → **System Security**.
3. On the **System Security** screen, ensure that **Password Status** is set to **Unlocked**.
4. In the **System Password** field, alter or delete the existing system password, and then press Enter or Tab.
5. In the **Setup Password** field, alter or delete the existing setup password, and then 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.
6. Press Esc to return to the **System BIOS** screen. Press Esc again, and a message prompts you to save the changes.

Related links

System Security

GUID-FE3B97ED-EBAD-48E9-9F6B-E0F6993D18D2

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.

Related links

System Security

GUID-3B8E4DC7-A04C-45F7-872F-937D58940233

System Information

You can use the **System Information** screen to view system properties such as Service Tag, system model name, and the BIOS version.

Related links

System Information details

System BIOS

Viewing System Information

GUID-AA57C8A4-C138-4C2D-BA35-C97F05802511

Viewing System Information

To view the **System Information** screen, perform the following steps:

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

   ```
   F2 = System Setup
   ```

   NOTE: If your operating system begins to load before you press F2, wait for the system to finish booting, and then restart your system and try again.
3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **System Information**.

Related links

System Information

GUID-27BFB944-8076-438E-AC65-5FE9D59F9D94

System Information details

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

Option	Description
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	Specifies the contact information of the system manufacturer.

Option	Description
Contact Information	
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.

Related links

System Information
System Information details
Viewing System Information

GUID-4AC544B8-6044-49A0-BA0B-3B10EFAAD1D8

Memory Settings

You can use the **Memory Settings** screen to view all the memory settings and enable or disable specific memory functions, such as system memory testing and node interleaving.

Related links

Memory Settings details
System BIOS
Viewing Memory Settings

GUID-C7F63EB3-866A-4831-A062-244E1B0E038F

Viewing Memory Settings

To view the **Memory Settings** screen, perform the following steps:

1. Turn on, or restart your system.
2. Press F2 immediately after you see the following message:
   ```
   F2 = System Setup
   ```
   NOTE: If your operating system begins to load before you press F2, wait for the system to finish booting, and then restart your system and try again.
3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Memory Settings**.

Related links

Memory Settings
Memory Settings details

GUID-3A2FD360-F145-4F49-8115-EE4BCCB336D1

Memory Settings details

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

Option	Description
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.

Option	Description
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**.

Related links

Memory Settings
Viewing Memory Settings

GUID-DC7EA918-5F55-443A-991D-C8ADF6E669A9

Processor Settings

You can use the **Processor Settings** screen to view the processor settings, and perform specific functions such as enabling virtualization technology, hardware prefetcher, and logical processor idling.

Related links

Processor Settings details
System BIOS
Viewing Processor Settings

GUID-3E89E62D-A11A-4D9D-AB02-AB8A4ED42B48

Viewing Processor Settings

To view the **Processor Settings** screen, perform the following steps:

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

   ```
   F2 = System Setup
   ```

   NOTE: If your operating system begins to load before you press F2, wait for the system to finish booting, and then restart your system and try again.
3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Processor Settings**.

Related links

Processor Settings
Processor Settings details

GUID-5FC21783-239F-4469-BE5F-153EB5403270

Processor Settings details

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

Option	Description
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.
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:

Option	Description
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.

Option	Description

Option	Description
Level 3 Cache	Specifies the total L3 cache.
Number of Cores	Specifies the number of cores per processor.

Related links

Processor Settings
Viewing Processor Settings

GUID-F33F285F-4220-499B-BBEF-A68FA3EA4487

SATA Settings

You can use the **SATA Settings** screen to view the SATA settings of SATA devices and enable RAID on your system.

Related links

SATA Settings details
System BIOS
Viewing SATA Settings

GUID-25B3807E-8768-43C6-815D-5BEF129CE7C2

Viewing SATA Settings

To view the **SATA Settings** screen, perform the following steps:

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

   ```
   F2 = System Setup
   ```

   NOTE: If your operating system begins to load before you press F2, wait for the system to finish booting, and then restart your system and try again.
3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **SATA Settings**.

Related links

SATA Settings
SATA Settings details

GUID-6A121632-4C76-4B06-B845-FB9CA41ACDB1

SATA Settings details

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

Option	Description
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.

Option	Description
Model	Specifies the drive model of the selected device.
Drive Type	Specifies the type of drive attached to the SATA port.

Option	Description

Option	Description
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.

Option	Description
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.

Option	Description
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.

Option	Description
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 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.

Option	Description
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.

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

Option	Description
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.

Related links

SATA Settings
Viewing SATA Settings

GUID-AB8D4EA2-ECA6-48C0-BD15-8BCC450C7993

Integrated Devices

You can use the **Integrated Devices** screen to view and configure the settings of all integrated devices including the video controller, integrated RAID controller, and the USB ports.

Related links

Integrated Devices details
System BIOS
Viewing Integrated Devices

GUID-2F5235A0-3E33-46E1-B904-272A8D18F2CC

Viewing Integrated Devices

To view the **Integrated Devices** screen, perform the following steps:

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

   ```
   F2 = System Setup
   ```

   NOTE: If your operating system begins to load before you press F2, wait for the system to finish booting, and then restart your system and try again.
3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Integrated Devices**.

Related links

Integrated Devices
Integrated Devices details

GUID-0F237DCA-AE8A-4972-985B-69DA22BE42EA

Integrated Devices details

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

Option	Description
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.**

Option	Description
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.

Related links

Integrated Devices

Viewing Integrated Devices

GUID-EE725DEB-6B68-44A0-81B0-D2DBA24C92AC

Serial Communication

You can use the **Serial Communication** screen to view the properties of the serial communication port.

Related links

Serial Communication details

System BIOS

Viewing Serial Communication

GUID-6D665549-AED7-4979-8ABE-2DC1A5A2B12A

Viewing Serial Communication

To view the **Serial Communication** screen, perform the following steps:

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

   ```
   F2 = System Setup
   ```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Serial Communication**.

Related links

Serial Communication
Serial Communication details

GUID-E157144B-C958-42B2-A59D-9EF371F99AD4

Serial Communication details

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

Option	Description
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.

Related links

Serial Communication
Viewing Serial Communication

GUID-0CC8F614-DBD3-4971-91CD-37D65FFAB985

System Profile Settings

You can use the **System Profile Settings** screen to enable specific system performance settings such as power management.

Related links

System Profile Settings details
System BIOS
Viewing System Profile Settings

GUID-4B312423-5C9C-4952-A839-01CFC98C1F1A

Viewing System Profile Settings

To view the **System Profile Settings** screen, perform the following steps:

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

   ```
   F2 = System Setup
   ```

   NOTE: If your operating system begins to load before you press F2, wait for the system to finish booting, and then restart your system and try again.
3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **System Profile Settings**.

Related links

System Profile Settings
System Profile Settings details

GUID-2E9B46A1-71E3-4072-9D86-DB648757F0E6

System Profile Settings details

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

Option	Description
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.

Option	Description
	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.**

Related links

System Profile Settings
Viewing System Profile Settings

GUID-39ED4430-3C7E-4E1A-BBDA-3B0C354FD9B1

Miscellaneous Settings

You can use the **Miscellaneous Settings** screen to perform specific functions such as updating the asset tag and changing the system date and time.

Related links

Miscellaneous Settings details
System BIOS
Viewing Miscellaneous Settings

GUID-F1DD6C36-AEB2-495B-9FDB-70E29BE86DCE

Viewing Miscellaneous Settings

To view the **Miscellaneous Settings** screen, perform the following steps:

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

   ```
   F2 = System Setup
   ```

   NOTE: If your operating system begins to load before you press F2, wait for the system to finish booting, and then restart your system and try again.
3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Miscellaneous Settings**.

Related links

Miscellaneous Settings
Miscellaneous Settings details

GUID-982AD1EF-9ED6-457F-8E44-AF6A9717AABD

Miscellaneous Settings details

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

Option	Description
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.

Related links

Miscellaneous Settings
Viewing Miscellaneous Settings

GUID-AC8A0FBD-0C5C-45F9-AA5E-5E49B24390D9

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**.

Related links

Device Settings
System BIOS
Entering the iDRAC Settings utility
Changing the thermal settings

GUID-5F211B20-DF41-4ABE-95AC-CF114FD072EE

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.

Related links

iDRAC Settings utility

GUID-6AA43BF5-38BB-49C3-9F28-ADBA64D3AC88

Changing the thermal settings

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

1. Click **iDRAC Settings** → **Thermal**.
2. Under **SYSTEM THERMAL PROFILE** → **Thermal Profile**, select one of the following options:
   - Default Thermal Profile Settings
   - Maximum Performance (Performance Optimized)
   - Minimum Power (Performance per Watt Optimized)
3. Under **USER COOLING OPTIONS**, set the **Fan Speed Offset**, **Minimum Fan Speed**, and **Custom Minimum Fan Speed**.
4. Click **Back** → **Finish** → **Yes**.

Related links

iDRAC Settings utility

GUID-D76F5889-93F6-49F1-863B-922D65790737

Device Settings

Device Settings enables you to configure device parameters.

Related links

System BIOS

GUID-D044F152-F12C-4FB9-82C8-BDE11D47146E

Dell Lifecycle Controller

Dell Lifecycle Controller (LC) provides advanced embedded systems management capabilities including system deployment, configuration, update, maintenance, and diagnosis. LC is delivered as part of the iDRAC out-of-band solution and Dell system embedded Unified Extensible Firmware Interface (UEFI) applications.

Related links

Embedded system management

GUID-59438B5D-182F-4C94-8866-83903AF71AC2

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**.

Related links

Dell Lifecycle Controller

GUID-D62AC4EB-E0AF-48F5-8F92-54F0371E005F

Boot Manager

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

Related links

Boot Manager main menu
System BIOS
Viewing Boot Manager

GUID-9A03D297-C202-4104-9623-7DB4EB128468

Viewing Boot Manager

To enter **Boot Manager**:

1. Turn on, or restart your system.
2. Press F11 when you see the following message:

   ```
   F11 = Boot Manager
   ```

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

Related links

Boot Manager
Boot Manager main menu

GUID-4F3E3CE5-39AC-4CF6-B32D-A7671063B1D5

Boot Manager main menu

Menu item	Description
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	Enables you to access boot menu, where you can select a one-time boot device to boot from.
Launch System Setup	Enables you to access System Setup.
Launch Lifecycle Controller	Exits the Boot Manager and invokes the Dell Lifecycle Controller program.
System Utilities	Enables you to launch System Utilities menu such as System Diagnostics and UEFI shell.

Related links

Boot Manager
Viewing Boot Manager

GUID-76A71008-00CE-437D-8D48-F60AF16524C7

One-shot BIOS boot menu

One-shot BIOS boot menu enables you to select a one-shot boot device to boot from the following options:

- Launch Diagnostics
- BIOS Update File Explorer
- Reboot System

Related links

Boot Manager

GUID-1E9A33BE-0F74-44FE-ABA5-6BE18A66A9C7

System Utilities

System Utilities contains the following utilities that can be launched:

- Launch Diagnostics
- BIOS Update File Explorer
- Reboot System

Related links

Boot Manager

GUID-765B8384-69A6-4C68-9814-36BBBDBCC03F

PXE boot

The Preboot Execution Environment (PXE) is an industry standard client or interface that allows networked computers that are not yet loaded with an operating system to be configured and booted remotely by an administrator.

GUID-14CB1AEA-AC53-441E-AF76-1AFDF51449E8

6

Installing and removing system components

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

GUID-5268AEA2-87A4-47D0-AB11-85BF1AA4AAB4

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, the system must be populated always with air shrouds and with either a component or with a blank.

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

GUID-14C8C71E-DE81-44BD-A5B1-14F47B0C92A9

Before working inside your system

Prerequisites

Follow the safety guidelines listed in the Safety instructions section.

Steps

1. Turn off the system, including any attached peripherals.
2. Disconnect the system from the electrical outlet and disconnect the peripherals.
3. If applicable, remove the system from the rack.

   For more information, see the *Rack Installation* placemat at **Dell.com/poweredgemanuals**.
4. Remove the system cover.

Related links

Removing the system top cover (front)

Removing the system top cover (back)

GUID-74DF2612-3440-4B9B-A9EB-0053379CD85B

After working inside your system

Prerequisites

Follow the safety guidelines listed in the Safety instructions section.

Steps

1. Install the system cover.
2. If applicable, install the system into the rack.

   For more information, see the *Rack Installation* placemat at **Dell.com/poweredgemanuals**.
3. Reconnect the peripherals and connect the system to the electrical outlet.
4. Turn on the system, including any attached peripherals.

Related links

Installing the system top cover (front)

Installing the system top cover (back)

GUID-57DAAFDD-3B9C-4E62-AD30-D9B54E8D025B

Recommended tools

You need the following tools to perform the removal and installation procedures:

- Phillips #1 screwdriver
- Phillips #2 screwdriver
- #T6 and #T10 Torx screwdrivers
- Wrist grounding strap

GUID-574BA1BC-1669-4DFD-BA70-1EEF244B14F2

System covers

The system cover protects the innards of the server and helps in maintaining air flow inside the server. Removing the system cover actuates the intrusion switch and aids in maintaining system security.

Related links

Removing the system top cover (front)

Installing the system top cover (front)

Removing the system top cover (back)

Installing the system top cover (back)

GUID-D08B90EC-43E1-4F33-BCE2-E3F390600D85

Removing the system top cover (front)

Prerequisites

CAUTION: Do not operate the system without the system cover. This can result in overheating and cause component damage.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Turn off the system, including any attached peripherals.
3. Disconnect the system from the electrical outlet and disconnect the peripherals.

Steps

1. Turn the system cover lock to the unlocked position.
2. Press the release tabs on the system top cover, and slide the cover toward the front of the system.

3. Hold the cover on both sides, and lift the cover away from the system.

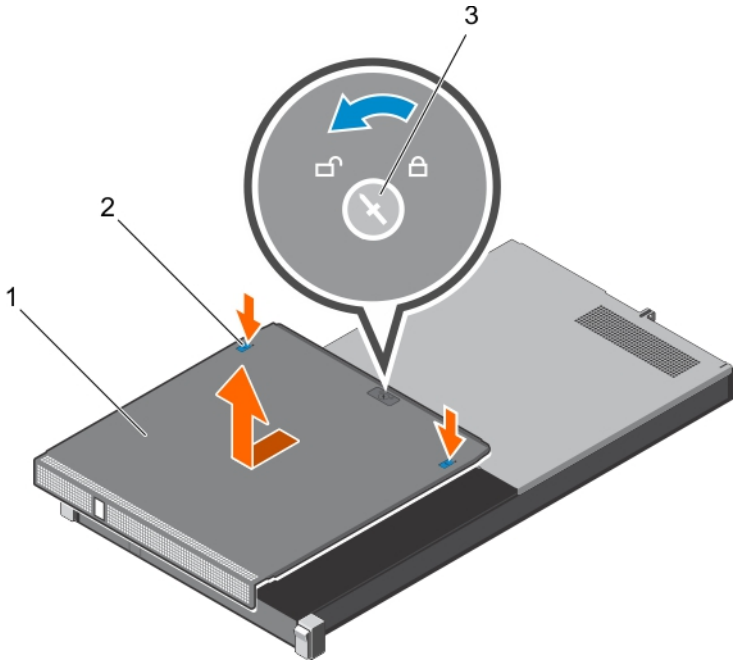

Figure 9. Removing the system top cover (front)

1. system top cover (front)
2. release tab (2)
3. system cover lock

Related links

Safety instructions

Installing the system top cover (front)

GUID-0D75CD2F-3E13-49D1-AD8D-8FFE180BDA29

Installing the system top cover (front)

Prerequisites

CAUTION: Do not operate the system without the system cover. This can result in overheating and cause component damage.

1. Follow the safety guidelines listed in the safety instructions section.
2. Ensure that all internal cables are connected and routed correctly.

NOTE: Closing the system cover with incorrect cable routing can damage the cables.

Steps

1. Align the slots of the system top cover with the tabs on the chassis.
2. Slide the cover toward the back of the chassis until it locks into place.
3. Rotate the system cover lock to the locked position.

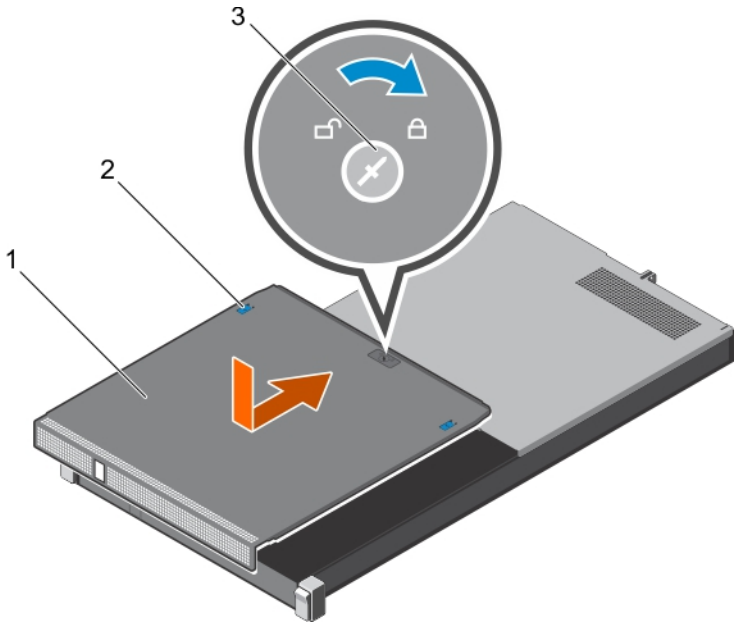

Figure 10. Installing the system top cover (front)

1. system top cover (front)
2. release tab (2)
3. system cover lock

Next steps

Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

Related links

Safety instructions

Removing the system top cover (front)

GUID-2D0DA70A-046F-4A45-BB2E-E69337841AD6

Removing the system top cover (back)

Prerequisites

CAUTION: Do not operate the system without the system cover. This can result in overheating and cause component damage.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Turn off the system, including any attached peripherals.
3. Disconnect the system from the electrical outlet and disconnect the peripherals.
4. Remove the system from the rack.
5. Keep the Phillips #1 screwdriver ready.

Steps

1. Remove the screws securing the system top cover to the chassis.
2. Slide the system top cover toward the back of the system.
3. Hold the cover on both sides, and lift the cover away from the system.

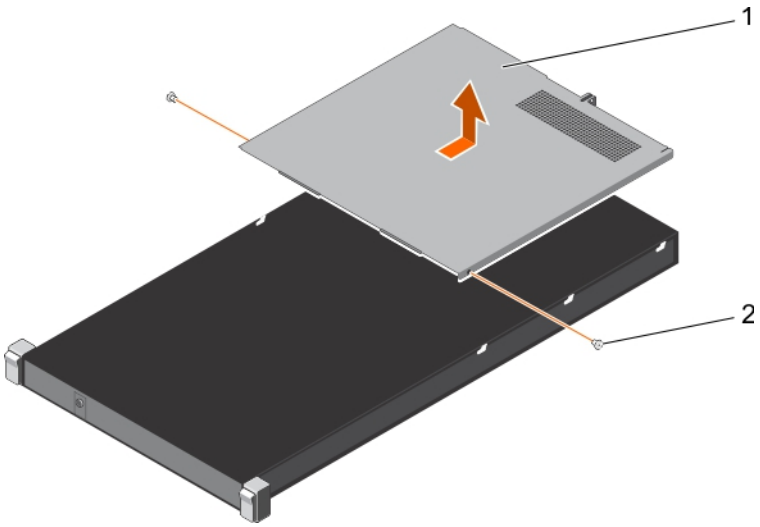

Figure 11. Removing the system top cover (back)

1. system top cover (back)
2. screw (2)

Related links

Safety instructions
Before working inside your system
Installing the system top cover (back)

GUID-12E574A9-1427-456D-AF56-2AB8E81ACFAB

Installing the system top cover (back)

Prerequisites

1. Follow the safety guidelines listed in the safety instructions section.
2. Ensure that all internal cables are connected and routed correctly.
3. Keep the Phillips #1 screwdriver ready.

CAUTION: Closing the system cover with incorrect cable routing can damage the cables.

Steps

1. Align the slots of the system top cover with the tabs on the chassis.
2. Align the guide pin on the back of the chassis with the guide slot on the back of the cover.
3. Slide the cover towards the front of the chassis until the guide pin on the back of the chassis locks on the back of the cover.
4. Secure the system top cover to the chassis by using the screws.

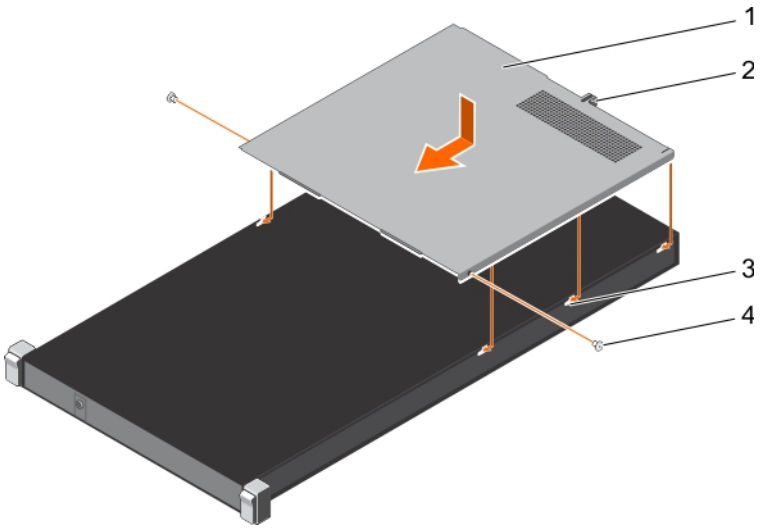

Figure 12. Installing the system top cover (back)

1. system top cover (back)
2. guide slot on the system cover
3. tab on the chassis (6)
4. screw (2)

Next steps

CAUTION: Turn on the system only when both the system top covers are installed.

1. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.
2. Install the system into the rack.

Related links

Safety instructions

Removing the system top cover (back)

GUID-F502E0AA-951E-40D2-86A0-2E58CCA08163

Inside the system PowerEdge C4130

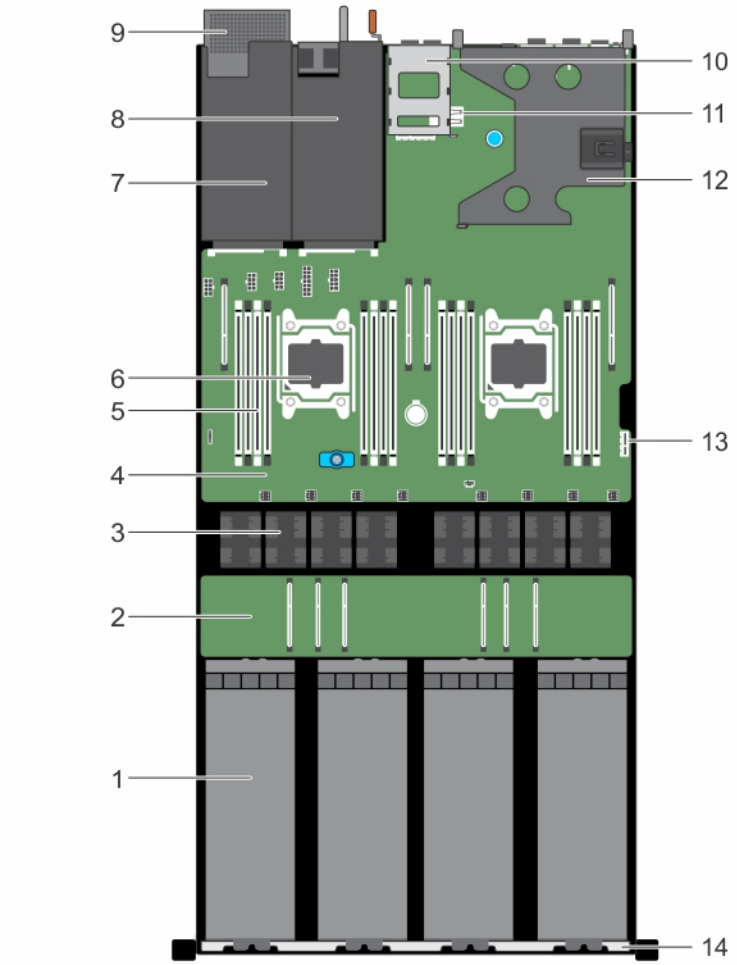

Figure 13. Inside the system - PowerEdge C4130

1. GPU (4)
2. GPU switch board (optional)
3. cooling fan (8)
4. system board
5. DIMM (16)
6. processor (2)
7. power supply unit 2 slot/2.5 inch hard drive slot
8. power supply unit 1 slot
9. 2.5 inch hard drive cage (optional)
10. 1.8 inch uSATA SSD cage
11. internal USB key connector
12. expansion card riser
13. IDSDM connector
14. front inner wall of the chassis

Inside the system PowerEdge C4130 with SXM2 GPU

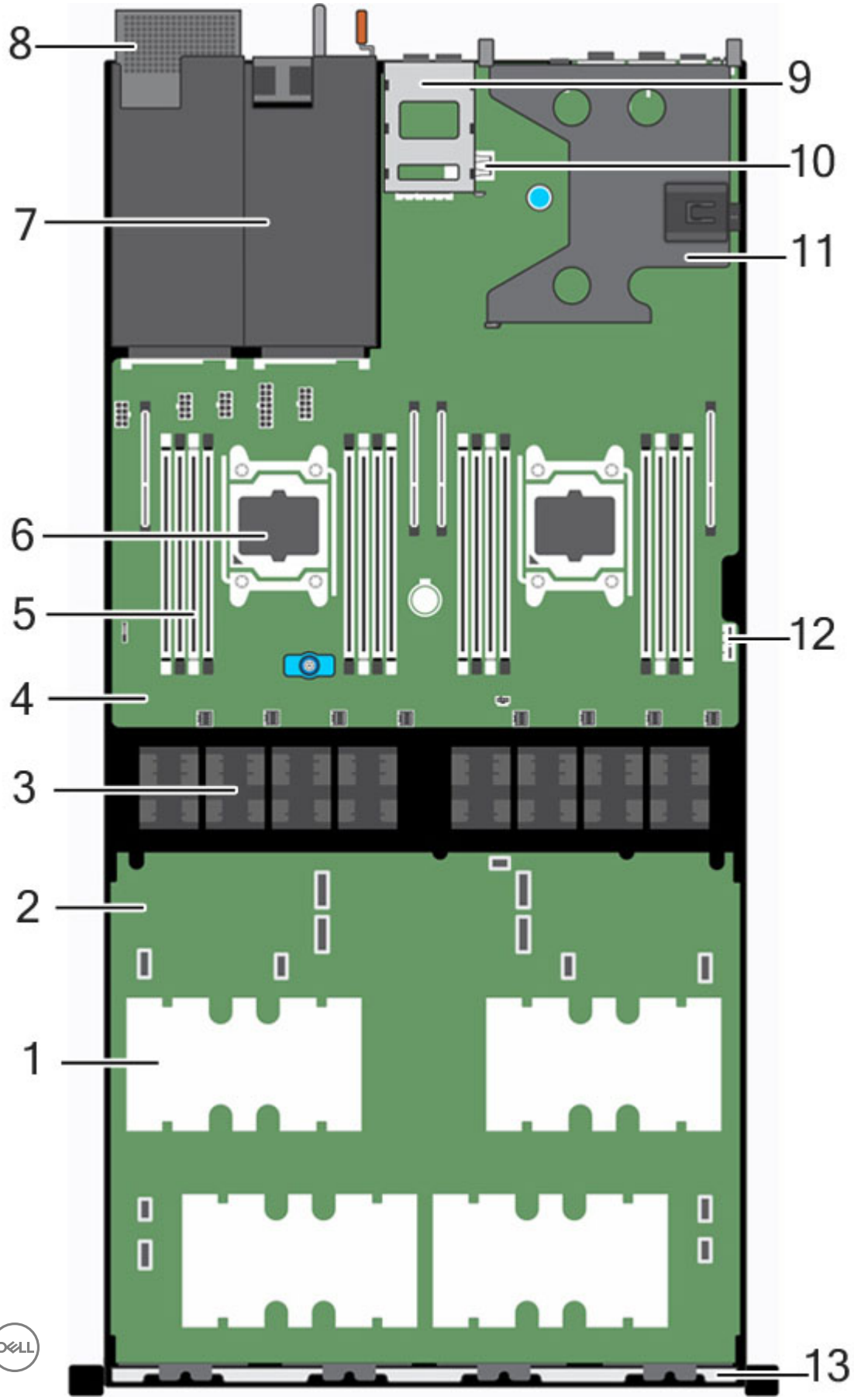

Figure 14.

1. 1. GPU (4)
2. NVLink board
3. Cooling fan (8)
4. System board
5. DIMM (16)
6. Processor (2)
7. Power supply unit
8. 2.5 inch hard drive cage (optional)
9. 1.8 inch uSATA SSD cage
10. Internal USB key connector
11. Expansion card riser
12. IDSDM connector
13. Front inner wall of the chassis

GUID-0FA90B62-A92A-4582-A39A-9203A309F0C8

Chassis intrusion switch

The Chassis Intrusion Switch detects any intrusion into the interior of your system and provides an indication of the same in the system event logs. This switch is activated as soon as the cover of your system chassis is removed.

NOTE: If the intrusion cable is missing or not connected, a notification is received in the ESM and intrusion status is not logged in the system event log.

The chassis intrusion switch detects any unauthorized access into the interior of your system and provides an indication of the same. This switch is activated as soon as the system cover is removed and access is made to the interior of your system.

Related links

Removing the intrusion switch
Installing an internal SD card

GUID-18058CD2-1C22-44B2-809B-2E7DF535BD63

Removing the intrusion switch

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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

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 GPU power and signal cables do not interfere with the intrusion switch cable.

Steps

1. Disconnect the intrusion switch cable from the connector on the system board.
2. Slide the intrusion switch out of the intrusion switch slot.

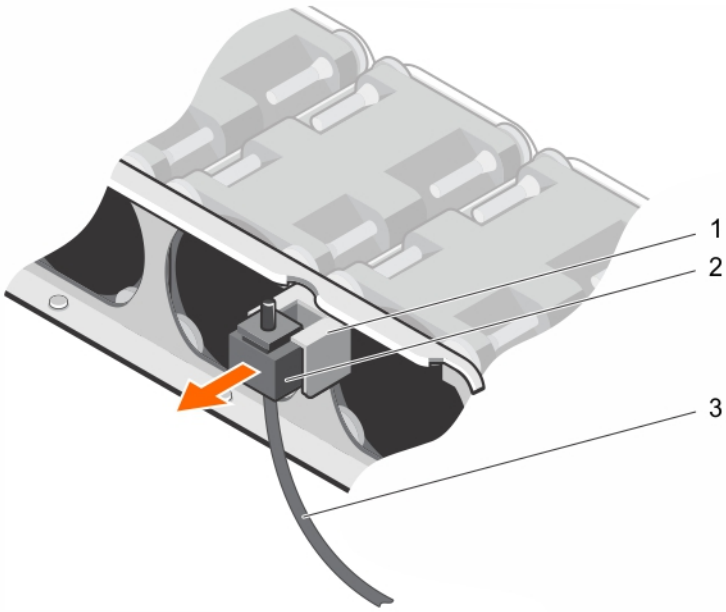

Figure 15. Removing the intrusion switch

1. intrusion switch slot
2. intrusion switch
3. intrusion switch cable

Next steps

1. Install the intrusion switch.
2. Follow the procedure listed in the After working inside your system section.

Related links

Safety instructions
Before working inside your system
After working inside your system
Installing the intrusion switch

GUID-91671F26-3BB6-4486-A0D0-C65AD3BD4829

Installing the intrusion switch

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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

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

Steps

1. Insert the intrusion switch into the intrusion switch slot.
2. Slide the intrusion switch until it locks into position.
3. Route the intrusion switch cable through the cable routing tab.
4. Connect the intrusion switch cable to the connector on the system board.

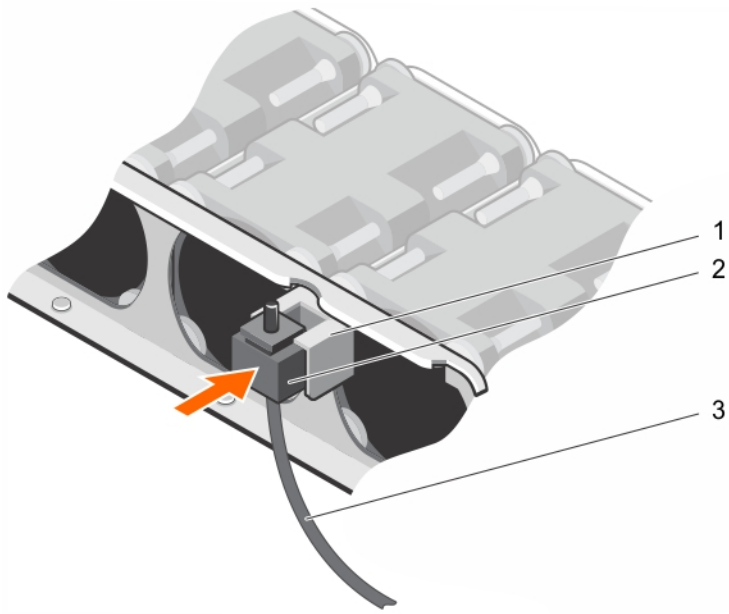

Figure 16. Installing the intrusion switch

1. intrusion switch slot
2. intrusion switch
3. intrusion switch cable

Next steps

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

Related links

Safety instructions
Before working inside your system
After working inside your system
Removing the intrusion switch

GUID-0CBC7747-E59B-4278-90A7-C44C79218332

Internal dual SD module (optional)

The Internal Dual SD module (IDSDM) provides you with a redundant SD card solution. You can configure the IDSDM for storage or as the OS boot partition. The IDSDM 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.

Related links

Removing an internal SD card
Installing an internal SD card
Removing the internal dual SD module
Installing the internal dual SD module

GUID-5F4D01E4-31D8-429C-95FA-D3AC73D9FFD0

Removing an internal 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: 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.

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

Steps

1. Locate the SD card slot on the internal dual SD module
2. Press the card to release it from the slot.
3. Temporarily label each SD card with its corresponding slot before removal.

Next steps

Install the SD card(s).

Related links

Safety instructions
Before working inside your system
Installing an internal SD card

GUID-0624BC6B-8744-4F0C-B440-63A963218242

Installing an internal 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.

1. Follow the safety guidelines listed in the 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 enabled in System setup.

Steps

1. Locate the SD card slot on the internal dual SD module.

   NOTE: The slot is keyed to ensure correct insertion of the card.

2. Orient the SD card appropriately and insert the contact-pin end of the card into the slot.
3. Press the card into the card slot until it locks into place.

Next steps

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

Related links

Safety instructions
Before working inside your system
After working inside your system
Removing an internal SD card

GUID-76A0078C-5CB5-4191-A04F-5ACC61D5DC56

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

Steps

1. Locate the internal dual SD module (IDSDM) on the system board.
2. If installed, remove the SD card(s).

   Temporarily label each SD card with its corresponding slot before removal. Install the SD card(s) into the same slots.
3. Hold the pull tab and pull the dual SD module out of the system board.

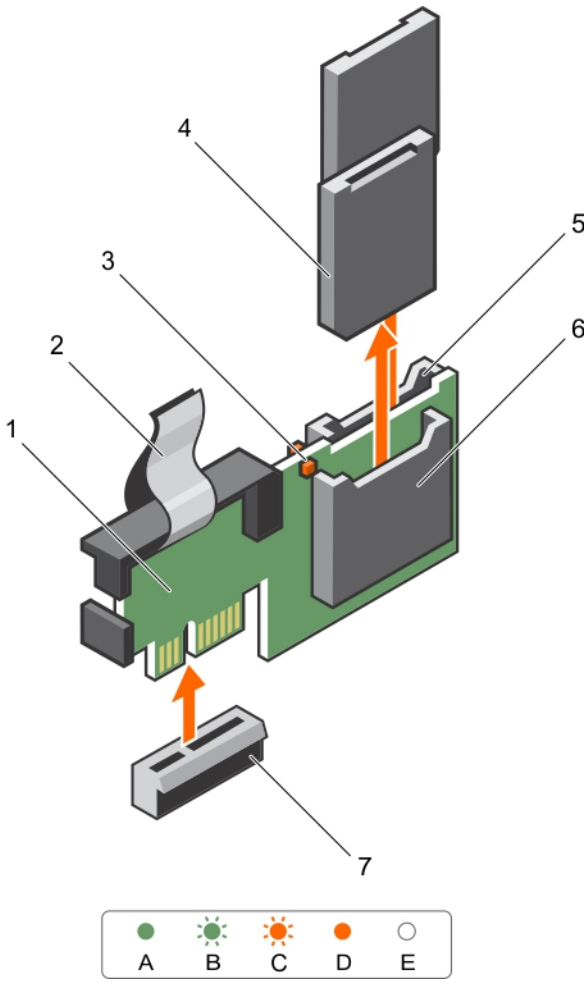

Figure 17. Removing the internal dual SD module (IDSDM)

1. IDSDM
2. pull tab
3. LED status indicator (2)
4. SD card (2)
5. SD card slot 2
6. SD card slot 1

7. IDSDM connector

The following table describes the IDSDM indicator codes:

Table 25. IDSDM indicator codes

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

Next steps

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

Related links

Safety instructions
Before working inside your system
After working inside your system
System board connectors
Installing the internal dual SD module

GUID-1B80509E-246D-4714-9748-0C95E3DF566A

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

Steps

1. Locate the internal dual SD module (IDSDM) connector on the system board.
2. Align the connectors on the system board and the IDSDM.
3. Push the IDSDM until it is firmly seated on the system board.

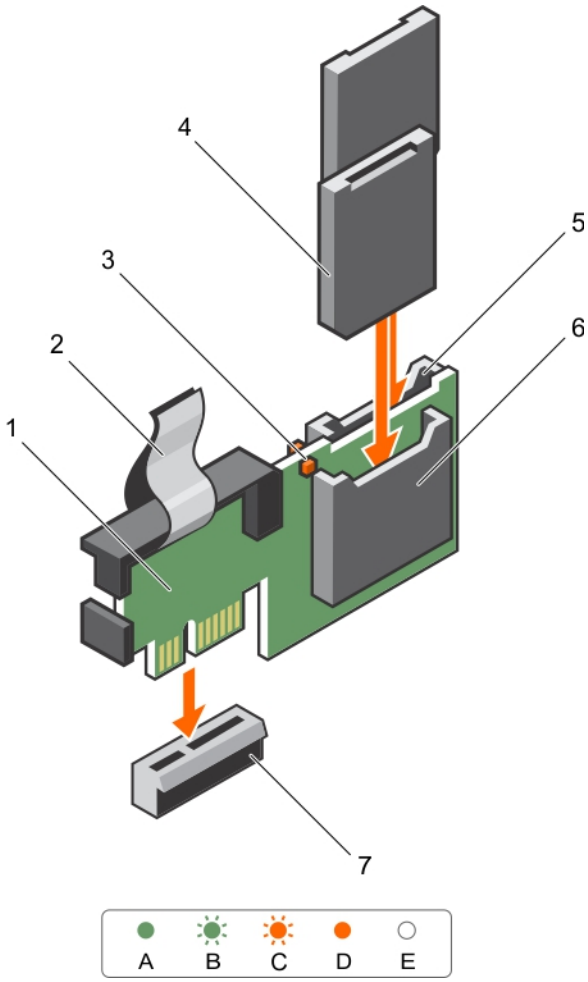

Figure 18. Installing the optional internal dual SD module

1. IDSDM
2. pull tab
3. LED status indicator (2)
4. SD card (2)
5. SD card slot 2
6. SD card slot 1
7. IDSDM connector

Next steps

1. Install the SD card(s), if applicable.
2. Follow the procedure listed in the After working inside your system section.

Related links

Safety instructions
Before working inside your system
After working inside your system
System board connectors
Removing the internal dual SD module

GUID-2DA7A8F5-B4B1-4A51-A896-53050B49C9FC

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.

Related links

Removing the cooling shroud

Installing the cooling shroud

GUID-5BBA5EC0-8059-4442-81A3-2C1D61EE74A2

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.

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.

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

Steps

Lift the cooling shroud away from the chassis.

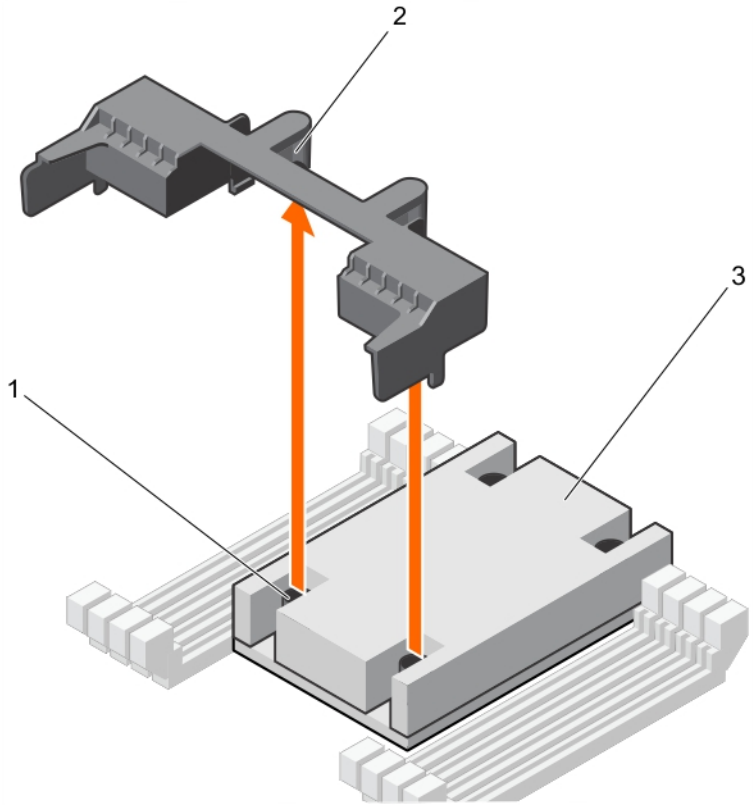

Figure 19. Removing the cooling shroud

1. screw on the heat sink (2)
2. guide slot on the cooling shroud (2)
3. heat sink

Next steps

1. Install the cooling shroud.

Related links

Safety instructions
Before working inside your system
Installing the cooling shroud

GUID-55D2762F-E20F-45F6-876D-97A63B328045

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. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Ensure that the memory module ejectors are closed.

Steps

1. Align the guide slots on the cooling shroud with the screws on the heat sink.
2. Lower the cooling shroud into the chassis until it is firmly seated.

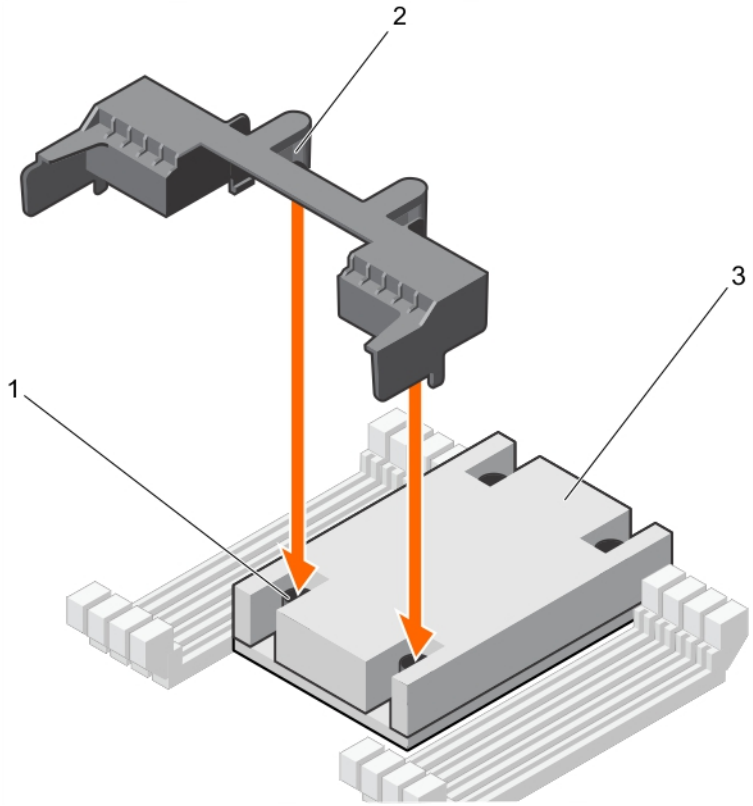

Figure 20. Installing the cooling shroud

1. screw on the heat sink (2)
2. guide slot on the cooling shroud (2)
3. heat sink

Next steps

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

Related links

Safety instructions
Before working inside your system
After working inside your system
Removing the cooling shroud

GUID-F5760768-E22B-4DCD-B936-E73B1B4CCA44

Processor blank

Related links

Removing a processor blank
Installing a processor blank

GUID-5181F303-4ACB-4884-BAF8-955CB70A1BDD

Removing a processor 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 the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.

Steps

1. Press the ejectors on both ends of the memory module sockets to open processor blank.
2. Hold the processor blank by its edges and lift it away from the system.

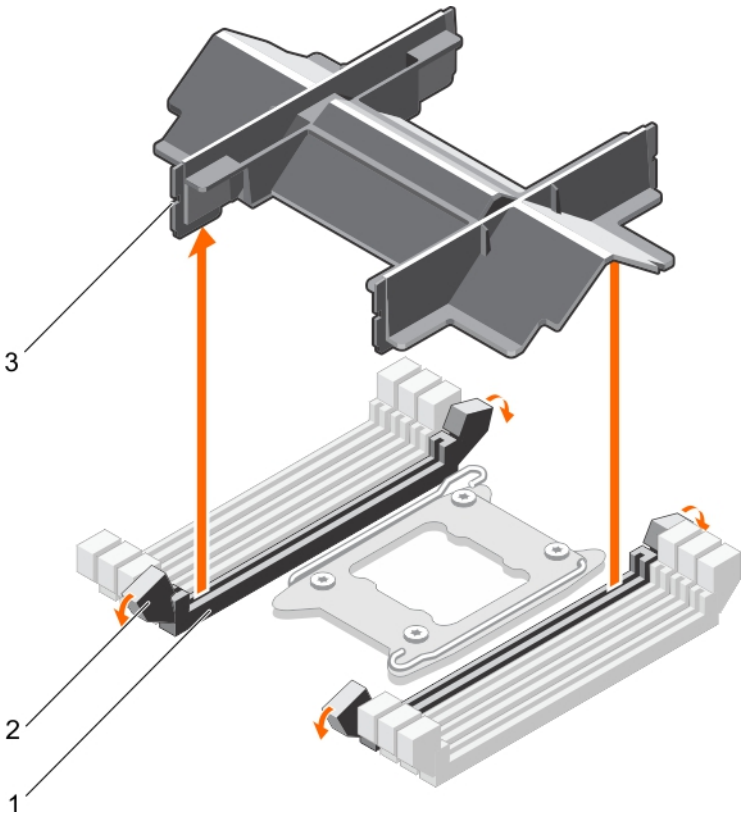

Figure 21. Removing a processor blank

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

Next steps

1. Install the processor and the heat sink.
2. Install the memory module(s).
3. If you are removing a processor permanently, install the processor blank.

Related links

Safety instructions
Before working inside your system
After working inside your system
Installing a processor
Installing a heat sink
Installing memory modules
Installing a processor blank

GUID-D7C2E9DE-C4AA-411E-A41A-361E49A44226

Installing a processor blank

If you are converting a dual processor system to a single processor system, install the processor 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 are shipped with your product.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Ensure that the memory module socket ejectors are in the unlocked position.

Steps

1. Align the processor blank with the memory module socket on the system board.
2. Lower the processor blank into the memory module socket, and press the blank firmly until the memory module socket ejectors click into place.

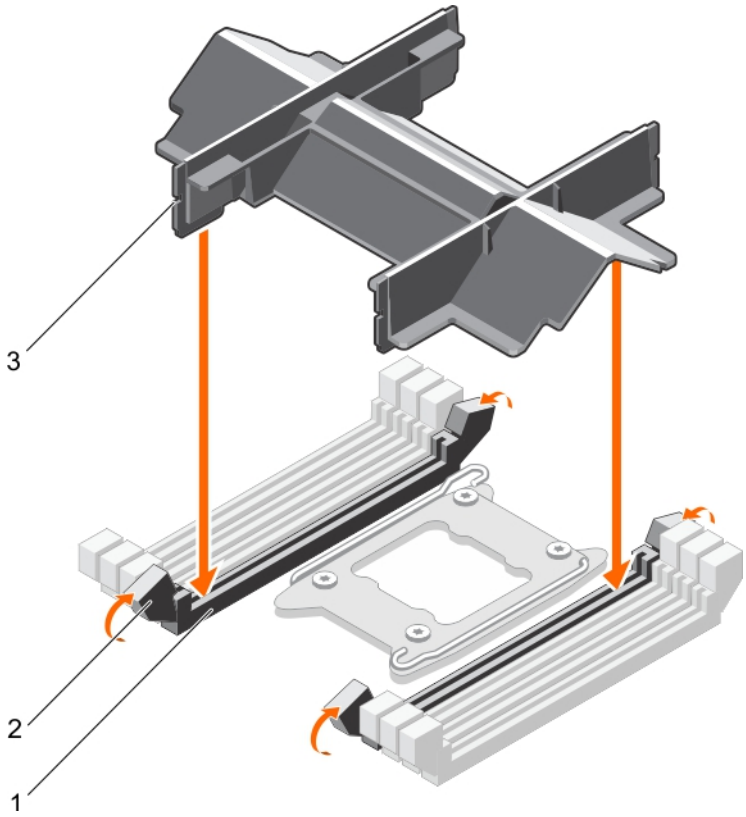

Figure 22. Installing a processor blank

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

Next steps

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

Related links

[Safety instructions]
[Before working inside your system]
[After working inside your system]
[Removing a processor blank]

GUID-F773F9CE-959F-4846-9F51-819409E8682D

System memory

Your system supports DDR4 registered DIMMs (RDIMMs) and load registered DIMMs (LRDIMMs).

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

Memory bus operating frequency can be 1333 MT/s, 1600 MT/s, 1866 MT/s, 2133 MT/s, or 2400 MT/s depending on the following factors:

- DIMM type (RDIMMs or LRDIMMs)
- Number of DIMMs populated per channel
- System profile selected (for example, Performance Optimized, Custom, or Dense Configuration Optimized)
- Maximum supported DIMM frequency of the processors

The system contains 16 memory sockets split into two sets of 8 sockets, one set per processor. Each 8-socket set is organized into four channels. In each channel, the release levers of the first socket are marked white and the second socket black.

NOTE: DIMMs in sockets A1 to A8 are assigned to processor 1 and DIMMs in sockets B1 to B8 are assigned to processor 2.

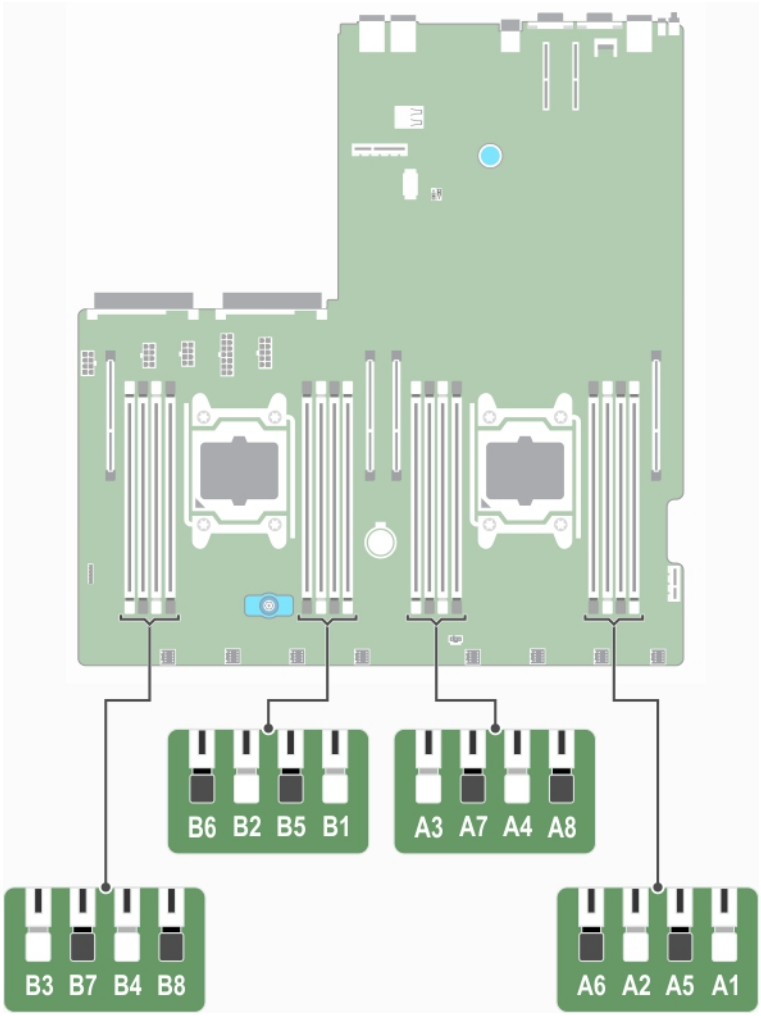

Figure 23. Memory socket locations

Table 26. Memory channels

Processor 1	channel 0: slots A1, A5	channel 1: slots A2, A6	channel 2: slots A3, A7	channel 3: slots A4, A8
Processor 2	channel 0: slots B1, B5	channel 1: slots B2, B6	channel 2: slots B3, B7	channel 3: slots B4, B8

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

Table 27. Memory population

DIMM Type	DIMMs Populated/ Channel	Voltage	Operating Frequency (in MT/s)	Maximum DIMM Rank/ Channel
RDIMM	1	1.2 V	2400, 2133, 1866, 1600, 1333	Dual rank or single rank
	2		2400, 2133, 1866, 1600, 1333	Dual rank or single rank
LRDIMM	1	1.2 V	2400, 2133, 1866, 1600, 1333	Quad rank
	2		2400, 2133, 1866, 1600, 1333	Quad rank

GUID-2723D997-89FA-429D-9CB8-02C23F4EC5CF

General memory module installation guidelines

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

The 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 memory modules can be mixed. For more information, see the Mode-specific guidelines section.
- Up to two dual or single-rank RDIMMs can be populated per channel.
- Populate memory module 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 B8 are available.
- Populate all the sockets with white release tabs first and then the black release tabs.
- Populate the sockets by the highest rank count, in the following order—first in sockets with white release tabs and then with the black release tabs. For example, if you want to mix single-rank and dual-rank memory modules, populate dual-rank memory modules in the sockets with white release tabs and single-rank memory modules in the sockets with black release tabs.
- 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 memory modules, populate 8 GB memory modules in the sockets with white release tabs and 4 GB memory modules in the sockets with black release tabs.
- In a dual-processor configuration, the memory configuration for each processor should be identical. For example, if you populate socket A1 for processor 1, then populate socket B1 for processor 2, and so on.
- 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 memory module capacities in a system is not supported.
- Mixing LRDIMMs and RDIMMs is not supported.
- Populate four memory modules per processor (one DIMM per channel) at a time to maximize performance.

Related links

Mode-specific guidelines
Installing memory modules
Installing the cooling shroud
Sample memory configurations

GUID-30ABB8BF-8DD5-4139-B67F-82BC5C5BE1F5

Mode-specific guidelines

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

GUID-984F2B7A-CDB4-48AA-8EEA-9FB6EAF2F789

Advanced Error Correction Code (lockstep)

Advanced Error Correction Code (ECC) mode extends SDDC from x4 DRAM based DIMMs to both x4 and x8 DRAMs. This protects against single DRAM chip failures during normal operation.

The installation guidelines for memory modules are as follows:

- Memory modules must be identical in size, speed, and technology.
- DIMMs installed in memory sockets with white release levers must be identical and the same rule applies for sockets with black release levers. This ensures that identical DIMMs are installed in matched pair —for example, A1 with A2, A3 with A4, A5 with A6, and so on.

GUID-4E0D57EB-0369-4D2F-9B34-9CF1CE1058B5

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.

GUID-5C2CC231-2DE5-4CBD-A7F3-A9F46A570D89

Memory sparing

NOTE: To use memory sparing, this feature must be enabled in System Setup.

In this mode, one rank per channel is reserved as a spare. If persistent correctable errors are detected on a rank, the data from this rank is copied to the spare rank, and the failed rank is disabled.

With memory sparing enabled, the system memory available to the operating system is reduced by one rank per channel. For example, in a dual-processor configuration with sixteen 4 GB single-rank memory modules, the available system memory is: 3/4 (ranks/channel) × 16 (memory modules) × 4 GB = 48 GB, and not 16 (memory modules) × 4 GB = 64 GB.

NOTE: Memory sparing does not offer protection against a multi-bit uncorrectable error.

NOTE: Both Advanced ECC/Lockstep and Optimizer modes support memory sparing.

GUID-C028BC5D-CF38-4517-A533-BD1B8BA71DDC

Memory mirroring

Memory mirroring offers the strongest memory module reliability mode compared to all other modes, providing improved uncorrectable multi-bit failure protection. In a mirrored configuration, the total available system memory is one half of the total installed physical memory. Half of the installed memory is used to mirror the active memory modules. In the event of an uncorrectable error, the system switches over to the mirrored copy. This ensures SDDC and multi-bit protection.

The installation guidelines for memory modules are as follows:

- Memory modules must be identical in size, speed, and technology.
- Memory modules installed in memory module sockets with white release levers must be identical and the same rule applies for sockets with black and green release tabs. This ensures that identical memory modules are installed in matched pairs—for example, A1 with A2, A3 with A4, A5 with A6, and so on.

Table 28. Processor configuration

Processor	Configuration	Memory population rules	Memory population information
Single CPU	Memory population order	{1,2}, {3,4}	See Memory mirroring note

GUID-60347680-0521-4A35-AAF2-839CA9AE684A

Sample memory configurations

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

NOTE: 1R, 2R, and 4R in the following tables indicate single-rank, dual-rank, and quad-rank memory modules respectively.

Table 29. Memory configurations—single processor

System capacity (in GB)	Memory modules size (in GB)	Number of memory modules	Memory module rank, organization, and frequency	Memory module slot population
4	4	1	1R, x8, 2133 MT/s, 1R, x8, 1866 MT/s	A1
8	4	2	1R, x8, 2133 MT/s, 1R, x8, 1866 MT/s	A1, A2
16	4	4	1R, x8, 2133 MT/s, 1R, x8, 1866 MT/s	A1, A2, A3, A4
	8	2	2R, x8, 2133 MT/s, 2R, x8, 1866 MT/s	A1, A2
24	4	6	1R, x8, 2133 MT/s, 1R, x8, 1866 MT/s	A1, A2, A3, A4, A5, A6
32	8	4	2R, x8, 2133 MT/s, 2R, x8, 1866 MT/s	A1, A2, A3, A4
	16	2	2R, x8, 2133 MT/s, 2R, x8, 1866 MT/s	A1, A2
	32	1	2R, x8, 2133 MT/s, 2R, x8, 1866 MT/s	A1
48	8	6	2R, x8, 2133 MT/s, 2R, x8, 1866 MT/s	A1, A2, A3, A4, A5, A6
64	8	8	2R, x8, 2133 MT/s, 2R, x8, 1866 MT/s	A1, A2, A3, A4, A5, A6, A7, A8
	16	4	2R, x8, 2133 MT/s, 2R, x8, 1866 MT/s	A1, A2, A3, A4
	32	2	2R, x8, 2133 MT/s, 2R, x8, 1866 MT/s	A1, A2
96	16	6	2R, x4, 2133 MT/s, 2R, x4, 1866 MT/s	A1, A2, A3, A4, A5, A6
128	16	8	2R, x4, 2133 MT/s, 2R, x4, 1866 MT/s,	A1, A2, A3, A4, A5, A6, A7, A8

System capacity (in GB)	Memory modules size (in GB)	Number of memory modules	Memory module rank, organization, and frequency	Memory module slot population
	32	4	2R, x4, 2133 MT/s, 2R, x4, 1866 MT/s,	A1, A2, A3, A4
192	32	6	2R, x4, 2133 MT/s, 2R, x4, 1866 MT/s	A1, A2, A3, A4, A5, A6
256	32	8	2R, x4, 2133 MT/s, 2R, x4, 1866 MT/s	A1, A2, A3, A4, A5, A6, A7, A8
512	64	8	4R, x4, 2400 MT/s	A1, A2, A3, A4, A5, A6, A7, A8

Table 30. Memory configurations—dual processors

System capacity (in GB)	Memory modules size (in GB)	Number of memory modules	Memory module rank, organization, and frequency	Memory module slot population
8	4	2	1R, x8, 2133 MT/s, 1R, x8, 1866 MT/s	A1, B1
16	4	4	1R, x8, 2133 MT/s, 1R, x8, 1866 MT/s	A1, A2, B1, B2
32	4	8	1R, x8, 2133 MT/s, 1R, x8, 1866 MT/s	A1, A2, A3, A4, B1, B2, B3, B4
64	4	16	1R, x8, 2133 MT/s 1R, x8, 1866 MT/s	A1, A2, A3, A4, A5, A6, A7, A8, B1, B2, B3, B4, B5, B6, B7, B8
	8	8	2R, x8, 2133 MT/s, 2R, x8, 1866 MT/s	A1, A2, A3, A4, B1, B2, B3, B4
	16	4	1R, x8, 2133 MT/s, 1R, x8, 1866 MT/s	A1, A2, B1, B2
	32	2	1R, x8, 2133 MT/s, 1R, x8, 1866 MT/s	A1, B1
96	8	12	2R, x8, 2133 MT/s, 2R, x8, 1866 MT/s	A1, A2, A3, A4, A5, A6, B1, B2, B3, B4, B5, B6
128	8	16	2R, x8, 2133 MT/s 2R, x8, 1866 MT/s	A1, A2, A3, A4, A5, A6, A7, A8, B1, B2, B3, B4, B5, B6, B7, B8
	16	8	2R, x4, 2133 MT/s,	A1, A2, A3, A4, B1, B2, B3, B4

System capacity (in GB)	Memory modules size (in GB)	Number of memory modules	Memory module rank, organization, and frequency	Memory module slot population
			2R, x4, 1866 MT/s	
	32	4	1R, x8, 2133 MT/s, 1R, x8, 1866 MT/s	A1, A2, B1, B2
160	16 and 8	12	2R, x4, 2133 MT/s, 2R, x8, 2133 MT/s, 2R, x4, 1866 MT/s 2R, x8, 1866 MT/s	A1, A2, A3, A4, A5, A6, B1, B2, B3, B4, B5, B6 **NOTE: 16 GB memory modules must be installed in slots numbered A1, A2, A3, A4, B1, B2, B3, and B4 and 8 GB memory modules must be installed in slots A5, A6, B5, and B6.**
192	16	12	2R, x4, 2133 MT/s, 2R, x4, 1866 MT/s	A1, A2, A3, A4, A5, A6, B1, B2, B3, B4, B5, B6
256	16	16	2R, x4, 2133 MT/s, 2R, x4, 1866 MT/s,	A1, A2, A3, A4, A5, A6, A7, A8, B1, B2, B3, B4, B5, B6, B7, B8
	32	8	2R, x4, 2133 MT/s, 2R, x4, 1866 MT/s	A1, A2, A3, A4, B1, B2, B3, B4
384	32	12	2R, x4, 2133 MT/s	A1, A2, A3, A4, A5, A6, B1, B2, B3, B4, B5, B6
512	32	16	2R, x4, 2133 MT/s	A1, A2, A3, A4, A5, A6, A7, A8, B1, B2, B3, B4, B5, B6, B7, B8
1024	64	16	4R, x4, 2400 MT/s	A1, A2, A3, A4, A5, A6, A7, A8, B1, B2, B3, B4, B5, B6, B7, B8

GUID-8959921E-87A0-427A-A8EC-BE39ACF26BC3

Removing memory modules

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

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

2. To release the memory module from the socket, simultaneously press the ejectors on both ends of the memory module socket.
3. Lift and remove the memory module from the system.

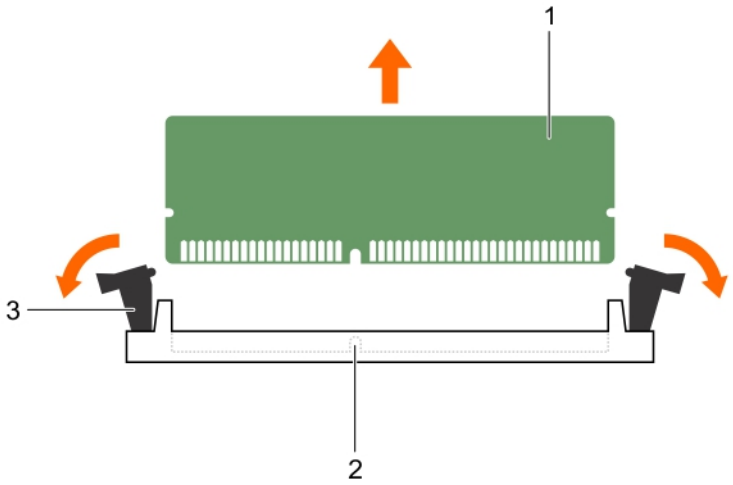

Figure 24. Removing the memory module

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

Next steps

1. If you are removing the memory module permanently, install a memory-module blank.
2. Install the memory module.
3. Install the cooling shroud.
4. Follow the procedure listed in the After working inside your system section.

Related links

Safety instructions
Before working inside your system
After working inside your system
Installing memory modules
Installing the cooling shroud
Removing the cooling shroud

GUID-AA773EDC-FC9D-4325-8F44-9EE3C5E9D89C

Installing memory modules

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

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, processor blanks must be installed. Remove processor blanks only if you intend to install memory modules and a processor.

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.

2. 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.

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

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

3. 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.

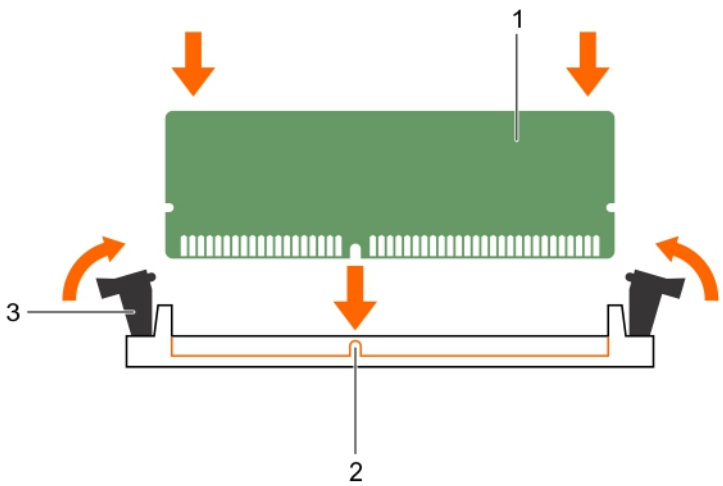

Figure 25. Installing the memory module

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 the After working inside your system section.
3. Press F2 to enter System Setup, and check the **System Memory** setting.

   The system should have already changed the value to reflect the installed memory.

4. If the value is incorrect, one or more of the memory modules may not be installed properly. Ensure that the memory module is firmly seated in the memory module socket.
5. Run the system memory test in system diagnostics.

GUID-41344D5D-E4CF-4B9D-845A-B530EBDCFF7E

Processors and heat sinks

Use the following procedure when:

- Removing and installing a heat sink
- Installing an additional processor
- Replacing a processor

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

GUID-113B427B-4E84-402C-A1EF-78FA18097C19

Removing a heat sink

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: 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.

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

1. Follow the safety guidelines listed in Safety instructions section.
2. Follow the procedure listed in the Before working inside your system.
3. Keep the Phillips #2 screwdriver ready.
4. Remove the cooling shroud.
5. Remove the PCIe shroud, if removing processor 1 heat sink.

WARNING: The heat sink is hot to touch for some time after the system has been powered down. Allow the heat sink to cool before removing it.

Steps

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

   Allow some time (approximately 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.

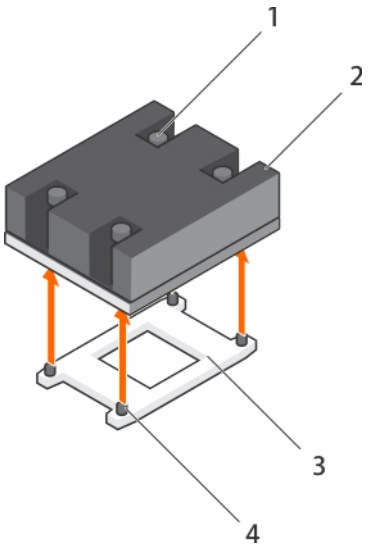

Figure 26. Removing the heat sink

1. retention screw (4)
2. heat sink
3. processor socket
4. heat sink retention socket (4)

Next steps

Remove the processor

Related links

Safety instructions
Removing the cooling shroud
Removing the PCIe shroud
Removing a processor
Installing a heat sink
Before working inside your system
After working inside your system

GUID-72FC3562-C978-49BA-A32E-EED271C890CF

Removing a processor

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

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Keep the Phillips #2 screwdriver ready.
4. Remove the cooling shroud.
5. Remove the PCIe shroud, if removing processor 1.
6. Remove the heat sink.
7. If you are 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.

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.

WARNING: The processor is hot to touch for some time after the system has been powered down. Allow the processor to cool before removing it.

Steps

1. Release the *open first* socket lever near the unlock icon by pushing the lever down and out from under the tab.
2. Release the *close first* socket release lever near the lock icon by pushing the lever down and out from under the tab. Lift the lever 90 degrees upward.
3. Lower the *open first* socket-release lever to lift the processor shield.
4. Hold the tab on the processor shield and lift the processor shield until the *open first* socket-release lever lifts up.

   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.
5. Lift the processor out of the socket and leave the *open first* socket-release lever up.

   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 anti-static container for reuse, return, or temporary storage. Do not touch the bottom of the processor. Touch only the side edges of the processor.

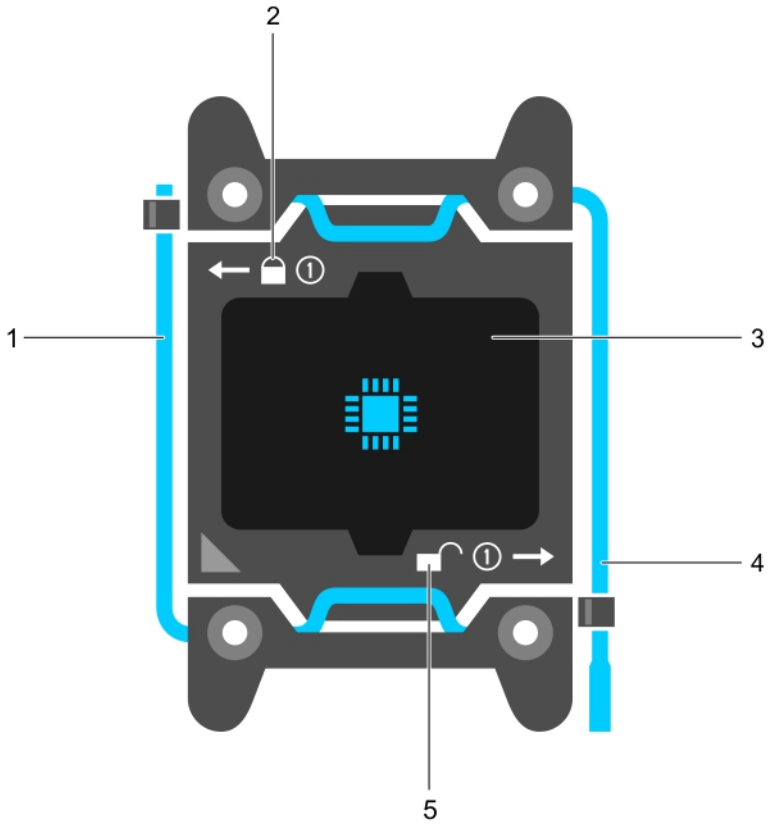

Figure 27. Processor shield

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

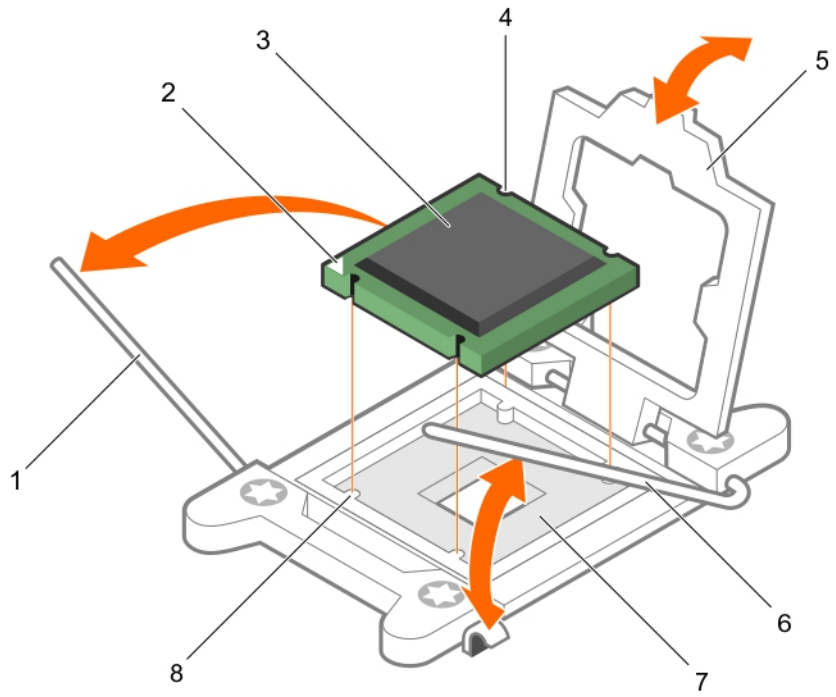

Figure 28. Removing and installing a processor

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)

Next steps

1. Replace the processor(s).
2. Install the heat sink.
3. Install the PCIe Shroud, if replacing processor 1
4. Reinstall the cooling shroud.
5. Follow the procedure listed in the After working inside your system section.

Related links

Before working inside your system
After working inside your system
Installing a processor
Installing a heat sink
Installing the cooling shroud
Installing the cooling shroud
Installing the PCIe shroud

GUID-F0D773C6-9A87-4A50-AA67-46D963B5B654

Installing a processor

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. Follow the procedure listed in the Before working inside your system section.
3. Keep the Phillips #2 screwdriver ready.
4. If you are 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 also update the system BIOS by using the Dell Lifecycle Controller.
5. Remove the cooling shroud.
6. Remove the PCIe shroud, if installing processor 1.

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: 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.

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

Steps

1. Unpack the new processor.

   NOTE: If the processor has previously been used in a system, remove any remaining thermal grease from the processor by using a lint-free cloth.
2. Locate the processor socket.
3. If applicable, remove the socket protective cap.
4. Release the *open first* socket-release lever near the unlock icon by pushing the lever down and out from under the tab.
5. Similarly, release the *close first* socket-release lever near the lock icon by pushing the lever down and out from under the tab. Lift the lever 90 degrees upward.
6. Hold the tab near the lock symbol on the processor shield and lift it up and out of the way.

   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.
7. Align the processor with the socket keys.

   CAUTION: Do not use force to seat the processor. When the processor is positioned correctly, it engages easily into the socket.
8. Align the pin-1 indicator of the processor with the triangle on the .

   CAUTION: Do not use force to seat the processor. When the processor is positioned correctly, it engages easily into the socket.
9. Place the processor on the socket such that the slots on the processor align with the socket keys.
10. Close the processor shield.
11. Lower the *close first* socket-release lever near the lock icon and push it under the tab to lock it.

12. Similarly, lower the *open first* socket-release lever near the unlock icon and push it under the tab to lock it.

Next steps

NOTE: Ensure that you install the heat sink after you install the processor. The heat sink is necessary to maintain proper thermal conditions.

1. Install the heat sink.
2. Install the cooling shroud.
3. If applicable, install the PCIe shroud.
4. While booting, press F2 to enter System Setup and verify that the processor information matches the new system configuration.
5. Run the system diagnostics to verify that the new processor operates correctly.

Related links

Safety instructions
Before working inside your system
After working inside your system
Removing a processor blank
Installing a heat sink
Installing the cooling shroud
Installing the PCIe shroud
Removing a processor

GUID-ED964F5B-205B-4DB9-8204-2073D779CAA9

Installing a heat sink

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. Keep the Phillips #2 screwdriver ready.
3. Follow the procedure listed in the Before working inside your system section.
4. Remove the cooling shroud.
5. Remove the PCIe shroud.
6. Install the processor.

Steps

1. If you are using an existing heat sink, remove the thermal grease from the heat sink by using a clean lint-free cloth.
2. Use the thermal grease syringe included with your processor kit to apply the grease in a thin spiral on the top of the processor.

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

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

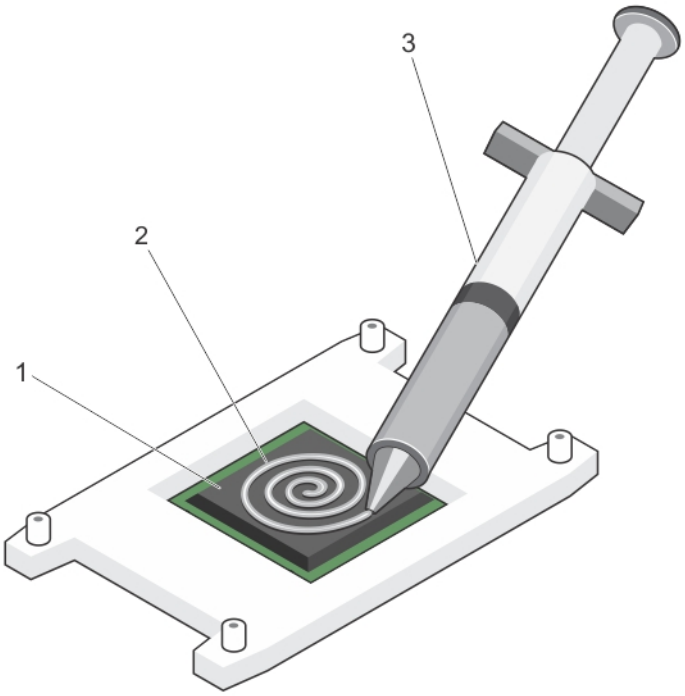

Figure 29. Applying thermal grease on the top of the processor

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

3. Place the heat sink onto the processor.
4. Tighten one of the four screws to secure the heat sink to the system board.
5. Tighten the screw diagonally opposite to the first screw you have tightened.

NOTE: 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 after the screw is seated. The screw tension should not be more than 6 in-lb (6.9 kg-cm).

6. Repeat the procedure for the remaining two screws.

Next steps

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

Related links

Safety instructions
Before working inside your system
After working inside your system
Installing a processor
Installing the cooling shroud
Installing the PCIe shroud
Removing a heat sink

GUID-F391F081-3AE1-4072-B15A-1CF57ED62563

System battery

The system board battery is used for low-level system functions like powering the real-time clock and storing the computer's BIOS settings.

Related links

Replacing the system battery

GUID-3D7F66B9-8237-4AFE-B689-5213990CE2F5

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. For more information, see the safety information that shipped with 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.

NOTE: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Disconnect the GPU signal and power cables from the system board.

Steps

1. Locate the battery socket. For more information, see the System board jumpers and connectors section.

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

2. Place your finger between the securing tabs at the negative side of the battery connector and lift the battery out of the socket.

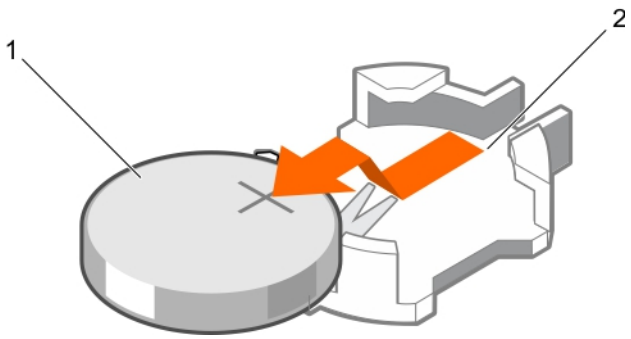

Figure 30. Removing the system battery

1. system battery
2. system battery slot

3. To install a new system battery, hold the battery with the "+" facing up and slide it under the securing tabs.

4. Press the battery into the connector until it snaps into place.

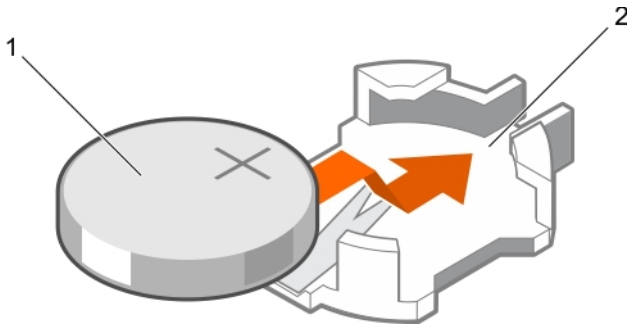

Figure 31. Installing the system battery

1. system battery
2. system battery slot

Next steps

1. Connect the GPU signal and power cables to the system board.
2. Follow the procedure listed in the After working inside your system section.
3. While booting, press F2 to enter 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. Exit System Setup.

Related links

Safety instructions
Before working inside your system
After working inside your system
System board connectors
Installing a GPU riser cable on the system board

GUID-E366E299-B507-4CBE-95C9-6650DBECD20E

PCIe shroud

GUID-E991D3F8-0C25-4AD2-BBAE-ABCC82705FDC

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

Steps

Lift the PCIe shroud away from the system.

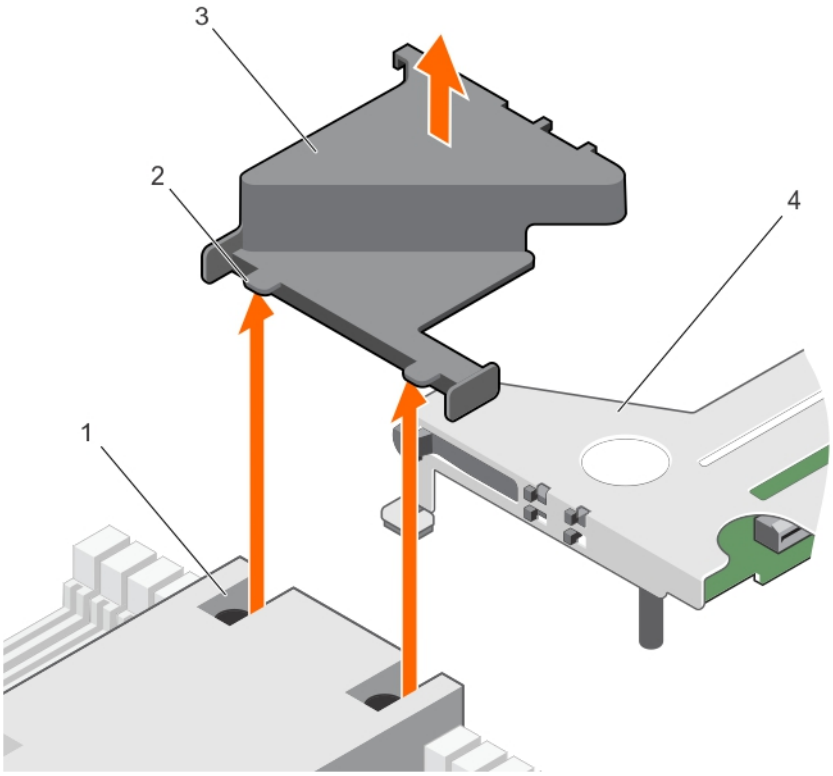

Figure 32. Removing the PCIe shroud

1. slot on the heat sink (2)
2. tab on the PCIe shroud (2)
3. PCIe shroud
4. expansion card riser

Next steps

1. Install the PCIe shroud.

Related links

Safety instructions
Before working inside your system
After working inside your system
Installing the PCIe shroud

GUID-2CDBED79-46ED-4213-9852-A3228A77E257

Installing the PCIe 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.

Follow the safety guidelines listed in the Safety instructions section.

Steps

Insert the tabs on the PCIe shroud into the slots on the heat sink.

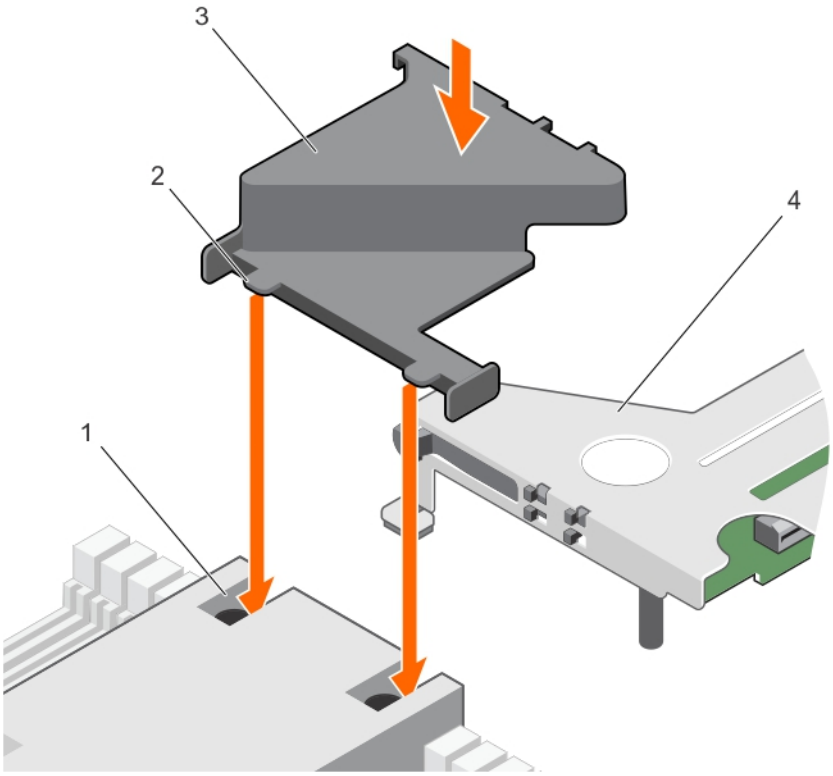

Figure 33. Installing the PCIe shroud

1. slot on the heat sink (2)
2. tab on the PCIe shroud (2)
3. PCIe shroud
4. expansion card riser

Next steps

Follow the procedure listed in after working inside your system.

Related links

[Safety instructions]
[After working inside your system]
[Removing the PCIe shroud]

GUID-4E460395-1564-46DD-9C60-4A37D9A97902

Expansion card riser and expansion cards

GUID-9E9187B3-1353-453E-84B1-D5C32A74FFFA

Expansion card installation guidelines

Depending on your system configuration, the following PCI Express (PCIe) generation 3 expansion cards are supported:

Table 31. Supported expansion cards

Configuration	PCIe slot	Processor connection	Height	Length	Link width	Slot width
Four PCIe GPUs with switch board and one processor (Configuration A)	1	Processor 1	Low Profile	Half Length	x8	x16
	2	Processor 1	Low Profile	Half Length	x16	x16

Configuration	PCIe slot	Processor connection	Height	Length	Link width	Slot width
Four PCIe GPUs with switch board and two processors (Configuration B)	1	Processor 1	Low Profile	Half Length	x8	x16
	2	Processor 1	Low Profile	Half Length	x16	x16
Four PCIe GPUs without switch board and two processors (Configuration C)	1	Processor 1	Low Profile	Half Length	x8	x16
	2	Processor 2	Low Profile	Half Length	x8	x16
Two PCIe GPUs without switch board and two processors (Configuration D)	1	Processor 1	Low Profile	Half Length	x16	x16
	2	Processor 2	Low Profile	Half Length	x16	x16
Two PCIe GPUs without switch board and one processor (Configuration E)	1	Processor 1	Low Profile	Half Length	x8	x16
	2	NA	NA	NA	NA	NA
Two PCIe GPUs without switch board and two processors (Configuration F)	1	Processor 1	Low Profile	Half Length	x8	x16
	2	Processor 2	Low Profile	Half Length	x8	x16
Four PCIe GPUs with switch board with dual GPU virtual mode and two processors (Configuration G)	1	Processor 1	Low Profile	Half Length	x16	x16
	2	Processor 2	Low Profile	Half Length	x16	x16
Three PCIe GPUs without switch board and two processors (Configuration H)	1	Processor 1	Low Profile	Half Length	x8	x16
	2	Processor 2	Low Profile	Half Length	x8	x16
Three PCIe GPUs without switch board and two processors (Configuration I)	1	Processor 1	Low Profile	Half Length	x8	x16
	2	NA	NA	NA	NA	NA
Four SXM2 GPUs with NVLink board and two processors (Configuration K)	1	Processor 1	Low Profile	Half Length	x8	x16
	2	Processor 1	Low Profile	Half Length	x16	x16

NOTE: Configuration G supports virtual mode. In the virtual mode, GPUs 1 and 2 are connected to processor 1 and GPUs 3 and 4 are connected to processor 2.

The following table provides guidelines for installing expansion cards to ensure proper cooling and mechanical fit. Expansion cards should be installed in the card priority and slot priority order mentioned in table.

NOTE: The x16 link width riser cards on the expansion card riser are cabled to the system board.

NOTE: For configuration K, the x16 link width riser card on the expansion card cage is cabled to the NVLink board.

NOTE: The expansion card slots are not hot swappable.

Table 32. Expansion card installation order

Category	Card priority	Card type	Configurations A and B		Configurations C, F, and H		Configurations D and G		Configurations E and I		Configuration K	
			Slot priority	Max allowed	Slot priority	Max allowed	Slot priority	Max allowed	Slot priority	Max allowed	Slot priority	Max allowed
RAID	1	H730P (low profile)	1	1	1	1	1	1	1	1	-	-
	2	H730 (low profile)	1	1	1	1	1	1	1	1	-	-
	3	H330 (low profile)	1	1	1	1	1	1	1	1	-	-
		H330 (low profile) IEC	1	1	1	1	1	1	1	1	-	-
	4	H830 (low profile)	1, 2	2	1,2	2	1,2	2	1	1	1	1
	5	H810 (low profile)	1, 2	2	1,2	2	1,2	2	1	1	1	1
	6	12 GB SAS HBA (low profile)	1, 2	2	1,2	2	1,2	2	1	1	-	-
Non-RAID		HBA330 adapter	1	1	1	1	1	1	1	1	-	-
Infiniband		Mellanox dual port card	2	1	n/a	0	1,2	2	n/a	0	2	1
		Mellanox single port card	2	1	n/a	0	1,2	2	n/a	0	2	1
		Mellanox dual port adapter	1, 2	2	1, 2	2	1, 2	2	1	1	1,2	2
		Mellanox single port adapter	1, 2	2	1, 2	2	1, 2	2	1	1	1,2	2
		Intel low profile card	2	1	n/a	n/a	1, 2	1	n/a	n/a	2	1
Fiber channel		QLogic dual port 16 Gbps Fibre Channel adapter	1, 2	2	1, 2	2	1, 2	2	1	1	1,2	2
		Emulex dual port 16 Gbps Fibre Channel adapter	1, 2	2	1, 2	2	1, 2	2	1	1	1,2	2
		QLogic single port 16 Gbps Fibre Channel adapter	1, 2	2	1, 2	2	1, 2	2	1	1	1,2	2
		Emulex single port 16 Gbps Fibre Channel adapter	1, 2	2	1, 2	2	1, 2	2	1	1	1,2	2

Category	Card priority	Card type	Configurations A and B		Configurations C, F, and H		Configurations D and G		Configurations E and I		Configuration K	
			Slot priority	Max allowed	Slot priority	Max allowed	Slot priority	Max allowed	Slot priority	Max allowed	Slot priority	Max allowed
		Emulex FC8 low profile card	1, 2	2	1, 2	2	1, 2	2	1	1	1,2	2
		QLogic FC8 low profile card	1, 2	2	1, 2	2	1, 2	2	1	1	1,2	2
10 Gb NICs		10 Gb NICs (low profile)	1, 2	2	1, 2	2	1, 2	2	1	1	1,2	2
		10 Gb SFP+ NICs (low profile)	1, 2	2	1, 2	2	1, 2	2	1	1	1,2	2
PCIe SSD		NVMe half height, half length	1, 2	2	1, 2	2	1, 2	2	1	1	1	1
		PCIe half height, half length	1, 2	2	1, 2	2	1, 2	2	1	1	1	1

GUID-CD7C5915-9CB3-4BAD-833C-AB1F4E6B12E3

Removing the expansion card riser cage

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. Follow the procedure listed in the Before working inside your system section.
3. Remove the PCIe shroud. See removing the PCIe shroud.

   CAUTION: The expansion card riser cables must be disconnected from the system board or the NVLink board before removing the expansion card riser cage, to prevent pin damage in the PCIe connectors.
4. If applicable, disconnect the expansion card riser cables from the system board or the NVLink board.

Steps

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

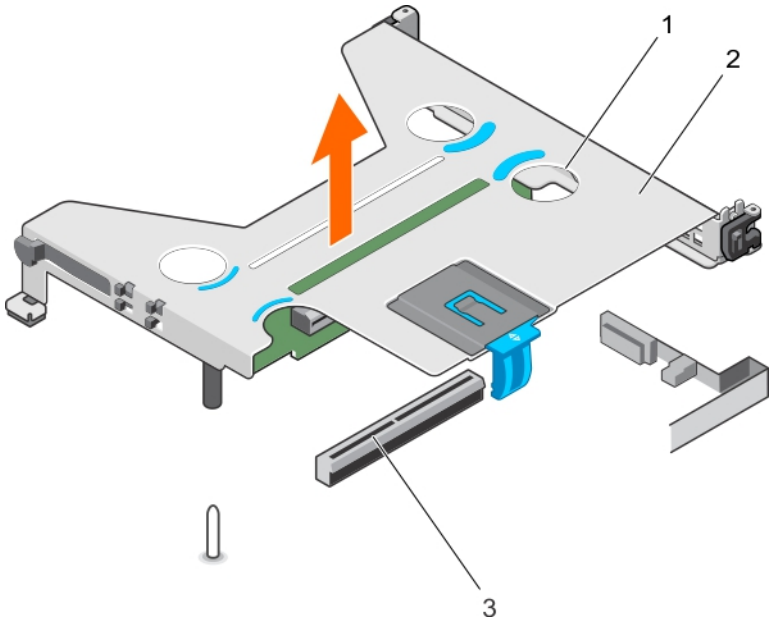

Figure 34. Removing the expansion card riser cage

1. touch point (4)
2. expansion card riser cage
3. riser connector on the system board

Next steps

1. Install the expansion card riser, if applicable.
2. Install the expansion card, if applicable.

   CAUTION: The expansion card riser cables must be connected to the system board or the NVLink board only after installing the expansion card riser cage, to prevent pin damage in the PCIe connectors.
3. Install the expansion card riser cage.

Related links

Safety instructions
After working inside your system
Installing expansion cards
Installing the expansion card riser cage

GUID-0CA7E106-5CED-4BD1-A390-69FFB85AE1AD

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.

NOTE: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

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

Steps

1. Remove the screws that secure the expansion card riser board to the expansion riser cage.
2. Remove the expansion board(s) from the expansion card riser cage.

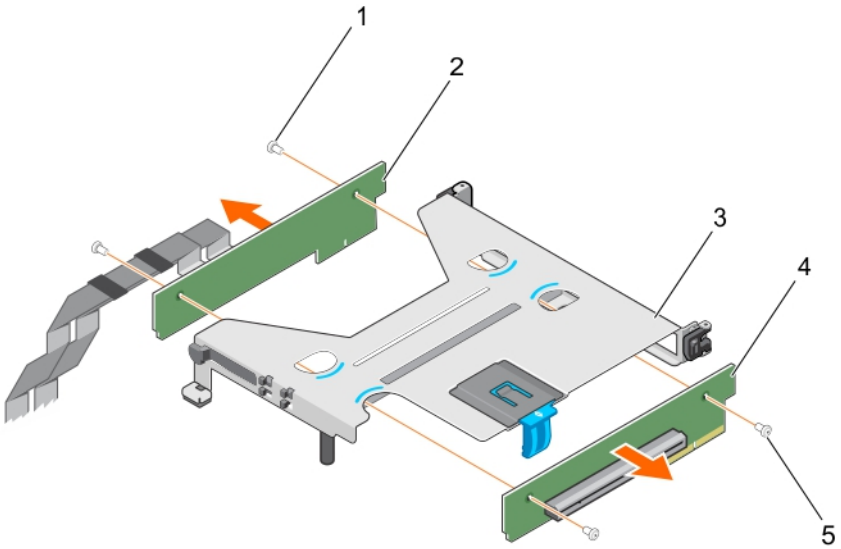

Figure 35. Removing expansion card riser from expansion card riser cage

1. screws (2)
2. cabled expansion card riser board
3. expansion card riser cage
4. expansion card riser board
5. screw (2)

Next steps

CAUTION: The expansion card riser cables must be connected to the system board or the NVLink board only after installing the expansion card riser cage, to prevent pin damage in the PCIe connectors.

1. Install the expansion card, if applicable.
2. Install the expansion card riser cage.

Related links

Safety instructions
Before working inside your system
After working inside your system
Installing the expansion card riser
Installing the expansion card riser cage
Removing the PCIe shroud
Installing the expansion card riser cage
Installing expansion cards

GUID-6DA7DE9B-5728-4982-9F31-2672E22F1182

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.

NOTE: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

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

Steps

1. Align the expansion card riser board with the expansion card riser cage.
2. Tighten the screws to secure the expansion card riser board to the expansion card riser cage.

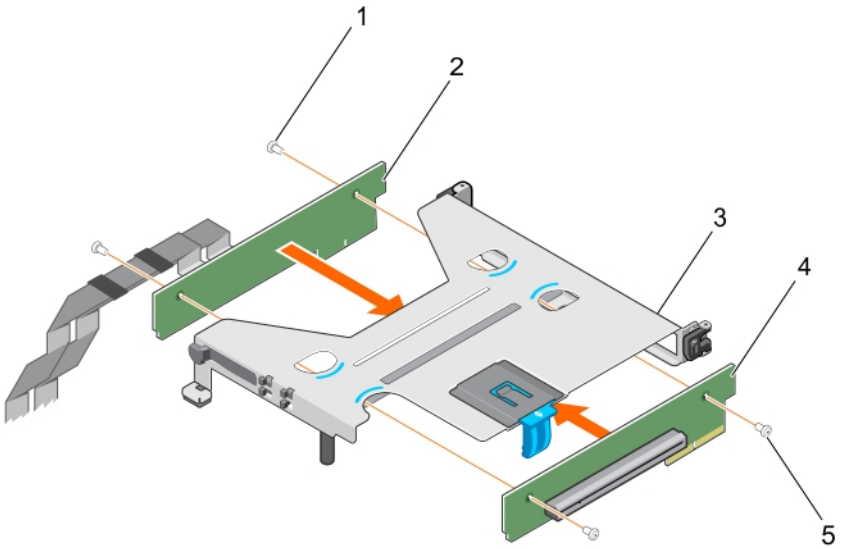

Figure 36. Installing the expansion card riser board

1. screw (2)
2. cabled expansion riser board
3. expansion card riser cage
4. expansion card riser board
5. screw (2)

Next steps

1. If applicable, connect the riser cables to the system board/NVLink board.
2. If applicable, install the expansion card.
3. Install the expansion card riser cage.
4. Follow the procedure listed in the After working inside your system section.
5. Install any device drivers required for the expansion card. For more information, see the documentation for the card.

Related links

Safety instructions
Before working inside your system
After working inside your system
Removing the expansion card riser
Removing the expansion card riser cage
Installing the PCIe shroud
Removing expansion cards

GUID-D0B5B678-065A-4C81-A4C1-304324001698

Installing the expansion card riser cage

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. Follow the procedure listed in the Before working inside your system section.
3. If applicable, install the expansion card(s) into the expansion card riser. For more information, see Installing expansion cards section.

CAUTION: The expansion card riser should be installed in the system before you connect the expansion card riser cables to prevent pin damage in the PCIe connectors on the system board or the NVLink board (if installed).

Steps

1. Align the expansion card riser cage with the guide pin on the system board and the guide slot on the chassis.
2. Lower the expansion card riser cage and press it until it clicks into place.

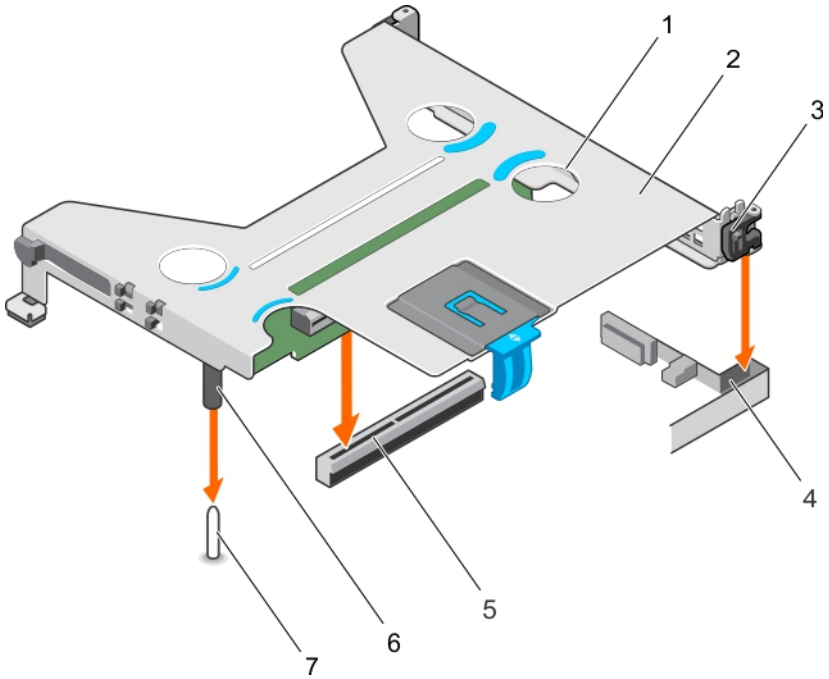

Figure 37. Installing expansion card riser cage

1. touch point (4)
2. expansion card riser cage
3. expansion card clip
4. guide slot on the chassis
5. riser connector on the system board
6. guide post on the expansion card riser
7. guide pin on the system board

Next steps

1. If applicable, connect the riser cables to the system board or if installed, the NVLink board.
2. Install the PCIe shroud.
3. Follow the procedure listed in the After working inside your system section.
4. Install any device drivers required for the expansion card. For more information, see the documentation for the card.

Related links

Safety instructions
Before working inside your system
After working inside your system
Installing the PCIe shroud
Removing the PCIe shroud
Removing the expansion card riser cage

GUID-BFE3E4DA-AB0D-4DEB-AD0C-90B48D88AC9D

Removing 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.

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

   CAUTION: The expansion card riser cables must be disconnected from the system board or NVLink board before removing the expansion card riser cage to prevent pin damage in the PCIe connectors.
3. Disconnect any cables connected to the expansion card and the system board.
4. Remove the PCIe shroud.
5. Remove the expansion card riser cage.

Steps

1. Pull the expansion card latch to open it.
2. Open the expansion card clip.
3. Hold the expansion card by its edges, and pull it from the expansion card connector.

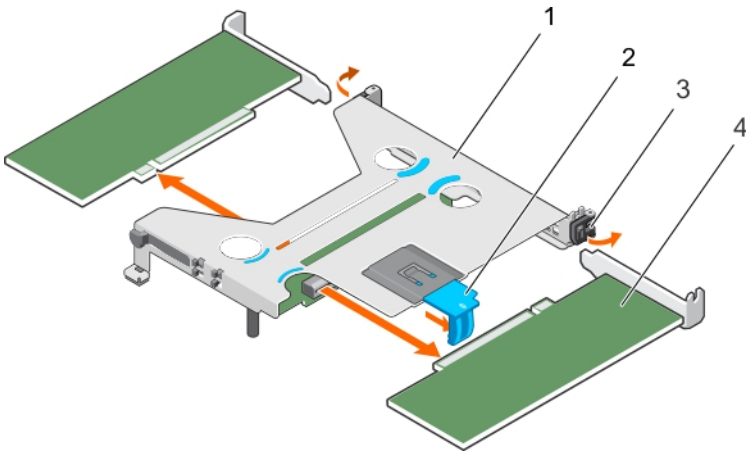

Figure 38. Removing expansion card from the expansion card riser cage

1. expansion card riser cage
2. expansion card latch
3. expansion card clip
4. expansion card (low-profile, half-length card)

4. If you are removing the expansion card permanently, install an expansion card blank by performing the following steps:
   a. Slide the expansion card blank into the expansion card slot on the side of the expansion card riser.
   b. Close the expansion card clip.

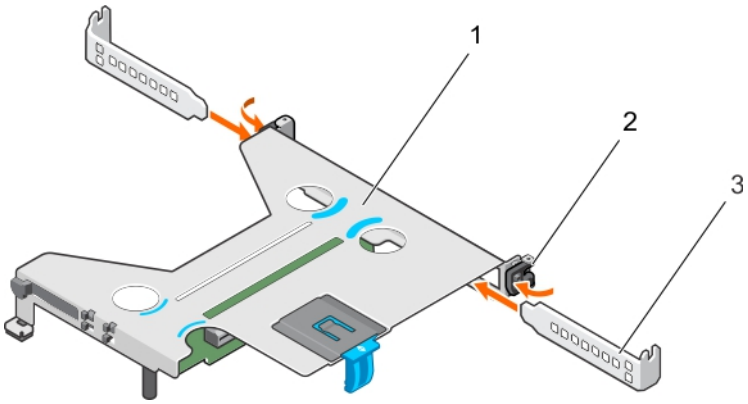

Figure 39.

1. Expansion card riser cage
2. Expansion card clip
3. Expansion card blank

NOTE: You must install an expansion card blank to maintain Federal Communications Commission (FCC) certification of the system. The expansion card blank keeps dust and dirt out of the system and aids in proper cooling and airflow inside the system.

5. Close the expansion card latch.

Next steps

1. Install the expansion card riser cage.

Related links

Safety instructions
Before working inside your system
After working inside your system
Removing the PCIe shroud
Installing the expansion card riser cage
Installing expansion cards

GUID-8E760B39-C8F9-4647-A7F4-B5ABB3E8B47D

Installing 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.

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

CAUTION: The expansion card riser cables must be disconnected from the system board or NVLink board before removing the expansion card riser cage, to prevent pin damage in the PCIe connectors.

4. Remove the expansion card riser cables.
5. Remove the expansion card riser cage.

Steps

1. Locate the expansion card connector on the expansion card riser.
2. Open the expansion card clip.

3. If an expansion card blank is installed, open the expansion card clip and slide the expansion card blank out of the expansion card riser cage.

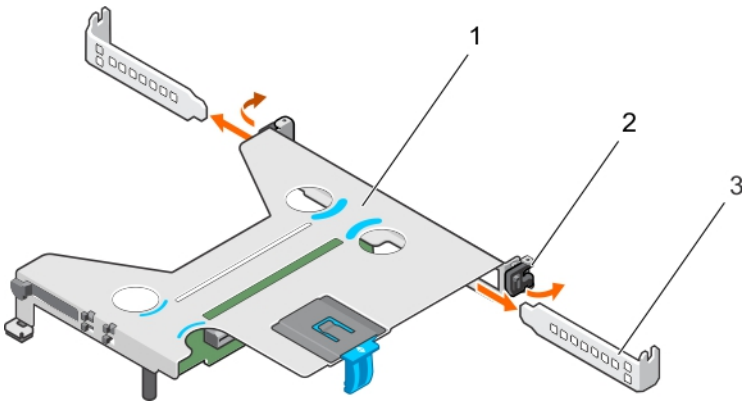

Figure 40. Removing expansion card blank

1. Expansion card riser cage
2. Expansion card clip
3. Expansion card blank

4. Pull the expansion card latch to open it.
5. Hold the expansion card by its edges and align the expansion card with the expansion card connector on the expansion card riser cage.
6. Insert the expansion card into the expansion card connector until the expansion card is fully seated.
7. Close the expansion card latch.
8. Close the expansion card clip.

Next steps

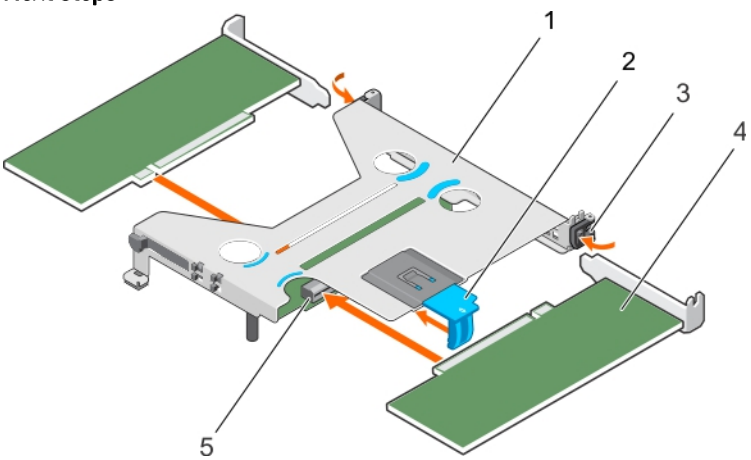

Figure 41. Installing an expansion card

1. expansion card riser cage
2. expansion card latch
3. expansion card clip
4. expansion card (low-profile, half-length card)
5. expansion card connector

CAUTION: The expansion card riser cables must be connected to the system board or the NVLink board only after installing the expansion card riser cage, to prevent pin damage in the PCIe connectors.

1. Connect the cables to the expansion card and the system board.
2. Install the expansion card riser.
3. Install the PCIe shroud.
4. Follow the procedure listed in the After working inside your system section.

Related links

[Safety instructions]
[Before working inside your system]
[After working inside your system]
[Installing the PCIe shroud]
[Removing expansion cards]

GUID-09D01D66-5774-45CE-9520-A84EB90318B8

Expansion card cabling diagrams

Cabling two expansion cards

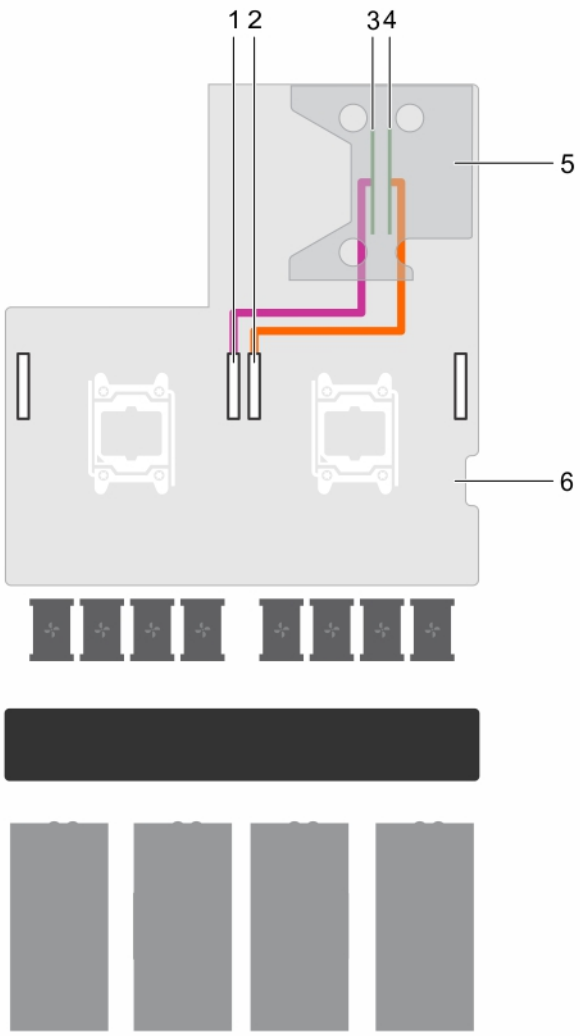

Figure 42. Cabling two expansion cards

1. GPU 4 PCIe connector on the system board
2. GPU 1 PCIe connector on the system board
3. expansion slot 2 connector (x16)
4. expansion slot 1 connector (x16)
5. expansion card riser
6. system board

Cabling one expansion card

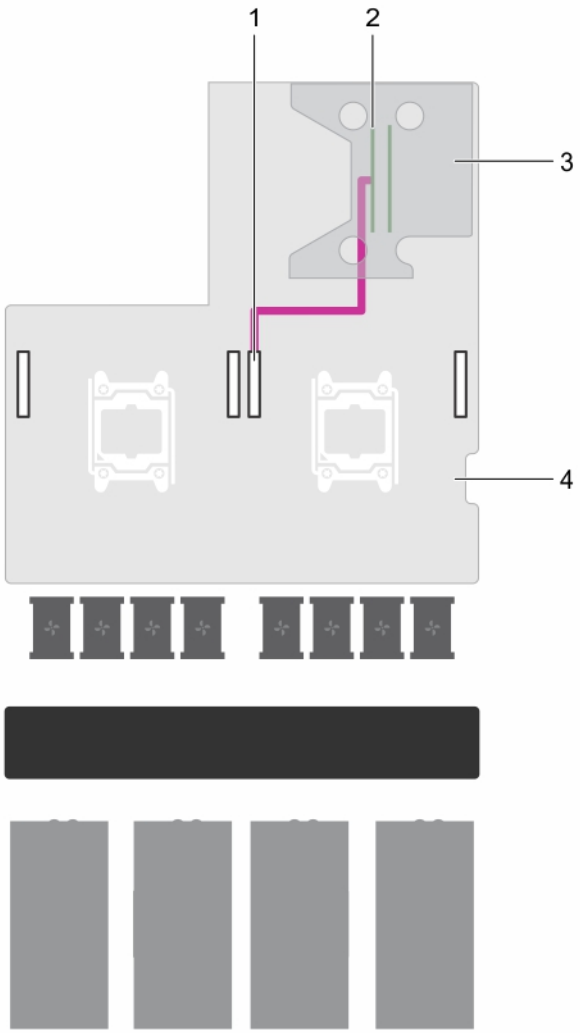

Figure 43. Cabling one expansion card

1. GPU 1 PCIe connector on the system board
2. expansion slot 2 connector (x16)
3. expansion card riser
4. system board

Cabling expansion riser card with NVLink board configuration

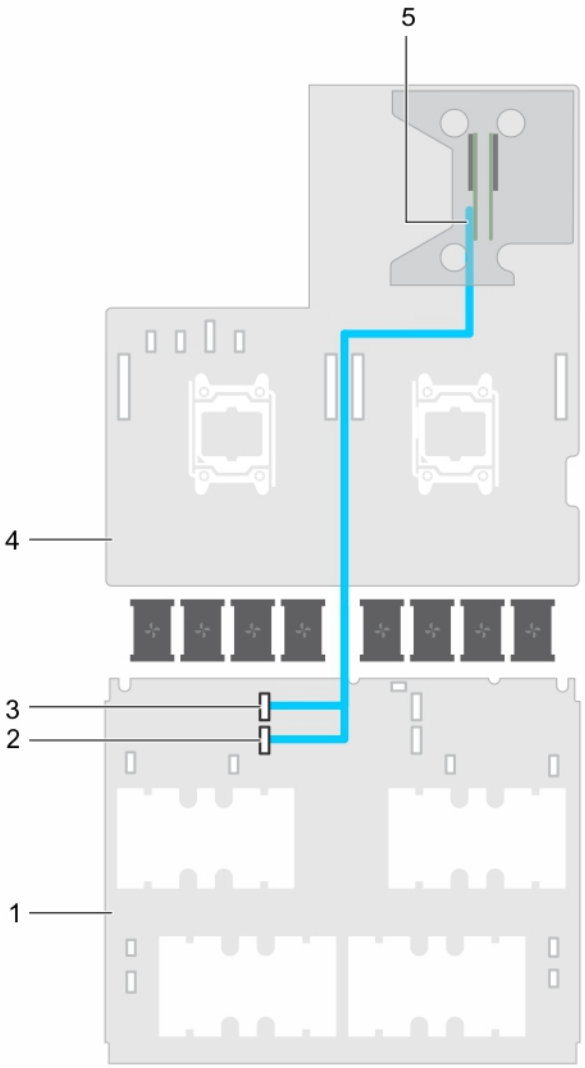

Figure 44. Cabling expansion card with NVLink board

1. NVlink board
2. PCIe DN2 cable connector on the NVLINK board
3. PCIe DN1 cable connector on the NVLINK board
4. system board
5. expansion riser slot 2 connector (x16)

GUID-75B0A475-F880-4DF0-9405-4EE3B2C3E248

Power supply units

Your system supports one of the following:

- Up to two 2000 W AC power supply units (PSUs)
- Up to two 1600 W AC PSUs
- Up to two 1100 W AC PSUs (only for systems that support two GPUs)

NOTE: The PSU 2 slot also functions as the optional 2.5 inch hard drive cage slot. If you install the 2.5 inch hard drive cage in the PSU 2 slot, your system will not support the redundancy feature.

NOTE: The Platinum 2000 W PSUs and 1600 W PSUs are rated only for 200 V AC to 240 V AC input.

NOTE: When two identical PSUs are installed, power supply redundancy (1+1 – with redundancy or 2+0 – without redundancy) is configured in system BIOS. In redundant mode, power is supplied to the system equally from both PSUs when Hot Spare is disabled. When Hot Spare is enabled, one of the PSUs will be put into standby when system utilization is low to maximize efficiency.

NOTE: If two PSUs are used, they must be of 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 servers can result in a PSU mismatch condition or failure to power on.

Related links

Removing the power supply unit blank
Installing the power supply unit blank
Removing an AC power supply unit
Installing an AC power supply unit

GUID-DE802C03-9996-495C-9942-249068F1F3E4

Hot spare feature

Your system supports the hot spare feature that significantly reduces the power overhead associated with power supply redundancy.

When the hot spare feature is enabled, one of the redundant PSUs is switched to the 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 PSUs active is more efficient than having one PSU in the sleep state, the active PSU can also activate the 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 falls below 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* available at **Dell.com/idracmanuals**.

GUID-B47EDED9-F4D6-4083-B618-D9842891F709

Removing the power supply unit blank

Remove the power supply unit (PSU) blank when you are installing a second PSU or a 2.5 inch hard drive cage in the PSU 2 slot.

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 ensure proper system cooling, the PSU blank must be installed in the PSU 2 slot in a non-redundant configuration. Remove the PSU blank only if you are installing a second PSU or a 2.5 inch hard drive cage.

Follow the safety guidelines listed in the Safety instructions section.

Steps

Remove the PSU blank from the PSU 2 slot by pulling the blank outward.

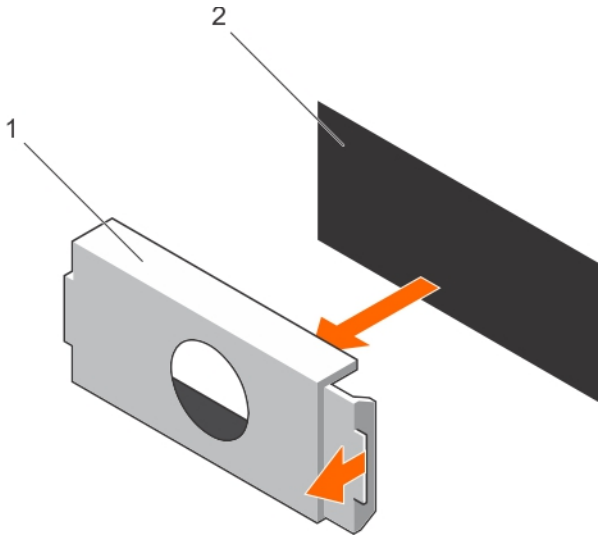

Figure 45. Removing the PSU blank

1. PSU blank
2. PSU bay

Next steps

Install PSU 2 or the 2.5 inch hard drive cage.

Related links

[Safety instructions]
[Installing an AC power supply unit]
[Installing the optional 2.5 inch hard drive cage]
[Installing the power supply unit blank]

GUID-31B0C40E-1100-424F-B270-8C6D22CF8FB5

Installing the power supply unit blank

Install the power supply unit (PSU) blank when you remove PSU 2 or the 2.5 inch hard drive cage from the PSU 2 slot. Install the PSU blank only in the PSU 2 slot.

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. If applicable, remove PSU 2 or the 2.5 inch hard drive cage.

Steps

Align the power supply unit blank with the power supply unit slot and push it into the power supply unit slot until it clicks into place.

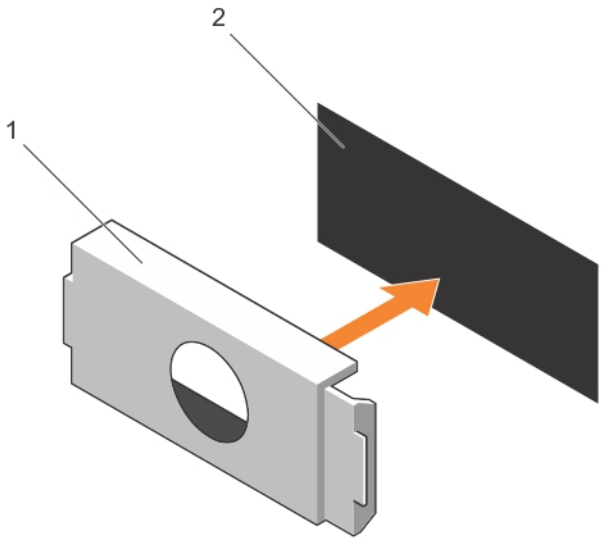

Figure 46. Installing the PSU blank

1. PSU blank
2. PSU slot

Related links

Safety instructions
Removing the optional 2.5 inch hard drive cage
Removing an AC power supply unit
Removing the power supply unit blank

GUID-9281B8D3-BB0E-4DA4-A281-A4D5A005732A

Removing an AC 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 install 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 and from the PSU you intend to remove.
3. Remove the cables from the strap on the PSU.

Steps

Press the release latch and slide the PSU out of the PSU slot by holding the PSU handle.

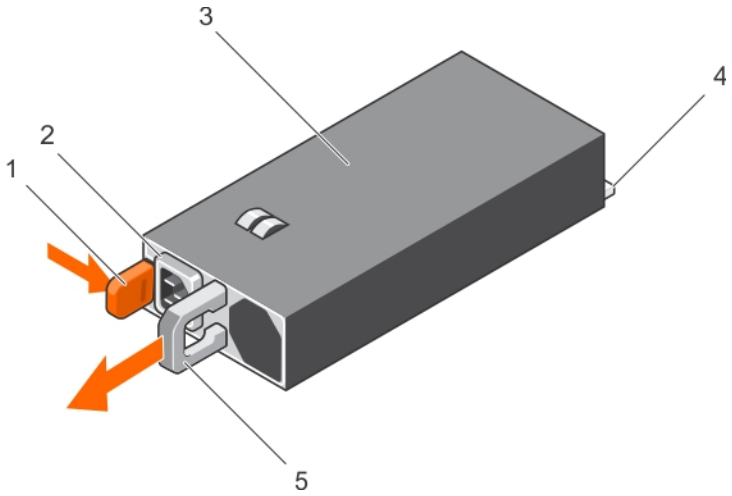

Figure 47. Removing an AC PSU

1. release latch
2. PSU cable connector
3. PSU
4. connector
5. PSU handle

Next steps

Depending on your requirement, perform one of the following steps:

- If you are not replacing PSU 2 immediately, install a PSU blank.
- Install the replacement AC PSU.
- Install the 2.5 inch hard drive cage.

Related links

Safety instructions
Installing an AC power supply unit
Installing the power supply unit blank
Installing the optional 2.5 inch hard drive cage

GUID-56C23430-F9FE-4878-AC2F-D430797CBC48

Installing an AC 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. For systems that support redundant power supply units (PSUs), ensure that both the PSUs are of the same type and same maximum output power.

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

Steps

1. Slide the replacement PSU into the PSU slot until the PSU is fully seated and the release latch snaps into place.

   CAUTION: When connecting the power cable, secure the cable with the strap.
2. Connect the PSU power cable to the PSU power cable connector.

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

3. Plug the power cable into a power outlet.

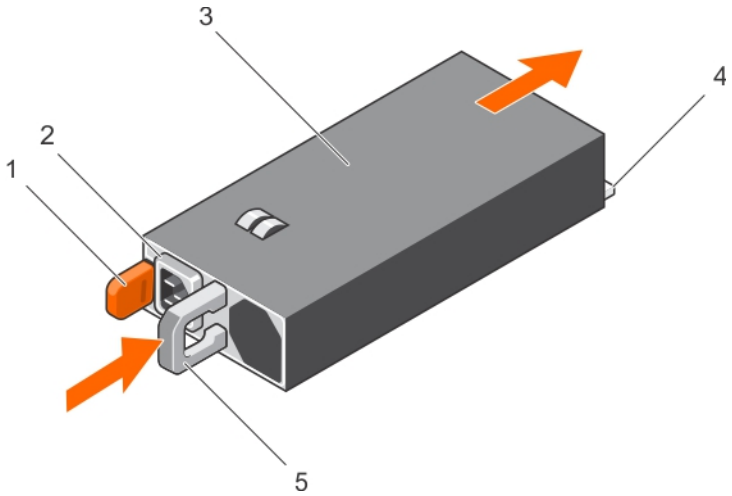

Figure 48. Installing an AC PSU

1. release latch
2. PSU cable connector
3. PSU unit
4. connector
5. PSU handle

Related links

Safety instructions
Removing the power supply unit blank
Removing an AC power supply unit

GUID-7B4E078F-7CAB-4DF4-B293-422E5C6F6C4D

Hard drives

Your system supports up to four 2.5 inch SAS or SATA cabled hard drives.

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: Systems with NVLink board configuration do not support the optional 2.5 inch hard drive cage.

NOTE: SAS and SATA hard drives cannot be mixed in a system.

NOTE: Use only SAS and SATA hard drives that have been tested and approved for your system.

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

Related links

- Removing the optional 2.5 inch hard drive cage
- Installing the optional 2.5 inch hard drive cage
- Removing the optional 2.5 inch hard drive cage cover
- Installing the optional 2.5 inch hard drive cage cover
- Removing 2.5 inch cabled hard drives from the hard drive cage
- Installing a 2.5 inch cabled hard drive into the hard drive cage
- Removing a 1.8 inch uSATA SSD blank
- Removing a 1.8 inch uSATA SSD carrier
- Removing a 1.8 inch uSATA SSD blank
- Installing a 1.8 inch uSATA SSD carrier
- Removing a 1.8 inch uSATA SSD from a SSD carrier
- Installing a 1.8 inch uSATA SSD into a SSD carrier
- Removing the 1.8 inch uSATA SSD cage
- Installing the 1.8 inch uSATA SSD cage
- Removing the 1.8 inch uSATA SSD backplane
- Installing the 1.8 inch uSATA SSD backplane

GUID-C96A0711-B6C3-4C91-9E3A-4EAF716E4729

Removing the optional 2.5 inch hard drive cage

The PSU 2 slot also functions as the optional 2.5 inch hard drive cage slot.

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. Follow the procedure listed in before working inside your system.
3. Disconnect the power cable from the system board.
4. Disconnect the signal cable from the system board or expansion card.
5. Keep the Phillips #1 screwdriver ready.

Steps

1. Remove the screw securing the hard drive cage to the hard drive cage slot.

   NOTE: When you slide the hard drive cage out of the hard drive cage slot, ensure that the cables disconnected from the system board do not interfere with other components on the system board.

2. Slide the hard drive cage out of the hard drive cage slot.

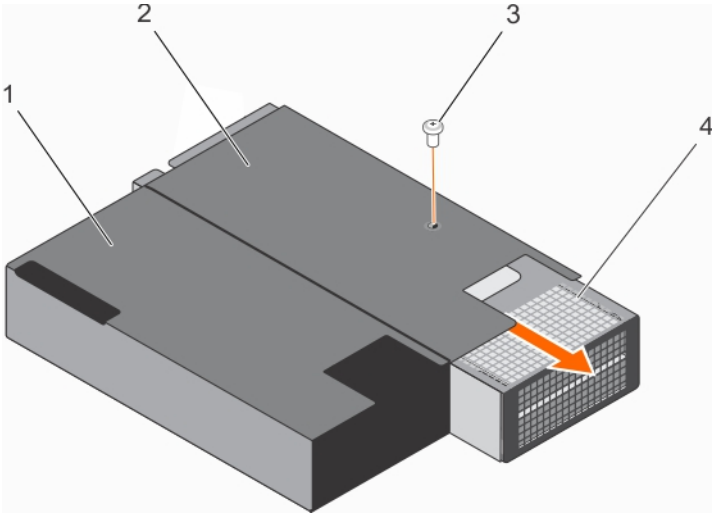

Figure 49. Removing the 2.5 inch hard drive cage

1. PSU 1 slot
2. PSU 2 slot/2.5 inch hard drive cage slot
3. screw
4. hard drive cage

Next steps

If you are removing the hard drive cage permanently, install any one of the following:

- PSU blank
- PSU 2
- 2.5 inch hard drive cage

Related links

Safety instructions
Before working inside your system
Installing the power supply unit blank
Installing an AC power supply unit
Installing the optional 2.5 inch hard drive cage

GUID-8A3A02BC-6FE2-48C7-A1D2-EDB60BAEF0D2

Installing the optional 2.5 inch hard drive cage

The PSU 2 slot also functions as the optional 2.5 inch hard drive cage slot. If you install the 2.5 inch hard drive cage in the PSU 2 slot, your system will not support the redundancy feature.

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. Follow the procedure listed in the Before working inside your system section.
3. Remove the PSU/PSU blank, if installed.
4. Install the 2.5 inch hard drives in the hard drive cage.
5. Route the power and signal cables through the hard drive cage slot.
6. Keep the Phillips #1 screwdriver ready.

Steps

1. Slide the hard drive cage into the hard drive cage slot in the chassis.
2. Secure the hard drive cage to the hard drive cage slot by using the screws.

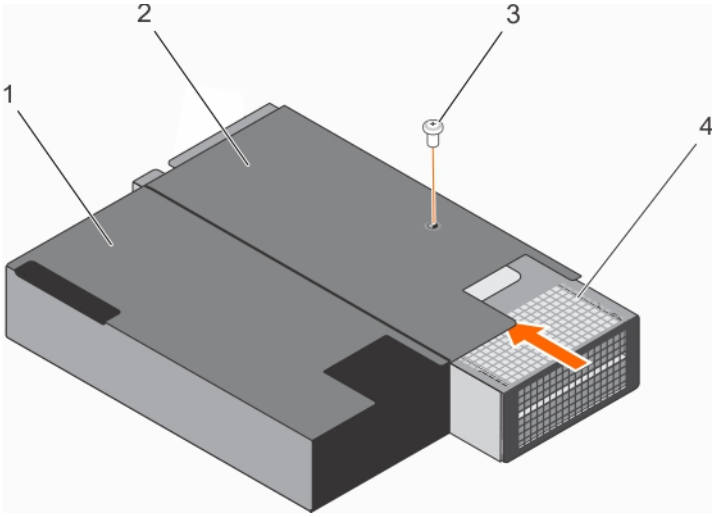

Figure 50. Installing the 2.5 inch hard drive cage

1. PSU 1 slot
2. PSU 2 slot/2.5 inch hard drive cage slot
3. screw
4. hard drive cage

Next steps

1. Connect the power cable to the system board.
2. Connect the signal cables to the system board or expansion card.
3. Follow the procedure listed in the After working inside your system section.

Related links

Safety instructions
Before working inside your system
Removing the optional 2.5 inch hard drive cage

GUID-5F2BBA9D-4320-4489-A21C-82DB15110416

Removing the optional 2.5 inch hard drive cage cover

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. Follow the procedure listed in the Before working inside your system section.
3. Remove the 2.5 inch hard-drive cage. For more information, see removing the optional 2.5 inch hard-drive cage
4. Keep the Phillips #1 screwdriver ready.

Steps

1. Remove the screws securing the hard drive cage cover to the hard-drive cage.
2. Slide the hard-drive cage cover toward the front of the hard-drive cage to disengage it from the slots on the hard-drive cage.
3. Lift the hard-drive cage cover away from the hard drive cage.

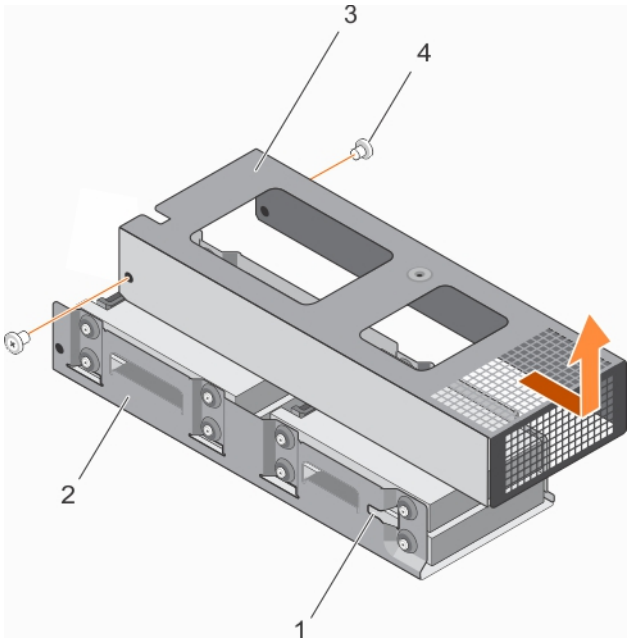

Figure 51. Removing the 2.5 inch hard drive cage cover

1. slot on the hard-drive cage (2)
2. hard-drive cage
3. hard-drive cage cover
4. screw (2)

Next steps

Depending on your requirement, install or remove the 2.5 inch hard drive(s).

Related links

Safety instructions
Before working inside your system
Installing a 2.5 inch cabled hard drive into the hard drive cage
Removing 2.5 inch cabled hard drives from the hard drive cage
Installing the optional 2.5 inch hard drive cage
Installing the optional 2.5 inch hard drive cage cover

GUID-4D581E7E-87AC-4F6E-AFB5-3B5511C68D05

Installing the optional 2.5 inch hard drive cage cover

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. Follow the procedure listed in before working inside your system.
3. Remove the hard drive cage.
4. If applicable, install the 2.5 inch hard drive(s) into the hard drive cage.
5. Connect the power and signal cable(s) to the hard drive(s) in the hard drive cage.

Steps

1. Lower the hard drive cage cover onto the hard drive cage.
2. Slide the hard drive cage cover toward the back of the cage to engage it with the slots on the hard drive cage.

3. Use the screws to secure the hard drive cage cover to the hard drive cage.

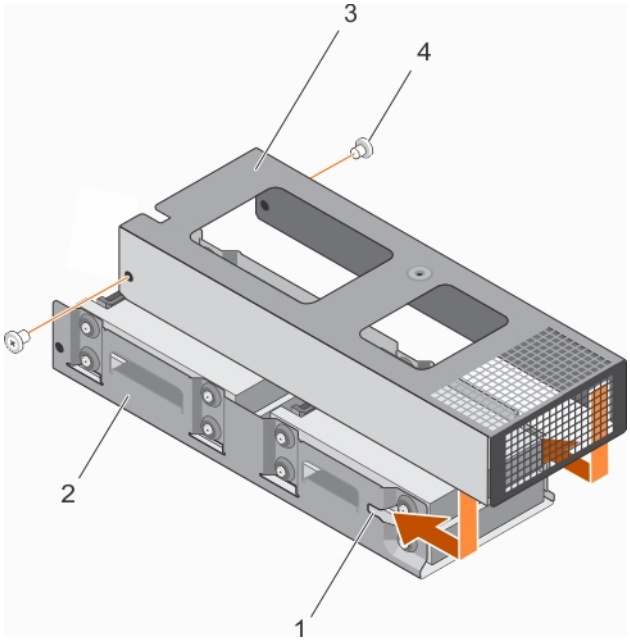

Figure 52. Installing the 2.5 inch hard drive cage cover

1. slot on the hard drive cage (2)
2. hard drive cage
3. hard drive cage cover
4. screw (2)

Next steps

1. Install the hard drive cage into the PSU 2 slot/2.5 inch hard drive slot on the chassis.
2. Follow the procedure listed in after working inside your system.

Related links

Safety instructions
After working inside your system
Removing the optional 2.5 inch hard drive cage
Removing the optional 2.5 inch hard drive cage cover

GUID-61F2CA49-3E88-43AA-9D4C-C6D2527CA86B

Removing 2.5 inch cabled hard drives from the hard drive cage

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. Follow the procedure listed in before working inside your system.
3. Keep the Phillips #2 screwdriver ready.
4. Remove the 2.5 inch hard drive cage.
5. Remove the 2.5 inch hard drive cage cover.

About this task

CAUTION: To maintain proper system cooling, a minimum of two hard drives must be installed in hard drive 0/E and 1/F slots.

Steps

1. Remove the screws securing the hard drive to the hard drive cage.
2. Remove hard drives 0/E and 1/F by performing the following steps:
   a. Disconnect the signal/power cable from the hard drives.
   b. Lift hard drive 0/E out of the hard drive cage.
   c. Slide hard drive 1/F out of the hard drive cage.

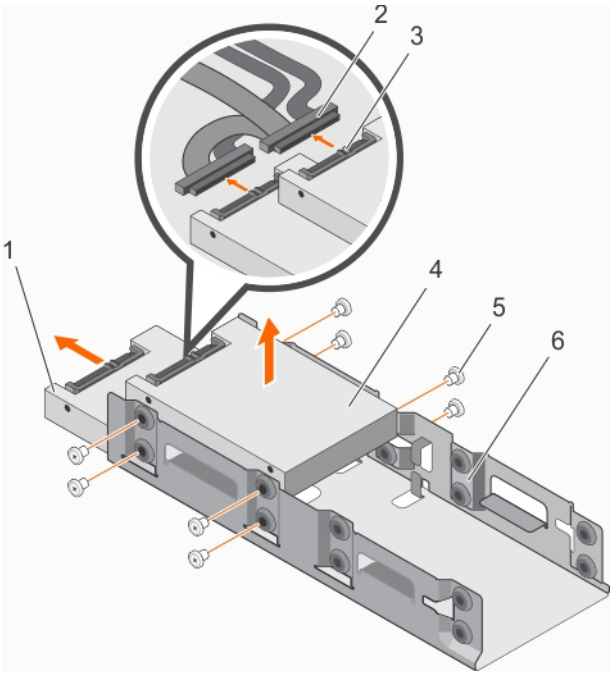

Figure 53. Removing a 2.5 inch cabled hard drive (hard drive 0/E and hard drive 1/F) from the hard drive cage

1. hard drive 1/F
2. power and signal cable connector (2)
3. power and signal cable connector on hard drive
4. hard drive 0/E
5. screw (8)
6. hard drive cage

3. If you want to remove hard drives 2/C and 3/D, perform the following steps:
   a. Remove hard drives 0/E and 1/F.
   b. Disconnect the signal/power cables from hard drive 2/C and 3/D.
   c. Remove the signal/power cables routed through the cable clip on the hard drive cage.
   d. Lift hard drive 2/C out of the hard drive cage.
   e. Slide hard drive 3/D out of the hard drive cage.

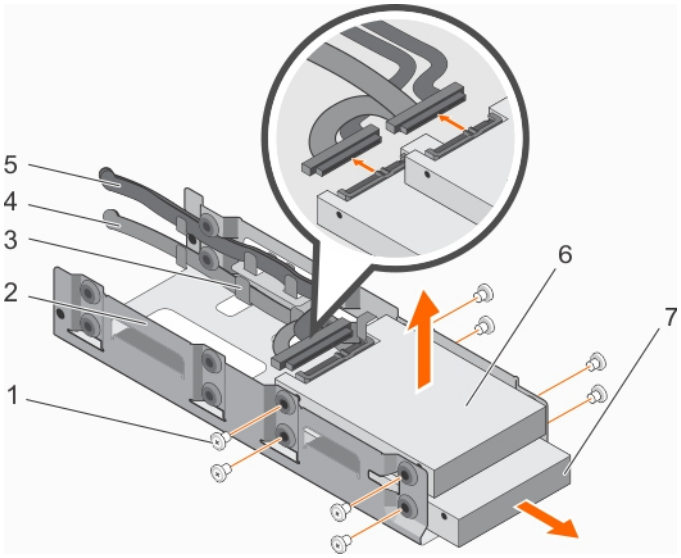

Figure 54. Removing a 2.5 inch cabled hard drive (hard drive 2/C and hard drive 3/D) from the hard drive cage

1. screw (8)
2. hard drive cage
3. cable routing clip
4. power cable
5. signal cable
6. hard drive 2/C
7. hard drive 3/D

Next steps

1. Install the hard drives.
2. Install the hard drive cage cover.
3. Install the hard drive cage into the hard drive cage slot in the chassis.

Related links

Safety instructions
Installing a 2.5 inch cabled hard drive into the hard drive cage
Installing the optional 2.5 inch hard drive cage cover
Installing the optional 2.5 inch hard drive cage

GUID-7E21C31E-ACF2-4F65-B76F-DB816EF77CDC

Installing a 2.5 inch cabled hard drive into the hard drive cage

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. Keep the Phillips #2 screwdriver ready.
3. Remove the hard drive cage.
4. Remove the hard drive cage cover.

NOTE: Systems with NVLink board configuration do not support the optional 2.5 inch hard drive cage.

NOTE: If you are installing four hard drives, ensure that you install hard drives 3/D and 2/C before you install hard drives 1/F and 0/E.

NOTE: If you are installing two hard drives, install hard drives 1/F and 0/E.

NOTE: To maintain proper system cooling, a minimum of 2 hard drives must be installed in hard drive slots 0/E and 1/F.

Steps

1. To install hard drives 3/D and 2/C, perform the following steps:
   a. Slide hard drive 3/D into the hard drive cage.
   b. Lower hard drive 2/C into the hard drive cage.
   c. Secure the hard drives to the hard drive cage by using the screws.
   d. Connect the power/signal cable to the hard drives.
   e. Route the cables through the cable routing clip on the hard drive cage.

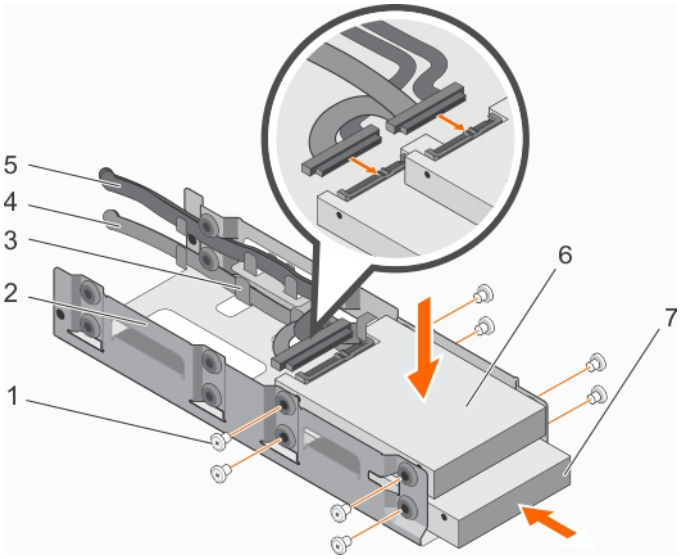

Figure 55. Installing a 2.5 inch cabled hard drive (hard drive 2/C and hard drive 3/D) from the hard drive cage

1. screw (8)
2. hard drive cage
3. cable routing clip
4. power cable
5. signal cable
6. hard drive 2/C
7. hard drive 3/D

2. To install hard drives 1/F and 0/E, perform the following steps:
   a. Slide hard drive 1/F into the hard drive cage.
   b. Lower hard drive 0/E into the hard drive cage.
   c. Secure the hard drives to the hard drive cage by using the screws.
   d. Connect the power/signal cable to the hard drives.

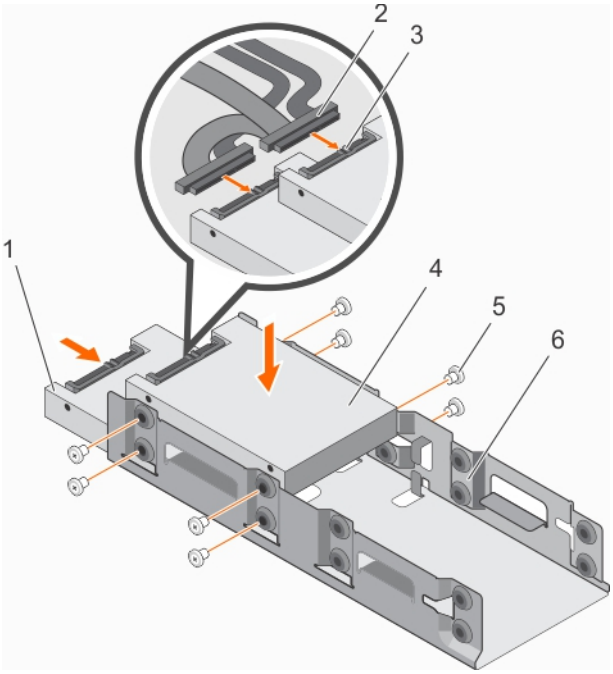

Figure 56. Installing a 2.5 inch cabled hard drive (hard drive 0/E and hard drive 1/F) from the hard drive cage

1. hard drive 1/F
2. power and signal cable connector (2)
3. power and signal cable connector on hard drive
4. hard drive 0/E
5. screw (8)
6. hard drive cage

Next steps

1. Install the 2.5 inch hard drive cage cover.
2. Install the hard drive cage into the hard drive cage slot.
3. Connect the power/signal cables to the system board.
4. Follow the procedure listed in after working inside your system.
5. Enter System Setup and ensure that the hard drive's controller is enabled.
6. Exit the System Setup program and reboot the system.
7. Install any software required for the hard drive operation as described in the documentation for the hard drive.

Related links

Safety instructions
Installing the optional 2.5 inch hard drive cage cover
Installing the optional 2.5 inch hard drive cage
System Setup
Removing 2.5 inch cabled hard drives from the hard drive cage

GUID-ACFDE6BE-58D4-49BF-90BF-61C85A38D969

Hard drive cabling diagrams

Cabling SAS and SATA hard drives to the RAID card

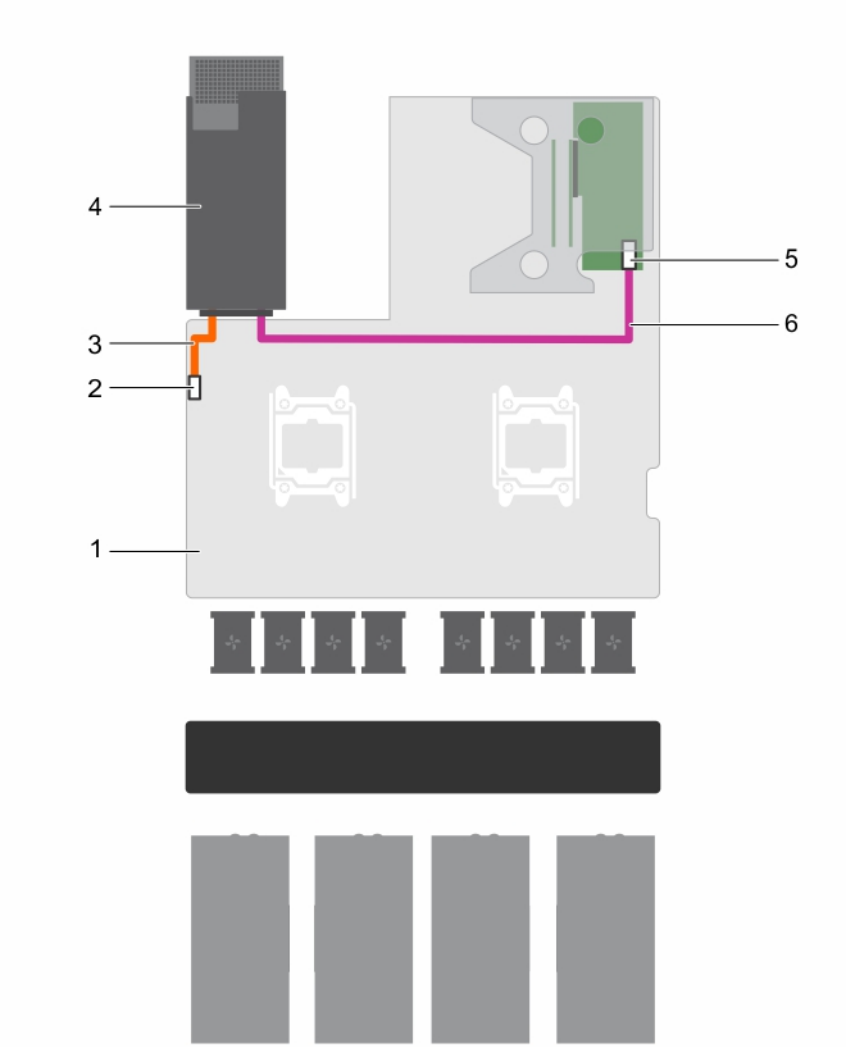

Figure 57. Cabling SAS and SATA hard drives to the RAID card

1. system board
2. 2.5 inch hard drive cage power connector
3. power cable
4. 2.5 inch hard drive cage slot
5. Port A connector on the RAID card
6. signal cable

Cabling SATA hard drives to the SATA connector on the system board

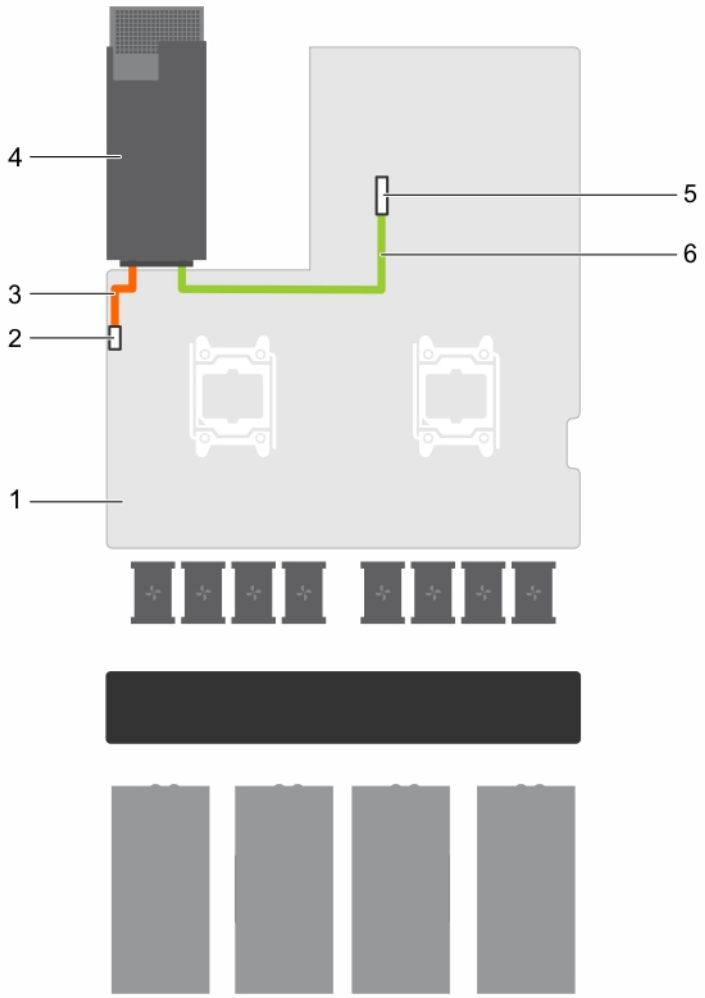

Figure 58. Cabling SATA hard drives to the SATA connector on the system board

1. system board
2. 2.5 inch hard drive cage power connector
3. power cable
4. 2.5 inch hard drive cage slot
5. SATA connector on the system board
6. signal cable

GUID-39352EB4-02CF-4D0B-BE40-F465067E9E97

uSATA SSDs

The PowerEdge C4130 supports up to two 1.8 inch uSATA Solid State Drives (SSDs). The uSATA SSDs connect to the system board through the hard drive backplane.

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

When you format an SSD, allow enough time for the formatting to be completed. High-capacity SSDs can take a number of hours to format.

GUID-E94941A2-BF73-488E-945C-25761B5E4739

Removing a 1.8 inch uSATA SSD blank

Prerequisites

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

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

Steps

Press the release button and slide the SSD blank out of the SSD slot.

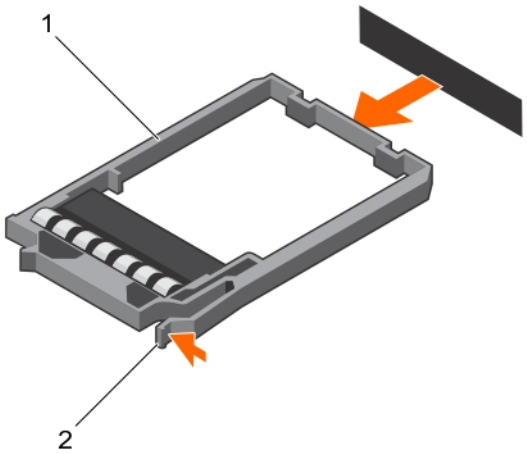

Figure 59. Removing a 1.8 inch SSD blank

1. SSD blank
2. release tab

Next steps

Install the 1.8 inch uSATA SSD carrier or SSD blank.

Related links

Safety instructions
Installing a 1.8 inch uSATA SSD carrier
Installing a 1.8 inch uSATA SSD blank

GUID-69C097FB-A30E-411B-9C9B-ECA32645B690

Installing a 1.8 inch uSATA SSD blank

Install the SSD blank if you are removing the SSD permanently or not replacing it immediately.

Prerequisites

Follow the safety guidelines listed in the Safety instructions section.

Steps

Insert the SSD blank into the SSD slot until the release button clicks into place.

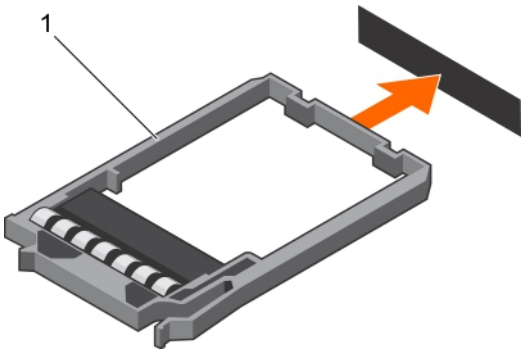

Figure 60. Installing a 1.8 inch SSD blank

1. SSD blank

Related links

Safety instructions

Removing a 1.8 inch uSATA SSD blank

GUID-BD6E709D-E571-4715-BD00-BB766E64B03D

Removing a 1.8 inch uSATA SSD carrier

You need to remove the SSD carrier because the SSD is installed in the SSD 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.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Using the management software, prepare the SSD for removal. Wait until the indicators on the SSD carrier signal that the SSD can be removed safely.

   If the SSD is online, the green activity fault indicator flashes as the drive is turned off. When the SSD indicators are off, the SSD drive is ready for removal. For more information, see the documentation for the storage controller.

   NOTE: The 1.8 inch uSATA SSDs are hot swappable only with software RAID S130. If your system supports software RAID S130 proceed to step 4. If not, continue with step 3.
3. Turn off the system, including any attached peripherals.
4. Disconnect the system from the electrical outlet and disconnect the peripherals.

Steps

1. Press the release button to open the SSD carrier release handle.
2. Slide the SSD carrier out of the SSD cage.

   The SSD is installed in the SSD carrier.

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

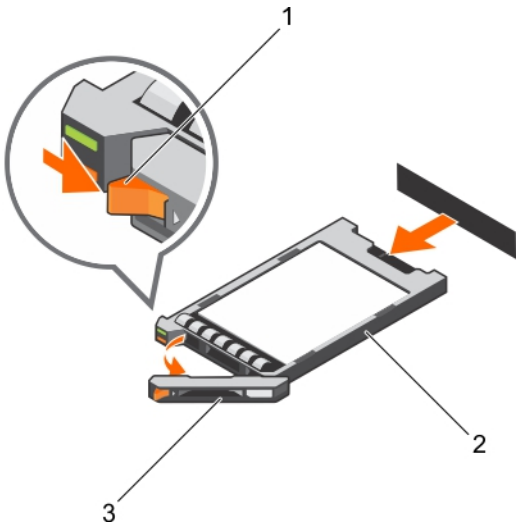

Figure 61. Removing a 1.8 inch uSATA SSD carrier

1. release button
2. SSD carrier
3. SSD carrier handle

Next steps

Depending on your requirement, perform one of the following steps:

- If you are not replacing the SSD immediately, insert an SSD blank in the empty SSD slot.
- Install the 1.8 inch uSATA SSD carrier.

Related links

Safety instructions
Installing a 1.8 inch uSATA SSD blank
Installing a 1.8 inch uSATA SSD carrier

GUID-CD29FBCE-AE8D-4CC1-9884-1BD135E1DC4D

Installing a 1.8 inch uSATA SSD 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 SSDs that have been tested and approved for use with the SSD backplane.

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

   NOTE: The 1.8 inch uSATA SSDs are hot swappable only with software RAID S130.

2. If your system does not support software RAID S130, turn off your system.

Steps

1. If an SSD blank is installed in the SSD slot, remove it.
2. Install the SSD in the SSD carrier.
3. Press the release button on the front of the SSD carrier, and open the SSD carrier handle.
4. Insert the SSD carrier into the SSD slot until the carrier connects with the backplane.
5. Close the SSD carrier handle to lock the SSD in place.

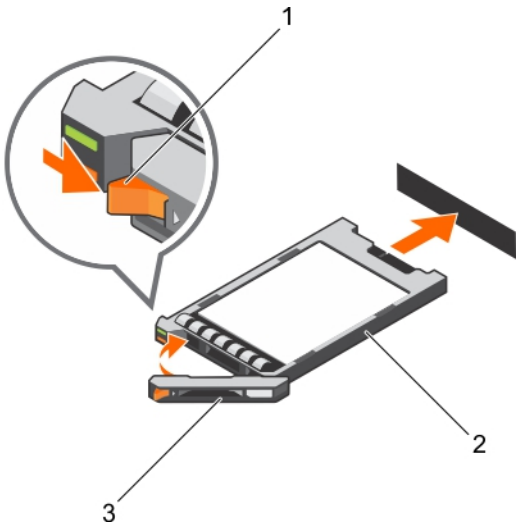

Figure 62. Installing a 1.8 inch uSATA SSD carrier

1. release button
2. SSD carrier
3. SSD carrier handle

Next steps

1. Connect the system to the electrical outlet and connect the peripherals
2. Turn on the system, including any attached peripherals.

Related links

Safety instructions
Removing a 1.8 inch uSATA SSD blank
Removing a 1.8 inch uSATA SSD carrier

GUID-14930BE5-5C41-429E-A504-DF5D1A762EF8

Removing a 1.8 inch uSATA SSD from a SSD 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.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Turn off the system, including any attached peripherals.
3. Remove the SSD carrier from the SSD cage.

NOTE: The SSD is installed in the SSD carrier.

Steps

1. Turn the SSD carrier over.
2. Pull the rails of the SSD carrier and lift the SSD out of the SSD carrier.

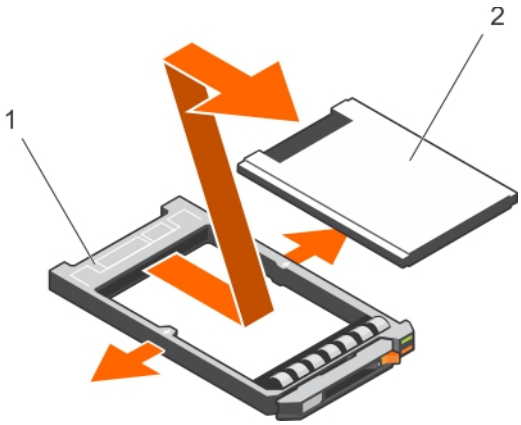

Figure 63. Removing a 1.8 inch SSD into a SSD carrier

1. SSD carrier
2. SSD

Next steps

Install the SSD into the SSD carrier.

Related links

Safety instructions

Installing a 1.8 inch uSATA SSD into a SSD carrier

GUID-48D7A0C7-138A-47F2-9AD6-D79FCC728C78

Installing a 1.8 inch uSATA SSD into a SSD 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.

Steps

1. Insert the SSD into the SSD carrier with the connector end of the SSD toward the back of the SSD carrier.
2. Press the SSD until it is firmly seated.

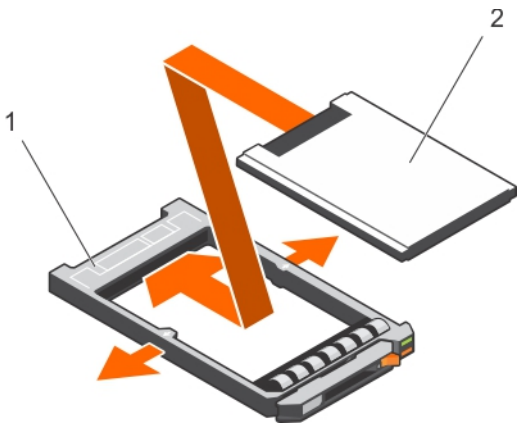

Figure 64. Installing a 1.8 inch SSD into a SSD carrier

1. SSD carrier
2. SSD

GUID-A37C0162-C949-4C8D-8629-4C438C0E52F1

Removing the 1.8 inch uSATA SSD cage

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. Follow the procedure listed in before working inside your system.
3. Remove the 1.8 inch SSD(s) from the SSD cage.

Steps

Hold the SSD cage by the edges and lift the cage out of the chassis.

The SSD backplane is attached to the SSD cage. When you lift the SSD cage, the backplane will disengage from the backplane connector on the system board.

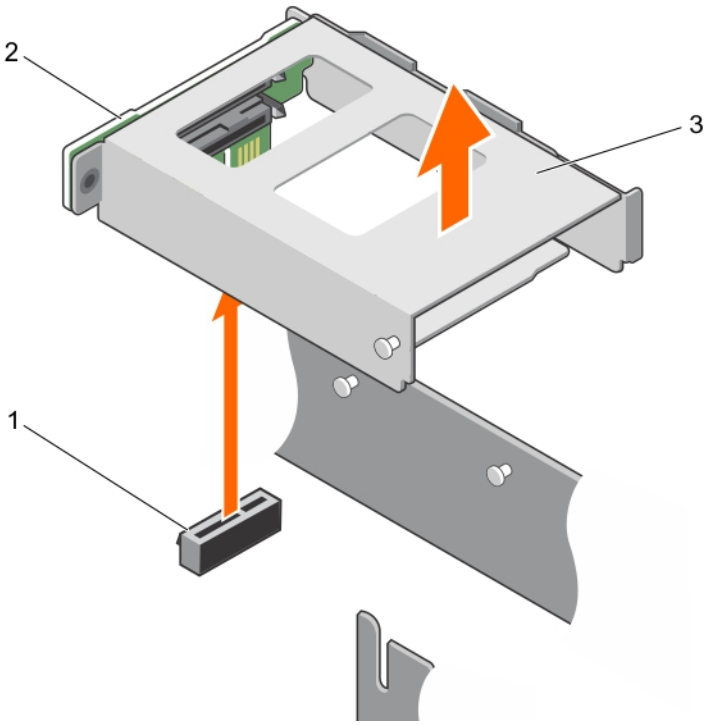

Figure 65. Removing the 1.8 inch SSD cage

1. 1.8 inch SSD backplane connector
2. 1.8 inch SSD backplane
3. 1.8 inch SSD cage

GUID-F37C0486-73EF-4F87-8AD6-835F2FE096D2

Installing the 1.8 inch uSATA SSD cage

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. Follow the procedure listed in before working inside your system.

Steps

1. Align the tabs on the SSD cage and the PSU 1 slot with the slots on the chassis and SSD cage.
2. Press the SSD cage until the SSD backplane engages with the SSD backplane connector on the system board.

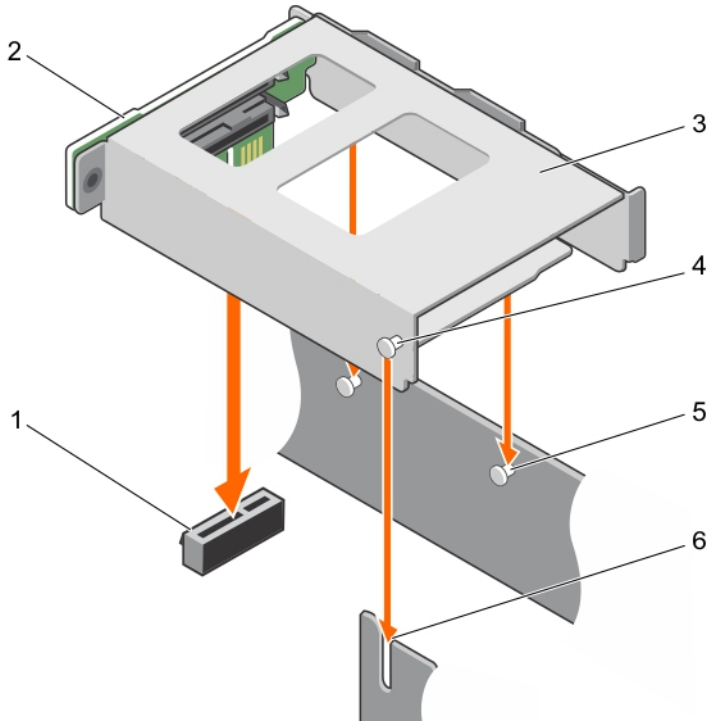

Figure 66. Installing the 1.8 inch SSD cage

1. 1.8 inch SSD backplane connector
2. 1.8 inch SSD backplane
3. 1.8 inch SSD cage
4. tab on the SSD cage
5. tab on the PSU 1 slot (2)
6. slot on the chassis

Next steps

1. Install the 1.8 inch SSD carrier or SSD blank(s) into the SSD cage.
2. Follow the procedure listed in after working inside your system.

Related links

Safety instructions
Installing a 1.8 inch uSATA SSD blank
Installing a 1.8 inch uSATA SSD carrier
Removing the 1.8 inch uSATA SSD cage

GUID-D7253016-8E05-4315-BBA7-7A2E3D7098E5

Removing the 1.8 inch uSATA SSD 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.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in before working inside your system.
3. Keep the Torx T10 screwdriver ready.
4. Remove both the SSD carriers.
5. Remove the 1.8 inch SSD cage.

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

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

Steps

1. Remove the screw securing the SSD backplane to the SSD cage.
2. Remove the SSD backplane from the slot on the SSD cage.

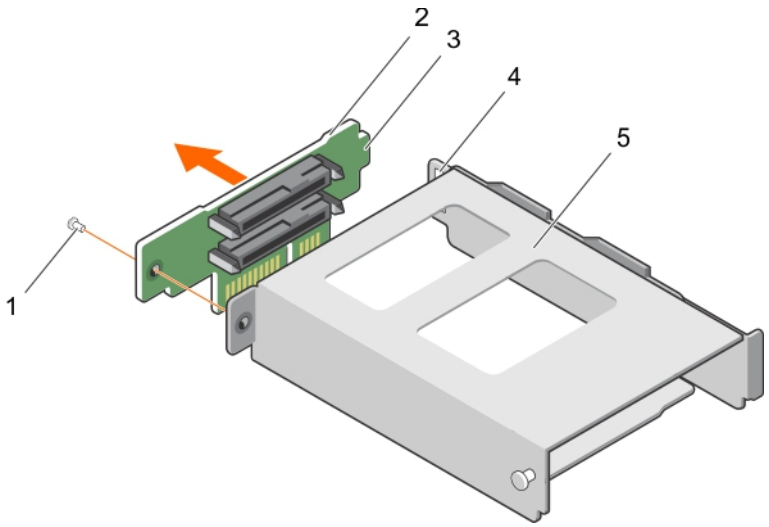

Figure 67. Removing the 1.8 inch SSD backplane

1. screw
2. SSD backplane
3. tab on the SSD backplane
4. slot on the SSD cage
5. SSD cage

Related links

Safety instructions
Before working inside your system
Installing the 1.8 inch uSATA SSD backplane

GUID-B4010B02-8843-4589-9041-FB168CB55815

Installing the 1.8 inch uSATA SSD 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.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in before working inside your system.
3. Remove the 1.8 inch SSD cage.

NOTE: The 1.8 inch SSD backplane is installed on the back of the 1.8 inch SSD cage.

Steps

1. Slide the SSD backplane tab into the slot on the SSD cage.
2. Align the screw hole on the SSD backplane with the screw hole on the SSD cage.
3. Secure the SSD backplane to the SSD cage by using the screw.

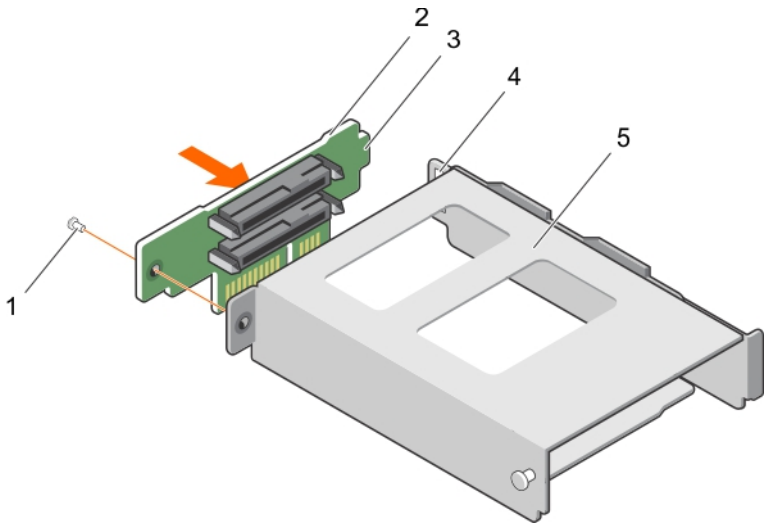

Figure 68. Installing the 1.8 inch SSD backplane

1. screw
2. SSD backplane
3. tab on the SSD backplane
4. slot on the SSD cage
5. SSD cage

Next steps

1. Install the SSD cage.
2. Follow the procedure listed in after working inside your system.

Related links

Safety instructions
Installing the 1.8 inch uSATA SSD cage
Removing the 1.8 inch uSATA SSD backplane

GUID-7FAF4A1B-15E3-4719-BD0E-1BC8CF22FB33

Internal USB memory key (optional)

An optional USB memory key installed inside your system can be used as a boot device, security key, or mass storage device.

To boot from the USB memory key, configure the USB memory key with a boot image and then specify the USB memory key in the boot sequence in System Setup.

The internal USB port must be enabled in **Internal USB Port** option in the **Integrated Devices** screen of **System Setup**.

The internal USB port is located on the system board.

NOTE: To locate the internal USB port (INT_USB) on the system board, see the System board jumpers and connectors section.

GUID-15A79888-AA71-4B42-B0EC-DAAC479D0892

Replacing the optional internal USB memory key

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 the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Remove the PCIe shroud.
4. If installed, disconnect the expansion card riser cables from the system board.
5. Remove the expansion card riser.

Steps

1. Locate the USB port or USB key on the system board.
   To locate the USB port, see the System board jumpers and connectors section.
2. If installed, remove the USB key from the USB port.

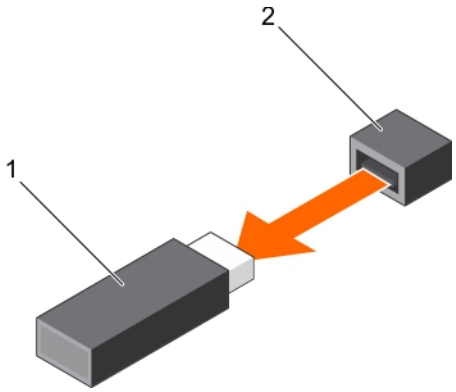

Figure 69. Removing the internal USB key

1. USB memory key
2. USB port

3. Insert the replacement USB key into the USB port.

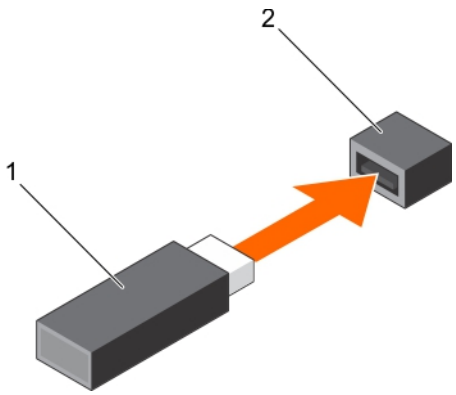

Figure 70. Installing the internal USB key

1. USB memory key
2. USB port

Next steps

1. Install the expansion card riser.
2. If installed, connect the expansion card riser cables to the system board.
3. Install the PCIe shroud.
4. Follow the procedure listed in the After working inside your system section.
5. While booting, press F2 to enter System Setup and verify that the system detects the USB key.

Related links

Safety instructions
Before working inside your system
After working inside your system
Removing the PCIe shroud
Installing the PCIe shroud
Installing the expansion card riser cage
Removing the expansion card riser cage
System Setup
System board connectors

GUID-C0022AA9-4554-46E1-80DF-0A9296B6FCA0

Cable routing clip

GUID-3EDA30CC-2731-4715-B46A-736EA98AFA13

Removing the cable routing clip

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. Follow the procedure listed in before working inside your system.
3. Disconnect and remove the cables routed through the cable routing clip.
4. Keep the Phillips #2 screwdriver ready.

Steps

1. Remove the screws securing the cable routing clip to the system board.
2. Lift the cable routing clip away from the system board.

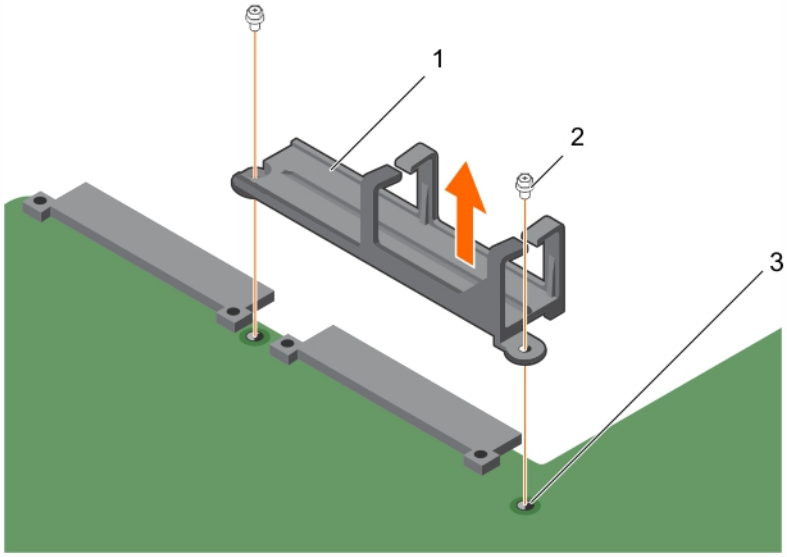

Figure 71. Removing the cable routing clip

1. cable routing clip
2. screw (2)
3. screw hole on the system board (2)

Related links

Safety instructions
Before working inside your system
Installing the cable routing clip

GUID-545A595E-51A2-43AA-859D-A2349179BBAC

Installing the cable routing clip

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. Follow the procedure listed in before working inside your system.

Steps

1. Align the screw holes on the cable routing clip with the screw holes on the system board and lower the clip on the system board.
2. Secure the cable routing clip to the system board by using the screws.

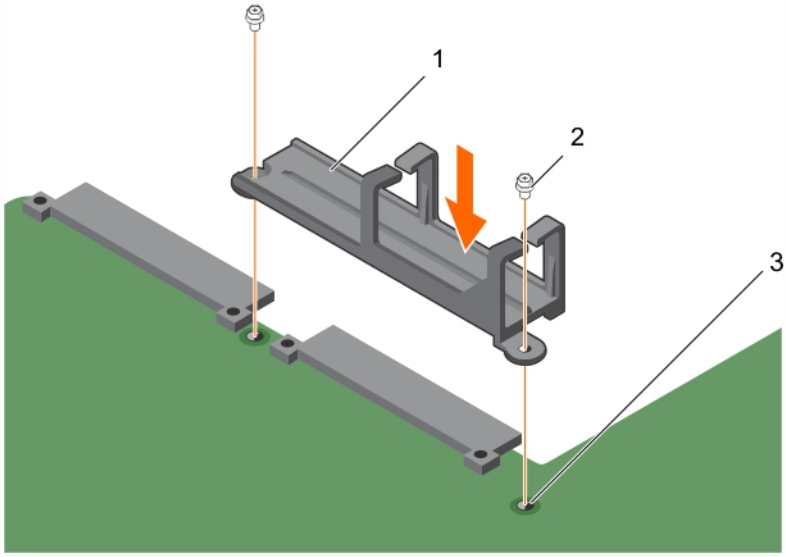

Figure 72. Installing the cable routing clip

1. cable routing clip
2. screw (2)
3. screw hole on the system board (2)

Next steps

1. Connect and route the cables through the cable routing clip.
2. Follow the procedure listed in after working inside your system.

Related links

Safety instructions
Before working inside your system
After working inside your system
Removing the cable routing clip

GUID-BC395B99-9FF1-411A-A3E3-AE00C469C152

System board

GUID-BB43C31B-CA2D-45F6-8AAD-F01780B7514B

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 Platform 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 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.

NOTE: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Keep the Philips #2 screwdriver ready.
4. Remove the following components:
    a. PCIe shroud
    b. Expansion card riser
    c. PSU(s)
    d. 2.5 inch hard drive cage, if applicable
    e. Internal dual SD module
    f. 1.8 inch SSD cage with backplane
    g. Internal USB key (if installed)
    h. Cooling shroud
    i. Heat sink(s)
    j. Processor(s)/Processor blank

        CAUTION: To prevent damage to the processor pins when replacing a faulty system board, ensure that you cover the processor socket with the processor protective cap.

    k. Memory modules and memory module blanks
    l. Cable routing clip
5. Disconnect all cables from the system board.

Steps

1. Remove the screws that secure the system board to the chassis.

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

    CAUTION: Do not lift the system board by holding a memory module, processor, or other components.
2. Lift the system board by holding both the system board holders, and slide the system board toward the front of the chassis. The connectors are disengaged from the back of the chassis slots.
3. Lift the system board out of the chassis.

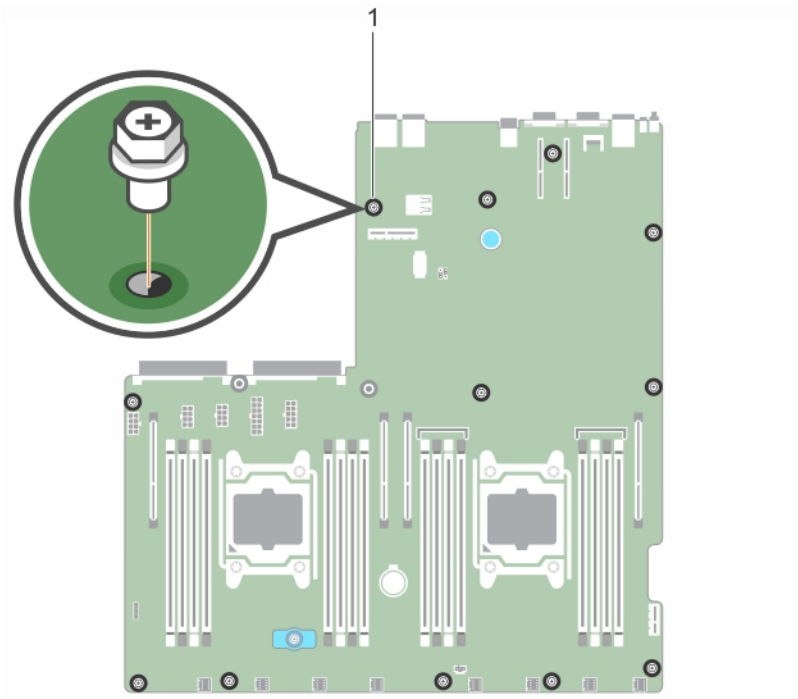

Figure 73. Removing the screws on the system board

1. screw (12)

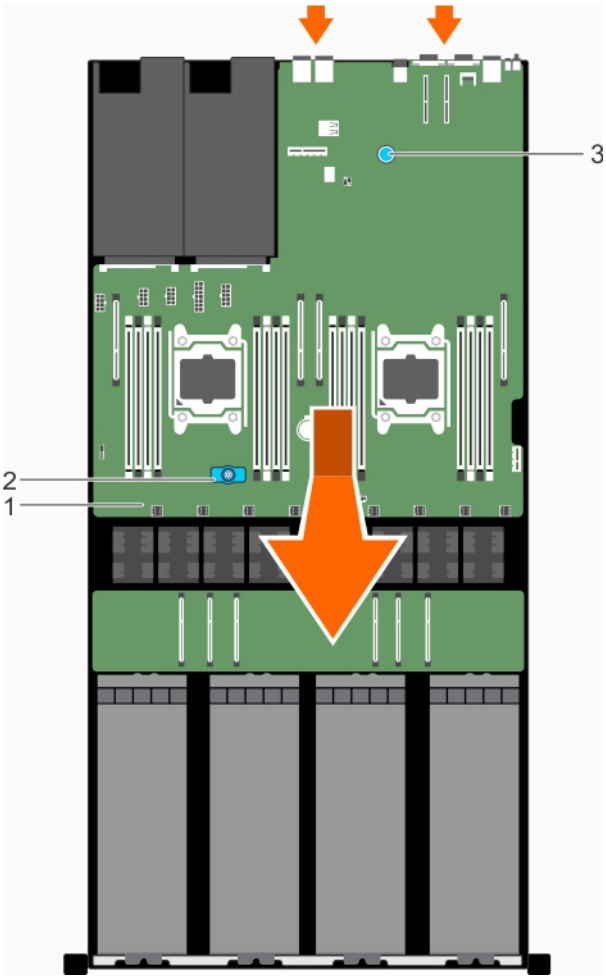

Figure 74. Removing the system board

1. system board
2. system board holder (front)
3. system board holder (back)

Next steps

Install the system board.

Related links

- Safety instructions
- Before working inside your system
- Installing the system board
- Removing the PCIe shroud
- Removing the expansion card riser cage
- Removing an AC power supply unit
- Removing the optional 2.5 inch hard drive cage
- Removing an internal SD card
- Removing the 1.8 inch uSATA SSD cage
- Replacing the optional internal USB memory key
- Removing the cooling shroud
- Removing a heat sink
- Removing a processor
- Removing memory modules
- Removing the cable routing clip

GUID-E8B999E5-1A57-4410-8498-3091F9F0BFD8

Installing the system board

Prerequisites

NOTE: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

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. Follow the procedure listed in before working inside your system.
3. Keep the Phillips #2 screwdriver ready.

Steps

1. Unpack the new system board.

CAUTION: Do not lift the system board 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.

2. Hold the system board holders and lower the system board into the chassis at an angle so that the connectors on the back of the system board engage with the slots on the back of the chassis.

3. Push the system board toward the back of the chassis until the board is firmly seated.

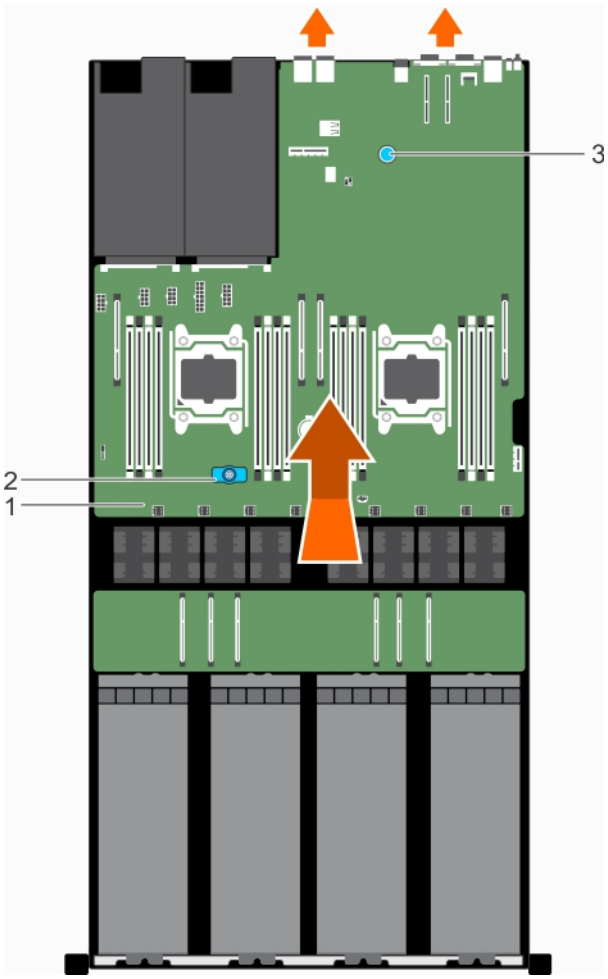

Figure 75. Installing the system board

1. system board
2. system board holder (front)
3. system board holder (back)

4. Secure the system board to the chassis by using the screws.

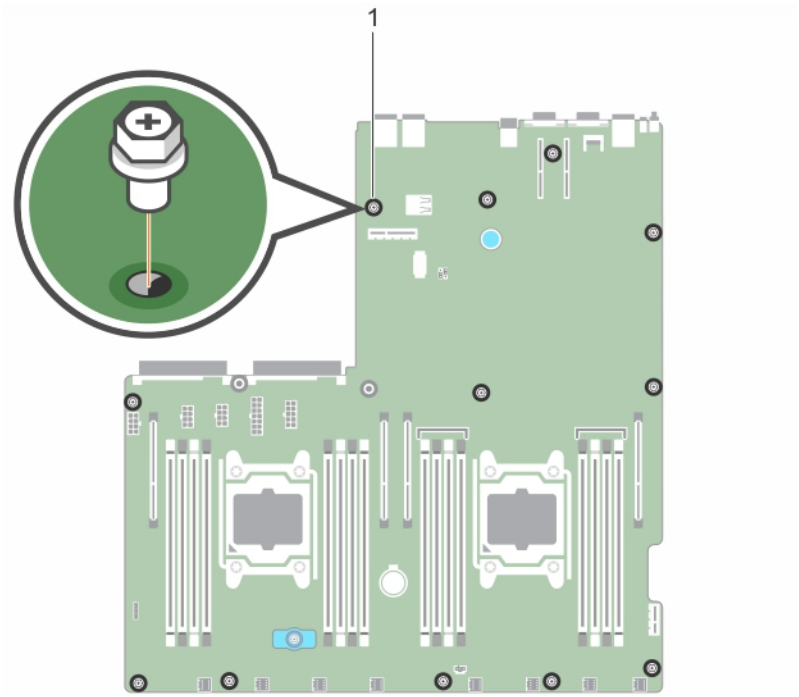

Figure 76. Installing the screws on the system board

1. screw (12)

Next steps

1. If applicable, install the Trusted Platform Module (TPM).
2. Replace the following components:
   a. Internal USB key, if applicable
   b. Internal dual SD module
   c. Expansion card riser
   d. PSU(s)
   e. 2.5 inch hard drive cage, if applicable
   f. Processors(s)/processor blank(s)
   g. Heat sink(s)
   h. PCIe shroud
   i. Memory modules and memory module blanks
   j. 1.8 inch SSD cage with the backplane
   k. Cooling shroud
   l. Cable routing clip
3. Reconnect all cables to the system board.

   NOTE: Ensure that the cables inside the system are routed along the chassis wall and the GPU and hard drive cables are routed through the cable routing clip.
4. Follow the procedure listed in after working inside your system.
5. Ensure that you perform the following steps:
   a. Use the **Easy Restore** feature to restore the service tag.
   b. If the service tag is not backed up in the backup flash device, enter the system service tag manually.
   c. Update the BIOS and iDRAC versions.
   d. Re-enable the Trusted Platform Module (TPM).

Related links

- Safety instructions
- Before working inside your system
- After working inside your system
- Removing the system board
- Replacing the optional internal USB memory key
- Installing an internal SD card
- Installing the expansion card riser cage
- Installing an AC power supply unit
- Installing the optional 2.5 inch hard drive cage
- Installing a processor
- Installing a heat sink
- Installing the PCIe shroud
- Installing memory modules
- Installing the 1.8 inch uSATA SSD backplane
- Installing the cooling shroud
- Installing the cable routing clip

GUID-98F53302-E3EC-4D02-840A-D42BCA014CCC

Entering the system Service Tag by using System Setup

If Easy Restore fails to restore the Service Tag, use System Setup to enter the Service Tag.

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

   NOTE: You can enter the Service Tag only when the Service Tag field is empty. Ensure that you enter the correct Service Tag. After 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 the *Integrated Dell Remote Access Controller User's Guide* at **Dell.com/idracmanuals**.

GUID-272FC99F-AEC2-48DA-9006-61AAF3E69D17

Restoring the Service Tag by using the Easy Restore feature

The Easy Restore feature enables you to restore your system's Service Tag, license, UEFI configuration, and the system configuration data after replacing the system board. All data is automatically backed up in a backup flash device. 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. Perform one of the following steps:
   - Press **Y** to restore the Service Tag, license, and diagnostics information.
   - Press **N** to navigate to the Dell Lifecycle Controller based restore options.
   - Press F10 to restore data from a previously created **Hardware Server Profile**.

   After the restore process is complete, BIOS prompts to restore the system configuration data.
3. Perform one of the following steps:
   - 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.

GUID-F083FE03-F846-48D5-BEFC-F22D3510DB04

Trusted Platform Module

Trusted Platform Module (TPM) is a dedicated microprocessor designed to secure hardware by integrating cryptographic keys into devices. A software can use a Trusted Platform Module to authenticate hardware devices. As each TPM chip has a unique and secret RSA key burned in as it is produced, it can perform the platform authentication.

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.

NOTE: This is a Field Replaceable Unit (FRU). Removal and installation procedures must be performed only by Dell certified service technicians.

GUID-30920CBE-7D41-4066-A84A-3A7BE117F4A8

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 came with the product.

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

Steps

1. Locate the Trusted Platform Module (TPM) connector on the system board.

   NOTE: To locate the TPM connector on the system board, see the System board connectors section.

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.

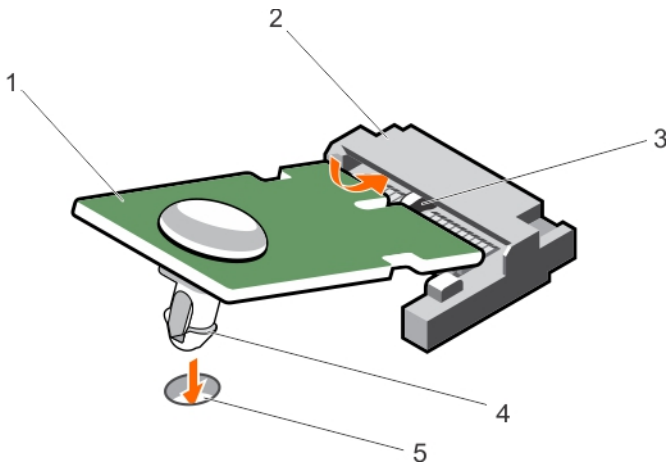

Figure 77. Installing the TPM

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

Next steps

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

Related links

[Before working inside your system]
[After working inside your system]
[Installing the system board]

GUID-16126077-74DF-4B12-B1B3-6FD7C7955A3E

Initializing the TPM for BitLocker users

Initialize the TPM.

For more information about initializing the TPM, see http://technet.microsoft.com/en-us/library/cc753140.aspx.

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

GUID-3D7E4A48-7004-48E0-9C9E-5E684C2E9E13

Initializing the TPM for TXT users

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

GUID-C279DEEF-B09B-401F-8529-59F157568DB6

Cooling fans

Your system supports eight cabled cooling fans.

Related links

[Removing a cooling fan]
[Installing a cooling fan]

GUID-E54676A7-1506-4A5E-9A5F-C050E9BBAE46

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.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in before working inside your system.
3. Remove the system top cover (front).

NOTE: The procedure for removing each fan is identical.

Steps

1. Disconnect the cooling fan power cable from the system board.
2. Hold the cooling fan by its edges and lift the cooling fan out of the chassis.

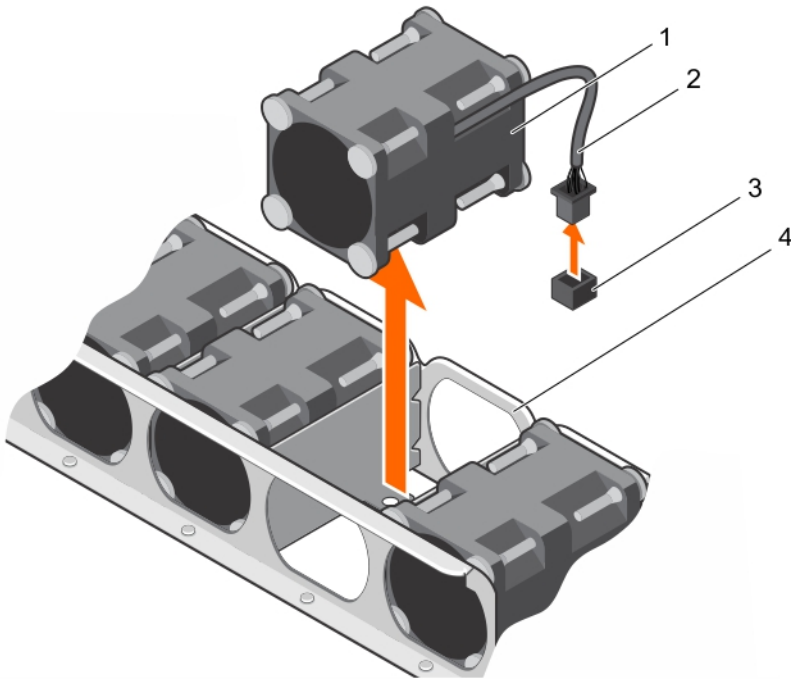

Figure 78. Removing cooling fan

1. cooling fan (8)
2. cooling fan power cable
3. cooling fan connector on system board
4. cooling fan slot

Next steps

1. Install the cooling fan.

Related links

Safety instructions
Before working inside your system
Installing a cooling fan

GUID-702CD1D0-AD7B-448A-9217-36C0B1099B03

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.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in before working inside your system.
3. Remove the system top cover (front).

Steps

1. Hold the cooling fan by the sides with the cable end facing the system board.

CAUTION: Make sure the airflow arrows on the side of the fans are pointing to the rear of the chassis. If the cooling fan is installed in reverse direction the system may overheat.

2. Align the cooling fan with the slot on the chassis and slide the fan into the slot.
3. Connect the cooling fan power cable to the cooling fan connector on the system board.

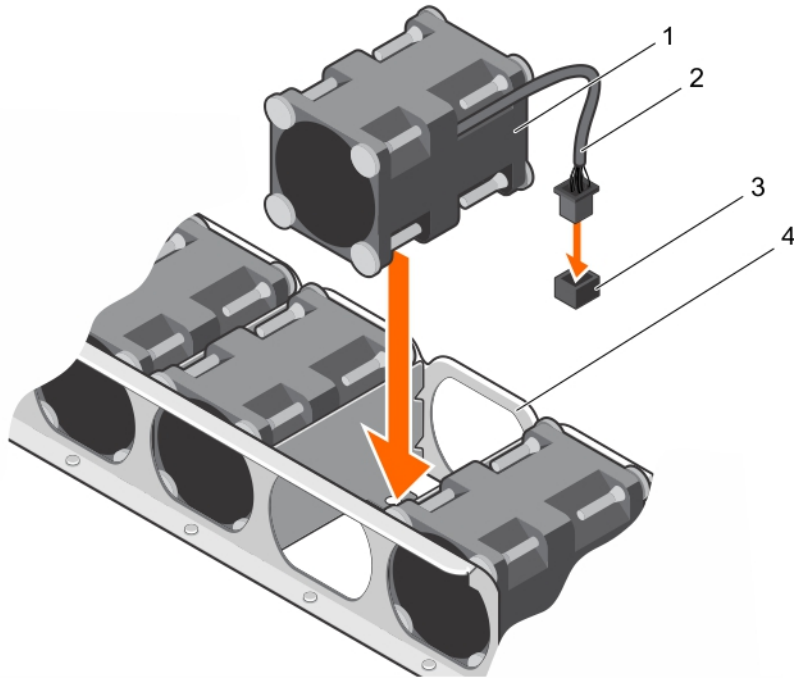

Figure 79. Installing cooling fan

1. cooling fan (8)
2. cooling fan power cable
3. cooling fan connector on system board
4. cooling fan slot

Next steps

1. Install the system top cover (front).
2. Follow the procedure listed in after working inside your system.

Related links

Safety instructions
Before working inside your system
After working inside your system
Installing the system top cover (front)
Removing the system top cover (front)
Removing a cooling fan

GUID-0DA8964D-C4EC-4FFE-AAA4-6B95FE04DEC5

Graphics processing unit

NOTE: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

PowerEdge C4130 supports two form factors of GPUs:

- Up to four PCIe GPUs supported with the GPU switch board or system board.
- Four SXM2 GPUs supported with the NVLink board.

Related links

PCIe Graphics processing unit
SXM2 Graphics processing unit

GUID-A80B54F0-173F-4B56-A31C-B0A424DA868C

PCIe Graphics processing unit

NOTE: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

The following are the high-level steps that you must perform to replace the PCIe GPUs:

1. Remove the GPU blank.
2. Remove the GPU riser cable from the system board.
3. Remove the GPU.
4. Remove the GPU riser cable board.
5. Remove the custom GPU brackets from the GPU removed from your system.
6. Remove the GPU brackets from the replacement GPU.
7. Remove the optional GPU switch board.
8. Install the optional GPU switch board.
9. Install the GPU brackets on the GPU removed from your system.
10. Install the custom GPU brackets on the replacement GPU.
11. Install the GPU riser cable board.
12. Install the GPU blank.
13. Install the GPU.
14. Install the GPU riser cable on the system board.

GUID-A6339DF4-A5DD-449B-9C45-57EED9D08586

GPU installation guidelines

- The processor must be of 145 W or less.
- Due to the high power consumption of GPUs, the ambient system inlet temperature is restricted to 25°C to ensure adequate system cooling when one or more GPU cards are installed.

  NOTE: Certain system configurations may require reduction in the maximum ambient system inlet temperature limit. The performance of the system may be impacted when operating above the maximum temperature limit or with a faulty fan.
- All GPUs must be of the same type and model.
- You can install up to four GPUs.

NOTE: Incorrect removal and installation of the GPUs will cause operational issues to your system.

GUID-C74BF688-BB65-44DB-9CCE-C2BB374DCDF7

Removing a GPU blank

You can remove the GPU blank only in configuration D. To remove GPU 2 in configuration D, remove the GPU blank from GPU slot 1. Do not remove GPU blanks in any other configuration.

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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should only be done by Dell certified service technicians.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Remove the system top cover (front).

Steps

1. Hold the back of the GPU blank and lift it at an angle to release it from the guide pins on the front inner wall of the chassis.
2. Lift the GPU blank out of the chassis.

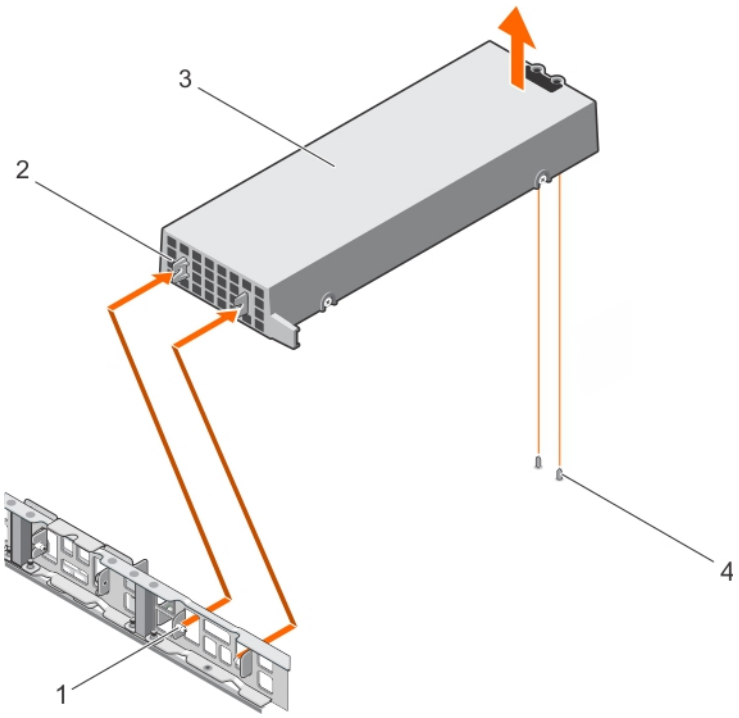

Figure 80. Removing a GPU blank

1. guide pin on the front inner wall of the chassis (2)
2. slot on the GPU blank (2)
3. GPU blank
4. guide pin on the chassis (2)

Related links

Safety instructions
Before working inside your system
Installing the system top cover (front)
Installing a GPU blank

GUID-51774785-0C32-4767-8B5B-6FEF4061A922

Removing a GPU riser cable from 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: The GPU riser cables should be removed before removing the GPUs to prevent pin damage in the GPU connectors on the system board.

NOTE: This is a Field Replaceable Unit (FRU). Removal and installation procedures should only be done by Dell certified service technicians.

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

Steps

1. Press the release latches located on the GPU riser cable connector on the system board.

   NOTE: Pressing the release latches will not eject the GPU riser cable from the system board.

2. Pull the GPU riser cable out of the GPU riser cable connector on the system board.

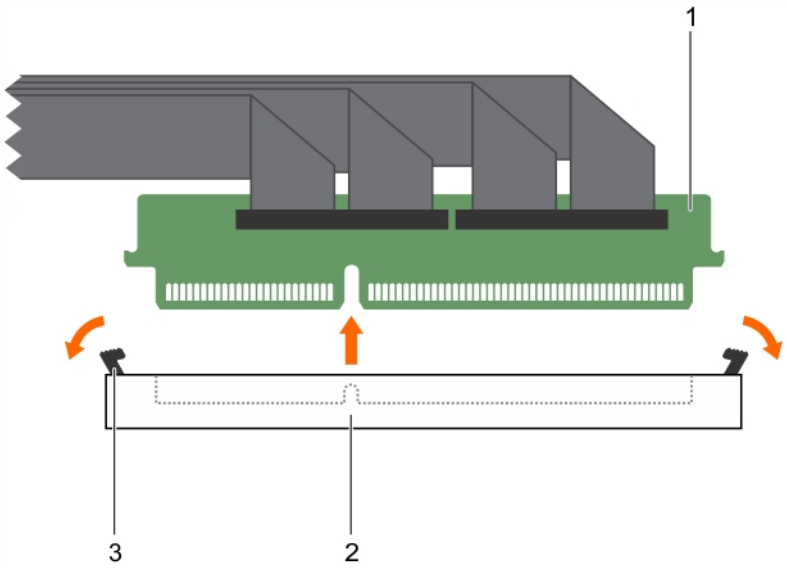

Figure 81. Removing a GPU riser cable from the system board

1. riser cable connector
2. riser cable connector on the system board
3. release latch (2)

Next steps

Remove the GPU.

Related links

Safety instructions
Before working inside your system
Removing a GPU

GUID-A5AC4771-23AB-495F-8A45-80253EB206F1

Removing a GPU

To remove GPU 2, remove GPU 1 first and to remove GPU 4, remove GPU 3 first.

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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

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

2. Remove the GPU riser cables connected to the switch board or system board.

CAUTION: The GPU riser cables should be removed before removing the GPUs to prevent pin damage in the GPU connectors on the system board.

3. Disconnect the power cables connected to the system board.

Steps

1. Hold the GPU by the support brackets, and lift the GPU at an angle to release it from the guide pins on the front inner wall of the chassis.

NOTE: Do not hold the GPU by the GPU riser cable board while removing the GPU.

2. Lift the GPU out of the chassis.

CAUTION: While removing the GPU out of the chassis ensure that the guide pins on the chassis do not scrape the GPU.

3. Disconnect the power cable connected to the GPU.

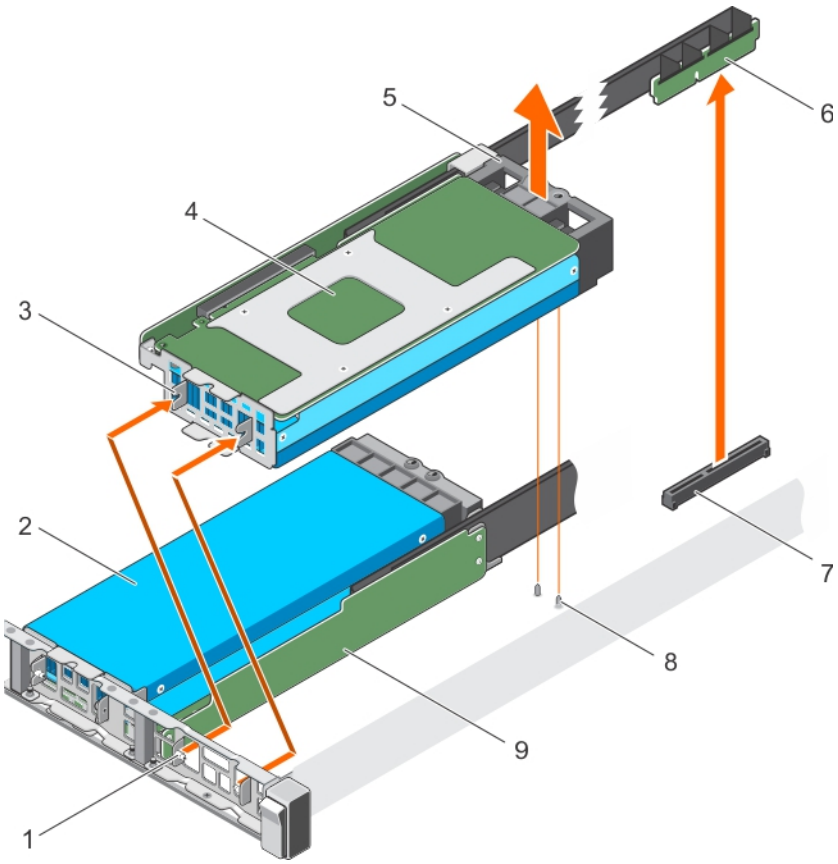

Figure 82. Removing the GPU

1. guide pin on the front inner wall of the chassis (2)
2. GPU 2
3. slot on the GPU I/O bracket (2)
4. GPU 1
5. GPU support bracket
6. GPU riser cable
7. GPU connector on the system board or on the switch board
8. Guide pins on the chassis
9. GPU riser cable board

Next steps

Remove the GPU riser cable board.

Related links

Safety instructions
Removing a GPU riser cable from the system board
Installing a GPU
Removing a GPU riser cable board

GUID-5AFBEF37-EBDC-4487-8DA0-1A3B9CCD4057

Removing a GPU riser cable 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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Keep the Philips #2 screwdriver ready.
3. Remove the GPU from the chassis.
4. Disconnect the power cables connected to the GPU.

Steps

1. Remove the screws securing the GPU riser cable board to the GPU.
2. Pull the GPU riser cable board to disengage the connector on the GPU riser cable board from the GPU.
3. Remove the GPU riser cable routed through the GPU riser cable clip.

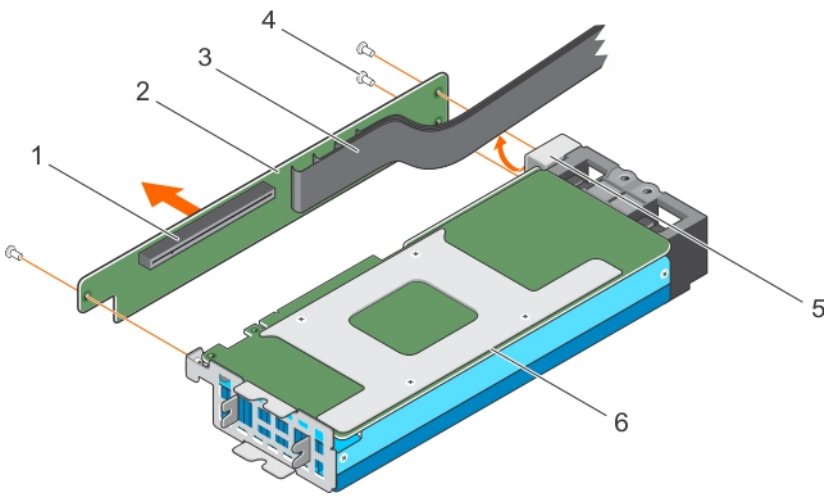

Figure 83. Removing a GPU riser cable board

1. connector on the GPU riser cable board
2. GPU riser cable board
3. GPU riser cable
4. screw (3)
5. GPU riser cable clip
6. GPU

Next steps

Removing the custom GPU brackets from the GPUs removed from your system.

Related links

Safety instructions

Removing the custom GPU brackets from the GPUs removed from your system

Installing a GPU riser cable board

GUID-2E652E83-002F-4B5C-9BDC-E39730AB3CB7

Removing the custom GPU brackets from the GPUs removed from your system

The Nvidia, Intel, or AMD brackets are installed on the Nvidia, Intel, or AMD GPUs shipped with your system. These brackets should be removed from the Nvidia, Intel, or AMD GPUs removed from your system and installed on the replacement GPUs.

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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Keep the Philips #1 and #2 screwdrivers ready.
3. Remove the GPU riser cable board.

NOTE: Depending on the type of Nvidia GPUs supported on your system, the location of the screws and type of GPU brackets will vary.

Steps

1. Remove the screws securing the front I/O bracket to the GPU, and remove the I/O bracket.
2. Remove the screws securing the support bracket to the GPU, and remove the support bracket.

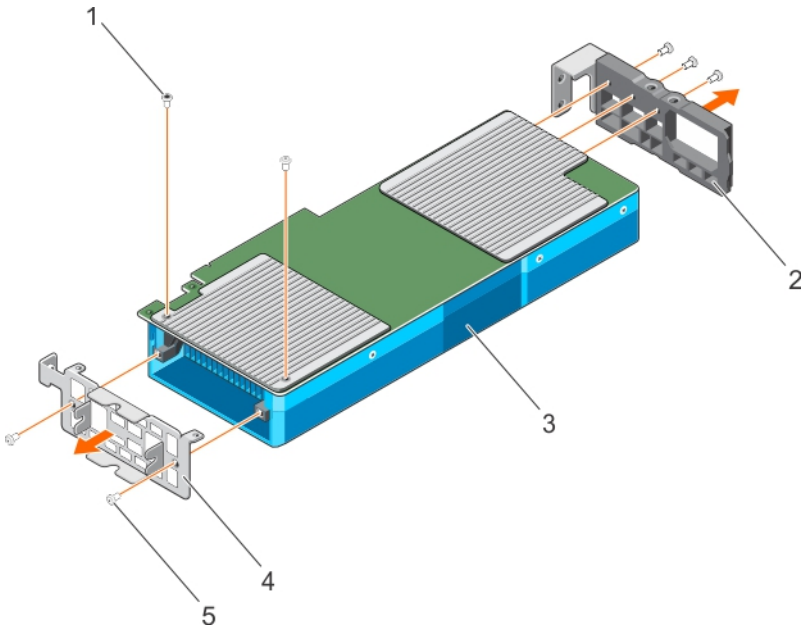

Figure 84. Removing the custom Nvidia GPU I/O brackets and the support brackets

1. Torx screw (2)
2. support bracket
3. GPU
4. I/O bracket
5. screw (5)

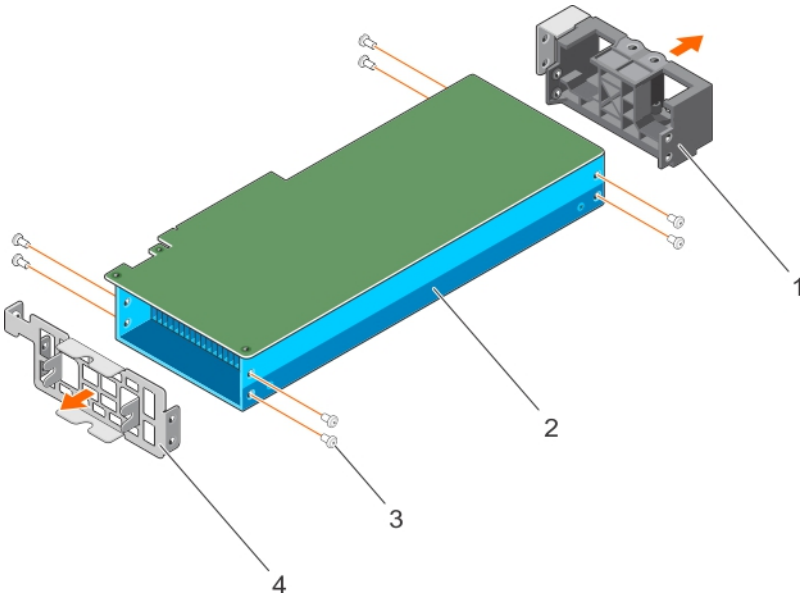

Figure 85. Removing the custom Intel GPU I/O brackets and the support brackets

1. support bracket
2. GPU
3. screw (8)
4. I/O bracket

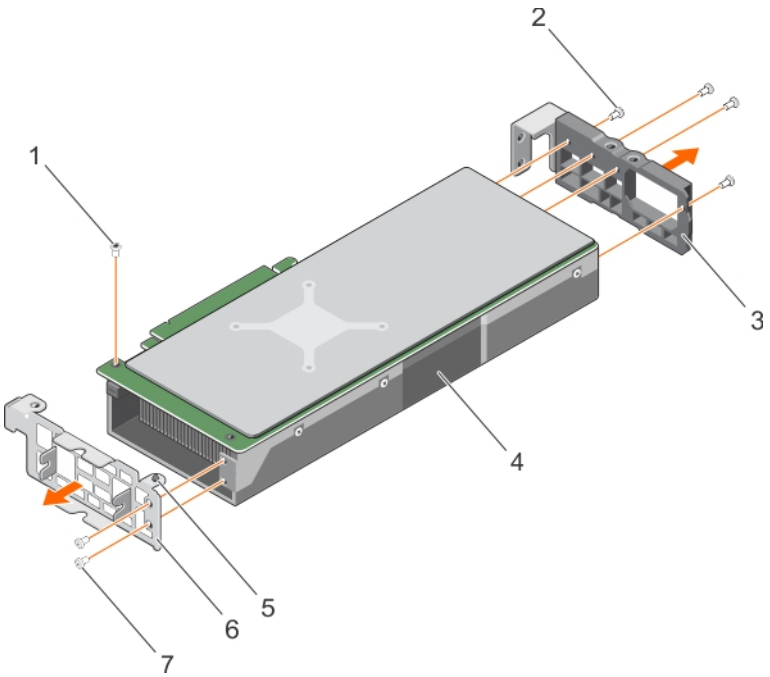

Figure 86. Removing the custom AMD I/O brackets and the support brackets

1. pan head screw
2. screw (4)
3. support bracket
4. GPU
5. alignment guide
6. I/O bracket
7. flat head screw (2)

Next steps

Remove the GPU brackets from the replacement GPUs.

NOTE: This procedure is not applicable to the AMD GPUs since the replacement AMD GPUs are shipped without brackets.

Related links

Safety instructions
Removing a GPU riser cable board
Removing the GPU brackets from the replacement GPUs
Installing the custom GPU brackets on the replacement GPUs

GUID-7B4D0FA0-452E-4CED-9932-4E17537F3F17

Removing the GPU brackets from the replacement GPUs

This procedure is not applicable to the AMD replacement GPUs because they are shipped without the I/O and support brackets. The Nvidia or Intel replacement GPUs are shipped with specific Nvidia or Intel I/O and support brackets. These brackets should be removed from the replacement Nvidia or Intel GPUs and installed on the Intel or Nvidia GPUs removed from your system. The procedure to remove the Nvidia and Intel brackets from the replacement GPUs is identical.

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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Keep the Philips #1, #2, and the Torx T6 screwdrivers ready.
3. Remove the custom GPU brackets from the GPU removed from your system.

Steps

1. Remove the screws securing the front I/O bracket to the GPU, and remove the I/O bracket.
2. Remove the screws securing the support bracket to the GPU, and remove the support bracket.

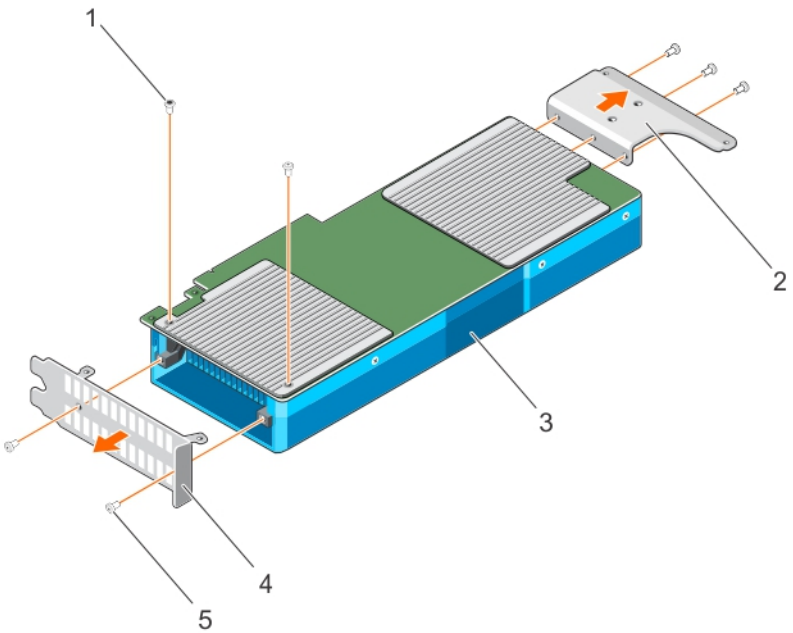

Figure 87. Removing the Nvidia GPU I/O brackets and the support brackets

1. Torx screw (2)
2. support bracket

3. GPU
4. I/O bracket
5. screw (5)

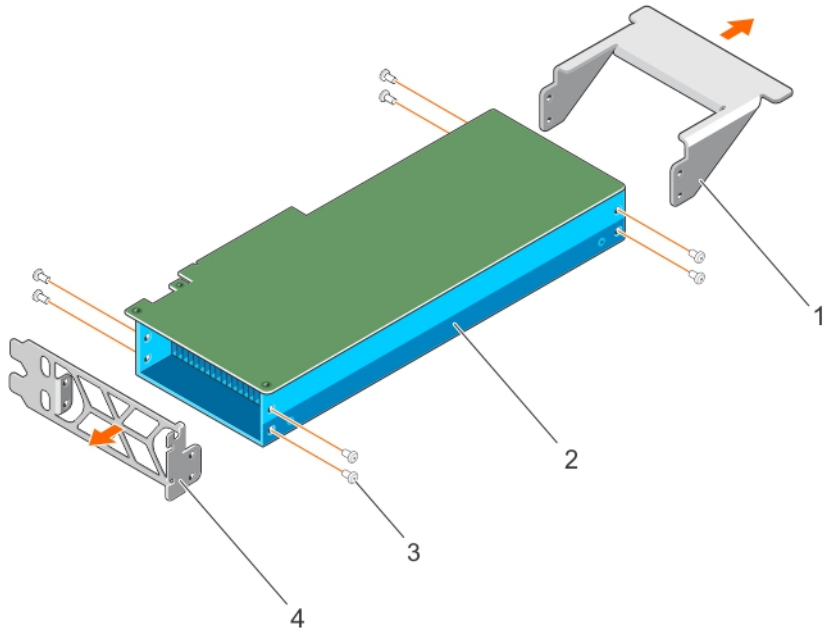

Figure 88. Removing the GPU Intel I/O brackets and the support brackets

1. support bracket
2. GPU
3. screw (8)
4. I/O bracket

Next steps

Install the brackets on the GPU that you removed from your system.

Related links

Safety instructions
Installing the GPU brackets on the GPUs removed from your system
Installing the custom GPU brackets on the replacement GPUs

GUID-4B59AB13-29D2-4D40-AE81-150C9700E77C

Removing the optional GPU switch 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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Remove the system top cover (front).
4. Disconnect the GPU signal cables from the system board and then from the switch board.

   NOTE: The GPU riser signal cable should be removed from the switchboard before removing the GPUs to prevent pin damage in the GPU connectors on the switch board.
5. Remove all GPUs from the chassis.

6. Disconnect the switch board power cable.
7. Keep the Philips #2 screwdriver ready.

Steps

1. Loosen the screws securing the GPU switch board to the chassis.
2. Slide the GPU switch board toward the front of the chassis to disengage the slots on the GPU switch board from the tabs on the chassis.
3. Lift the GPU switch board out of the chassis.

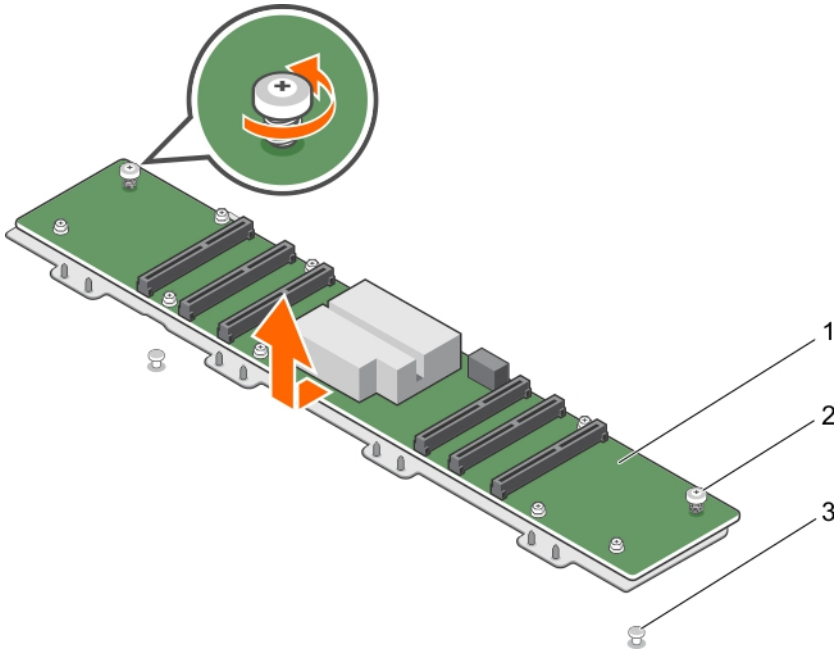

Figure 89. Removing the GPU switch board

1. GPU switch board
2. captive screw (2)
3. tab on the chassis (2)

Next steps

1. Install the system top cover (front).
2. Follow the procedure listed in the After working inside your system section.

Related links

Safety instructions
Before working inside your system
After working inside your system
Installing the system top cover (front)
Installing the optional GPU switch board

GUID-94AD9AF8-84D1-4201-9233-15D3AC0F1A22

Installing the optional GPU switch 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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

NOTE: The switch board used in configurations A and B is not interchangeable with the switch board used in configuration G.

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

Steps

1. Align the tabs on the chassis with the slots on the GPU switch board.
2. Slide the GPU switch board toward the back of the chassis to engage the slots on the GPU switch board with the tabs on the chassis.
3. Tighten the screws securing the switch board to the chassis.

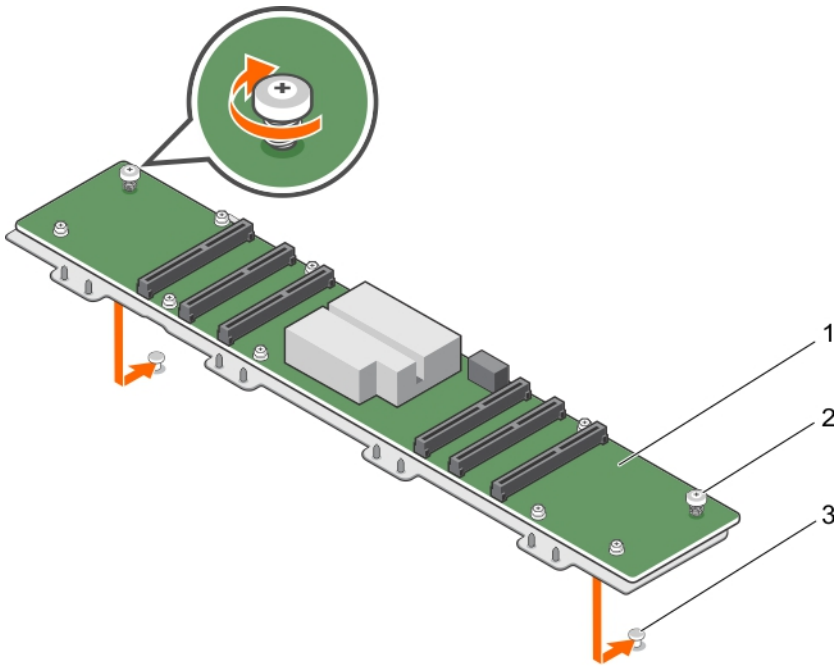

Figure 90. Installing the GPU switch board

1. GPU switch board
2. captive screw (2)
3. tab on the chassis (2)

Next steps

1. Connect the GPU switch board power cable.
2. Install the GPUs.
3. Connect the GPU signal cables to the switch board and the system board.
4. Follow the procedure listed in the After working inside your system section.

Related links

GPU cabling diagrams
After working inside your system
Installing a GPU
Removing the optional GPU switch board

GUID-E86C4BC7-32E3-4534-8214-983BCA848D99

Installing the GPU brackets on the GPUs removed from your system

This procedure is not applicable to the AMD replacement GPUs because they are shipped without the I/O and support brackets. The Nvidia or Intel replacement GPUs are shipped with specific Nvidia or Intel I/O and support brackets. These brackets should be removed from the replacement Nvidia or Intel GPUs and installed on the Nvidia or Intel GPUs removed from your system. The procedure to install the Nvidia or Intel brackets on the GPUs removed from your system is identical.

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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Keep the Phillips #1, #2, and the Torx T6 screwdrivers ready.
3. Remove the GPU brackets.

Steps

1. Align the screw holes on the front I/O bracket with the screw holes on the GPU.
2. Secure the I/O bracket to the GPU by using the screws.
3. Align the screw holes on the support bracket with the screw holes on the GPU.
4. Secure the support bracket to the GPU by using the screws.

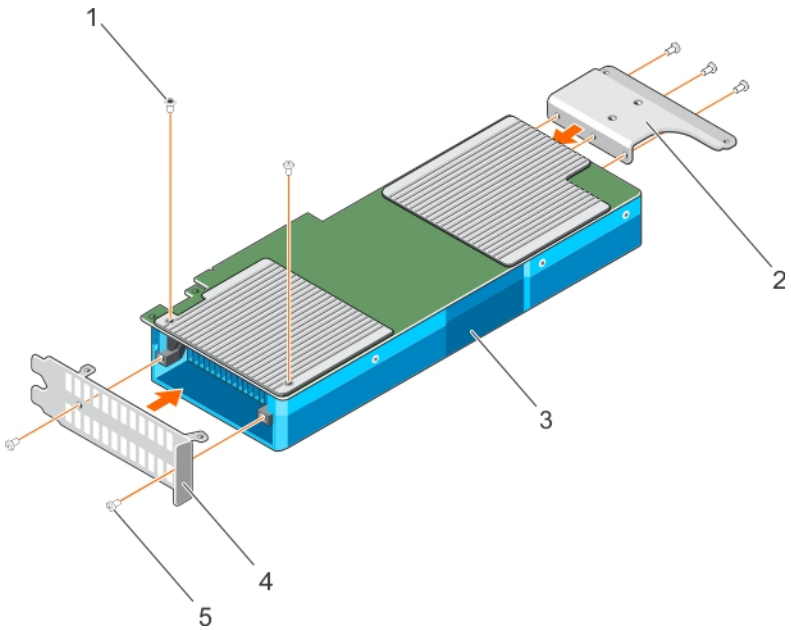

Figure 91. Installing the Nvidia GPU I/O brackets and the support brackets

1. Torx screw (2)
2. support bracket
3. GPU
4. I/O bracket
5. screw (5)

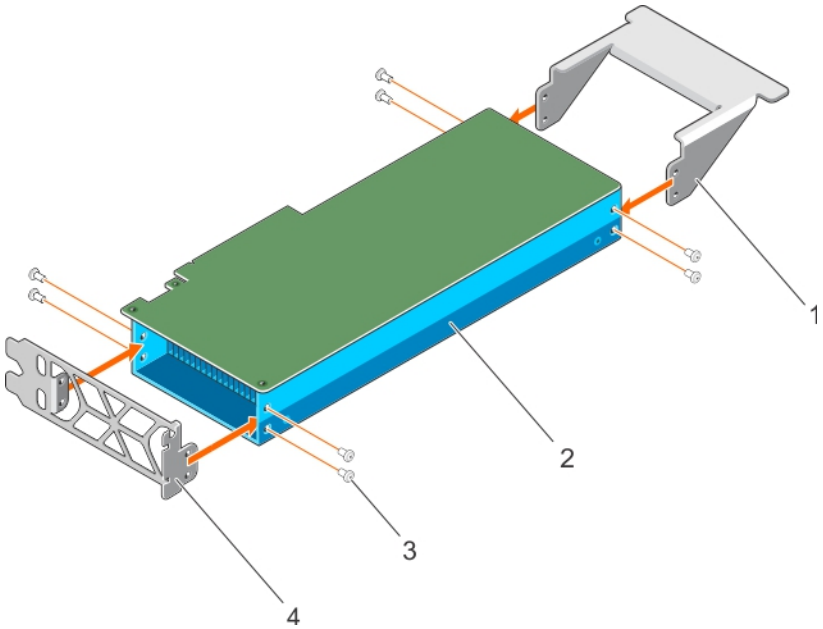

Figure 92. Installing the Intel GPU I/O brackets and the support brackets

1. support bracket
2. GPU
3. screw (8)
4. I/O bracket

Next steps

Install the custom GPU brackets on the replacement GPU.

Related links

Safety instructions
Installing the custom GPU brackets on the replacement GPUs
Removing the GPU brackets from the replacement GPUs

GUID-C6FCACB1-45CA-4FC3-90E3-80CA74ED0EF7

Installing the custom GPU brackets on the replacement GPUs

The AMD replacement GPUs are shipped without specific I/O and support brackets. The Nvidia and Intel replacement GPUs are shipped with specific Nvidia and Intel I/O and support brackets. These brackets should be removed from the replacement Nvidia or Intel GPUs and installed on the Nvidia or Intel GPUs removed from your system. The procedure to install the custom Nvidia, Intel or AMD brackets on the replacement GPUs is identical.

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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Keep the Phillips #1 and #2 screwdrivers ready.
3. Install the GPU brackets on the GPU removed from your system.

NOTE: This procedure is not applicable to AMD GPUs.

Steps

1. Align the screw holes on the front I/O bracket with the screw holes on the GPU.

NOTE: For the AMD GPUs, ensure that you align the hole on the I/O bracket with the alignment guide on the GPU.

2. Secure the I/O bracket to the GPU by using the screws.
3. Align the screw holes on the support bracket with the screw holes on the GPU.
4. Secure the support bracket to the GPU by using the screws.

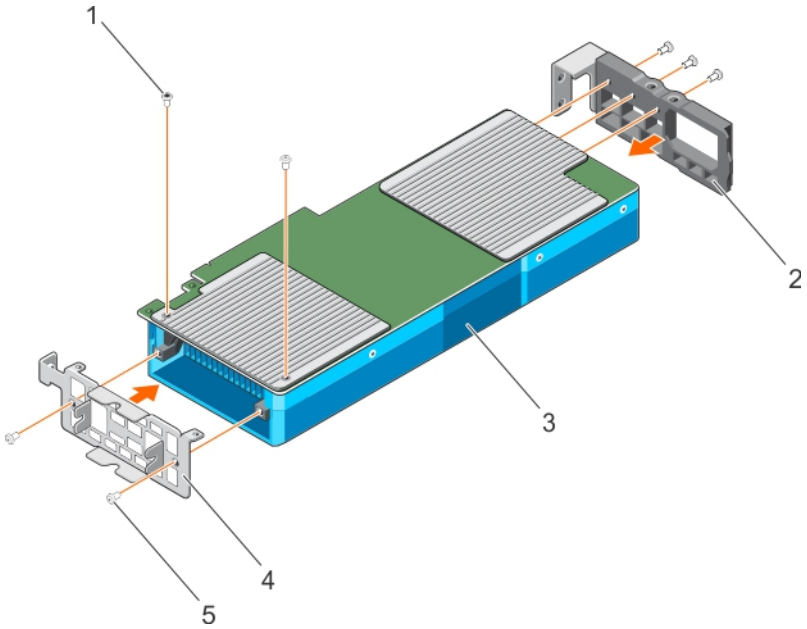

Figure 93. Installing the custom Nvidia GPU I/O brackets and the support brackets

1. Torx screw (2)
2. support bracket
3. GPU
4. I/O bracket
5. screw (5)

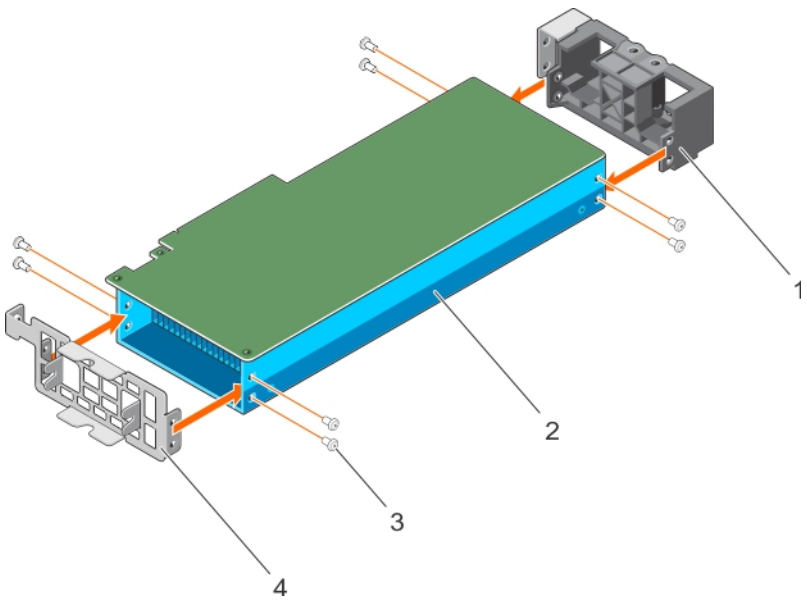

Figure 94. Installing the custom Intel GPU I/O brackets and the support brackets

1. support bracket
2. GPU
3. screw (8)
4. I/O bracket

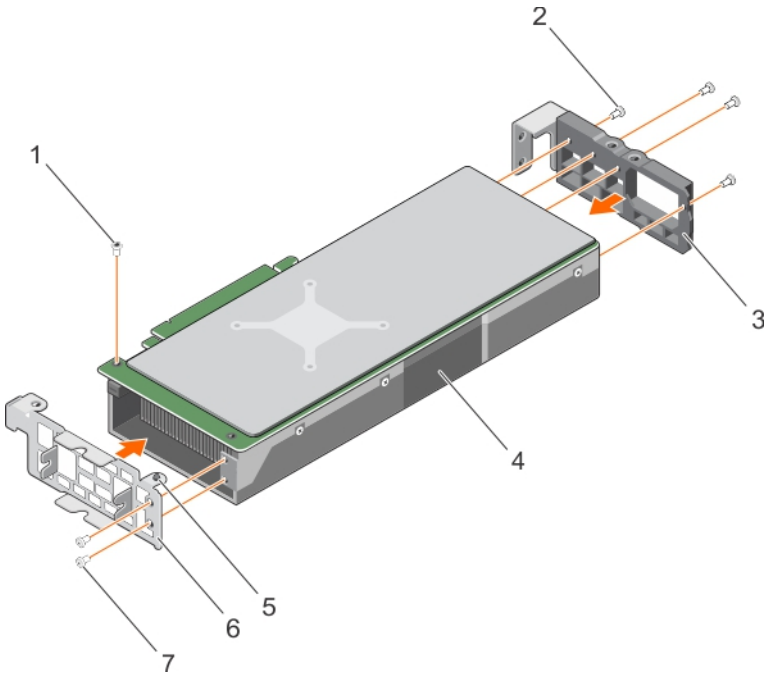

Figure 95. Installing the custom AMD GPU I/O brackets and the support brackets

1. pan head screw
2. screw (4)
3. support bracket
4. GPU
5. alignment guide
6. I/O bracket
7. flat head screw (2)

NOTE: For the AMD GPU support brackets, secure the two outer screws and then secure the two inner screws.

Next steps

Install the GPU cable riser board.

Related links

Safety instructions
Installing a GPU riser cable board
Removing the GPU brackets from the replacement GPUs

GUID-57907B93-8F46-4EBA-8563-9DD0D58196B6

Installing a GPU riser cable 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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Keep the Philips #2 screwdriver ready.
3. Install the custom GPU brackets on the replacement GPU.

Steps

1. Route the riser cable through the riser cable clip.
2. Align the connector on the riser cable board with the card edge connector on the GPU and press till it clicks into place.
3. Align the screw holes on the riser cable board with the screw holes on the GPU bracket.
4. Secure the riser cable board to the GPU by using the screws.

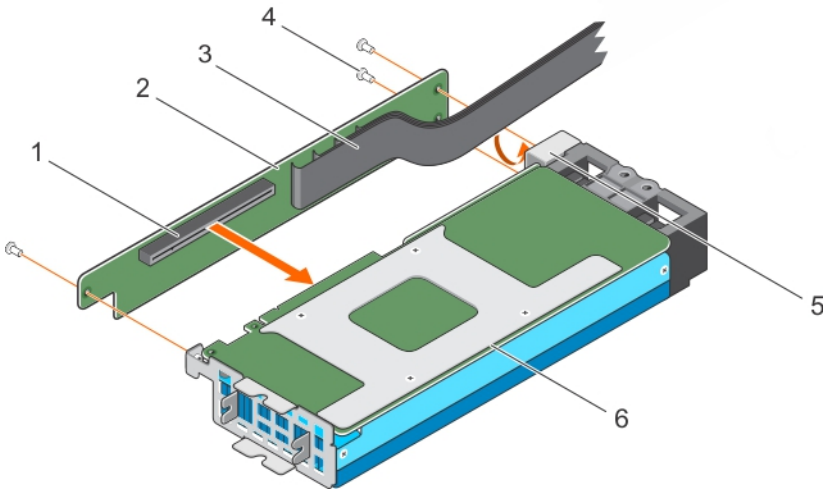

Figure 96. Installing a GPU riser cable from the system board

1. connector on the GPU riser cable board
2. GPU riser cable board
3. GPU riser cable
4. screw (3)
5. GPU riser cable clip
6. GPU

NOTE: Do not hold the GPU by the GPU riser cable board.

Next steps

1. Connect the power cables to the GPU.
2. Install the GPU or GPU blank.

CAUTION: The GPU should be installed in the system before installing the GPU riser cables to prevent pin damage in the PCIe connectors on the system board or switch board.

Related links

Safety instructions
Installing the custom GPU brackets on the replacement GPUs
Installing a GPU
Installing a GPU blank
Removing a GPU riser cable board

GUID-80E9BDD9-265E-4222-A226-7C6808F140E6

Installing a GPU blank

You can install the GPU blank only in configuration D. To install GPU 2, install the GPU blank in GPU slot 1.

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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

Follow the safety guidelines listed in the Safety instructions section.

Steps

1. Lower the front of the GPU blank at an angle and slide it to engage the slots on the GPU blank with the guide pins on the front inner wall of the chassis.
2. Lower the back of the GPU blank to engage the guide holes on the GPU blank with the guide pins on the chassis.

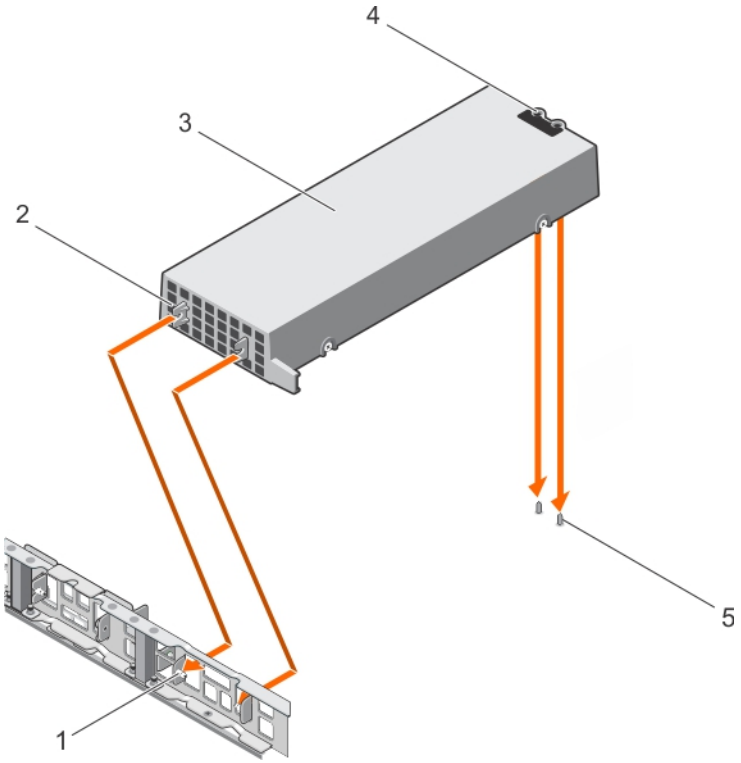

Figure 97. Installing a GPU blank

1. guide pin on the front inner wall of the chassis (2)
2. slot on the GPU blank (2)
3. GPU blank
4. guide holes on the back of the GPU blank (2)
5. guide pin on the chassis (2)

Next steps

Install GPU 2.

Related links

Safety instructions
Installing a GPU
Removing a GPU blank

GUID-875DBFF2-4AEF-4EDB-BA24-D24108F02437

Installing a GPU

Your system supports up to four GPUs.

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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the GPU installation guidelines.
3. Install the GPU brackets.
4. Install the GPU riser cable board.

Steps

1. Lower the front of the GPU at an angle and slide it to engage the slots on the GPU with the guide pins on the front inner wall of the chassis.

   NOTE: Do not hold the GPU by the GPU riser cable board.

   CAUTION: While installing the GPU, ensure that the guide pins on the chassis do not scrape the GPU.
2. Lower the back of the GPU to engage the guide holes on the GPU with the guide pins on the chassis.
3. Connect the GPU power cables to the GPU and the system board or the switch board.

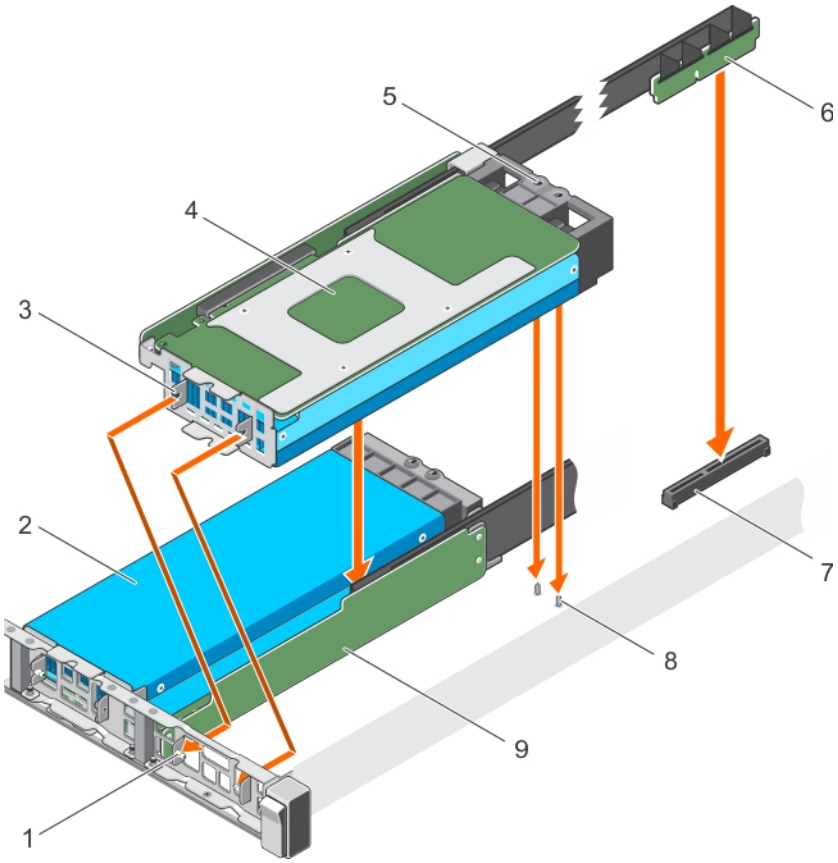

Figure 98. Installing the GPU

1. guide pin on the front inner wall of the chassis (2)
2. GPU 2
3. slot on the GPU I/O bracket (2)
4. GPU 1
5. guide hole on the GPU support bracket
6. GPU riser cable
7. GPU connector on the system board or on the switch board
8. guide pin on the chassis (2)
9. GPU riser cable board

Next steps

CAUTION: The GPU should be installed in the system before installing the GPU riser cables to prevent pin damage in the PCIe connectors on the system board or switch board.

1. If required, install the GPU blank.
2. Install the GPU riser cable to the system board.

Related links

Safety instructions
GPU installation guidelines
Installing a GPU riser cable on the system board
Installing a GPU blank
Removing a GPU

GUID-06E5C09C-2F78-4860-AA57-4C789E7DAB32

Installing a GPU riser cable on 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.

NOTE: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Install the GPU.

CAUTION: The GPU should be installed in the system before installing the GPU riser cables to prevent pin damage in the PCIe connectors on the system board or switch board.

Steps

1. Align the edge connector of the riser cable with the alignment key of the riser cable connector on the system board.
2. Insert the riser cable into the riser cable connector on the system board and press till it clicks into place.
3. Close the release latches.

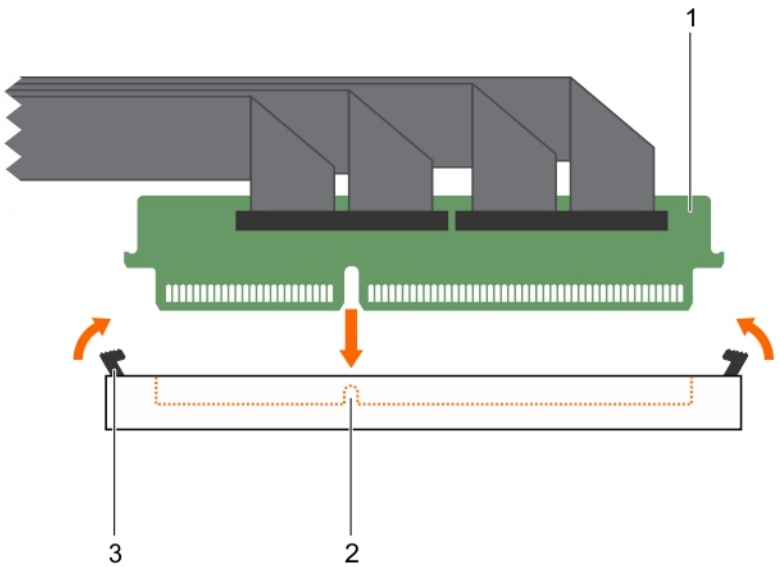

Figure 99. Installing a GPU riser cable board

1. riser cable connector
2. alignment key
3. release latch (2)

Next steps

Follow the procedure listed in after working inside your system.

Related links

Safety instructions
After working inside your system
Installing a GPU
Removing a GPU riser cable from the system board

GUID-90C9CD8A-668E-4959-B052-B8AA0F5D6F25

GPU cabling diagrams

Cabling configuration A and B systems

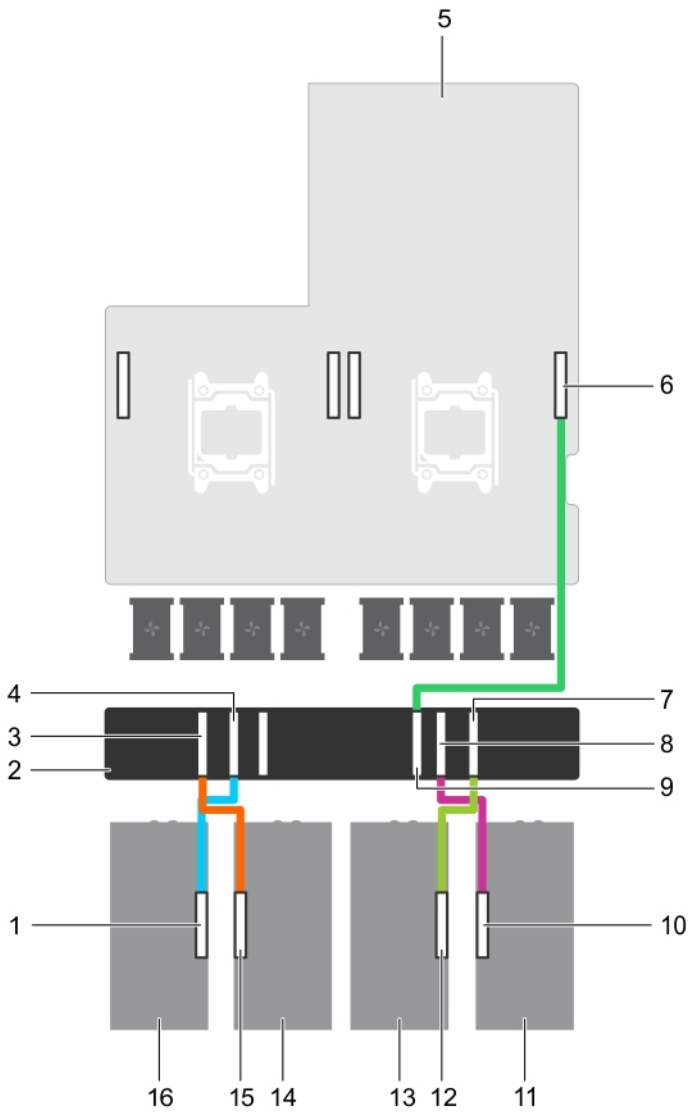

Figure 100. Cabling single and dual processor systems with four GPUs and a GPU switch board (Configurations A and B)

1. GPU 4 riser cable connector on the GPU
2. GPU switch board
3. GPU 3 connector on the GPU switch board
4. GPU 4 connector on the GPU switch board
5. system board
6. GPU 2 connector on the system board
7. GPU 2 connector on the GPU switch board
8. GPU 1 connector on the GPU switch board
9. CPU 1 connector on the GPU switch board
10. GPU 1 riser cable connector on the GPU
11. GPU 1
12. GPU 2 riser cable connector on the GPU
13. GPU 2
14. GPU 3
15. GPU 3 riser cable connector on the GPU
16. GPU 4

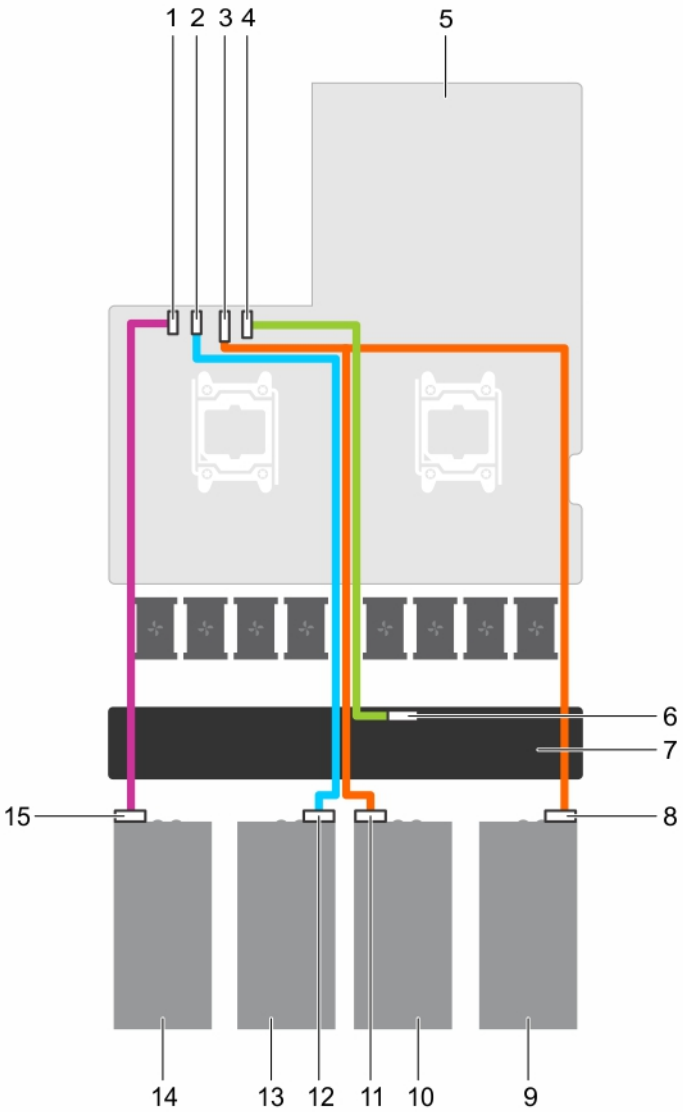

Figure 101. Power cabling for single and dual processor systems with four GPUs and a GPU switch board (Configurations A and B)

1. GPU 4 power connector on the system board
2. GPU 3 power connector on the system board
3. GPU 1/2 power connector on the system board
4. GPU switch board power connector on the system board
5. system board
6. GPU switch board power connector on the GPU switch board
7. GPU switch board
8. power connector on GPU 1
9. GPU 1
10. GPU 2
11. power connector on GPU 2
12. power connector on GPU 3
13. GPU 3
14. GPU 4
15. power connector on GPU 4

Cabling configuration C systems

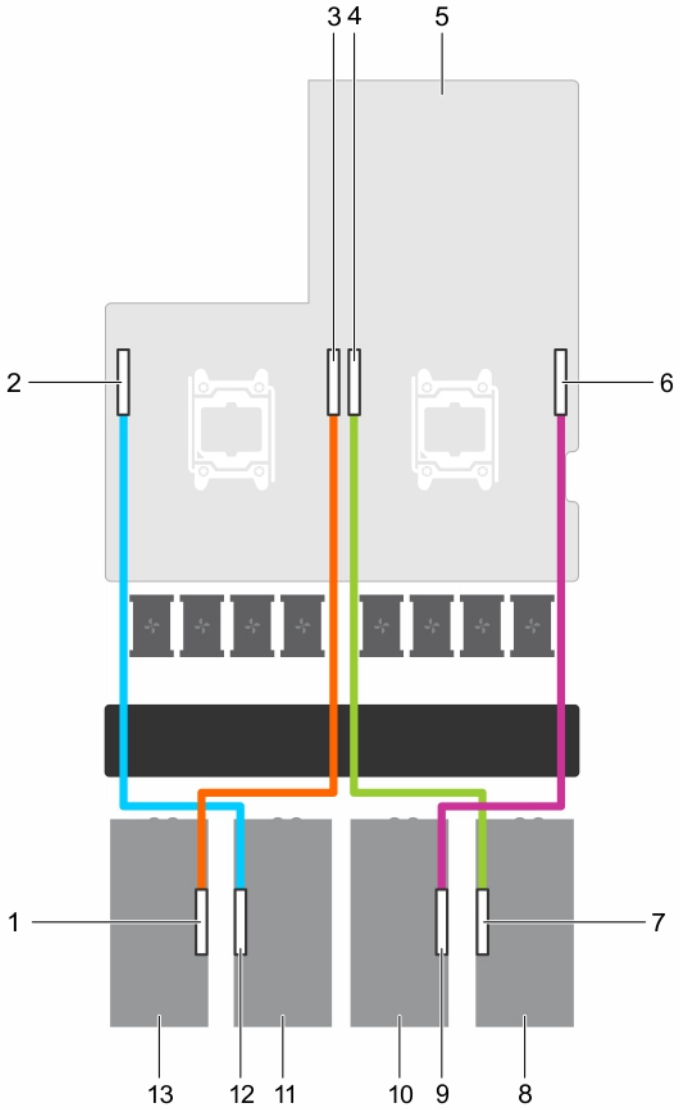

Figure 102. Cabling a dual processor system with four GPUs (Configuration C)

1. GPU 4 riser cable connector on the GPU
2. GPU 3 connector on the system board
3. GPU 4 connector on the system board
4. GPU 1 connector on the system board
5. system board
6. GPU 2 connector on the system board
7. GPU 1 riser cable connector on the GPU
8. GPU 1
9. GPU 2 riser cable connector on the GPU
10. GPU 2
11. GPU 3
12. GPU 3 riser cable connector on the GPU
13. GPU 4

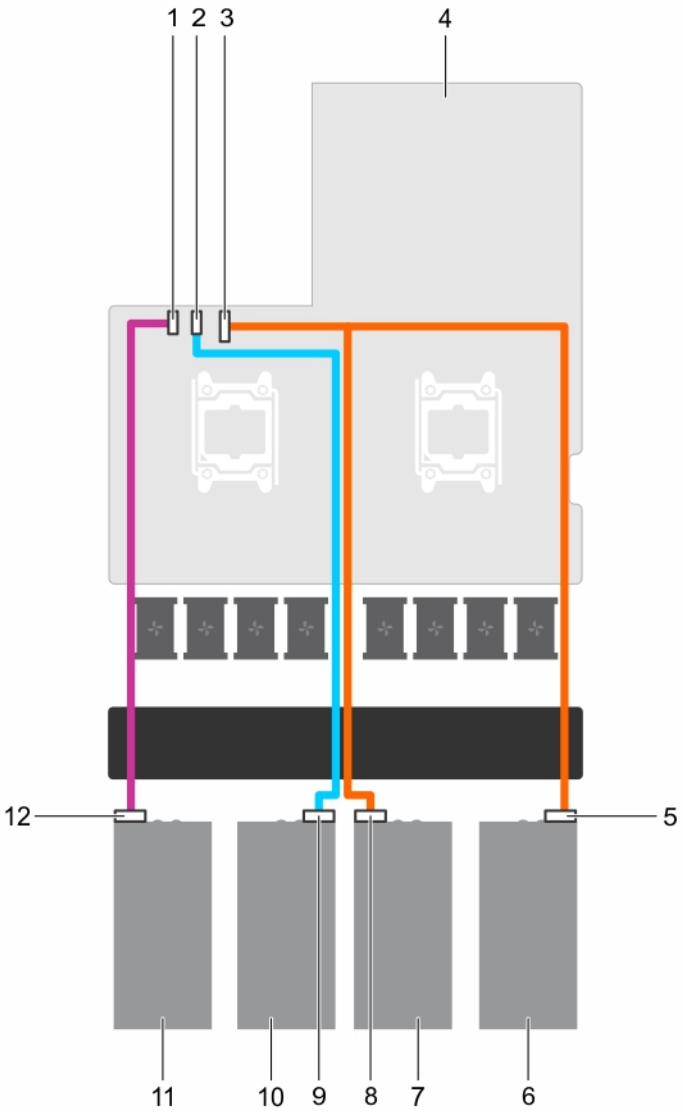

Figure 103. Power cabling for a dual processor system with four GPUs (Configuration C)

1. GPU 4 power connector on the system board
2. GPU 3 power connector on the system board
3. GPU 1/2 power connector on the system board
4. system board
5. power connector on GPU 1
6. GPU 1
7. GPU 2
8. power connector on GPU 2
9. power connector on GPU 3
10. GPU 3
11. GPU 4
12. power connector on GPU 4

Cabling configuration D systems

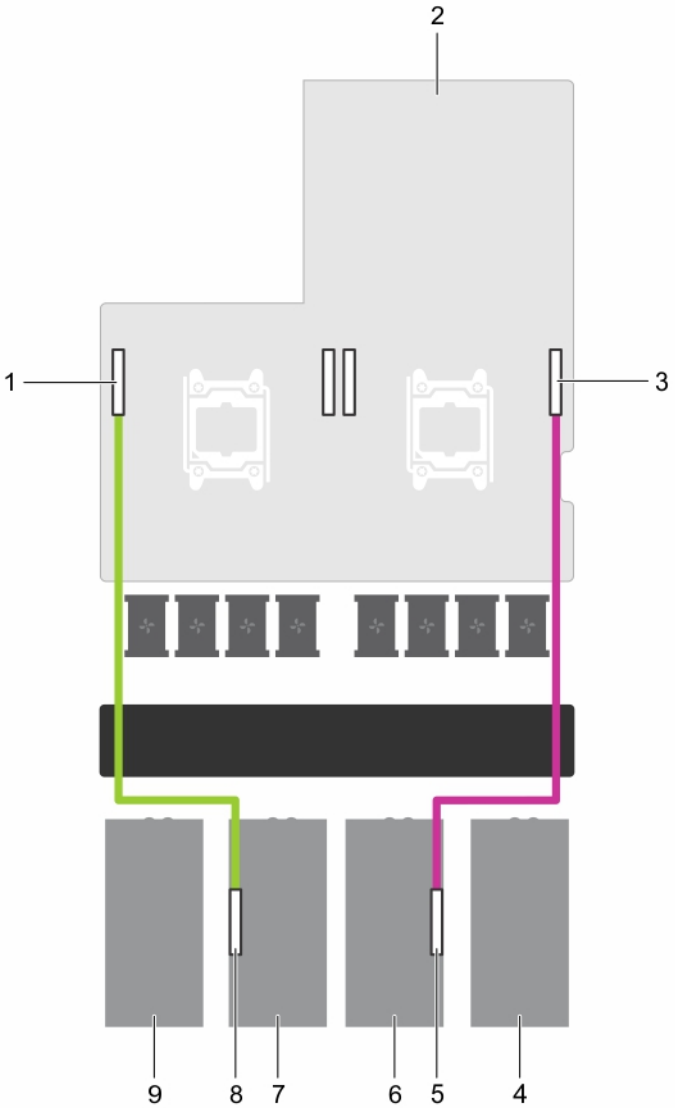

Figure 104. Cabling a dual processor system with two GPUs (Configuration D)

1. GPU 3 riser cable connector on the system board
2. system board
3. GPU 2 connector on the system board
4. GPU 1 blank
5. GPU 2 riser cable connector on the GPU
6. GPU 2
7. GPU 3
8. GPU 3 riser cable connector on the GPU
9. GPU 4 blank

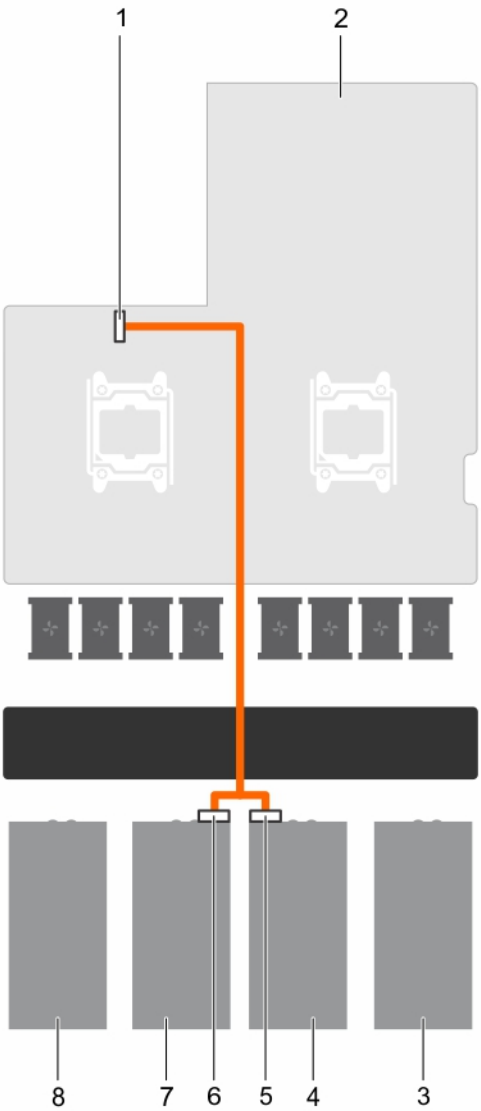

Figure 105. Power cabling for a dual processor system with two GPUs (Configuration D)

1. GPU 1/2 power connector on the system board
2. system board
3. GPU 1 blank
4. GPU 2
5. power connector on GPU 2
6. power connector on GPU 3
7. GPU 3
8. GPU 4 blank

Cabling configuration E systems

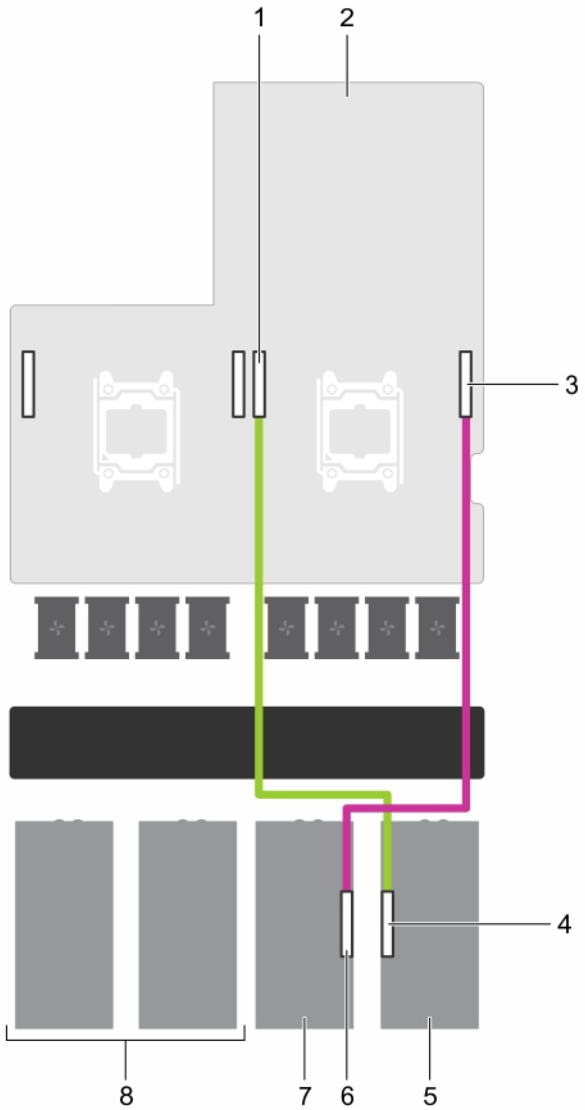

Figure 106. Cabling a single processor system with two GPUs (Configuration E)

1. GPU 1 connector on the system board
2. system board
3. GPU 2 connector on the system board
4. GPU 1 connector on the GPU
5. GPU 1
6. GPU 2 connector on the GPU
7. GPU 2
8. GPU 3 and GPU 4 blank

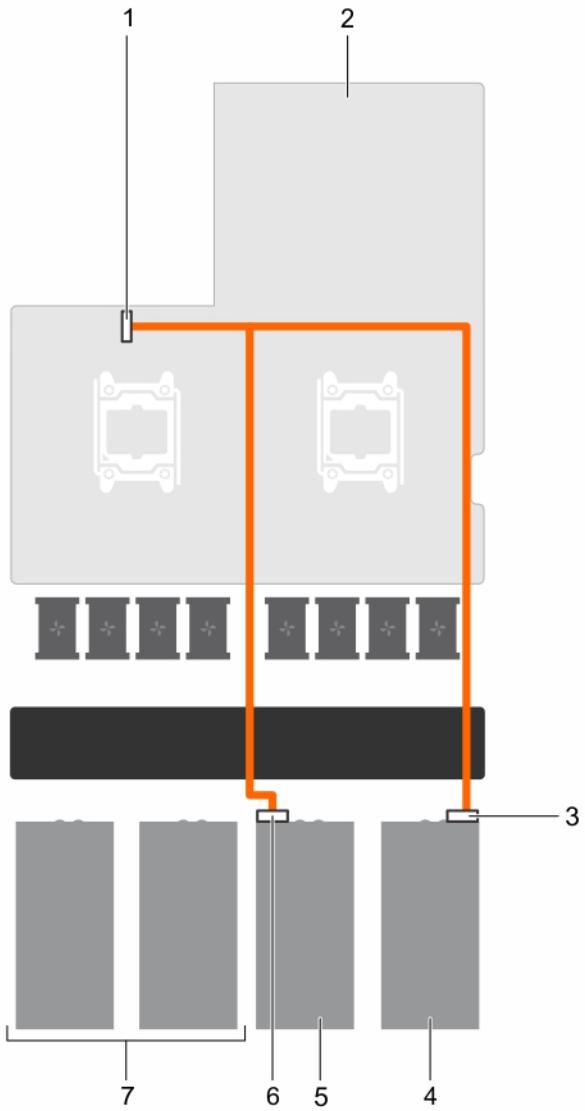

Figure 107. Power cabling for a single processor system with two GPUs (Configuration E)

1. GPU 1/2 power connector on the system board
2. system board
3. power connector on GPU 1
4. GPU 1
5. GPU 2
6. power connector on GPU 2
7. GPU 3 and GPU 4 blank

Cabling Configuration F systems

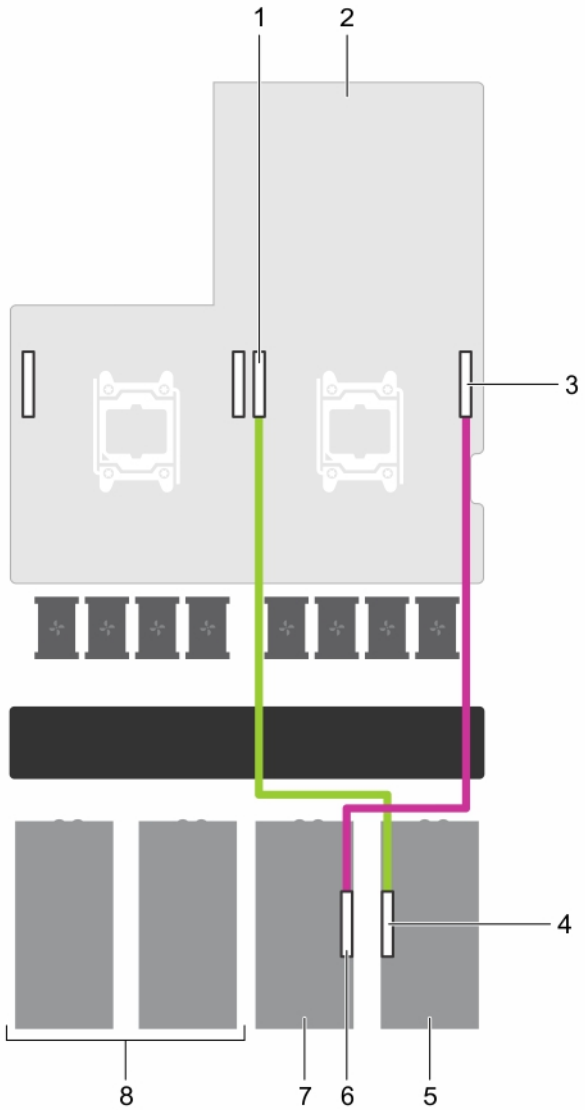

Figure 108. Cabling a dual processor system with two GPUs (Configuration F)

1. GPU 1 connector on the system board
2. system board
3. GPU 2 connector on the system board
4. GPU 1 connector on the GPU
5. GPU 1
6. GPU 2 connector on the GPU
7. GPU 2
8. GPU 3 and GPU 4 blank

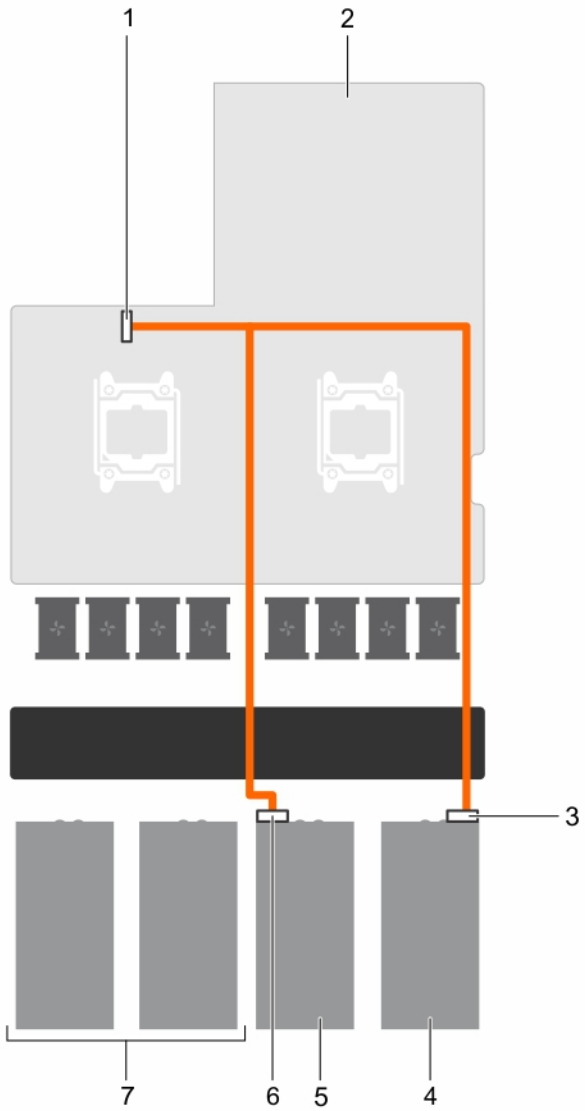

Figure 109. Power cabling for a dual processor system with two GPUs (Configuration F)

1. GPU 1/2 power connector on the system board
2. system board
3. power connector on GPU 1
4. GPU 1
5. GPU 2
6. power connector on GPU 2
7. GPU 3 and GPU 4 blank

Cabling configuration G systems

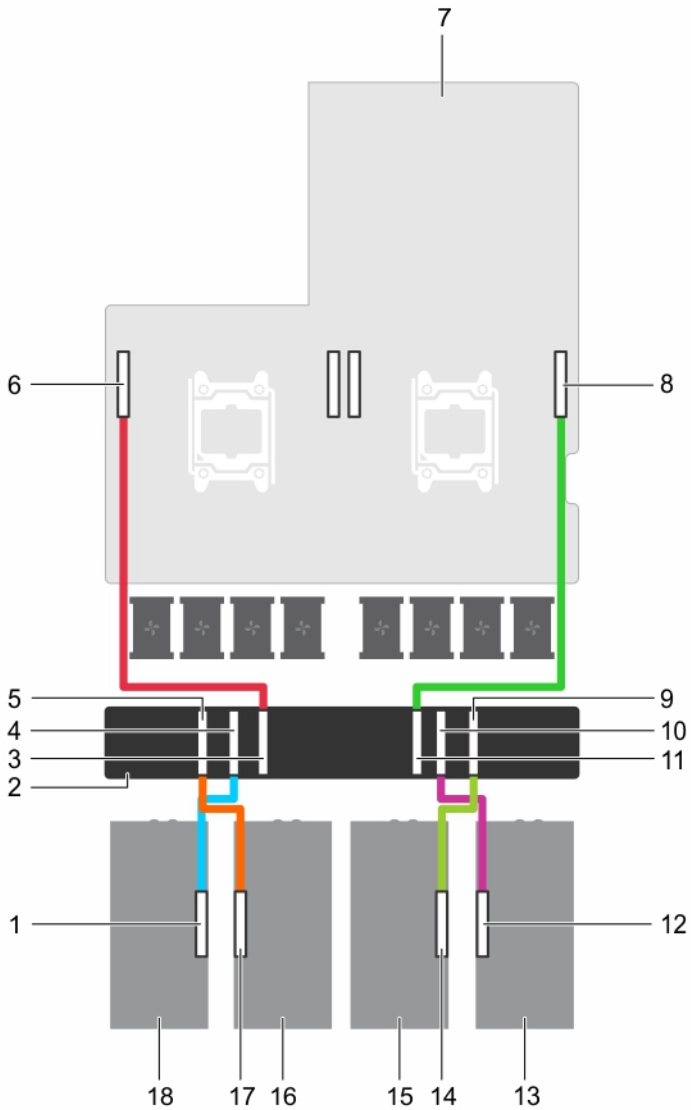

Figure 110. Cabling a dual processor system with four GPUs and a GPU switch board with dual GPU virtual mode (Configuration G)

1. GPU 4 riser cable connector on the GPU
2. GPU switch board
3. CPU 2 connector on the GPU switch board
4. GPU 4 connector on the GPU switch board
5. GPU 3 connector on the GPU switch board
6. GPU switch board connection to CPU 2 on the system board
7. system board
8. GPU switch board connection to CPU 1 on the system board
9. GPU 2 connector on the GPU switch board
10. GPU 1 connector on the GPU switch board
11. CPU 1 connector on the GPU switch board
12. GPU 1 riser cable connector on the GPU
13. GPU 1
14. GPU 2 riser cable connector on the GPU
15. GPU 2
16. GPU 3
17. GPU 3 riser cable connector on the GPU
18. GPU 4

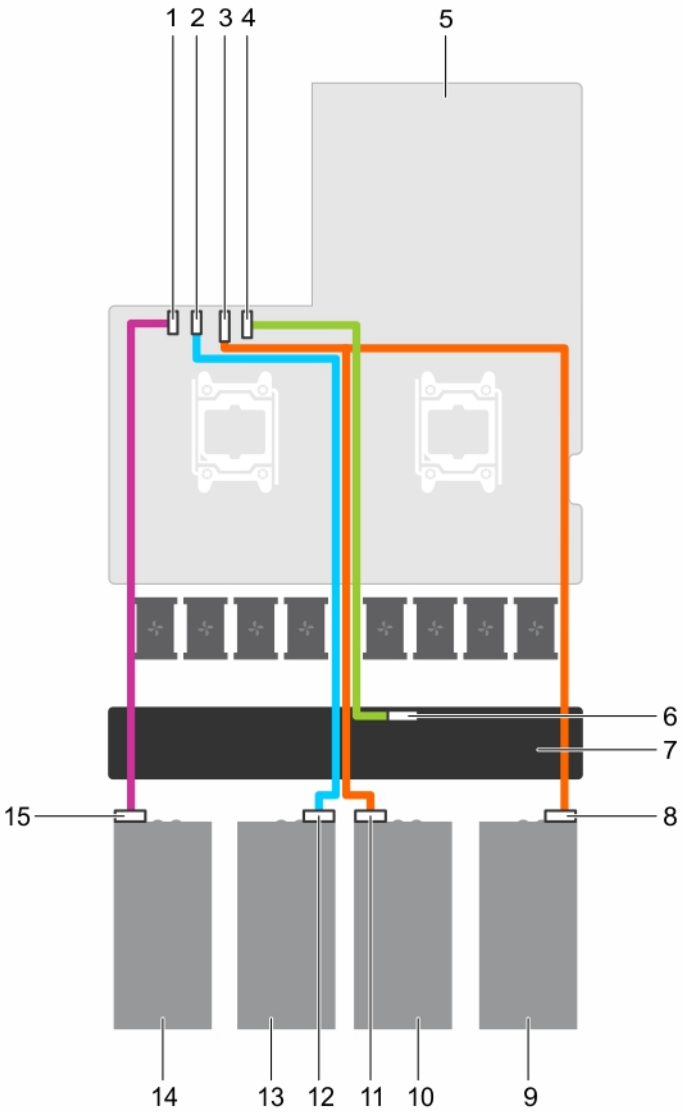

Figure 111. Power cabling for a dual processor system with four GPUs and a GPU switch board with dual GPU virtual mode (Configuration G)

1. GPU 4 power connector on the system board
2. GPU 3 power connector on the system board
3. GPU 1/2 power connector on the system board
4. GPU switch board power connector on the system board
5. system board
6. GPU switch board power connector on the GPU switch board
7. GPU switch board
8. power connector on GPU 1
9. GPU 1
10. GPU 2
11. power connector on GPU 2
12. power connector on GPU 3
13. GPU 3
14. GPU 4
15. power connector on GPU 4

Cabling configurations H and I

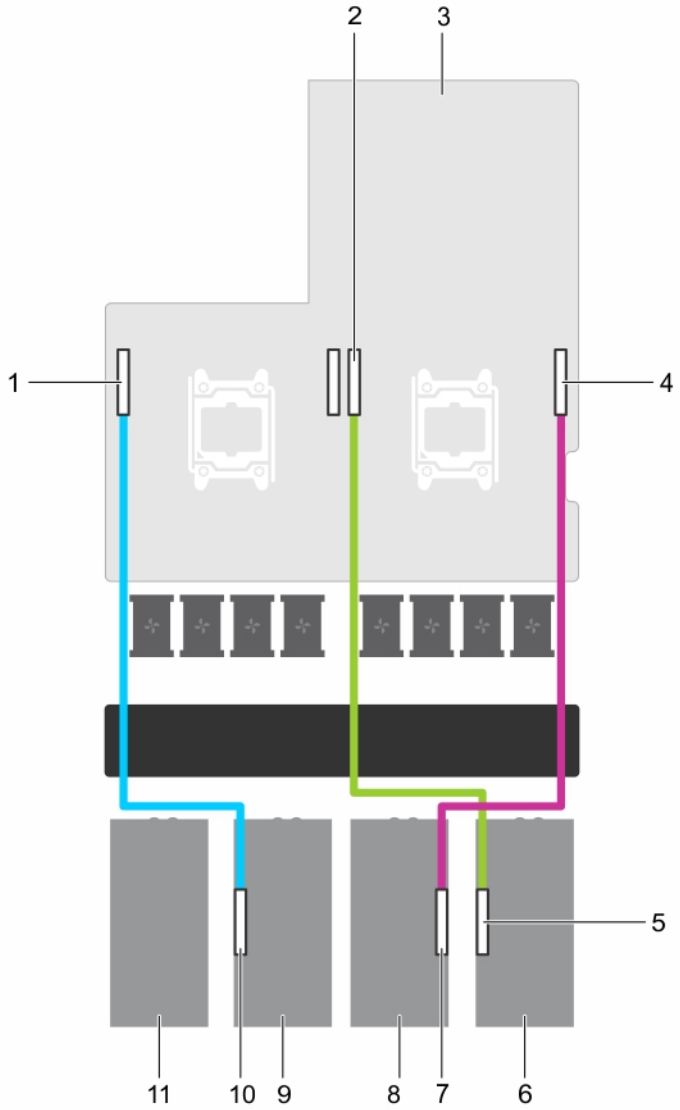

Figure 112. Cabling a dual processor system with three GPUs (Configurations H and I)

1. GPU 3 connector on the system board
2. GPU 1 connector on the system board
3. system board
4. GPU 2 connector on the system board
5. GPU 1 riser cable connector on GPU 1
6. GPU 1
7. GPU 2 riser cable connector on GPU 2
8. GPU 2
9. GPU 3
10. GPU 3 riser cable connector on GPU 3
11. GPU 4 blank

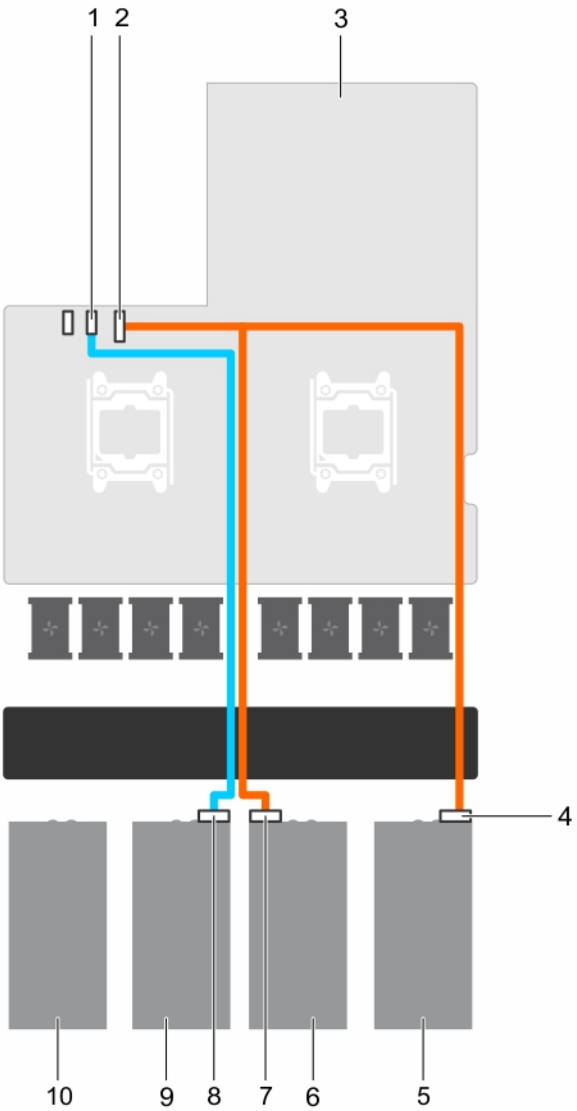

Figure 113. Power cabling for a dual processor system with three GPUs (Configurations H and I)

1. GPU 3 power connector on the system board
2. GPU 1/2 power connector on the system board
3. system board
4. power connector on GPU 1
5. GPU 1
6. GPU 2
7. power connector on GPU 2
8. power connector on GPU 3
9. GPU 3
10. GPU 4 blank

GUID-DE72B568-55B7-4687-9487-D904ED890F9F

SXM2 Graphics processing unit

NOTE: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

The following are the high-level steps that you must perform to replace the SXM2 GPUs:

1. Remove the NVLink air shroud.

2. Remove the SXM2 heat sink.
3. Remove the SXM2 GPU.
4. Remove the NVLink Board.
5. Install the NVLink Board.
6. Install the SXM2 GPU.
7. Install the SXM2 heat sink.
8. Install the NVLink air shroud.

GUID-13969953-F55D-487D-9DCF-77D725550978

Removing the NVLink Air 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.

NOTE: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

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

Steps

Lift and remove the NVLink air shroud from the NVLink board.

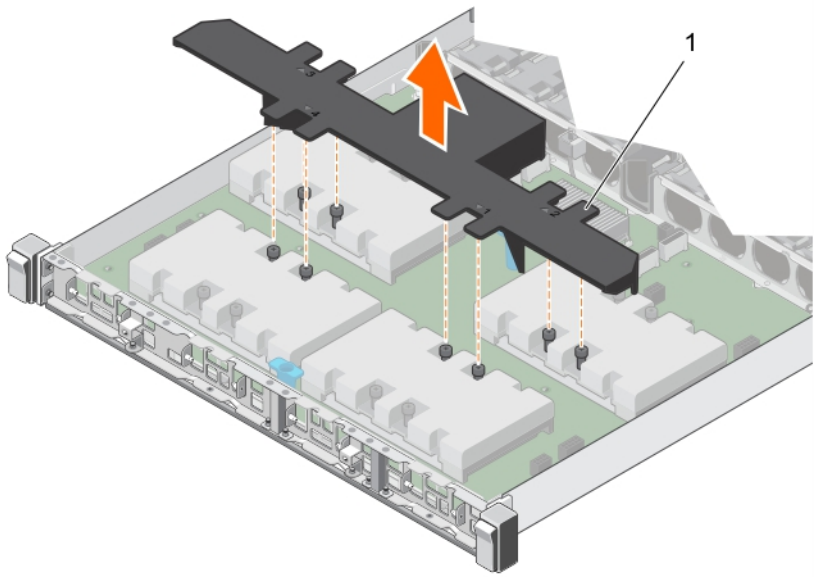

Figure 114. Removing NVLink air shroud

1. NVLink air shroud

Next steps

1. Remove a SXM2-GPU heat sink.
2. Remove a SXM2 GPU.

Related links

Safety instructions
Before working inside your system
Installing the NVLink Air Shroud
Removing an SXM2-GPU Heat Sink
Removing an SXM2 GPU
Removing the NVLink Board

GUID-58454251-1D95-473D-BD6C-AA25C25C17D3

Removing an SXM2-GPU Heat Sink

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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

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

Steps

1. Loosen one of the screws that secure the SXM2-GPU heat sink to the SXM2 GPU.
2. Loosen the screw diagonally opposite the screw you first removed and repeat the procedure for the remaining two screws.
3. Lift and remove the heat sink from the NVLink board.

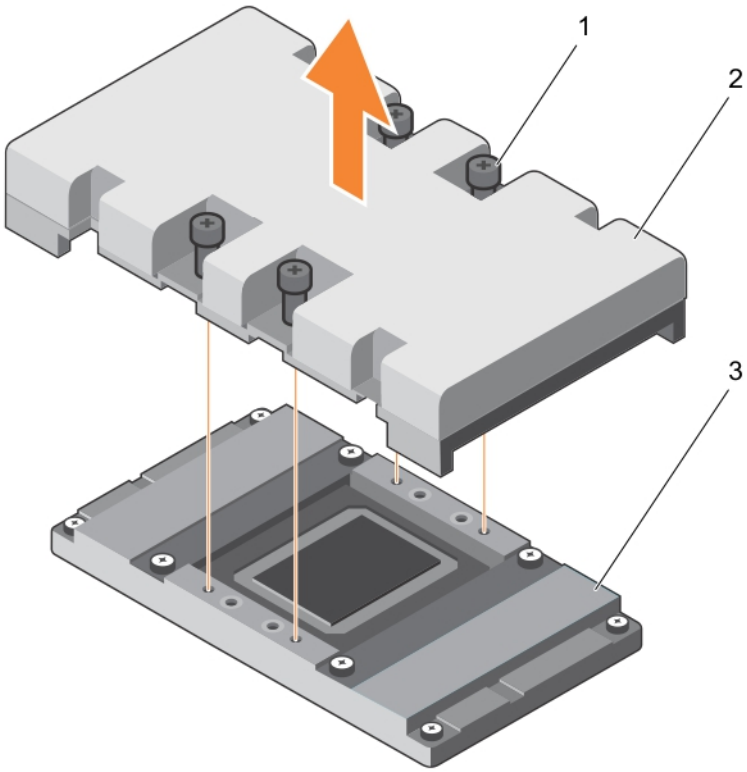

Figure 115. Removing SXM2-GPU heat sink

1. retention screws
2. SXM2-GPU heat sink
3. SXM2 GPU

Next steps

1. Remove a SXM2 GPU.

Related links

Safety instructions
Before working inside your system
Installing an SXM2-GPU Heat Sink
Removing an SXM2 GPU
Removing the NVLink Board

GUID-73FC55E4-4C61-4765-9820-62E234D6C509

Removing an SXM2 GPU

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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

CAUTION: To avoid any damage to the SXM2 GPU, ensure that you loosen the screws in a descending order starting from the screw numbered 8, on the NVLink board.

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

2. Follow the procedure listed in the Before working inside your system section.
3. Remove the NVLink air shroud.
4. Remove the SXM2-GPU heat sink.

Steps

1. Loosen the captive screws that secure the SXM2 GPU to the NVLink board in a descending order, as labeled on the NVLink board.
2. Lift and remove the SXM2 GPU out of its socket on the NVLink board.

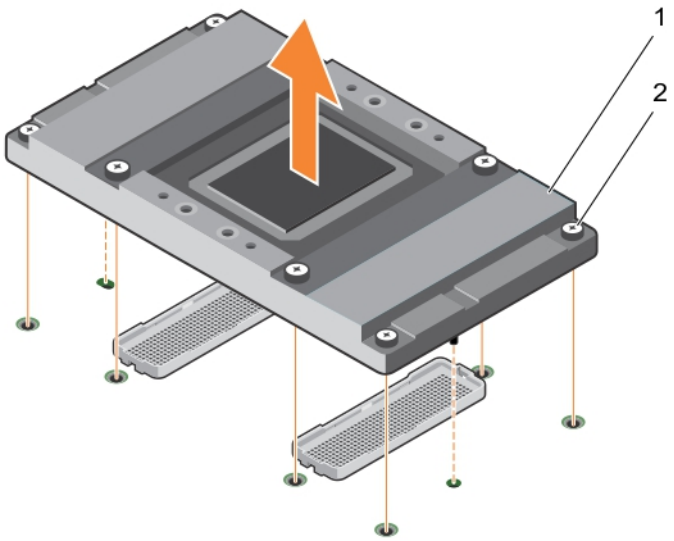

Figure 116. Removing SXM2 GPU

1. SXM2 GPU
2. captive screws (8)

Next steps

1. Remove the NVLink board.
2. Install a SXM2 GPU.

Related links

Safety instructions
Before working inside your system
Installing an SXM2 GPU
Removing the NVLink Board

GUID-DE13BDC9-7F7A-4DF2-A78F-16C779D129C1

Removing the NVLink 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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

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

3. Remove the following components:
    a. NVLink air shroud
    b. SXM2-GPU Heat Sink
    c. SXM2 GPU(s)

CAUTION: Disconnect the data cable from the system board and then the NVLink board to prevent pin damage in the PCIe connectors.

4. Disconnect and remove the data and power cables from the NVLink board and the system board.

CAUTION: The expansion card riser cables must be disconnected from the NVLink board before removing the NVLink board, to prevent pin damage in the PCIe connectors.

5. Disconnect the expansion card riser cable from the NVLink board.

Steps

1. Loosen the thumbscrews that secure the NVLink board to the chassis.
2. Hold the NVLink board by the board holder, and slide the NVLink board towards the system fan to release it from the chassis.
3. Lift and remove the NVLink board out of the chassis.

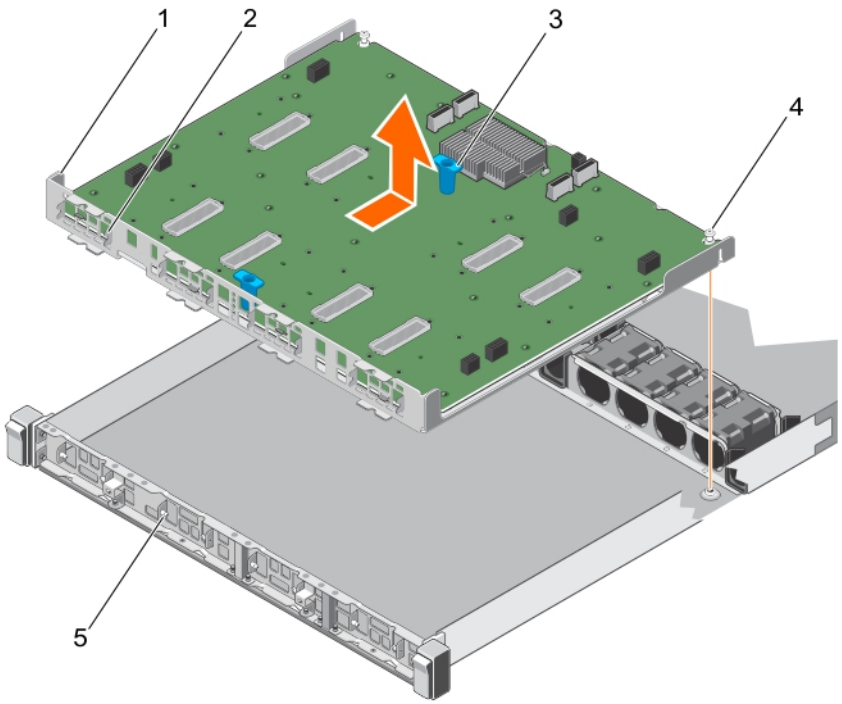

Figure 117. Removing the NVLink board

1. NVLink board tray
2. slot on the NVLink board tray (2)
3. board holder (2)
4. thumbscrew (2)
5. guide pin on the front inner wall of the chassis (8)

Next steps

1. Install the NVLink board.

Related links

Safety instructions
Before working inside your system
Installing the NVLink Board
Installing an SXM2 GPU
Installing an SXM2-GPU Heat Sink
Installing the NVLink Air Shroud

GUID-39392189-685E-4D72-8D2F-5EE3A16AD217

Installing the NVLink 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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

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

Steps

1. Hold the board holders and lower the NVLink board into the chassis at an angle. Slide it to engage the slots on the NVLink board tray with the guide pins on the front inner wall of the chassis.
2. Tighten the thumbscrews to secure the NVLink board to the chassis.

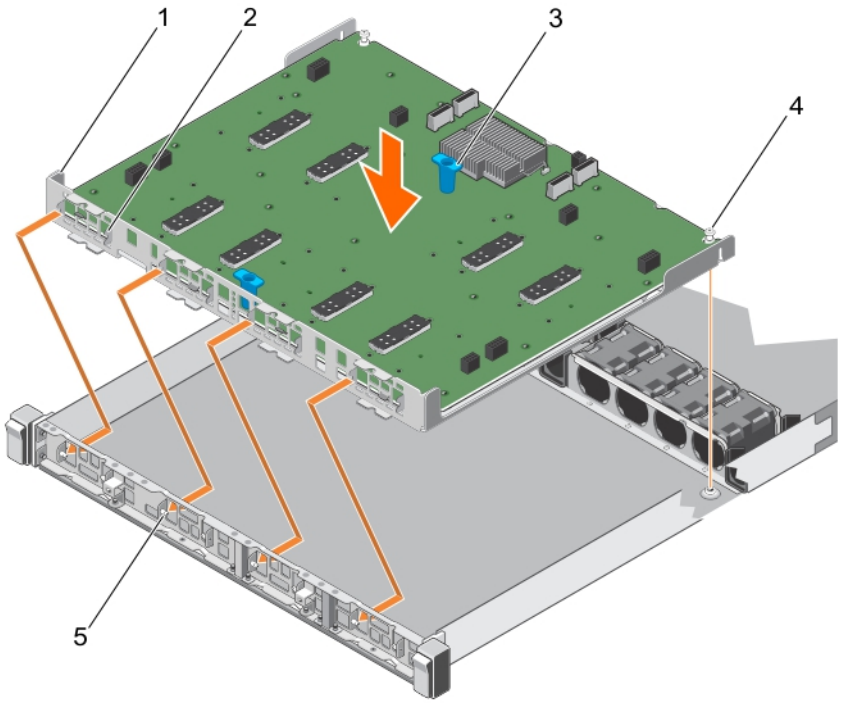

Figure 118. Installing the NVLink board

1. NVLink board tray
2. slot on the NVLink board tray (8)
3. board holder (2)
4. thumbscrew (2)
5. guide pin on the front inner wall of the chassis (8)

CAUTION: Connect the data cable to the NVLink board and then to the system board to prevent pin damage in the PCIe connectors.

3. Connect the data and power cables to the NVLink board and then to the system board.
4. Connect the expansion card riser cable to the NVLink board.

Next steps

1. Install the SXM2 GPUs.

Related links

Safety instructions
Before working inside your system
After working inside your system
Removing the NVLink Board
Installing an SXM2 GPU
Removing an SXM2-GPU Heat Sink
Installing the NVLink Air Shroud

GUID-7C75281C-95EC-4633-844E-D61ED0FAD046

Installing an SXM2 GPU

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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

CAUTION: To avoid any damage to the SXM2 GPU, ensure that you tighten the screws in ascending order starting from the screw numbered 1, on the NVLink board.

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

Steps

1. Unpack the new SXM2 GPU.
2. Locate the processor socket on the NVLink board.
3. If installed, remove the socket protective caps from the SXM2 GPU sockets on the NVLink board.

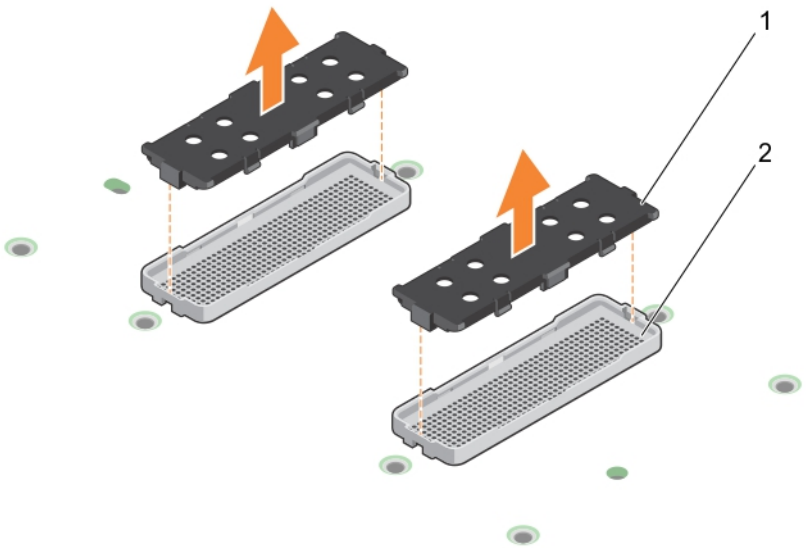

Figure 119. Removing the socket protective caps

1. socket protective cap (2)
2. SXM2 GPU socket (2).

4. If installed, remove the socket protective caps from the SXM2 GPU.
5. Align the guide pins with their slots on the NVLink board and gently lower SXM2 GPU on to the SXM2GPU sockets.
6. Tighten the captive screws in ascending order as labeled on the NVlink board.

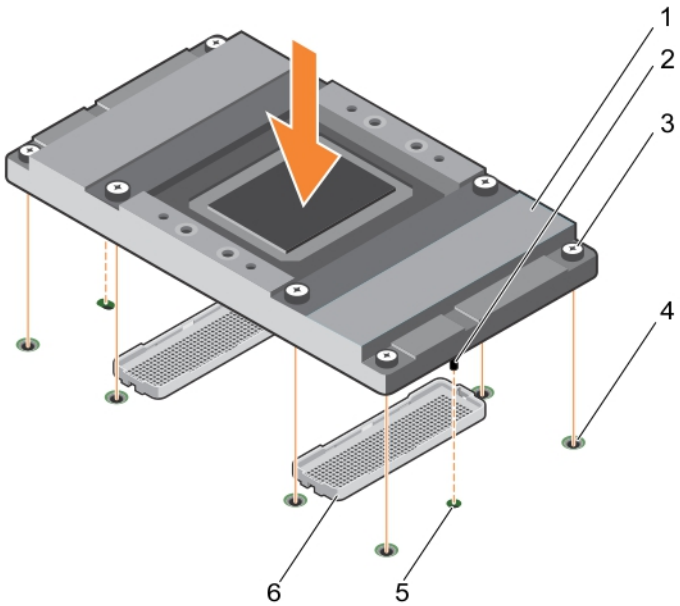

Figure 120. Installing SXM2 GPU

1. SXM2 GPU
2. SXM2 GPU guide pin (2)
3. captive screw (8)
4. screw hole (8)
5. guide-pin slot (2)
6. SXM2 GPU socket (2)

Next steps

1. Install the SXM2-GPU heat sink.
2. Install the NVLink air shroud.

Related links

Safety instructions
Before working inside your system
After working inside your system
Removing an SXM2 GPU
Installing an SXM2-GPU Heat Sink
Installing the NVLink Air Shroud

GUID-50A467AC-8AC7-4BF6-B5EA-125BDC6126B6

Installing an SXM2-GPU Heat Sink

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: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

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

Steps

1. If you are using an existing SXM2-GPU heat sink, remove the thermal grease from the heat sink by using a clean lint-free cloth.
2. Apply the thermal grease on the top of the SXM2 GPU.

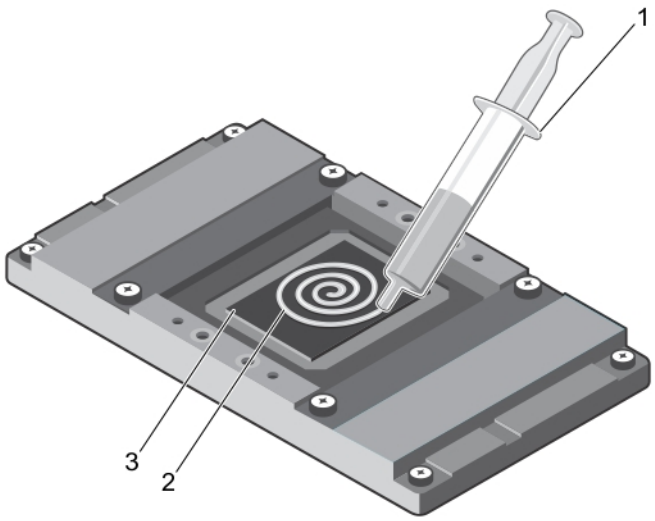

Figure 121. Applying thermal grease on the top of the SXM2 GPU

1. thermal grease syringe
2. thermal grease
3. SXM2 GPU

3. Align the heat sink with the outline on the NVLink board around the SXM2 GPU and lower it on top of the SXM2 GPU.
4. Tighten one of the four screws to secure the heat sink to the NVLink board, then tighten the screw diagonally opposite to the first screw and repeat the procedure for the remaining two screws.

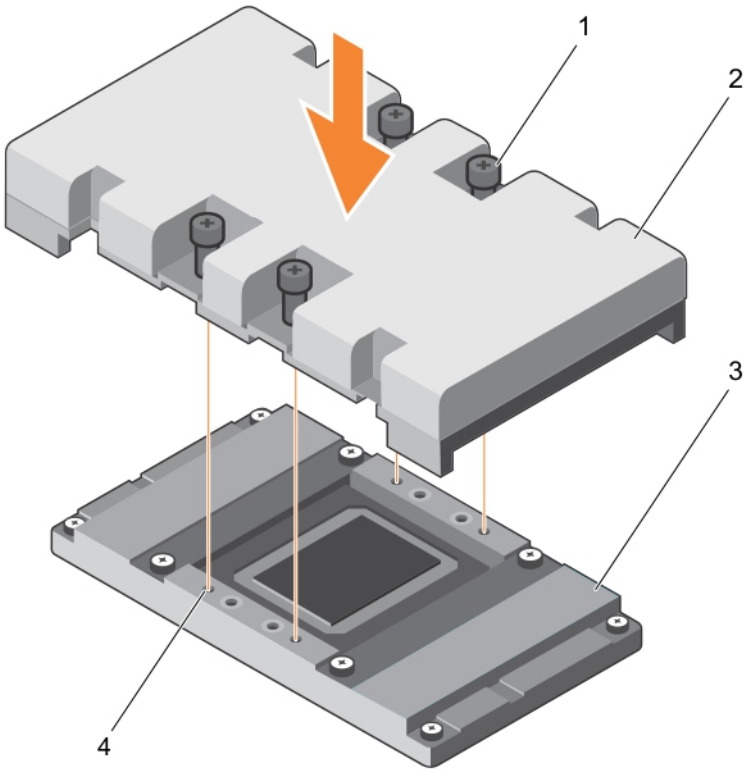

Figure 122. Installing a SXM2-GPU heat sink

1. retention screw (4)
2. SXM2-GPU heat sink
3. SXM2 GPU
4. retention screw hole (4)

Next steps

1. Install the NVLink air shroud.

Related links

Safety instructions
Before working inside your system
After working inside your system
Removing an SXM2-GPU Heat Sink
Installing the NVLink Air Shroud

GUID-0CEABD24-A338-4DA8-86DE-B53369183812

Installing the NVLink Air 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.

NOTE: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

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

Steps

1. Align the guide slots on the NVLink air shroud with the screws on the graphics heat sink.
2. Lower the NVLink air shroud into the NVLink board until it is firmly seated.

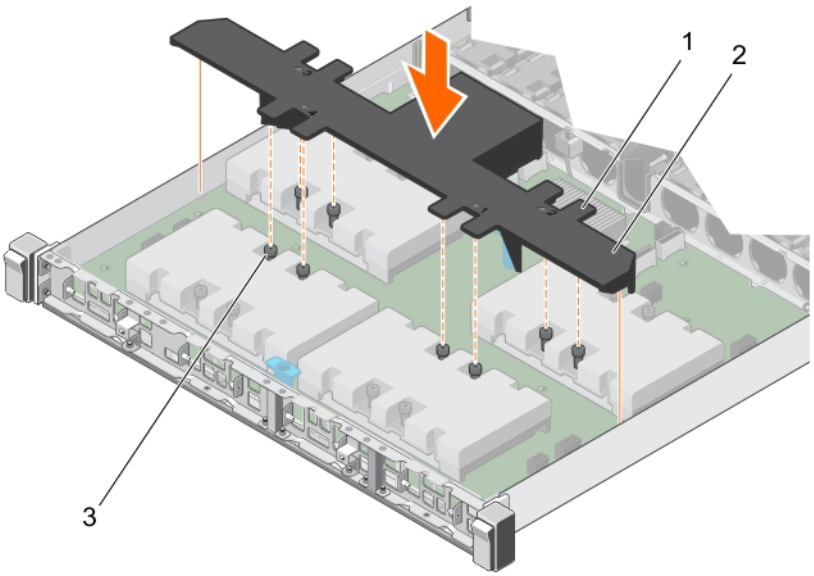

Figure 123. Installing a NVLink air shroud

1. guide slots on the NVLink air shroud
2. NVLink air shroud
3. retention screw (8)

GUID-0A03E349-9D5C-4D12-85B6-62AB30BF51D8

SXM2 GPU cabling diagrams

Cabling configuration K systems

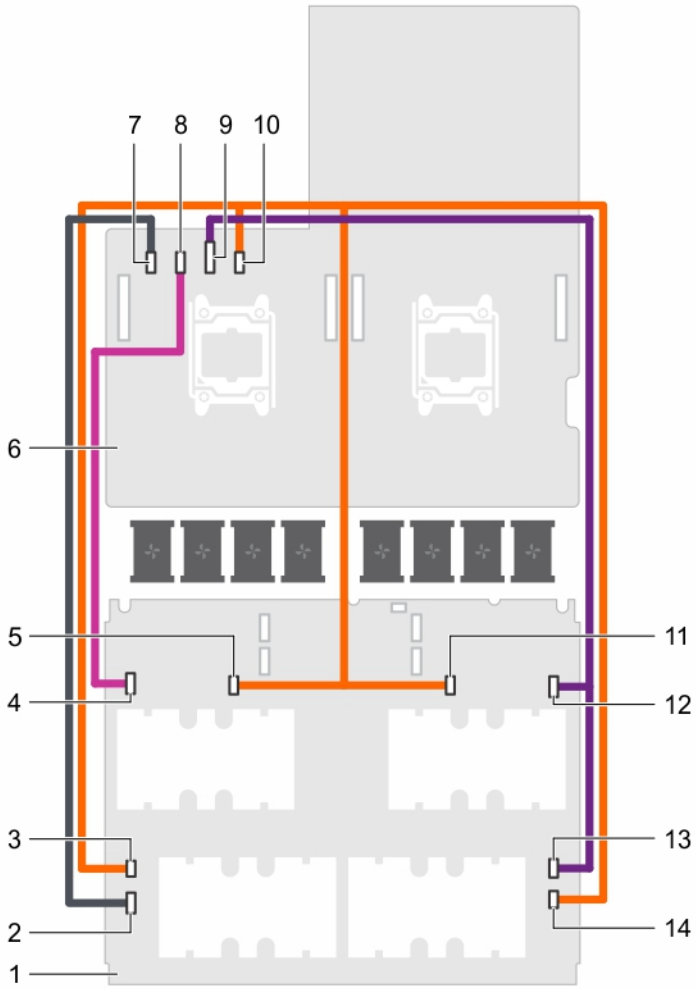

Figure 124. Power cabling for a dual processor system with four SXM2 GPUs (Configurations K)

1. NVLink board
2. SXM2 GPU4 power(4A) connector on the NVLink board
3. SXM2 GPU4 power(4B) connector on the NVLink board
4. SXM2 GPU3 power(3A) connector on the NVLink board
5. SXM2 GPU3 power(3B) connector on the NVLink board
6. system board
7. SXM2 GPU4 power connector on the system board
8. SXM2 GPU3 power connector on the system board
9. SXM2 GPU1/2 power connector on the system board
10. SXM2 GPU1/2/3/4 power connector on the system board
11. SXM2 GPU2 power(2B) connector on the NVLink board
12. SXM2 GPU2 power(2A) connector on the NVLink board
13. SXM2 GPU1 power(1A) connector on the NVLink board
14. SXM2 GPU1 power(1B) connector on the NVLink board

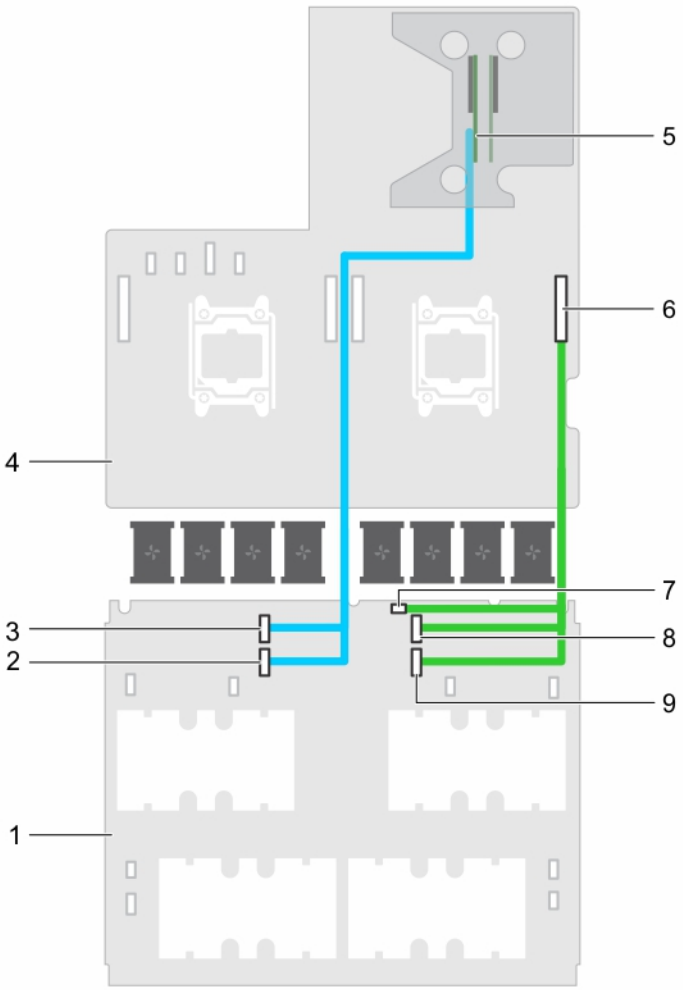

Figure 125. Data cabling a dual processor system with four SXM2 GPUs (Configurations K)

1. NVLink Board
2. PCIe DN2 cable connector on the NVLink board
3. PCIe DN1 cable connector on the NVLink board
4. system board
5. slot 2 riser card
6. NVLink data cable connector on the system board
7. NVLink board power connector
8. PCIe UP1 cable connector on the NVLink board
9. PCIe UP2 cable connector on the NVLink board

GUID-B1263DD2-0980-4715-AD9E-087548D7069F

Control panel module

GUID-1321A9DD-59EB-4316-86BB-4E54E297DDCD

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 are shipped with your product.

NOTE: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Keep the Phillips #1 screwdriver ready.
4. Remove the system top cover (front).

Steps

1. Hold and pull the plastic pull tab to disconnect the control panel cable from the control panel module.
2. Remove the screws securing the control panel module to the chassis.
3. Lift the control panel module away from the chassis.

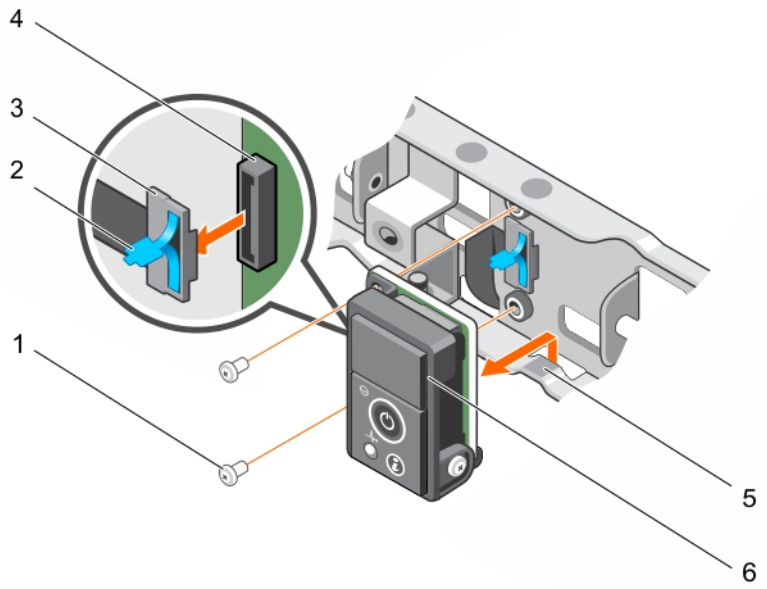

Figure 126. Removing the control panel module

1. screw (2)
2. plastic pull tab
3. control panel cable
4. control panel connector
5. notch
6. control panel module

Next steps

1. Install the control panel module.
2. Follow the procedure listed in the After working inside your system section.

Related links

Safety instructions
Before working inside your system
After working inside your system
Removing the system top cover (front)
Installing the control panel module

GUID-1F1559F2-5978-4FBD-A26F-67E7962B9AC5

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 are shipped with your product.

NOTE: This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

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

Steps

1. Insert the control panel module behind the notch on the chassis.
2. Align the screw holes on the control panel module with the screw holes on the chassis.
3. Secure the control panel module to the chassis by using the screws.
4. Connect the control panel cable to the control panel connector.

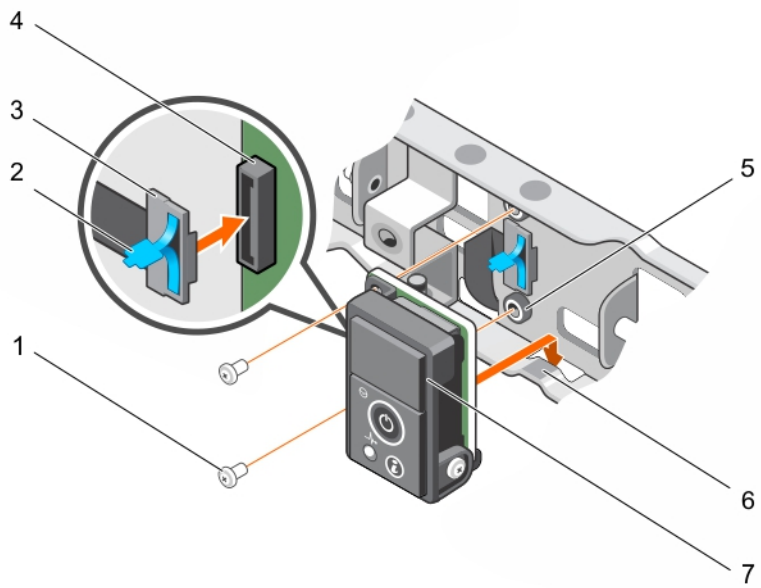

Figure 127. Installing the control panel module

1. screw (2)
2. plastic pull tab
3. control panel cable
4. control panel connector
5. screw hole on chassis (2)
6. notch
7. control panel module

Next steps

1. Install the system top cover (front).
2. Follow the procedure listed in the After working inside your system section.

Related links

Safety instructions
Before working inside your system
After working inside your system
Installing the system top cover (front)
Removing the control panel module

GUID-382400E8-7573-4F2E-B37B-D94B4ADFF723

7

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.

GUID-4E39AEC2-D683-4E67-9537-06EFB6DDA764

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

GUID-5101AF8E-D6E1-481A-8B40-4EE392FF2573

When to use the Embedded System Diagnostics

Run the Embedded System Diagnostics (ePSA) if your system does not boot.

GUID-7974519C-CC64-43B3-842D-24658948DEED

Running the Embedded System Diagnostics from Boot Manager

Prerequisites

Run the Embedded System Diagnostics (ePSA) if your system does not boot.

Steps

1. When the system is booting, press F10.
2. Use the up arrow 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 executing the tests on all the detected devices.

GUID-0A3EEBD3-A15A-4F44-BA52-166762DACD9C

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 executing the tests on all the detected devices.

GUID-F3B6DEB8-E427-42C3-9290-73C6716DF21B

System diagnostic controls

Menu	Description
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**.

GUID-4DD3160B-A6B1-49E6-8746-61291A7BA385

8

Jumpers and connectors

This topic provides specific information about the system jumpers. It also provides some basic information about jumpers and switches and describes the connectors on the various boards in the system. Jumpers on the system board help to disable system and setup passwords. You must know the connectors on the system board to install components and cables correctly.

GUID-89C370DD-0527-4375-806F-BA3E5AB0B7E3

System board jumper settings

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

Table 33. 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).

Related links

- Disabling a forgotten password
- Removing the system top cover (front)
- Installing the system top cover (front)
- Removing the system top cover (back)
- Installing the system top cover (back)

GUID-ACB6F1FF-8E38-420D-B8C5-79B856D5174E

Disabling a forgotten password

The software security features of the system 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

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, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover.
3. Move the jumper on the system board jumper from pins 4 and 6 to pins 2 and 4.
4. Install the system cover.

   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. Remove the system cover.
8. Move the jumper on the system board jumper from pins 2 and 4 to pins 4 and 6.
9. Install the system cover.
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.

Related links

Safety instructions
System board jumper settings
Removing the system top cover (front)
Installing the system top cover (front)
Removing the system top cover (back)
Installing the system top cover (back)

GUID-2547BD5B-20F5-42AA-A10E-183D8AFC78C7

System board connectors

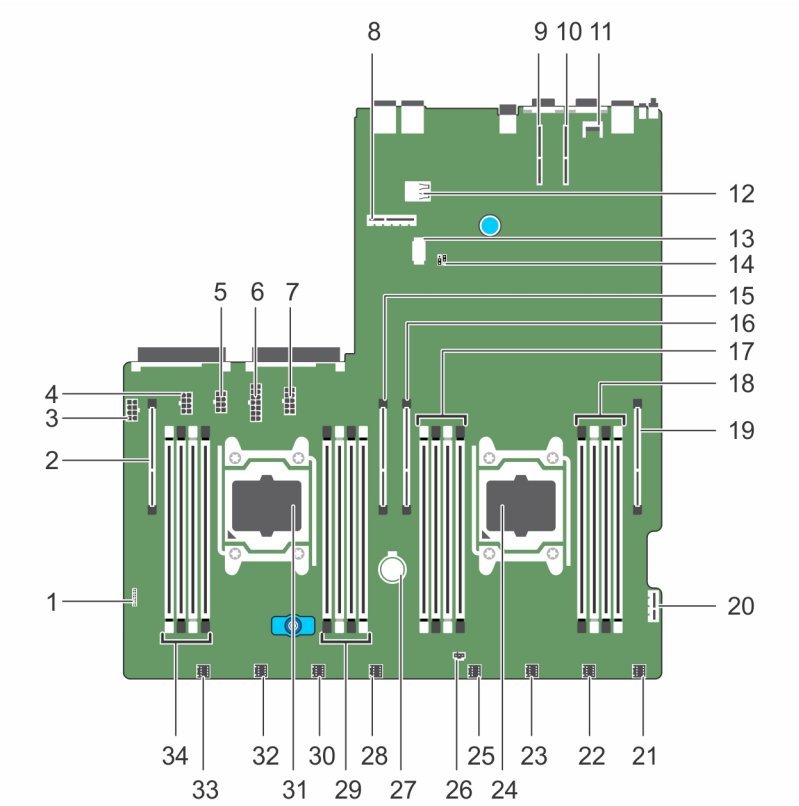

Figure 128. System board jumpers and connectors

Table 34. System board connectors

Item	Connector	Description
1	CTRL_PNL	Front panel connector
2	GPU3 (CPU2_PE3_ABCD)	GPU 3 PCIe Connector
3	4HDD_PWR	2.5 inch hard drive cage power connector
4	GPU_4_PWR	GPU 4 power connector
5	GPU_3_PWR	GPU 3 power connector
6	GPU_1/2_PWR	GPU 1/2 power connector
7	PLX_PWR (PCIe_Switch_board)	Switch board power connector
8	2SSD_BP	1.8 inch SSD backplane connector
9	RISER_SLOT2 (CPU2_PE1_AB)	Expansion slot 2 x8 connector
10	RISER_SLOT0 (CPU1_PE1_AB)	Expansion slot 1 x8 connector
11	TPM_MODULE	Trusted Platform Module connector
12	USB_INT	Internal USB connector
13	4HHD_SIG	SATA x4 signal connector

Item	Connector	Description
14	PSWD & PSWD_NVRAM	Password jumpers
15	GPU4 (CPU2_PE2_ABCD)	GPU 4 PCIe connector
16	GPU1 (CPU1_PE3_ABCD)	GPU 1 PCIe connector
17	A3, A7, A4, A8	Memory module sockets for processor 1
18	A1, A5, A2, A6	Memory module sockets for processor 1
19	GPU2 (CPU1_PE2_ABCD)	GPU 2 PCIe connector
20	IDSDM	Internal dual SD module connector
21	FAN-1	Fan 1 connector
22	FAN-2	Fan 2 connector
23	FAN-3	Fan 3 connector
24	CPU1	Processor 1
25	FAN-4	Fan 4 connector
26	INTRUSION_CABLE	Intrusion cable connector
27	BATTERY	System battery
28	FAN-5	Fan 5 connector
29	B1, B5, B2, B6	Memory module sockets for processor 2
30	FAN-6	Fan 6 connector
31	CPU2	Processor 2
32	FAN-7	Fan 7 connector
33	FAN-8	Fan 8 connector
34	B3, B7, B4, B8	Memory module sockets for processor 2

Related links

Installing the system board

GUID-F0F202CF-EE07-4E1D-A75D-DA8F9A7D0E16

9

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.

NOTE: Solution validation was performed by using the factory shipped hardware configuration.

GUID-AA40BE72-4211-418B-B3D6-227C121CE237

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. To avoid this issue, 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.

GUID-69388A15-9003-4F17-8D27-4AA6073BEDF2

Troubleshooting external connections

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

GUID-DABCADE7-4D29-437D-B303-0CA36941F512

Troubleshooting the video subsystem

Prerequisites

NOTE: Ensure the Local Server Video Enabled option is selected in the iDRAC Graphical User Interface (GUI), under Virtual Console. If this option is not selected, local video is disabled.

Steps

1. Check the cable connections (power and display) 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.

Next steps

If the tests fail, see the Getting help section.

Related links

Getting help

GUID-8798D73D-0E8B-4B34-8197-7093B6BCC140

Troubleshooting a USB device

Prerequisites

NOTE: Follow steps 1 to 6 to troubleshoot a USB keyboard or mouse. For other USB devices, go to step 7.

Steps

1. Disconnect the keyboard and/or mouse cables from the system and reconnect them.
2. If the problem persists, connect the keyboard and/or mouse to another USB port on the system.
3. If the problem is resolved, restart the system, enter System Setup, and check if the non-functioning USB ports are enabled.

   NOTE: Older operating systems may not support USB 3.0.
4. Check if USB 3.0 is enabled in System Setup. If enabled, disable it and see if the issue is resolved.
5. In **iDRAC Settings Utility**, ensure that **USB Management Port Mode** is configured as **Automatic** or **Standard OS Use**.
6. If the problem is not resolved, replace the keyboard and/or mouse with a known working keyboard or mouse.

   If the problem is not resolved, proceed to step 7 to troubleshoot other USB devices attached to the system.
7. Turn off all attached USB devices, and disconnect them from the system.
8. Restart the system.
9. If your keyboard is functioning, enter System Setup, verify that all USB ports are enabled on the **Integrated Devices** screen. If your keyboard is not functioning, use remote access to enable or disable the USB options.
10. Check if USB 3.0 is enabled in System Setup. If it is enabled, disable it and restart your system.
11. If the system is not accessible, reset the NVRAM_CLR jumper inside your system and restore the BIOS to the default settings. See the System board jumper setting section
12. In the **IDRAC Settings Utility**, ensure that **USB Management Port Mode** is configured as **Automatic** or **Standard OS Use**.
13. Reconnect and turn on each USB device one at a time.
14. If a USB device causes the same problem, turn off the device, replace the USB cable with a known good cable, and turn on the device.

Next steps

If all troubleshooting fails, see the Getting help section.

Related links

System Setup

System board connectors

Getting help

Getting help

GUID-659F00AB-451A-4F65-A1B5-F81CBC725D7F

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 known working cable, and turn on the system and the serial device.

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

Next steps

If the problem persists, see the Getting help section.

Related links

Getting help

GUID-7773C999-4E5B-4E57-AA5F-C61B5E28EE3A

Troubleshooting a NIC

Steps

1. Run the appropriate diagnostic test. For more information, see the Using system diagnostics section for the 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 glow, the cable connected might be disengaged.
   - If the activity indicator does not glow, the network driver files might be damaged or missing.
     Install or replace the drivers as necessary. For more information, see the NIC documentation.
   - If the problem persists, use another connector on the switch or hub.
4. Ensure that the appropriate drivers are installed and the protocols are bound. For more information, see the NIC documentation.
5. Enter System Setup and confirm that the NIC ports are enabled on the **Integrated Devices** screen.
6. Ensure that all the NICs, hubs, and switches on the network are set to the same data transmission speed and duplex. For more information, 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 the problem persists, see the Getting help section.

Related links

Getting help

GUID-E2B764FD-D182-44DF-89D4-323FC133F96F

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 (if installed) from the system:
   - power supply unit(s)
   - optical drive
   - hard drives
   - hard drive backplane
   - USB memory key
   - cooling shroud
   - expansion card risers (if installed)

- expansion cards
- cooling fan assembly (if installed)
- cooling fans
- memory modules
- processor(s) and heat sink(s)
- system board

4. Let the system dry thoroughly for at least 24 hours.
5. Reinstall the components you removed in step 3 except the expansion cards.
6. Install the system cover.
7. Turn on the system and attached peripherals.

   If the problem persists, see the Getting help section.
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 the Using system diagnostics section.

Next steps

If the tests fail, see the Getting help section.

Related links

Hard drives
Replacing the optional internal USB memory key
Removing the cooling shroud
Removing the expansion card riser cage
Removing expansion cards
Removing an AC power supply unit
Removing a cooling fan
Removing a heat sink
Removing a processor
Removing memory modules
Using system diagnostics
Installing the system top cover (front)
Installing the system top cover (back)
Getting help

GUID-B1932160-4818-488E-B9B8-B71C4380C441

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 installed)
   - expansion cards
   - power supply unit(s)

- cooling fan assembly (if installed)
- cooling fans
- processor(s) and heat sink(s)
- memory modules
- hard drive carriers/cage
- 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 the Using system diagnostics section.

Next steps

If the problem persists, see the Getting help section.

Related links

Removing the system top cover (front)
Removing the system top cover (back)
Installing the system top cover (front)
Installing the system top cover (back)
Getting help

GUID-9213BA37-8512-4024-8F90-8CC85EF46558

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 set in System Setup, the problem may be caused by a software, rather than by a defective battery.

Steps

1. Re-enter the time and date in System Setup.
2. Turn off the system, and disconnect it from the electrical outlet for at least an hour.
3. Reconnect the system to the electrical outlet, and turn on the system.
4. Enter System Setup.

   If the date and time displayed in System Setup are not correct, check the System Error Log (SEL) for system battery messages.

Next steps

If the problem persists, see the Getting help section.

Related links

System Setup
Getting help

GUID-C94B06AE-4304-4297-823F-354064FD25EE

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.

GUID-355ABB62-FDF4-44D8-9C8A-39B58111A99F

Troubleshooting power source problems

1. Press the power button to ensure that your system is turned on. If the power indicator does not glow when the power button is pressed, press the power button firmly.
2. Plug in another working power supply unit 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 needed specifications.

GUID-22159E5D-F02E-49B2-B533-35D3B0AB200E

Power supply unit problems

1. Ensure that no loose connections exist.

   For example, loose power cables.
2. Ensure that the AC power source is properly connected to the PSU.

   NOTE: If the 2000 W PSU or 1600 W PSU is installed, ensure that it is connected to a 220 V AC power source.
3. Ensure that the power supply handle or LED indicates that the power supply is working properly.

   For more information about power supply indicators, see the Power indicator codes section.
4. If you have recently upgraded your system, ensure that the power supply unit (PSU) has enough power to support the new system.
5. 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.
6. Ensure that you use only PSUs with the Extended Power Performance (EPP) label on the back.
7. 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 problem persists, see the Getting help section.

Related links

Getting help

GUID-A5B99AB4-4B35-4E27-A852-E5AEA3D3DF5C

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, PCIe shroud, GPU blanks, PSU blank in PSU slot 2 if hard drive cage is not installed, uSATA SSD blanks if uSATA SSDs are not installed, memory module blank, or back-filler bracket is not removed.
- Ambient air temperature is 25°C or less depending on the system configuration.
- 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:

From the iDRAC web GUI:

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

From 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 User's Guide at **Dell.com/idracmanuals**.

Related links

Getting help

GUID-DCBA4221-CCF2-494C-AF44-B1CDCA4F0E9B

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: The fan number is referenced by the systems management software. In the event of a problem with a particular fan, you can easily identify and replace it by noting down the fan numbers on the cooling fan assembly.

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. Remove the system cover (front and back).

   NOTE: Do not operate the system without the system cover. This can result in overheating and cause component damage.

2. Reseat the fan or the fan's power cable.
3. Install the system cover (front and back).
4. Restart the system.

Next steps

If the problem persists, see the Getting help section.

Related links

Removing the system top cover (front)
Removing the system top cover (back)
Getting help

GUID-1DD8CE42-B3BC-40DB-9E9B-E2D6AE94011B

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 system diagnostic test. See the Using system diagnostics section for the available diagnostic tests.

   If the diagnostic tests indicate a fault, follow the corrective actions provided by the diagnostic tests.
2. If the system is not operational, turn off the system and attached peripherals, and unplug the system from the power source. Wait at least for 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. Enter System Setup, and check the system memory setting. Make any changes to the memory settings, if needed.

   If the memory settings match the installed memory but the problem 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 cover.
10. Enter System Setup and check the system memory setting.

    If the problem is not resolved, proceed with step 11.
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 working 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 problem persists, repeat step 12 through step 15 for each memory module installed.

Next steps

If the problem persists, see the Getting help section.

Related links

- Using system diagnostics
- System Setup
- Removing the system top cover (front)
- Removing the system top cover (back)
- Installing the system top cover (front)
- Installing the system top cover (back)
- Removing memory modules
- Getting help

GUID-4A33AA38-CEA4-4BF0-9CA0-7242BB73A6C4

Troubleshooting an internal USB key

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. Enter System Setup and ensure that the **USB key port** is enabled on the **Integrated Devices** screen.
2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
3. Remove the system cover.
4. Locate the USB key and reseat it.
5. Install the system cover.
6. Turn on the system and attached peripherals, and check if the USB key is functioning.
7. If the problem is not resolved, repeat step 2 and step 3.
8. Insert a known working USB key.
9. Install the system cover.

Next steps

If the problem persists, see the Getting help section.

Related links

- Removing the system top cover (front)
- Removing the system top cover (back)
- Installing the system top cover (front)
- Installing the system top cover (back)
- Removing the expansion card riser cage
- Installing the expansion card riser cage
- Removing the PCIe shroud
- Installing the PCIe shroud
- Getting help

GUID-A908B77C-1799-4484-AE42-6ABEE7756377

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 writable.

Steps

1. Enter 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 will be logged and chassis health will degrade.
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 on the system, including any attached peripherals.
7. Enter System Setup, and ensure that the **Internal SD Card Port** and **Internal SD Card Redundancy** modes are set to the needed modes.

   Verify that the 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 sourced from the primary SD card to the secondary SD card.

Related links

System Setup
Removing the system top cover (front)
Installing the system top cover (front)
Removing the system top cover (back)
Installing the system top cover (back)

GUID-F5D03287-62FA-4604-8244-AAEE11F6E703

Troubleshooting a hard drive

Prerequisites

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

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 diagnostic test. See the Using system diagnostics section.

   Depending on the results of the diagnostics test, proceed as needed through the following steps.
2. If your system has a RAID controller and your hard drives are configured in a RAID array, perform the following steps:
   a. Restart the system and press F10 during system startup to run the Dell Lifecycle Controller, and then run the Hardware Configuration wizard to check the RAID configuration.

      See the Dell Lifecycle Controller documentation or online help for information about RAID configuration.
   b. Ensure that the hard drives are configured correctly for the RAID array.
   c. Take the hard drive offline and reseat the drive.
   d. Exit the configuration utility and allow the system to boot to the operating system.
3. Ensure that the needed device drivers for your controller card are installed and are configured correctly. See the operating system documentation for more information.

4. Restart the system and enter the System Setup.
5. Verify that the controller is enabled and the drives are displayed in the System Setup.

Next steps

If the problem persists, see the Getting help section.

Related links

Using system diagnostics
System Setup
Getting help

GUID-5F97782D-691E-43D6-BDCC-23C7E77201C0

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. See the Using system diagnostics section.
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. See the Using system diagnostics section. If the tests fail, see the Getting help section.
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. See the Using system diagnostics section.

If the problem persists, see the Getting help section.

Related links

Using system diagnostics
Removing the system top cover (front)
Removing the system top cover (back)
Installing the system top cover (front)
Installing the system top cover (back)
System Setup
Getting help

GUID-57359D72-3AE7-4F27-8E9D-3D57099DBB22

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, you also have to see the documentation for your operating system and the expansion card.

Steps

1. Run the appropriate diagnostic test. See the Using system diagnostics section.
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. Turn on the system and attached peripherals.
7. If the problem is not resolved, turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
8. Remove the system cover.
9. Remove all expansion cards installed in the system.
10. Install the system cover.
11. Run the appropriate diagnostic test. See the Using system diagnostics section.

    If the tests fail, see the Getting help section.
12. 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. See the Using system diagnostics section.

Next steps

If the problem persists, see the Getting help section.

Related links

Using system diagnostics
Removing the system top cover (front)
Removing the system top cover (back)
Installing the system top cover (front)
Installing the system top cover (back)
System Setup
Getting help

GUID-BFCB0642-E2F1-4DF3-A36A-754CBF7252EE

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 the Using system diagnostics section.
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. See the Using system diagnostics section.
7. If the problem persists, see the Getting help section.

Related links

Using system diagnostics
Removing the system top cover (front)
Removing the system top cover (back)
Installing the system top cover (front)
Installing the system top cover (back)
System Setup
Getting help

GUID-604421D4-0FE7-419B-B3C4-BA6DBAA89190

Troubleshooting a GPU

NOTE: The GPU is a Field Replaceable Unit. Do not to troubleshoot the GPU without the assistance of a Dell certified service technician.

For more information, see the Getting help section.

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.

Related links

Getting help

GUID-A10CF731-933A-46F7-8071-AB809D784D2A

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/openmanagemanuals** > **OpenManage software**.

GUID-0DDED001-0DAF-447B-A3C1-3FD7708DA3A1

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 shipped with the operating system or application.

GUID-F1461F68-F9F6-4D40-BBFD-007E193F4AFE

Diagnostic messages

The system diagnostic utilities may issue messages if you run diagnostic tests on your system. For more information about system diagnostics, see the Using System Diagnostics section.

Related links

Using system diagnostics

GUID-AF5E9BFD-80C5-435B-A5DF-4C45B8A66AEC

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.

GUID-BE16C181-0959-44C3-B434-E44A0A602A4C

10

Getting help

Related links

Contacting Dell
Accessing system information by using QRL
Quick Resource Locator for C4130

GUID-DCA91BD8-DB0D-45D8-BB42-184861B08BA9

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.

GUID-4B759C30-846C-4112-9D10-F2E046D6690A

Documentation feedback

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

GUID-9ACE1BD3-E3FB-4823-A49B-88E2F2787E62

Accessing system information by using QRL

You can use the Quick Resource Locator (QRL) to get immediate access to the information about your system.

Prerequisites

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

The QRL includes the following information about your system:

About this task

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

Steps

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

GUID-731B00C0-4976-439B-83EC-91A6154EC9FA

Quick Resource Locator for C4130

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 PowerEdge system. To try out the QR code, scan the following image.