

Dell EMC PowerEdge Servers

Troubleshooting Guide

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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Introduction

Use this guide to learn how to identify and troubleshoot the Dell PowerEdge server issues.

In particular, this guide:

- Provides troubleshooting procedures for issues related to Server Operating System, Server Hardware, and Server Management Software.
- Provides an overview of diagnostic indicators and describes how to use the indicator codes to facilitate troubleshooting.
- Lists Dell PowerEdge server error messages and their probable causes, and provides the actions recommended to correct them.

NOTE: This guide does not cover every possible issue that might occur on Dell PowerEdge servers, however focuses on issues that are frequently encountered or are frequently asked questions.

Topics:

- [Audience](#)
- [Recommended tools](#)
- [Documentation resources](#)
- [Safety instructions](#)

Audience

The information in this troubleshooting guide is intended primarily for administrators, who are responsible for managing the Dell PowerEdge servers, however might be useful for all users of Dell servers.

Recommended tools

Lists the basic tools and equipment necessary to perform troubleshooting tasks on the Dell PowerEdge servers.

- Key to the bezel lock
The key is needed only if your system includes a bezel.
- Phillips #1 screwdriver
- Phillips #2 screwdriver
- Torx #T30 screwdriver
- 1/4 inch flat head screwdriver
- #4 nut driver
- Plastic scribe
- Wrist grounding strap
- ESD mat

You need the following tools to assemble the cables for a DC power supply unit:

- AMP 90871-1 hand-crimping tool or equivalent
- Tyco Electronics 58433-3 or equivalent
- Wire-stripper pliers to remove insulation from size 10 AWG solid or stranded, insulated copper wire

① | **NOTE:** Use alpha wire part number 3080 or equivalent (65/30 stranding).

Documentation resources








This section describes the troubleshooting documentation related to all components in a PowerEdge system.

Table 1. 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
Installing and servicing your system	For information on installing or removing the components in your system, see the Installation and Service Manual for your system.	Dell.com/poweredgemanuals
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
	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

Task	Document	Location
	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/openmanagemanuals
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

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:** It is recommended that you always use an antistatic mat and antistatic strap while working on components inside the system.
-  **NOTE:** To ensure proper operation and cooling, all bays in the system and system fans must be populated always with a component or with a blank.

Diagnostic indicators






The diagnostic indicators on the system indicates operation and error status.

Status LED indicators

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

- NOTE:** No status LED indicators are illuminated when the system is turned off. To start the system, plug it into a working power source and press the power button.
- NOTE:** Status LED indicators are always off and only turn solid amber if any error occurs.

Table 2. Status LED indicators

Icon	Description	Condition	Corrective action
	Hard drive indicator	The indicator turns solid amber if there is a hard drive error.	Check the System Event Log to determine if the hard drive has an error. Run the appropriate Online Diagnostics test. Restart the system and run embedded diagnostics (ePSA). If the hard drives are configured in a RAID array, restart the system and enter the host adapter configuration utility program.
	Temperature indicator	The indicator turns solid amber if the system experiences a thermal error (for example, the ambient temperature is out of range or fan failure).	<p>Ensure that none of the following conditions exist:</p> <ul style="list-style-type: none"> • A cooling fan has been removed or has failed. • System cover, air shroud, EMI filler panel, memory module blank, or back filler bracket is removed. • Ambient temperature is too high. • External airflow is obstructed. <p>If the problem persists, see the Getting help section.</p>
	Electrical indicator	The indicator turns solid amber if the system experiences an electrical error (for example, voltage out of range, or a failed power supply unit (PSU) or voltage regulator).	Check the System Event Log or system messages for the specific issue. If it is due to a problem with the PSU, check the LED on the PSU. Reseat the PSU. If the problem persists, see the Getting help section.
	Memory indicator	The indicator turns solid amber if a memory error occurs.	Check the System Event Log or system messages for the location of the failed memory. Reseat the memory module. If the problem persists, see the Getting help section.
	PCIe indicator	The indicator turns solid amber if a PCIe card experiences an error.	Restart the system. Update any required drivers for the PCIe card. Reinstall the card. If the problem persists, see the Getting help section.

NOTE: For more information about the supported PCIe cards, see the Expansion card installation guidelines section.

System health and system ID indicator codes



Figure 1. System health and system ID indicators

Table 3. System health and system ID indicator codes

System health and system ID indicator code	Condition
Blue solid	Indicates that the system is turned on, system is healthy and system ID mode is not active. Press the system health and system ID button to switch to system ID mode.
Blinking blue	Indicates that the system ID mode is active. Press the system health and system ID button to switch to system health mode.
Amber solid	Indicates that the system is in fail-safe mode. If the problem persists, see the Getting help section.
Blinking amber	Indicates that the system is experiencing a fault. Check the System Event Log or the LCD panel, if available on the bezel, for specific error message. For more information about error messages, see the <i>Dell Event and Error Messages Reference Guide</i> at Dell.com/openmanagemanuals > OpenManage software .

iDRAC Quick Sync 2 indicator codes

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



Figure 2. iDRAC Quick Sync 2 indicators

Table 4. iDRAC Quick Sync 2 indicators

Wireless indicator code	Condition	Corrective action
Off (default state)	Indicates that the iDRAC Quick Sync 2 feature is turned off. Press the iDRAC Quick Sync 2 button to turn on the iDRAC Quick Sync 2 feature.	If the LED fails to turn on, reseal the left control panel flex cable and check again. If the problem persists, see the Getting help section.
White solid	Indicates that iDRAC Quick Sync 2 is ready to communicate. Press the iDRAC Quick Sync 2 button to turn off.	If the LED fails to turn off, restart the system. If the problem persists, see the Getting help section.
Blinks white rapidly	Indicates data transfer activity.	If the indicator continues to blink indefinitely, see the Getting help section.

Table 6. NIC indicators

Status	Condition
Link and activity indicators are off	The NIC is not connected to the network.
Link indicator is green and activity indicator is blinking green	The NIC is connected to a valid network at its maximum port speed and data is being sent or received.
Link indicator is amber and activity indicator is blinking green	The NIC is connected to a valid network at less than its maximum port speed and data is being sent or received.
Link indicator is green and activity indicator is off	The NIC is connected to a valid network at its maximum port speed and data is not being sent or received.
Link indicator is amber and activity indicator is off	The NIC is connected to a valid network at less than its maximum port speed and data is not being sent or received.
Link indicator is blinking green and activity is off	NIC identify is enabled through the NIC configuration utility.

Power supply unit indicator codes

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

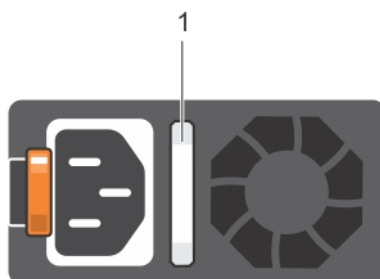


Figure 4. AC PSU status indicator

1 AC PSU status indicator or handle

Table 7. AC PSU status indicator

Power indicator codes	Condition
Green	A valid power source is connected to the PSU and the PSU is operational.
Blinking amber	Indicates a problem with the PSU.
Not illuminated	Power is not connected.
Blinking green	When the firmware of the PSU is being updated, the PSU handle blinks green. CAUTION: Do not disconnect the power cord or unplug the PSU when updating firmware. If firmware update is interrupted, the PSUs do not function.
Blinking green and turns off	When hot-plugging a PSU, the PSU handle blinks green five times at a rate of 4 Hz and turns off. This indicates a PSU mismatch with respect to efficiency, feature set, health status, or supported voltage. CAUTION: If two PSUs are installed, both the PSUs must have the same type of label. For example, Extended Power Performance (EPP) label. Mixing PSUs from previous generations of PowerEdge servers is not supported, even if the PSUs have the same power rating. This results in a PSU mismatch condition or failure to turn the system on.

Power indicator codes	Condition
△	CAUTION: When correcting a PSU mismatch, replace only the PSU with the blinking indicator. Swapping the PSU to make a matched pair can result in an error condition and unexpected system shutdown. To change from a high output configuration to a low output configuration or vice versa, you must turn off the system.
△	CAUTION: AC PSUs support both 240 V and 120 V input voltages with the exception of Titanium PSUs, which support only 240 V. When two identical PSUs receive different input voltages, they can output different wattages, and trigger a mismatch.
△	CAUTION: If two PSUs are used, they must be of the same type and have the same maximum output power.
△	CAUTION: Combining AC and DC PSUs is not supported and triggers a mismatch.

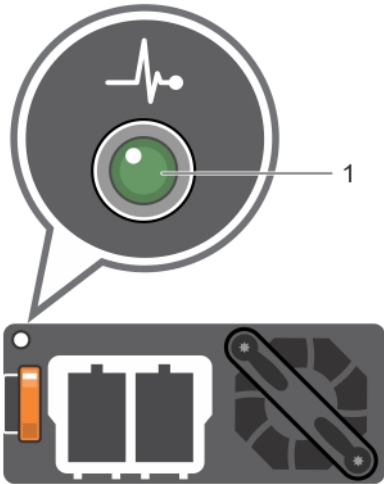


Figure 5. DC PSU status indicator

1 DC PSU status indicator

Table 8. DC PSU status indicator codes

Power indicator codes	Condition
Green	A valid power source is connected to the PSU and the PSU is operational.
Blinking amber	Indicates a problem with the PSU.
Not illuminated	Power is not connected.
Blinking green	When hot-plugging a PSU, the PSU indicator blinks green. This indicates that there is a PSU mismatch with respect to efficiency, feature set, health status, or supported voltage.
△	CAUTION: When correcting a PSU mismatch, replace only the PSU with the blinking indicator. Swapping the PSU to make a matched pair can result in an error condition and unexpected system shutdown. To change from a High Output configuration to a Low Output configuration or vice versa, you must turn off the system.
△	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.

Non-redundant power supply unit indicator codes

Press the self-diagnostic button to perform a quick health check on the non-redundant power supply unit (PSU) of the system.

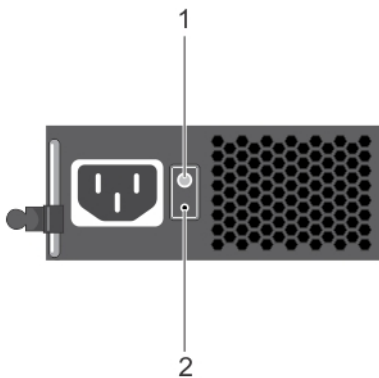


Figure 6. Non-redundant AC PSU status indicator and self-diagnostic button

- 1 Self-diagnostic button
- 2 AC PSU status indicator

Table 9. Non-redundant AC PSU status indicator

Power Indicator Pattern	Condition
Not lit	Power is not connected or PSU is faulty.
Green	A valid power source is connected to the PSU and the PSU is operational.

Hard drive indicator codes

Each hard drive carrier has an activity LED indicator and a status LED indicator. The indicators provide information about the current status of the hard drive. The activity LED indicator indicates whether the hard drive is currently in use or not. The status LED indicator indicates the power condition of the hard drive.

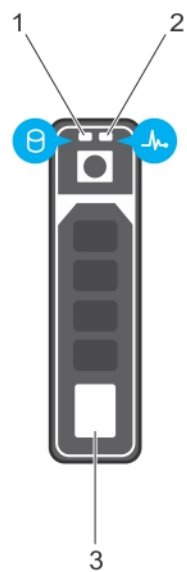


Figure 7. Hard drive indicators

- 1

Hard drive activity indicator
- 2

Hard drive status LED indicator
- 3

Hard drive

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

Table 10. Hard drive 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. <div><div><div></div><div>NOTE: The drive status indicator remains off until all hard drives are initialized after the system is turned on. Drives are not ready for removal during this time.</div></div></div>
Flashes green, amber, and then turns off	Predicted drive failure.
Flashes amber four times per second	Drive failed.
Flashes green slowly	Drive rebuilding.
Steady green	Drive online.
Flashes green for three seconds, amber for three seconds, and then turns off after six seconds	Rebuild stopped.

uSATA SSD indicator codes



Figure 8. uSATA SSD indicators

- 1

uSATA SSD activity indicator
- 2

uSATA SSD status indicator
- 3

uSATA SSD

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

Table 11. 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. <div>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.</div>
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 stopped.

Internal dual SD module indicator codes

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.

The following table describes the IDSDM indicator codes:

Table 12. IDSDM indicator codes

Convention	IDSDM indicator code	Description
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.

Running diagnostics

Running diagnostics help you to identify the cause for a system issue. The diagnostics test your system hardware without requiring additional equipment or risking data loss.

Topics:

- [Receiving automated support with SupportAssist](#)
- [PSA/ePSA Diagnostics](#)
- [Debugging mini crash dump files using by WinDbg in Windows operating system](#)

Receiving automated support with SupportAssist

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

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

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

PSA/ePSA Diagnostics

Run the Embedded System Diagnostics (ePSA) if your system does not boot.

Running the PSA/ePSA Diagnostics

- 1 While the system is booting, press **<F11>** to enter **Boot Manager**. Alternatively, press **<F10>** to enter Lifecycle Controller.
- 2 Use the up and down arrow keys to select **System Utilities** → **Hardware Diagnostics**.
 ⓘ **NOTE:** For systems that do not have Lifecycle Controller, press **<F10>** to launch the Utility Mode (diags) option.
- 3 Note down the error code.
 The following table describes the PSA/ePSA diagnostics error messages.

PSA/ePSA Diagnostics error codes

Error number (PSA and ePSA)	Error message	Description	Steps
PSA NA ePSA 2000-0111	CPU - exception occurred	An error occurred during the tests that may involve the system board.	<ol style="list-style-type: none"> 1 Update to the latest BIOS version. 2 Repeat the PSA diagnostics. 3 If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0112	CPU - machine check exception detected	An error occurred during the tests that may involve the system board.	<ol style="list-style-type: none"> 1 Update to the latest BIOS version. 2 Repeat the PSA diagnostics. 3 If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0114	CPU - Cache integrity test discrepancy	An error occurred during the tests that may involve the system board.	<ol style="list-style-type: none"> 1 Update to the latest BIOS version. 2 Repeat the PSA diagnostics. 3 Check temperatures in system health and check that no airflow obstructed. 4 If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0115	CPU - Stress Thermal condition. Limit (d)C. Actual (d)C	An error occurred during the tests that may involve the system board.	<ol style="list-style-type: none"> 1 Update to the latest BIOS version. 2 Repeat the PSA diagnostics. 3 Check temperatures in system health and check that no airflow obstructed. 4 If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0121	Memory - memory errors were detected and repaired	An error occurred during the tests that may involve the system board or memory of the system. However, the system has self repaired.	<ol style="list-style-type: none"> 1 Turn off the system and reseal the memory modules. 2 Update to the latest BIOS version. 3 Repeat the PSA diagnostics. 4 If failure continues, contact Dell Technical Support
PSA 1000-0122 ePSA 2000-0122	PSA Memory - test initialization failure ePSA Memory - memory errors were detected and excessive errors were detected	An error occurred during the tests that may involve the system board or memory of the system. However, the system has self repaired.	<ol style="list-style-type: none"> 1 Turn off the system and reseal the memory modules. 2 Update to the latest BIOS version. 3 Repeat the PSA diagnostics.

Error number (PSA and ePSA)	Error message	Description	Steps	
			4	If failure continues, contact Dell Technical Support
PSA 1000-0123 ePSA 2000-0123	Memory - integrity test failed	An error occurred during the tests that may involve the system board or memory of the system. However, the system has self repaired.	1 2	Turn off the system and reseat the memory modules. Repeat the PSA diagnostics.
PSA NA ePSA 2000-0124	System Log - <Timestamp>, <Log message>	This is information in the system log to show time and messages related to system events.	1 2	Clear the system log. Repeat the PSA diagnostics.
PSA NA ePSA 2000-0125	Event Log	The IPMI system event log is full for various reasons or logging has stopped because too many ECC errors have occurred.	1 2	Clear the IPMI system event log. Repeat the PSA diagnostics.
PSA NA ePSA 2000-0126	Event Log	The event log(s) must be cleared before testing can continue.	1 2	Clear the system event log. Repeat the PSA diagnostics.
PSA NA ePSA 2000-0131	Battery - the battery is not installed	An error occurred during the tests that may involve the main system board or battery of the system.	1 2 3 4	Turn off the system and reseat the system battery. Update to the latest BIOS version. Repeat the PSA diagnostics. If failure continues, contact Dell Technical Support.
PSA NA ePSA 2000-0132	Battery - the battery is reaching the end of its usable life	An error occurred during the tests that may involve the main system board or battery of the system.	1 2 3 4	Turn off the system and reseat the system battery. Update to the latest BIOS version. Repeat the PSA diagnostics. If failure continues, contact Dell Technical Support.
PSA NA ePSA 2000-0133	Battery - the battery cannot supply sufficient power	An error occurred during the tests that may involve the main system board or battery of the system.	1 2 3 4	Turn off the system and reseat battery. Update to the latest BIOS version. Repeat the PSA diagnostics. If failure continues, contact Dell Technical Support.
PSA 2000-0141 ePSA 2000-0141	Hard Drive - no drive detected	Your system BIOS is reporting that no Hard Disk Drive is being reported. If a Portable, reseat the hard drive, if a Desktop, reseat both ends of the data cable and reseat the power cable	1 2	If you don't have a hard disk drive (HDD), this may be an automatic message and requires no action. If you have an HDD, reconnect your HDD to the system board.

Error number (PSA and ePSA)	Error message	Description	Steps
		to the drive. Repeat the PSA diagnostics. If a known good hard drive is available, see if the good drive can be detected in the system or try the suspect drive in a working system.	3 Update to the latest BIOS. 4 Repeat the PSA diagnostics. 5 If failure continues, contact Technical Support
PSA 1000-0142 ePSA 2000-0142	PSA Hard Drive - drive self test failed ePSA Hard Drive - self test unsuccessful	Your hard disk drive has indicated a failure.	1 Update to the latest BIOS. 2 Turn off your computer and reconnect your hard disk drive (HDD) to the system board for instructions.) 3 Repeat the PSA diagnostics.
PSA 1000-0143 ePSA 2000-0143	Hard Drive - SMART read command unsuccessful	Your hard disk drive has indicated a failure.	
PSA 1000-0144 ePSA 2000-0144	Hard Drive - no support for drive self test	Your hard disk drive has indicated a failure.	
PSA 1000-0145 ePSA 2000-0145	PSA Hard Drive - timeout waiting for Drive Self Test to complete ePSA Hard Drive - self test did not complete	The hard drive test did not complete the last test attempted.	1 Check Dell.com/support for a firmware update for your hard drive. Update the firmware if one is available. 2 Reseat the drive, reseat the data cable and power connection at both ends if it is desktop. 3 Turn off your computer and reconnect your hard disk drive (HDD) to the system board. For more information, see your systems <i>Owners Manual</i> at Dell.com/poweredgemanuals . 4 Update to the latest BIOS. 5 Repeat the PSA diagnostics. 6 If failure continues, contact Dell Technical Support
PSA 1000-0146 ePSA 2000-0146	Hard Drive - self test log contains previous errors	Your hard drive has indicated a failure.	1 Update to the latest BIOS version. 2 Run a Chkdsk /r or format your hard drive and reinstall your operating system. 3 Repeat the PSA diagnostics. 4 If failure continues, contact Dell Technical Support
PSA 1000-0147 ePSA 2000-0147	PSA Optical Drive - IDE status failed.	Your CD or DVD drive has indicated a failure.	1 Update to the latest BIOS version. 2 Turn off your computer and reconnect your optical drive to the system board.

Error number (PSA and ePSA)	Error message	Description	Steps	
	ePSA Optical Drive - self test --(s)		3	Repeat the PSA diagnostics.
PSA 1000-0148 ePSA 2000-0148 replaced by 2000-0151, 2000-0152	PSA Optical Drive - BIST --(s) ePSA Optical Drive - incorrect status	Your CD or DVD drive has indicated a failure.	1	Update to the latest BIOS version.
			2	Turn off your computer and reconnect your optical drive to the system board.
			3	Repeat the PSA diagnostics.
PSA NA ePSA 2000-0149	Optical Drive - no drive detected	Your CD or DVD drive has indicated a failure.	1	Update to the latest BIOS version.
			2	Turn off your computer and reconnect your optical drive to the system board.
			3	Repeat the PSA diagnostics.
PSA NA ePSA 2000-0150 replaced 2000-0141	Hard Drive - No drive detected.	Your system BIOS is reporting that no Hard Disk Drive is being reported. If a Portable, reseal the hard drive, if a Desktop, reseal both ends of the data cable and reseal the power cable to the drive. Repeat the PSA diagnostics. If a replacement working hard drive is available, see if the working hard drive is detected by the system or try the suspect drive in a working system.	1	If you don't have a hard disk drive (HDD), this may be an automatic message and requires no action.
			2	If you have an HDD, reconnect your hard disk drive (HDD) to the system board.
			3	Update to the latest BIOS version.
			4	Repeat the PSA diagnostics.
			5	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0151	Hard Drive - BIST --(s)	The hard drive is showing an incorrect status in the diagnostic. Check for a firmware update for your hard drive.	1	If you have a replacement hard drive, install it.
			2	Update to the latest BIOS version.
			3	Repeat the PSA diagnostics.
			4	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0152	Optical Drive - BIST --(s)	The CD or DVD Drive is showing an incorrect status in the diagnostic.	1	Update to the latest BIOS.
			2	Remove and reinstall your optical drive.
			3	Repeat the PSA diagnostics.
			4	If failure continues, contact Technical Support
PSA NA ePSA 2000-0153	Hard Drive - Removable Hard Drive [d] - Incorrect status = [x] [s]	Check the installation of the removable drive, cables, and connections.	1	If you have an HDD, reconnect your hard disk drive (HDD) to the system board.
			2	Update to the latest BIOS version.

Error number (PSA and ePSA)	Error message	Description	Steps	
			3	Repeat the PSA diagnostics.
			4	If failure continues, contact Technical Support
PSA NA ePSA 2000-0154	Tape Drive - Tape Drive [s] - S/N [d], incorrect status = [d] [d]	Check installation of the tape drive, cables and connections. If the error persists, ensure that the drive firmware is current.	1	Update to the latest BIOS.
			2	Remove and reinstall your tape drive.
			3	Repeat the PSA diagnostics.
			4	If failure continues, contact Technical Support
PSA NA ePSA 2000-0155	Hard Drive - Not Installed	This is an error displayed when HDD is not inserted in the notebooks.	1	Update to the latest BIOS version.
			2	Remove and reinstall your Hard drive.
			3	Repeat the PSA diagnostics.
			4	If failure continues, contact Dell Technical Support
PSA 1000-0212 ePSA 2000-0212 (Not used with UEFI BIOS)	System board - CMOS, Location = (x), Expected = (x), Found = (x)	An error occurred during the tests that may involve the main system board of the system.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support.
PSA 1000-0213 ePSA 2000-0213 (Not used with UEFI BIOS)	System board - CMOS battery failure detected	An error occurred during the tests involving the CMOS battery (This maintains all the settings in the BIOS when there is no power to the system) On desktop systems this is a easily replaceable watch size battery, some portable systems may have a replaceable battery too.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	Remove and replace your CMOS battery.
			4	If failure continues, contact Dell Technical Support
PSA 1000-0221 ePSA 2000-0221 (Not used with UEFI BIOS)	PSA System board - Interval timer Channel 0 (mode 0) is not generating interrupts ePSA Timer - Interval timer not functional	An error occurred during the tests that may involve the main system board of the system. If a memory error is detected, try memory modules individually. If no 2000-0123 memory error & If diagnostics fail again after the BIOS is current, contact Technical Support to resolve the problem.	1	Update to the latest BIOS version.
			2	Reseat the CMOS battery.
			3	Repeat the PSA diagnostics
			4	If failure continues, contact Dell Technical Support
PSA 1000-0222 ePSA 2000-0222 (Not used with UEFI BIOS)	PSA System board - Interval timer Channel 0 (mode 0) is not generating interrupts ePSA Timer - Interval timer not functional	An error occurred during the tests that may involve the main system board of the system. If a memory error is detected, try memory modules individually. If	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics

Error number (PSA and ePSA)	Error message	Description	Steps	
		no 2000-0123 memory error & If diagnostics fail again after the BIOS is current, contact Technical Support to resolve the problem.	3	If failure continues, contact Dell Technical Support
PSA 1000-0223 ePSA 2000-0223 (Not used with UEFI BIOS)	System board - Timer - Interval timer initial clock output level incorrect	An error occurred during the tests that may involve the main system board of the system. If a memory error is detected, try memory modules individually. If no 2000-0123 memory error & If diagnostics fail again after the BIOS is current, contact Technical Support to resolve the problem.	1 2 3	Update to the latest BIOS version. Repeat the PSA diagnostics If failure continues, contact Dell Technical Support
PSA 1000-0224 ePSA 2000-0224 (Not used with UEFI BIOS)	System board - Interval timer had wrong time period in mode	An error occurred during the tests that may involve the main system board of the system. If a memory error is detected, try memory modules individually. If no 2000-0123 memory error & If diagnostics fail again after the BIOS is current, contact Technical Support to resolve the problem.	1 2 3	Update to the latest BIOS version. Repeat the PSA diagnostics If failure continues, contact Dell Technical Support
PSA 1000-0231 ePSA 2000-0231 (Not used with UEFI BIOS)	System board - Failure in Interval timer in mode	An error occurred during the tests that may involve the main system board of the system. If a memory error is detected, try memory modules individually. If no 2000-0123 memory error & If diagnostics fail again after the BIOS is current, contact Technical Support to resolve the problem.	1 2 3	Update to the latest BIOS version. Repeat the PSA diagnostics If failure continues, contact Dell Technical Support
PSA 2000-0232 ePSA 2000-0232 (Not used with UEFI BIOS)	System board - the RTC did not generate periodic ticks	An error occurred during the tests that may involve the main system board of the system. If a memory error is detected, try memory modules individually. If no 2000-0123 memory error & If diagnostics fail again after the BIOS is current, contact Technical Support to resolve the problem.	1 2 3	Update to the latest BIOS version. Repeat the PSA diagnostics If failure continues, contact Dell Technical Support
PSA 2000-0233 ePSA 2000-0233 (Not used with UEFI BIOS)	PSA System board - RTC 'seconds' count is not updating ePSA RTC - 'seconds' count is not updating	An error occurred during the tests that involve the Real Time Clock (RTC) of the main system board in the system. If a memory error is detected, try memory modules individually. If no	1 2	Update to the latest BIOS version. Repeat the PSA diagnostics

Error number (PSA and ePSA)	Error message	Description	Steps	
		2000-0123 memory error & If diagnostics fail again after the BIOS is current, contact Technical Support to resolve the problem.	3	If failure continues, contact Dell Technical Support
PSA 1000-0234 ePSA 2000-0234 (Not used with UEFI BIOS)	PSA System board - timeout waiting for RTC update flag to set ePSA System board - HPET incorrect time period.	An error occurred during the tests that may involve the main system board of the system. If a memory error is detected, try memory modules individually. If no 2000-0123 memory error & If diagnostics fail again after the BIOS is current, contact Technical Support to resolve the problem.	1 2 3	Update to the latest version. Repeat the PSA diagnostics If failure continues, contact Dell Technical Support
PSA 1000-0235 ePSA NA	System board - PM timer 1 had wrong time period.	An error occurred during the tests that may involve the main system board of the system. If a memory error is detected, try memory modules individually. If no 2000-0123 memory error & If diagnostics fail again after the BIOS is current, contact Technical Support to resolve the problem.	1 2 3	Update to the latest BIOS version. Repeat the PSA diagnostics If failure continues, contact Dell Technical Support
PSA 1000-0241 ePSA 2000-0241 (Not used with UEFI BIOS)	BIOS - A20 gate not enabled	An error occurred during the tests that may involve the main system board of the system. If a memory error is detected, try memory modules individually. If no 2000-0123 memory error & If diagnostics fail again after the BIOS is current, contact Technical Support to resolve the problem.	1 2 3	Update to the latest BIOS version. Repeat the PSA diagnostics. If failure continues, contact Dell Technical Support
PSA 1000-0242 ePSA 2000-0242 (Not used with UEFI BIOS)	PSA System board - no interrupt detected for IRQ. ePSA- System board - Interrupt controller - IRQ (d) - %s not detected	An error occurred during the tests that may involve the main system board of the system. If a memory error is detected, try memory modules individually. If no 2000-0123 memory error & If diagnostics fail again after the BIOS is current, contact Technical Support to resolve the problem.	1 2 3	Update to the latest BIOS version. Repeat the PSA diagnostics If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0243	System board - USB device, IO board, Daughter Card	An error occurred during the tests that may involve the USB controller or ports of the main system board of the system. Disconnect any USB devices and run the diagnostic again. Test	1 2	Update to the latest BIOS version. Repeat the PSA diagnostics

Error number (PSA and ePSA)	Error message	Description	Steps	
		USB devices in a different port. Try a known good USB device.	3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0244	System board - USB device	An error occurred during the tests that may involve the USB controller or ports of the main system board of the system. Disconnect any USB devices and run the diagnostic again. Test USB devices in a different port. Try a known good USB device.	1 2 3	Update to the latest BIOS version Repeat the PSA diagnostics If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0245	System board - USB device	An error occurred during the tests that may involve the USB controller or ports of the main system board of the system. Disconnect any USB devices and run the diagnostic again. Test USB devices in a different port. Try a known good USB device.	1 2 3	Update to the latest BIOS version. Repeat the PSA diagnostics. If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0251	Event Log - the log contains failing records.	This relates to BIOS events in servers only.	1 2	Update to the latest BIOS version. Repeat the PSA diagnostics.
PSA NA ePSA 2000-0261	System board - Data errors.	Multiple memory DIMMs failed, presumed to be caused by motherboard issues.	1 2 3	Update to the latest BIOS version. Repeat the PSA diagnostics. If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0313	Touchpad - pointing stick/ touchpad not detected	The mouse, touchpad, or trackstick is not being detected by the diagnostic tools. Power the system off, reseal any cable connection and check the BIOS to ensure that the touchpad or mouse has not been disabled.	1 2 3 4	Update to the latest BIOS version. If your mouse, touchpad, or pointing stick is disconnected, reconnect it. For laptops, make sure that your touchpad is active. If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0314	Thermal - the (s) reading (dc) exceeds the thermal limit.	The system board, heat sink, fan, or processor are failing the diagnostic tools.	1 2 3	Update to the latest BIOS version. Check the logs, the fan and for any other signs of overheating. If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0315	Sensor - the (s) reading (dc) is lower than expected	The system board or sensor is failing the diagnostic tools.	1 2 3	Update to the latest BIOS version Check the system logs. If failure continues, contact Technical Support

Error number (PSA and ePSA)	Error message	Description	Steps	
PSA 1000-0321 ePSA 2000-0321	PSA LCD EDID - unable to access EDID EEPROM ePSA Unable to detect LCD	LCD Extended Display Identification Data (EDID) - unable to access the EDID Electrically Erasable Programmable Read-Only Memory (EEPROM) in the LCD display is indicating a data failure. If there is video on the LCD, then the Display does not need replacement.	1 2 3 4	Update to the latest BIOS version. Turn off your computer and reconnect your LCD cable. Repeat the PSA diagnostics.. If failure continues, contact Dell Technical Support
PSA 1000-0322 ePSA 2000-0322	PSA LCD Panel - Error accessing the LCD inverter ePSA LCD panel - unable to modify brightness	LCD panel - unable to modify brightness. Try to adjust the brightness in Windows using the hotkeys. Boot to the BIOS and see if brightness can be adjusted at that point outside of Windows	1 2 3 4	Update to the latest BIOS version. Turn off your computer and reconnect your LCD cable. Repeat the PSA diagnostics. If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0323	LCD panel - Unable to detect inverter lamp status.	Check LCD connector and cables.	1 2 3	Update to the latest BIOS version. Repeat the PSA diagnostics. If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0324	LCD panel - user reported LCD BIST colors were not displayed	You may get this error if you answered No to the LCD BIST test instead of Yes. If you were able to clearly see red, blue, green white and white screen with text without distortion, lines, or color problems, re-run the diagnostic and if the screens appear normal, click Yes	1 2 3 4	Update to the latest BIOS version. Turn off your computer and reconnect your LCD cable. Repeat the LCD BIST diagnostics. If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0325	LCD panel - user provided no input for LCD BIST	You may get this error if you answered No to the LCD BIST test instead of Yes. If you were able to clearly see red, blue, green white and white screen with text without distortion, lines, or color problems, re-run the diagnostic and if the screens appear normal, click Yes	1 2 3 4	Update to the latest BIOS version. Turn off your computer and reconnect your LCD cable. Repeat the PSA diagnostics. If failure continues, contact Technical Support
PSA 1000-0326 ePSA 2000-0326	LCD panel - unable to turn lamp on or off	The backlight lamp was not able to be turned on or off during the diagnostic testing	1 2 3 4	Update to the latest BIOS. Turn off your computer and reconnect your LCD cable. Repeat the PSA diagnostics. If failure continues, contact Technical Support

Error number (PSA and ePSA)	Error message	Description	Steps
PSA NA ePSA 2000-0327	LCD panel - unable to use BIOS interface	The Liquid Crystal Display (LCD) panel does not display the BIOS screen correctly and the BIOS screen is not visible on the LCD.	<ol style="list-style-type: none"> 1 Update to the latest BIOS. 2 Turn off your computer and reconnect your LCD cable. 3 Repeat the PSA diagnostics. 4 If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0328	LCD panel - unable to detect variance in ambient light sensor	The Ambient light sensor that automatically dims the LCD in low light did not respond during the diagnostics.	<ol style="list-style-type: none"> 1 Update to the latest BIOS version. 2 Turn off your computer and reconnect your LCD cable. 3 Repeat the PSA diagnostics. 4 If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0331	Video controller - no video controller detected	The system is not detecting the graphics adapter. If you are using a desktop system and if a PCIe expansion card is installed, reseal the card and reconnect any internal power connections to the card. Then reconnect the video cable and repeat the PSA diagnostic.	<ol style="list-style-type: none"> 1 Update to the latest BIOS version. 2 Desktop: Turn off your computer and if equipped with PCIe expansion card, reseal the card. 3 Reconnect your LCD cable. 4 Repeat the PSA diagnostics.. 5 If failure continues,, contact Dell Technical Support
PSA NA ePSA 2000-0332	Video memory - Video memory integrity test discrepancy	PSA diagnostics detected a video memory failure. Please reset the system memory and update the BIOS to most current version.	<ol style="list-style-type: none"> 1 Update to the latest BIOS version. 2 Reseat the system memory 3 Turn off your computer and reconnect your LCD cable. 4 Repeat the PSA diagnostics. 5 If failure continues,, contact Dell Technical Support
PSA 1000-0333 ePSA 2000-0333	PSA Video - Graphics test timed out waiting for keyboard response ePSA Video - User provided no input for graphics test	PSA diagnostics did not record the user input (Y or N) after the video test. Ensure that you accurately answer queries that are prompted during the diagnostic.	<ol style="list-style-type: none"> 1 Error occurs when a graphics test times out while waiting for you to enter a response. 2 Update to the latest BIOS version. 3 Turn off your computer and reconnect your LCD cable. 4 Repeat the PSA diagnostics. 5 If failure continues, contact Dell Technical Support
PSA 1000-0334 ePSA 2000-0334	Video - user reported the patterns were not displayed correctly	You may get this error if you answered No to the color test instead of Yes. If you were able to clearly see both the vertical	<ol style="list-style-type: none"> 1 You may get this error if you answered No to the color test instead of Yes. 2 Update to the latest BIOS version.

Error number (PSA and ePSA)	Error message	Description	Steps	
		and horizontal color bars without distortion, lines, or color problems, re-run the diagnostic and if the bar appears normal, click Yes.	3	Turn off your computer and reconnect your LCD cable.
			4	Repeat the PSA diagnostics..
			5	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0411	Cables - not detected	Normally, the cable involved in the error (LCD LVDS CABLE for example) is indicated in the error message. Reseat the cable connection and inspect the cable and connections for damage.	1	Update to the latest BIOS.
			2	Turn off your system and reconnect the cable, jumper, or connection indicated in the error message.
			3	Replace damaged cables or devices.
			4	Repeat the PSA diagnostics.
			5	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0412	Cables - auxiliary cable not detected	Normally, the cable involved in the error (LCD LVDS CABLE for example) is indicated in the error message. Reseat the cable connection and inspect the cable and connections for damage.	1	Update to the latest BIOS version.
			2	Turn off your system and reconnect the cable, jumper, or connection indicated in the error message.
			3	Replace damaged cables or devices.
			4	Repeat the PSA diagnostics.
			5	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0413	Cables - LCD cable not detected	Normally, the cable involved in the error (LCD LVDS CABLE for example) is indicated in the error message. Reseat the cable connection and inspect the cable and connections for damage.	1	Update to the latest BIOS version.
			2	Turn off your system and reconnect the cable, jumper, or connection indicated in the error message.
			3	Replace damaged cables or devices.
			4	Repeat the PSA diagnostics.
			5	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-0414	Cables - Invertor cable not detected	Normally, the cable involved in the error (LCD LVDS CABLE for example) is indicated in the error message. Reseat the cable connection and inspect the cable and connections for damage.	1	Update to the latest BIOS version.
			2	Turn off your system and reconnect the cable, jumper, or connection indicated in the error message.
			3	Replace damaged cables or devices.
			4	Repeat the PSA diagnostics.

Error number (PSA and ePSA)	Error message	Description	Steps	
PSA NA ePSA 2000-0415	Cables - Check the following cables, jumper, connection, or sensors: [s]	Normally, the cable involved in the error (LCD LVDS CABLE for example) is indicated in the error message. Reseat the cable connection and inspect the cable and connections for damage.	5	If failure continues, contact Dell Technical Support
			1	Update to the latest BIOS version.
			2	Turn off your system and reconnect the cable, jumper, or connection indicated in the error message.
			3	Replace damaged cables or devices.
			4	Repeat the PSA diagnostics.
PSA NA ePSA 2000-0511	Fan - the (s) fan failed to respond correctly	The cooling fan is not responding to the diagnostics tool. Please check nothing is obstructing the fan.	5	If failure continues, contact Dell Technical Support
			1	Update to the latest BIOS version.
			2	Check your system for any obstructions to the air vents or cooling fan.
			3	Repeat the PSA diagnostics.
PSA NA ePSA 2000-0512	Fan - the (s) fan is running faster than expected.	This could be an issue with the system board, temperature sensor, or cooling fan. Please check everything is firmly seated.	4	If failure continues, contact Dell Technical Support
			1	Update to the latest BIOS version.
			2	Check for any loose connections, any obstructed air vents, and for any other signs of overheating.
			3	Repeat the PSA diagnostics.
PSA NA ePSA 2000-0620	Network - Network [d] - {Vendor supplied error}	The Network (Ethernet) device may be faulty. Depending on the system, this may be on the motherboard, an adapter, or a daughter card. Errors include Register test failed or Packet loopback test failed.	4	If failure continues, contact Dell Technical Support
			1	Update to the latest BIOS/ Firmware versions.
			2	Check for any loose connections or any bent pins in the connectors.
			3	Repeat the PSA diagnostics.
PSA NA ePSA 2000-0621	Network - Network [d] - Driver version [x] outdated. Version [x] or newer required for "[s]"	The Network (Ethernet) device Firmware may be out of date.	4	If failure continues, contact Dell Technical Support
			1	Update to the latest BIOS/ Firmware versions.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Technical Support

Error number (PSA and ePSA)	Error message	Description	Steps	
PSA NA ePSA 2000-8001	BIOS - No BIOS support for software interrupt [x] function[x] [x]	The motherboard BIOS revision may not be current. Update the BIOS to the most current version and the issue should resolve.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8002	BIOS - No BIOS support for SMI interface function(x) or Sensor [x] exceeded thermal zone [d]. Peak zone was [d].	The motherboard BIOS revision may not be current. Update the BIOS to the most current version and the issue should resolve.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8003	BIOS - Fan - Unable to set Manufacturing Mode	The motherboard BIOS revision may not be current. Update the BIOS to the most current version and the issue should resolve.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8004	BIOS - Fan - Unable to determine fan speeds	The motherboard BIOS revision may not be current. Update the BIOS to the most current version and the issue should resolve.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8005	LCD - LCD BIST not supported	The LCD BIST may not exist on all systems.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8006	BIOS - Fan - Unable to set fans to ([d], [d], or [d]) speed or No chipset event timer.	The motherboard BIOS revision may not be current. Update the BIOS to the most current version and the issue should resolve.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8007	BIOS - Log contains Fan events or Timer expected [d] observed [d]	This message is informational only - it provides a record of fan events.	1	Clear Log.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8008	Diagnostics - A. Out of memory! fMalloc() Failed! B. Unable to allocate memory for object data. Unable to [s] testable memory	The system may be unstable and should be rebooted.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support

Error number (PSA and ePSA)	Error message	Description	Steps	
	C. Unable to start application processors			
	D. Unable to stop all APs			
PSA NA ePSA 2000-8009	Diagnostics - Software Error	The System may be unstable and should be rebooted.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-800B	BIOS - Retrieve vendor ID function error	The system may be unstable.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-800C	BIOS - Get/Set inverter mode function error. Vendor: [s] Revision: [d]	The motherboard BIOS revision may not be current. Update the BIOS to the most current version and the issue should resolve.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-800D	BIOS - Set lamp off function error. Vendor: [s] Revision: [d]	The motherboard BIOS revision may not be current. Update the BIOS to the most current version and the issue should resolve.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-800E	BIOS - Set lamp on function error. Vendor: [s] Revision: [d]	The motherboard BIOS revision may not be current.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-800F	BIOS - Restore function error. Vendor: [s] Revision: [d].	The motherboard BIOS revision may not be current.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8010	System Board	High-Precision event timer not found.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support

Error number (PSA and ePSA)	Error message	Description	Steps	
PSA NA ePSA 2000-8011	USB Device Diagnostics - Invalid status returned from the device	The attached USB device is returning an invalid status to the BIOS.	1	Reseat the USB Device.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8012	Diagnostics - Invalid parameter passed to the device. Unknown test [d] selected	An unexpected parameter was passed to a device under test.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8013	Diagnostics - LCD [s] doesn't support test commands	Update the BIOS to the most current version and the issue should resolve.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8014	Diagnostics - ADDF module ([s]) device ([s]) failed with error code [x], number [x]. No EPSA beep code mapped!	The diagnostics program has run an external module, which has reported an unusual error.	1	Update to the latest BIOS.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8016	Diagnostics - Battery - unable to retrieve battery health	The motherboard BIOS revision may not be current.	1	Reseat the Battery
			2	Update to the latest BIOS version.
			3	Repeat the PSA diagnostics.
			4	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8017	BIOS - Battery - BIOS has no support for battery health	This optional feature may not be supported.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8018	Diagnostics - Fatal: The module reported multiple test results!!	The system may be unstable.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8019	Diagnostics - Unable to log to NVRAM	The system may be unstable.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support

Error number (PSA and ePSA)	Error message	Description	Steps	
PSA NA ePSA 2000-8020	Diagnostics - Low memory. [d]k bytes free!	The system may be unstable.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8115	Diagnostics - Unable to stop all APs	The system may be unstable.	1	Update to the latest BIOS version.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8154	Tape Drive - Tape Drive [d] - S/N [s], ULTRIUM [d] media found but drive. Requires ULTRIUM [s] for [s]	Install the correct tape drive media.	1	Use correct tape drive media.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8155	Tape Drive - Tape Drive [d] - S/N [s], data read does not match data written	Try different tape drive media.	1	Use different tape drive media.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8156	Tape Drive - Tape Drive [d] - S/N [s], no media cannot test drive	Insert writable tape drive media.	1	Insert writable media.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8157	Tape Drive - Tape Drive [d] - S/N [s], drive is not a supported drive	Tape drive model is unknown and not supported by diagnostics.	1	Reseat the Drive.
			2	Test with a known good drive if possible.
			3	Repeat the PSA diagnostics.
			4	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8158	Backplane - [DRIVE] Drive [d] - incorrect status = [x], [s]	The string indicates the backplane, expander, or removable hard drive is reporting an incorrect status.	1	Reseat the drives/cables/connections.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8160	PERC - PERC Battery [d] - incorrect status = [x], [s]	The [s] string may be one of the following messages: <ul style="list-style-type: none"> Battery missing or disconnected Replace battery pack 	1	Reseat parts.
			2	Repeat the PSA diagnostics.
			3	If failure continues, contact Dell Technical Support

Error number (PSA and ePSA)	Error message	Description	Steps	
		<ul style="list-style-type: none"> Remaining capacity low 		
PSA NA ePSA 2000-8165	OS - MBR code is unknown, possibly infected by a virus	The Master Boot Record on the Hard Disk Drive has unrecognized code present which is an indication of a virus infecting the system. It is recommended that you scan your system with an up-to-date antivirus application.	1 2	Update and run your anti-virus software. Update or reinstall your OS.
PSA NA ePSA 2000-8166	OS - Detected virus (s)	A virus appears to be infecting the system. It is recommended that you scan your system with an up-to-date antivirus application.	1	Update and run your anti-virus software.
PSA NA ePSA 2000-8170	PCIe - Training error on device PciTag [s] VendorID [x] DeviceID [x] SVID [x] SDID [x] Link Degraded, maxLinkWidth = x[d], negotiatedLinkWidth = x[d]	The system is reporting an error on a PCIe adapter.	1 2 3	Reseat the PCIe adapter. Repeat the PSA diagnostics. If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8415	Cables - BIOS reports no testable cable/jumper/connector/sensor	An internal failure of the diagnostic tool, not a hardware failure.	1 2 3	Update to the latest BIOS version. Repeat the PSA diagnostics. If failure continues, contact Dell Technical Support
PSA NA ePSA 2000-8611	Audio - User reported not hearing speaker tones	If the beep was not heard, verify that the internal speakers are connected properly. On some systems, internal speakers are a purchased option. For a given system, if the speaker is optional, it might not exist on that system. If audio is not heard, make sure to unplug anything plugged into an external headphone jack and re-run the test. External HP jacks can mute the internal speakers at the hardware level.	1 2 3 4	Unplug all external Audio Jacks. Reseat the internal speaker connector. Repeat the PSA diagnostics. If failure continues, contact Dell Technical Support

Debugging mini crash dump files using by WinDbg in Windows operating system

Prerequisites

- 1 Click **Start > Control Panel > System**.

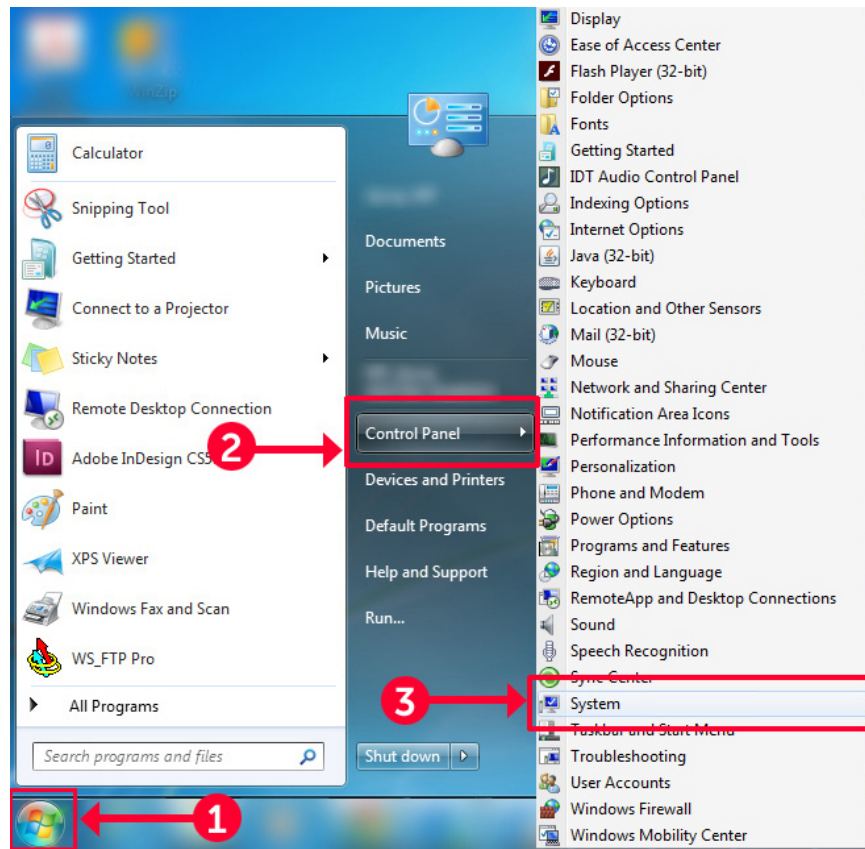


Figure 9. Opening the Systems page

- 2 In the **System** page, click **Advanced system settings** in the left pane.

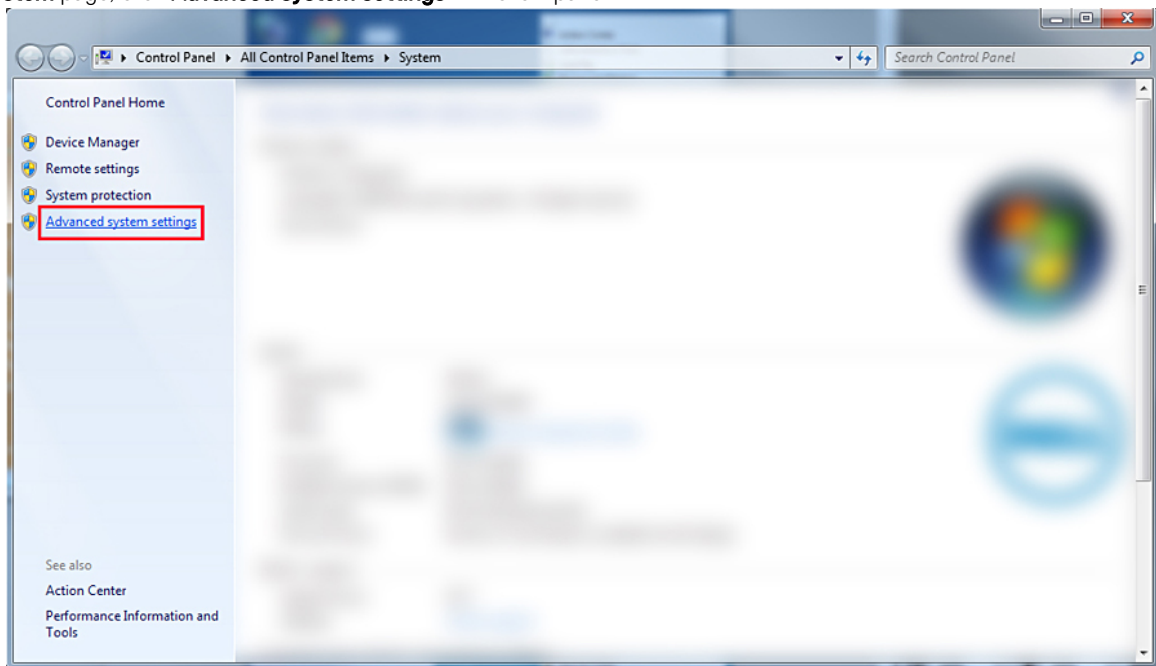


Figure 10. Advanced system settings page

- 3 In the **System Properties** window, click **Settings** under the **Startup and Recovery** section.

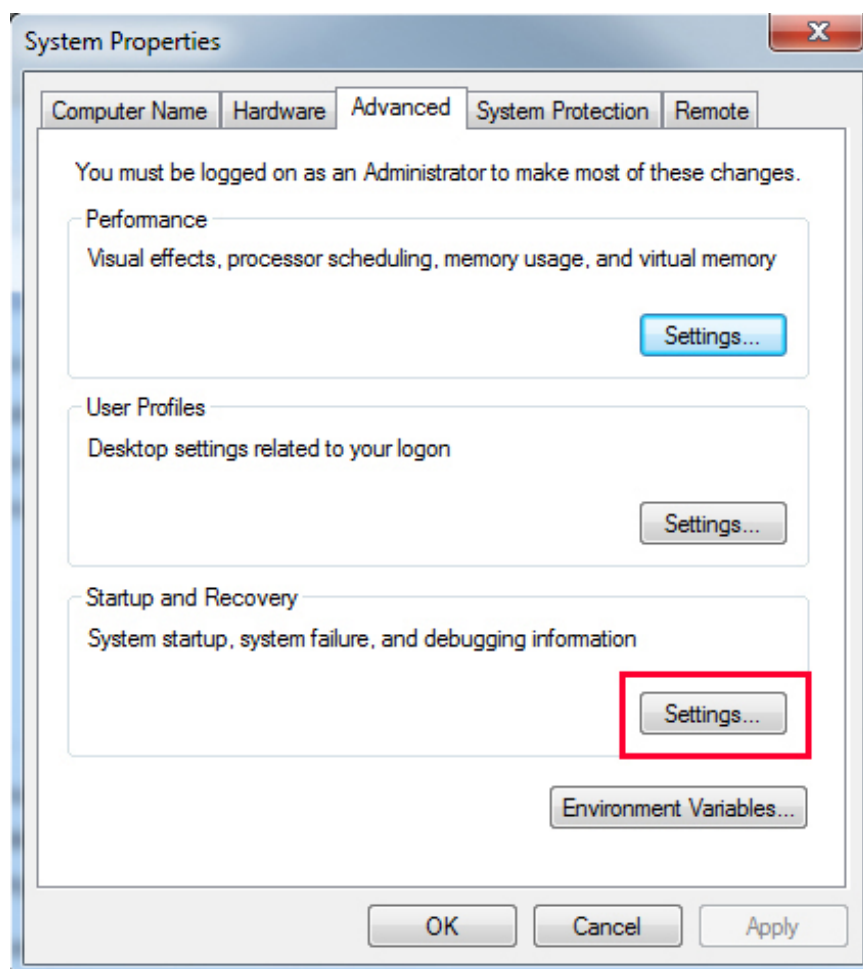


Figure 11. System Properties window

- 4 In the **Startup and Recovery** window, **System failure** section, do the following:
 - a Select **Write an event to the system log** to ensure that the minidump file is created in the event of a system failure.
 - b Select **Automatically restart** to restart the system after a blue screen of death (BSOD) occurs.

NOTE: For servers, it is recommended that you select the **Automatically restart** option so that the server can function if the error is not critical.

 - c Verify that the **Overwrite any existing file** option is not selected. This ensures that a record of failures is maintained if there are repeated occurrences of system failures.

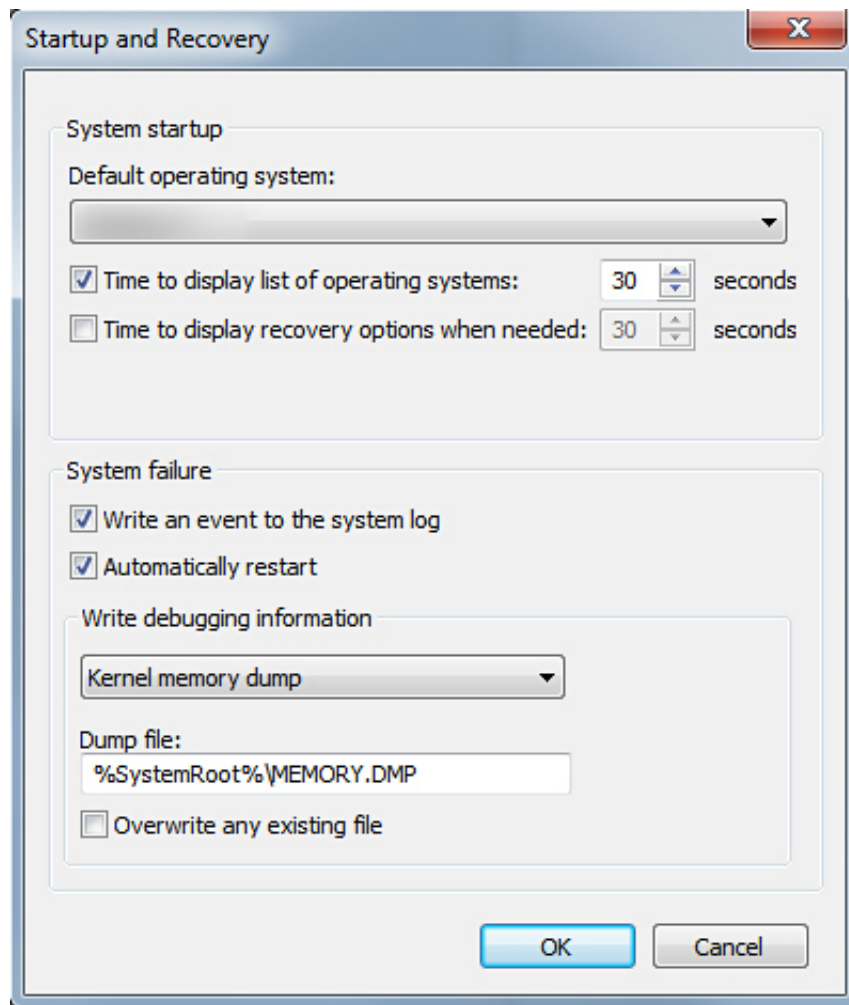


Figure 12. Startup and Recovery window

- 5 When a BSOD occurs, collect the minidump files by navigating to `C:\windows\minidump`.
- 6 Download and install the Windows Debugger (WinDbg) tool from <https://msdn.microsoft.com/en-us/windows/hardware/hh852365.aspx>.

Steps

- 1 Open WinDbg.
- 2 Click **File** → **Symbol File Path** or press **Ctrl + S** on the keyboard.
- 3 In the **Symbol Path** field, enter `SRV*<local path>*http://msdl.microsoft.com/download/symbols` where, `<local path>` is the path where you want to download the symbol files.
- 4 Click **OK**.
- 5 Click **File** → **Open Crash Dump** or press **Ctrl + D**.
- 6 Navigate to the folder where the mini dump file is saved.
- 7 Select the mini dump file and click **OK**.
- 8 Click **No** when the system prompts to save information for workspace.
Debugging starts.
- 9 Click **!analyze -v** to get detailed debugging information.
- 10 Note down the values for the following parameters:
 - a **DEFAULT_BUCKET_ID**
 - b **MODULE_NAME**

c **IMAGE_NAME**

11 Call Dell Technical Support for further assistance.

Troubleshooting hardware issues

This section helps you troubleshoot hardware issues in your system.

 **NOTE:** If the issue still persists, contact Dell Technical Support for assistance.

Topics:

- [Troubleshooting no power issues](#)
- [Troubleshooting system startup failure](#)
- [Troubleshooting external connections](#)
- [Troubleshooting the video subsystem](#)
- [Troubleshooting a USB device](#)
- [Troubleshooting a serial I/O device](#)
- [Troubleshooting a NIC](#)
- [Troubleshooting a wet system](#)
- [Troubleshooting a damaged system](#)
- [Troubleshooting the system battery](#)
- [Troubleshooting cooling problems](#)
- [Troubleshooting cooling fans](#)
- [Troubleshooting an internal USB key](#)
- [Troubleshooting an SD card](#)
- [Troubleshooting an optical drive](#)
- [Troubleshooting a tape backup unit](#)
- [Troubleshooting a storage controller](#)
- [Troubleshooting expansion cards](#)
- [Troubleshooting processors](#)
- [Troubleshooting hard drives](#)
- [Troubleshooting system memory](#)
- [Troubleshooting memory module issues](#)
- [Troubleshooting power supply units](#)
- [Troubleshooting RAID](#)
- [Troubleshooting thermal issue](#)

Troubleshooting no power issues

Prerequisite

Ensure all power supplies are firmly seated, power cables are connected, and both power supplies are operating.

Steps

- 1 Swap the AC power cable with a known-good power cable.
If the system works with a known-good AC power cable, replace the power cable.
- 2 Check the status of the power indicator on the power supply unit (PSU).

- If the power indicator is lit Green, reseal the PSU. If this does not fix the issue, test the system with a good PSU.
- If the power indicator is lit Amber, this indicates a PSU fault condition. Replace the PSU with a good PSU and check the indicator status.
- If the issue is resolved, consider replacing the PSU.

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.

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.

Troubleshooting the video subsystem

Prerequisite

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 step

If the tests fail, see the Getting help section.

Troubleshooting a USB device

Prerequisite

NOTE: Follow steps 1 to 5 to troubleshoot a USB keyboard or mouse. For other USB devices, go to step 6.

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.
- 4 In **iDRAC Settings Utility**, ensure that **USB Management Port Mode** is configured as **Automatic** or **Standard OS Use**.
- 5 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 6 to troubleshoot other USB devices attached to the system.
If the problem is not resolved, proceed to troubleshoot other USB devices attached to the system.
- 6 Turn off all attached USB devices, and disconnect them from the system.
- 7 Restart the system.
- 8 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.
- 9 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

- 10 In the **iDRAC Settings Utility**, ensure that **USB Management Port Mode** is configured as **Automatic** or **Standard OS Use**.
- 11 Reconnect and turn on each USB device one at a time.
- 12 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 step

If all troubleshooting fails, see the Getting help section.

Troubleshooting iDRAC Direct (USB XML configuration)

For information about USB storage device and system configuration, see *Integrated Dell Remote Access Controller User's Guide* at Dell.com/idracmanuals.

Steps

- 1 Ensure that your USB storage device is connected to the front USB Management Port, identified by  icon.
- 2 Ensure that your USB storage device is configured with an NTFS or an FAT32 file system with only one partition.
- 3 Verify that the USB storage device is configured correctly. For more information about configuring the USB storage device, see *Integrated Dell Remote Access Controller User's Guide* at Dell.com/idracmanuals.
- 4 In the **iDRAC Settings Utility**, ensure that **USB Management Port Mode** is configured as **Automatic** or **iDRAC Direct Only**.
- 5 Ensure that the **iDRAC Managed: USB XML Configuration** option is either **Enabled** or **Enabled only when the server has default credential settings**.
- 6 Remove and reinsert the USB storage device.
- 7 If import operation does not work, try with a different USB storage device.


Next step

If all troubleshooting fails, see the Getting help section.

Troubleshooting iDRAC Direct (Laptop connection)

For information about USB laptop connection and system configuration, see the *Integrated Dell Remote Access Controller User's Guide* at Dell.com/idracmanuals.

Steps

- 1 Ensure that your laptop is connected to the front USB Management Port, identified by  icon with a USB Type A/A cable.
- 2 On the **iDRAC Settings Utility** screen, ensure that **USB Management Port Mode** is configured as **Automatic** or **iDRAC Direct Only**.
- 3 If the laptop is running Windows operating system, ensure that the iDRAC Virtual USB NIC device driver is installed.
- 4 If the driver is installed, ensure that you are not connected to any network through WiFi or cabled ethernet, as iDRAC Direct uses a non-routable address.

Next step

If all troubleshooting fails, see the Getting help section.

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 step

If the problem persists, see the Getting help section.

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.
 - Try another known good network cable.
 - 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 the NICs 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.
- 8 Ensure that all network cables are of the proper type and do not exceed the maximum length.

Next step

If the problem persists, see the Getting help section.

Troubleshooting a wet system

Prerequisite

 **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
 - Hard drive tray
 - Cooling shroud
 - Expansion card risers (if installed)
 - Expansion cards
 - Cooling fan assembly (if installed)
 - Cooling fan(s)
 - 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, turn off 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 step

If the tests fail, see the Getting help section.

Troubleshooting a damaged system

Prerequisite

⚠ 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 fan(s)
 - processor(s) and heat sink(s)
 - memory modules
 - hard drive carriers or cage
- 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 step

If the problem persists, see the Getting help section.

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 the 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 step

If the problem persists, see the Getting help section.

Troubleshooting cooling problems

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

Ensure that the following conditions exist:

- System cover, cooling shroud, EMI filler panel, memory module blank, or back filler bracket is not removed.
- Ambient temperature is not higher than the system specific ambient temperature.
- 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.

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 management software of the system. 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 the Safety instructions section.

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

Steps

- 1 Reseat the fan or the fan's power cable.
- 2 Restart the system.

Next steps

- 1 Follow the procedure listed in the After working inside your system section.
- 2 If the problem persists, see the Getting help section.

Troubleshooting an internal USB key

Prerequisite

 **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 step

If the problem persists, see the Getting help section.

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 displayed 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.

Troubleshooting an optical drive

Prerequisite

 **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 Try using a different CD or DVD.
- 2 If the problem is not resolved, enter System Setup and ensure that the integrated SATA controller and the drive's SATA port are enabled.
- 3 Run the appropriate diagnostic test.
- 4 Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
- 5 If installed, remove the bezel.
- 6 Remove the system cover.
- 7 Ensure that the interface cable is securely connected to the optical drive and to the controller.
- 8 Ensure that a power cable is properly connected to the drive.
- 9 Install the system cover.

Next step

If the problem persists, see the Getting help section.

Troubleshooting a tape backup unit

Prerequisite

 **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 Use a different tape cartridge.
- 2 Ensure that the device drivers for the tape backup unit are installed and are configured correctly. See your tape drive documentation for more information about device drivers.
- 3 Reinstall the tape-backup software as instructed in the tape-backup software documentation.
- 4 Ensure that the interface cable of the tape drive is connected to the external port on the controller card.
- 5 Perform the following steps to ensure that the controller card is properly installed:
 - a Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
 - b Remove the system cover.
 - c Reseat the controller card in the expansion card slot.
 - d Install the system cover.
 - e Turn on the system and attached peripherals.

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

Next step

If you cannot resolve the problem, see the Getting help section.

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 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.

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 step

If the problem persists, see the Getting help section.

Troubleshooting processors

Prerequisite

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.

Troubleshooting hard drives

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.

NOTE: Ensure that the sleds internal SATA cables are connected correctly.

Steps

- 1 Run the appropriate diagnostic test. See the Using system diagnostics section.
Depending on the results of the diagnostics test, proceed as required 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 reseal 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. For more information, see the operating system documentation.
- 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 step

If the problem persists, see the Getting help section.

Checking hard drive status in the PERC BIOS

- 1 Press **Ctrl + R** during the POST process to open **PERC BIOS Configuration Utility**.

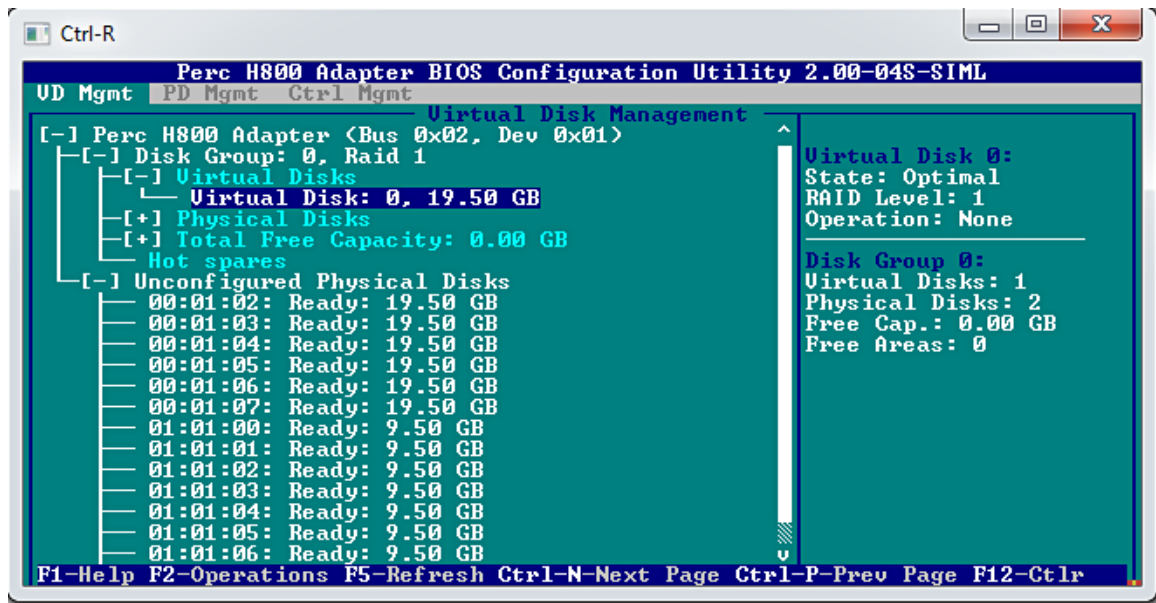


Figure 13. PERC Configuration Utility VD Mgmt screen

- 2 To check if the hard drive is participating in the RAID array, perform the following steps:
 - a Press **Ctrl + N** to go to the **PD Mgmt (Physical Disk Management)** screen and check if any hard drives are offline or missing.

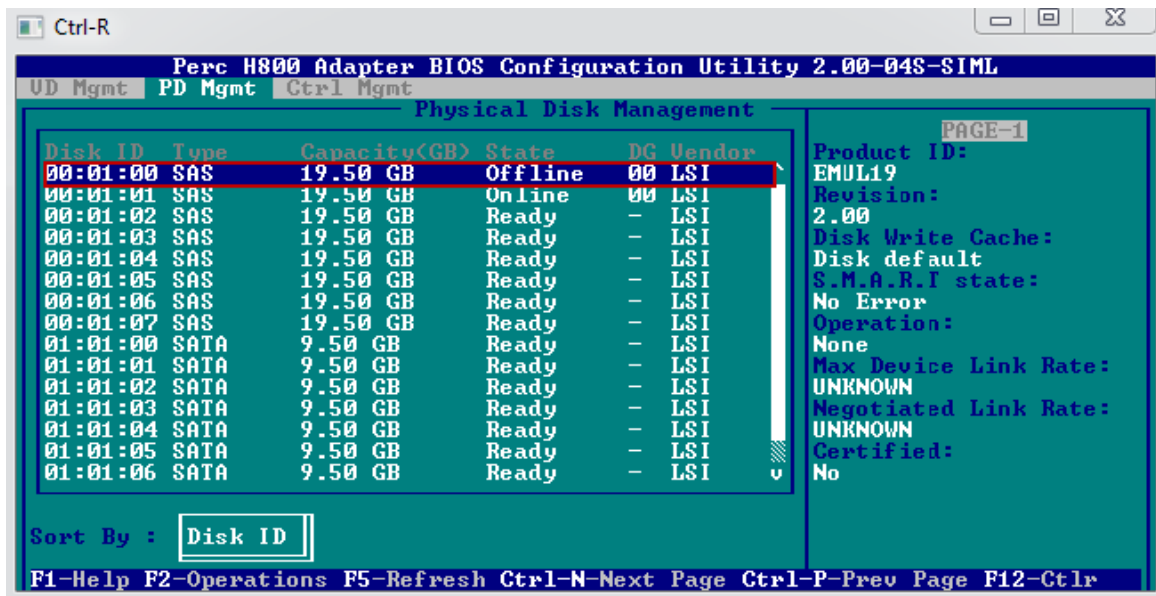


Figure 14. PERC Configuration Utility PD Mgmt screen

Hard drive status	Description
Offline	Hard drive is not part of the RAID array.
Online	Hard drive is part of the RAID array.
Ready	Hard drive is ready to be a part of the RAID array.

FAQs

How do I identify a hard drive failure?

Hard drive failures may occur because of logical, head, or mechanical failures. The following table describes the symptoms of failing hard drives:

Symptom	Description
Noisy hard drives	Noisy hard drives indicate head crash, noisy bearings, or a failed motor.
Data and disk errors	Files may not get saved or programs may stop responding.
Hard drive not detected	Operating system does not detect the hard drive.
System crash	Blue screen errors.
Slow read-write process	Delay in reading or writing data on the hard drive.

Perform the following steps if any of these symptoms occur:

- 1 Check if the hard drives are installed correctly.
- 2 Check the hard drive indicators. For more information, see Hard drive indicator codes section.
- 3 For systems with LED indicators, check the diagnostic LEDs. For more information, see Status LED indicators section.

NOTE: The diagnostic LED indicators might be different for different systems.

- For systems with LCD panel, check for the following error codes:

Error Code	Error Message	Description
E1810	Hard drive <number> fault.	Hard drive <number> has had a fault as determined by the SAS subsystem.
E1811	Hard drive <number> rebuild aborted.	Drive <number> has had its rebuild aborted.
E1812	Hard drive <number> removed.	Drive <number> has been removed from the system.

- Check the hard drive status in SupportAssist.
- Check the hard drive status in the RAID BIOS. For more information, see Checking hard drive status in the PERC BIOS section.

If you have any of the above error conditions, contact Dell Technical Support. When you call, keep the SupportAssist report and the troubleshooting logs ready.

How do I extract RAID-Controller Logs using MegaCLI for Windows and Linux?

NOTE: To export information about the status of the RAID controller and the connected hard drives, use the MegaCLI tool by LSI (Avagotech).

To create the appropriate diagnostic files, perform the following steps:

- Download the appropriate version of the MegaCli tool for Windows Operating systems from the [Avagotech support site](#).

NOTE:

For the most popular Linux operating systems, you also need the following file to ensure a smooth execution: -
Lib_Utills-1.00-09.noarch.rpm

- Unzip the downloaded files and copy them in any directory on the server or host system according your installed operating system. For example, on Windows the path can be C:\temp\megaccli, and on Linux the path can be /tmp/megaccli.
- Open a terminal in Linux or a command prompt in Windows operating systems and navigate to the newly created directory.
- Now, run the following commands:
 - To create the RAID controller logs in Windows, use the command `MegaCli.exe -FwTermLog -Dsply -aALL > ttylog.txt`.
 - To create the Event Log in Windows, use the command `MegaCli.exe -AdpEventLog -IncludeDeleted -f deleted.txt -aALL`.
 - To create the RAID controller logs in Linux, use the command `./MegaCli64 -FwTermLog -Dsply -aALL > /tmp/ttylog.txt`.
 - To create the Event Log in Linux, use the command `./MegaCli64 -AdpEventLog -IncludeDeleted -f deleted.txt -aALL`.

NOTE: The deleted.txt file is always stored in the MegaCli folder.

Symptoms

Hard disk drive making noise

Description

Clicking or other loud noise is heard from the hard drive. The noise can be intermittent and may or may not coincide with read or write operations.

Resolution

- 1 Run the custom ePSA diagnostics and obtain the error code. For more information on ePSA diagnostics, see [PSA/ePSA Diagnostics](#).
- 2 If the diagnostics fail, call Dell Technical Support for further assistance.
- 3 If the diagnostics pass, reseal the hard drive.
- 4 If the problem persists, call Dell Technical Support for further assistance.

Troubleshooting system memory

Prerequisite

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

Steps

- 1 If the system is operational, run the appropriate diagnostic test. See 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 step

If the problem persists, see the Getting help section.

Troubleshooting memory module issues

Following are guidelines to troubleshoot memory module issues:

- Check for the LCD status messages. The server's LCD screen displays text messages that indicate multi-bit and single-bit errors were detected in the System Event Log (SEL).
- Run the Dell SupportAssist to identify a faulty DIMM in the memory modules or in the System Event Logs (SEL) logs.
- Run the MPMemory diagnostics, which checks the logs first and then checks the DIMMs. If there is an issue, the test results display an error.
- Check for POST messaging error beep codes.
- Check for the POST status on the LCD screen.
- Check for memory and system compatibility.
- Delete the Single Bit Errors in the SEL log by using the OMSA, SupportAssist and CTRL-E to clear the SEL logs.
- Clear the Single-Bit Error (SBE) Log and Multi-Bit Error (MBE) Log to resolve the memory issues.
- Check for CPU socket for any bent pins.
- Ensure that the system is using the latest BIOS version. If not, update the BIOS and check if the error occurs.

Prerequisites to follow when installing or upgrading memory

- Identify the maximum memory capacity supported by the processor installed in the system.
- While installing the memory module, ensure that you follow the memory population rules. For more information, see the Memory population guidelines section.
- Ensure that the memory configurations set in the System BIOS matches with the memory modules installed in the system.

Memory population guidelines

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

- Populate DIMM sockets only if a processor is installed in the system.
- Populate release levers for all sockets in the following order—first white, then black, and then green.
- Mixing of different DIMM types is not supported. For example, only RDIMMs, only UDIMMs, or only LRDIMMs can be installed in a system.
- x4 and x8 DRAM based DIMMs can be mixed.
- Memory modules of different ranks can be mixed. For example, single rank and dual rank memory modules can be mixed. While mixing DIMMs with different capacities, ensure that you populate the sockets by highest rank count in the following order—first in sockets with white release levers, then black, and then green. 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. You can only mix maximum of two different rank DIMMs in the system.
- Memory modules of different capacities can be mixed. For example, 4 GB and 8 GB memory modules can be mixed. While installing memory modules of different capacities, ensure that you 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. You can mix maximum of two memory modules of different capacity.

- In a dual-processor configuration, the memory configuration for each processor should be identical through the first eight slots. For example, if you populate socket A1 for processor 1, then populate socket B1 for processor 2, and so on.

NOTE: For more information about the system memory guidelines specific to your system, see the Owner's Manual at [Dell.com/poweredgemanuals](https://www.dell.com/poweredge/manuals).

Memory modes

There are four types of memory modes:

- Advanced ECC (Lockstep)
- Memory Optimized (Independent Channel)
- Memory Sparing
- Memory Mirroring

You can configure the memory modes in the System BIOS. For more information, see the Configuring memory modes section.

Configuring memory modes

About this task

To configure memory modes, follow the procedure listed below:

Steps

- 1 Turn on or restart your system.
- 2 Press F2 immediately after you see the following message: <F2> = System Setup.
- 3 Click **System Setup Main menu > System BIOS > Memory Settings**.
- 4 In the **Memory Operating Mode** field, select the memory mode you want.

Memory Mirroring

In the memory mirroring mode, half of the installed memory is used to mirror the active DIMMs. When an uncorrectable error is detected, the system switches over to the mirrored copy. This mode offers SDDC and multi-bit protection and also provides strongest DIMM reliability mode compared to all other modes.

Memory Sparing

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 dual-rank DIMMs, the available system memory is: $3/4$ (ranks/channel) \times 16 (DIMMs) \times 4 GB = 48 GB, and not 16 (DIMMs) \times 4 GB = 64 GB.

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

NOTE: Both Advanced ECC or Lockstep and Optimizer modes support Memory Sparing.

Memory optimized (independent channel)

This mode supports SDDC only for memory modules that use x4 device width, and the mode does not impose any specific slot population requirements.

Advanced ECC

Advanced 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.

Memory lane failure

The disabling of the memory module in the channel results in memory lane failure.

Memory lane failure may occur due to the following reasons:

- The system is not using latest BIOS
- The memory modules are not seated properly on the DIMM sockets in the system.
- The system has a faulty DIMM socket.

Correctable and uncorrectable errors

Correctable errors can be detected and corrected if the chipset and DIMM support this functionality. Correctable errors are generally single bit errors (SBE). Most of the Dell servers are capable of detecting and correcting single bit errors. In addition, Dell servers with Advanced ECC mode support can detect and correct multi-bit errors.

Correctable errors can be classified as hard errors and soft errors. Hard errors typically indicate a problem with the DIMM. Although hard correctable memory errors are corrected by the system and will not result in system downtime or data corruption, they indicate a problem with the hardware. Soft errors do not indicate any issue with the DIMM. A soft error occurs when the data or ECC bits or both data and ECC bits on the DIMM are incorrect, but the error will not continue to occur after the data or ECC bits or both data and ECC bits on the DIMM have been corrected.

Uncorrectable errors are always multi-bit memory errors. While correctable errors do not affect the normal operation of the system, uncorrectable memory errors will immediately result in a system crash or shutdown of the system when not configured for Mirroring or RAID AMP modes. Uncorrectable memory errors can typically be isolated down to a failed Bank of DIMMs, rather than the DIMM itself.

System stops responding during POST after upgrading or installing a memory module

Issue:

During POST, the system stops responding or displays MEMTEST lane failure error message.

Resolution

Ensure the following:

- The system is using the latest BIOS.
- The memory modules are seated properly on the DIMM sockets in the system.
- The system has a no faulty DIMM socket.

How to resolve unsupported or mismatched memory module error messages reported during POST on a PowerEdge system?

Description:

After installing or upgrading a memory module, when you try to boot the system, an error message appears reporting an unsupported or mismatched memory module.

Resolution:

- If the memory module was replaced or upgraded, ensure that the maximum memory capacity and the memory type are supported by the processor installed in the system.
- While installing the memory module, ensure that you follow the memory population rules. For more information, see the Memory population guidelines section.

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.

The following sections provide information on troubleshooting power source and power supply units problems.

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.

📘 NOTE: Few power supply units require 200-240V AC to deliver their rated capacity. For more information, see the system Technical Specifications section in the Installation and Service Manual available at Dell.com/support/manuals.

Troubleshooting power supply unit problems

- 1 Ensure that no loose connections exist.
For example, loose power cables.
- 2 Ensure that the power supply handle LED indicates that the power supply is working properly.
- 3 If you have recently upgraded your system, ensure that the power supply unit has enough power to support the new system.
- 4 If you have a redundant power supply configuration, ensure that both the power supply units are of the same type and wattage.
If the LED You may have to upgrade to a higher wattage power supply unit.
- 5 Ensure that you use only power supply units with the Extended Power Performance (EPP) label on the back.

- 6 Reseat the power supply unit.

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

If the problem persists, see the Getting help section.

Troubleshooting RAID

RAID configuration using OpenManage Server Administrator

For more information about the OpenManage Server Administrator RAID Configuration video, go to <https://www.youtube.com/playlist?list=PLe5xhhyFjDPfL6NsJ29FXLVsP9uE-AFO0>.

Create Virtual Disk Express Wizard

The **Create Virtual Disk Wizard** allows you to select the wizard type and the RAID level. The **Create Virtual Disk Express Wizard** calculates the appropriate virtual disk configuration based on the available space and controller requirements. To make your own selections for the virtual disk configuration, select the **Advanced Wizard** option.

About this task

This task is not supported on PERC hardware controllers running in **HBA** mode. To create a virtual disk by using the **Create Virtual Disk Express Wizard**, perform the following steps:

Steps

- 1 On the upper-left corner of the **Server Administrator** page, expand **Storage**.
- 2 Click **PERC Controller**.
- 3 Click **Virtual Disks**.

The **Virtual Disk(s) on Controller <Controller Name>** page is displayed.

- 4 Click **Go to the Create Virtual Disk Wizard**.

The **Create Virtual Disk Wizard <Controller Name>** page is displayed.

- 5 Select the **Express Wizard** option and the **RAID level** from the drop-down menu.
- 6 Click **Continue**.

The **Create Virtual Disk Express Wizard - <Controller Name>** page displays the summary of attributes of the selected RAID level. The attributes include **Bus Protocol**, **Stripe Element Size**, **Read Policy**, and the selected physical disk. The default values of the virtual disk attributes excluding the RAID level are recommended for the selected RAID level.

- 7 In the **Name** field, type a name for the virtual disk.

The virtual disk name can contain only alphanumeric characters, spaces, dashes, and underscores. The maximum length of the virtual disk name depends on the controller. In most cases, the maximum length is 15 characters. The name cannot start with a space or end with a space.

NOTE: Dell recommends that you specify a unique name for each virtual disk. If you have virtual disks with the same name, it is difficult to differentiate the generated alerts.

- 8 In the **Size** field, type the size of the virtual disk.

The virtual disk size must be within the minimum and maximum values displayed against the **Size** field.

In some cases, the virtual disk is slightly larger than the size you specify. The **Create Virtual Disk Wizard** adjusts the size of the virtual disk to avoid rendering a portion of the physical disk space unusable.

- 9 If you want to change your selections, click **Go Back To Previous Page** to return to **Create Virtual Disk Express Wizard** page.

- 10 Click **Finish** to complete the virtual disk creation or click **Exit Wizard** to cancel the virtual disk creation.

For PERC H700 and PERC H800 controllers, if any of the drives you selected is in the spun down state, the following message is displayed:

The below listed physical drive(s) are in the **Spun Down** state. Executing this task on these drive(s) takes additional time, because the drive(s) need to spun up.

The message displays the ID(s) of the spun down drive(s).

 **NOTE:** When the hard drive is in the spun down state, the drive is not in active use.

The virtual disk is displayed on the **Virtual Disk(s) on Controller <Controller Name>** page.

Create virtual disk Advanced Wizard

The **Create Virtual Disk Advanced Wizard** allows you to specify the read, write, cache policy, and parameters such as RAID level, bus protocol, media type, and encrypted disk for the virtual disk. You can also select the physical disks and the controller connector. You must have a good knowledge of RAID levels and hardware to use the Advanced Wizard. If you want the wizard to recommend a virtual disk configuration for you, select the **Express Wizard** option.

About this task

 **NOTE:** This task is not supported on PERC hardware controllers running in HBA mode.

To create a virtual disk using the **Create Virtual Disk Advanced Wizard**:

Steps

- 1 On the upper-right corner of the **Server Administrator** page, click **Storage**.
- 2 Click **<PERC Controller>**.
- 3 Click **Virtual Disks**.
The **Virtual Disk(s) on Controller <Controller Name>** page is displayed.
- 4 Click **Go to the Create Virtual Disk Wizard**.
The **Create Virtual Disk Wizard <Controller Name>** page is displayed.
- 5 Select the **Advanced Wizard** option.
- 6 To make sure that only encrypted physical disks are used to create the virtual disk, select **Yes** from the **Create Encrypted Virtual Disk** drop-down list.
The RAID levels are available for selection based on the number of encrypted physical disks.
If you select **No**, the RAID levels are available based on the total number of physical disks present on the system.
- 7 Select the required RAID level from the drop-down menu.
- 8 Select **Bus Protocol**.
The options are:
 - SAS
 - SATA
- 9 Select **Media Type**.
The available options are:
 - HDD
 - SSD
- 10 Click **Continue**.

 **NOTE:** If you are creating an encrypted virtual disk, only the encrypted physical disks are displayed. Else, both encrypted and unencrypted physical disks are displayed.

Example:

Connector 0

The **Connector** section of the page displays the connectors on the controller and the disks attached to each connector. Select the disks you want to include in the virtual disk. In this example, the controller has a single connector with five disks.

- Physical disk 0:0
- Physical disk 0:1
- Physical disk 0:2
- Physical disk 0:3
- Physical disk 0:4

Physical Disks Selected

The **Physical Disks Selected** section of the page displays the disks you have chosen. In this example, two disks are selected.

- Physical disk 0:0
- Physical disk 0:1

Each RAID level has specific requirements for the number of disks that must be selected. RAID 10, RAID 50, and RAID 60 also have requirements for the number of disks that must be included in each stripe or span.

If the controller is a SAS controller with firmware version 6.1 and later, and you selected RAID 10, RAID 50, and RAID 60, the user interface displays the following:

- **All Disks**—Enables you to select all the physical disks in all the enclosures.
- **Enclosure**—Enables you to select all physical disks in the enclosure.

NOTE: The **All Disks** and **Enclosure** options enable you to edit spans after selecting the physical disks that comprise them. You can remove a span and specify a span again with different physical disks before proceeding.

- **Number of Disks per Span** — Enables you to select the number of disks in each span (default = 2). This option is available only on SAS controllers with firmware version 6.1 and later.

NOTE: This option is available only if **Intelligent Mirroring** is selected on the **Create Virtual Disk Advanced Wizard** page.

NOTE: On a SAS controller with firmware version 6.1 and later, RAID 10 supports only even number of disks per span and a maximum of 8 spans with 32 disks in each span.

Let us consider that the controller has three enclosures with six physical disks each (total number of available disks = 3 x 6 = 18 disks). If you select four disks per span, the controller creates four spans (18 disks/4 disks per span = 4 spans). The last two disks of the last enclosure are not part of RAID 10.

- Select the **number of disks to create a single spanned virtual disk** list box — Enables you to create a single span virtual disk with 22 or 26 physical drives for PERC controllers. This list box option is displayed only if you have selected RAID 10 in step 1 and the system has 22 or more physical drives.

NOTE: Only physical disks that comply with the virtual disk parameters, selected in the **Create Virtual Disk Wizard** page are displayed.

11 Select the required connector and the corresponding physical disk, and click **Continue**.

12 In the **Name** field, type a name for the virtual disk.

The virtual disk name can contain only alphanumeric characters, spaces, dashes, and underscores. The maximum length depends on the controller. In most cases, the maximum length is 15 characters.

The name cannot start with a space or end with a space. If you have virtual disks with the same name, it is hard to differentiate the generated alerts, Dell recommends that you specify a unique name for each virtual disk.

13 In the **Size** field, type the size of the virtual disk.

The virtual disk size must be within the minimum and maximum values displayed near the **Size** field.

In some cases, the virtual disk is slightly larger than the size you specify. The **Create Virtual Disk Wizard** adjusts the size of the virtual disk to avoid rendering a portion of the physical disk space unusable.

NOTE:

- If a physical disk is receiving a SMART alert, it cannot be used in a virtual disk.
- For a controller that has more than one channel, it may be possible to configure a virtual disk that is channel-redundant.

Depending on the RAID level you selected and the virtual disk size, this page displays the disks and connectors (channels or ports) available for configuring the virtual disk.

NOTE: The Size field displays the default size of the virtual disk depending upon the RAID configuration you selected. However, you can also specify a different size based on your requirement. The virtual disk size must be within the minimum and maximum values displayed against the Size field. In some cases, the virtual disk is slightly larger than the size you specify. The Create Virtual Disk Wizard adjusts the size of the virtual disk to avoid rendering a portion of the physical disk space unusable.

- 14 Select a stripe size from the **Stripe Element Size** drop-down list box. The stripe size refers to the amount of space that each stripe consumes on a single disk.
- 15 Select the required read, write, and disk cache policy from the respective drop-down list box. These selections can vary depending on the controller.

NOTE:

- There is limited support for write policy on controllers that do not have a battery. The cache policy is not supported on controllers that do not have a battery.
- If you have selected the **Create Encrypted Virtual Disk** option in **Create Virtual Disk Advanced Wizard**, then in the **Summary of Virtual Disk Attributes**, an **Encrypted Virtual Disk** attribute is displayed with a value **Yes**.

- 16 Click **Span Edit** to edit the spans created in **Create Virtual Disk Advanced Wizard**.

CAUTION: If you click **Span Edit**, **Intelligent Mirroring** that has already been applied becomes invalid.

NOTE: The **Span Edit** option is available in the following two cases:

- Only if the controller is a SAS controller with firmware 6.1 and later.
- If you selected RAID 10 while using [Create virtual disk Advanced Wizard](#).

- 17 If you want to change your selections, click **Go Back To Previous Page** to return to **Create Virtual Disk Advanced Wizard** page.
- 18 Click **Finish** to complete the virtual disk creation or click **Exit Wizard** to cancel the virtual disk creation.

The virtual disk is displayed in the **Virtual Disk(s) on Controller <Controller Name>** page.

For PERC H700 and PERC H800 controllers, if any of the drives you selected is in the spun down state, the following message is displayed:

The below listed physical drive(s) are in the spun down state. Executing this task on these drive(s) takes additional time, because the drive(s) need to spun up.

The message displays the ID(s) of the spun down drive(s).

The **Create Virtual Disk Advanced Wizard - <Controller Name>** page displays a checkbox next to each physical disk that is suitable as a dedicated hot spare. Select a **Physical Disk** checkbox if you want to assign a dedicated hot spare.

The **Physical Disk** checkbox is not available if the controller does not have a physical disk that is a suitable hot spare for the virtual disk you are creating. For example, the available physical disks may not be sufficient to protect the virtual disk. If the **Physical Disk** checkbox is not available, specify a smaller virtual disk, use a different RAID level, or change the disk selection.

NOTE: If you are creating an encrypted virtual disk, then encrypted physical disks are listed as candidates for hot spare.

RAID configuration by using Unified Server Configurator

The Unified Server Configurators (USC)'s main features include operating system deployment, firmware updates, hardware configuration, and diagnostics. The UEFI specification creates framework for many powerful applications that run without an operating system. The UEFI

specification includes the Trusted Computing Group (TCG) protocol that allows for Trusted Platform Module (TPM) measurements and secure updates which USC leverages to its fullest extent.

- 1 Select the **RAID configuration** tab to create the virtual disk as the boot device.
- 2 On the **View Current Configuration** screen, you can view a list of current controllers and virtual disks installed in the system.
 - a If the virtual disk or disks exist in the system, click **Exit** to exit the screen and continue with operating system installation. If the virtual disk or disks do not exist in the system, continue with the new virtual disk creation process.
- 3 On the **Select RAID Controller** screen, select the controller on which to configure a virtual disk.
 - If the selected controller contains a foreign configuration, the **Foreign Configuration Detected** screen is displayed.
 - Depending on the foreign configuration, you have the option to either **Clear**, **Import** or **Ignore** the foreign configuration.
 - If you select the **Clear Foreign Configuration** option, all the data gets deleted on the drives containing the foreign configuration, thereby allowing the drives to be used in a new configuration.
 - Selecting **Import Foreign Configuration** attempts to import the foreign configuration.
 - Selecting **Ignore Foreign Configuration** leaves the drives in their current state and uses free drives to create a new configuration.

i **NOTE:** Selecting the **Ignore Foreign Configuration** causes the system to generate alerts and error messages every time the system is started.

- 4 Select either the **Express Wizard** or **Advanced Wizard** window on the **Select a Configuration Option** screen.

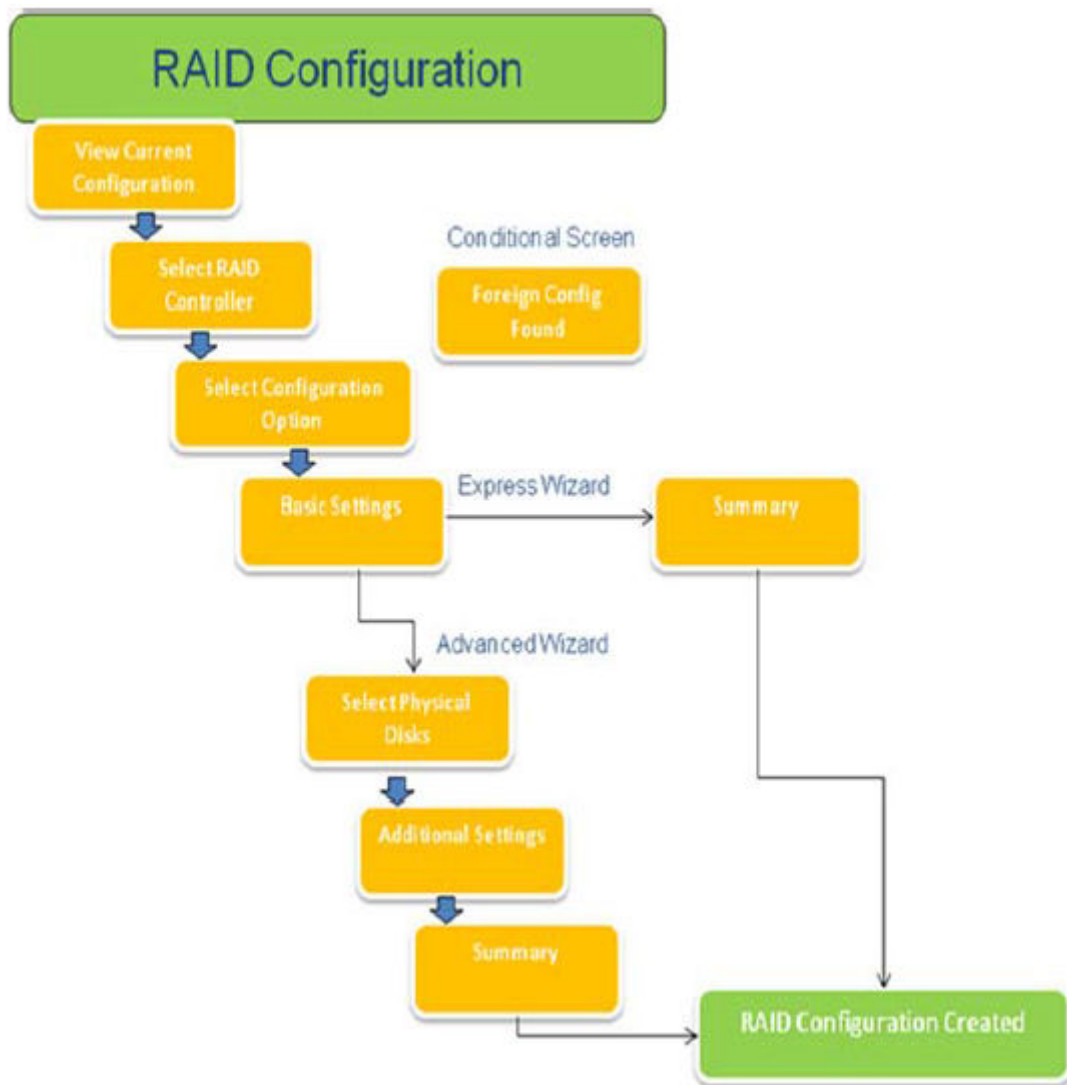


Figure 15. Flowchart of Unified Server Configurator's RAID configuration process

- 5 The Express option selects the appropriate disks depending upon the RAID type selected for virtual disk creation. The **Summary** screen is displayed. You can review the choices selected during the Express wizard.
- 6 Click **Finish** to create the virtual disk to be used for operating system installation.
- 7 The **Advanced** option takes you to a series of more screens. Select the RAID type on the **Basic Settings** screen. On the **Select Physical Disks** screen, select the physical disks that are the part of the virtual disk. The **Additional Settings** screen is displayed to define additional parameters for the virtual disk, such as stripe element size, read and write policy, and whether or not to assign a hot spare disk. The **Summary** of virtual disk attributes is displayed.
- 8 Click **Finish** to create virtual disk to be used for operating system installation.

Downloading and installing the RAID controller log export by using PERCCLI tool on ESXi hosts on Dell's 13th generation of PowerEdge servers

To export information about the status of the RAID controller and its attached hard drives, you can use the PERCCLI tool. To download and install the RAID controller log export by using PERCCLI tool on ESXi hosts on Dell's 13th generation of PowerEdge servers, perform the following steps:

- 1 Download the latest version of PERCCLI for ESX tool from **Dell.com/support/home**.
- 2 To upload the PERCCLI tool to Datastore:
 - a Select the **host** (1), and then click on the **Configuration** tab (2).
 - b In the **Hardware** panel, select **Storage** (3) and right-click **datastore1**.

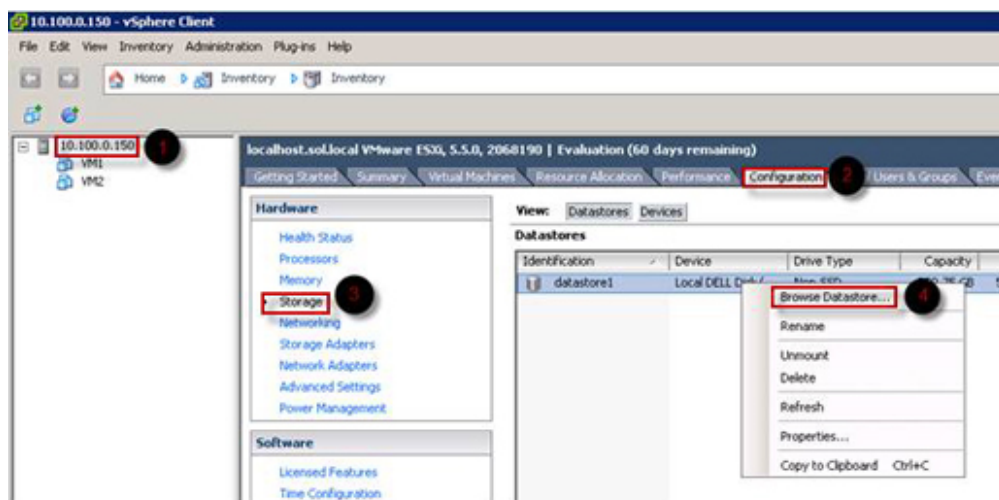


Figure 16. vSphere Client

- a In **Datastore Browser**, click **Upload**, and then click **Upload File**.



Figure 17. Datastore Browser

- 3 To enable Secure Socket Shell (SSH) select **host** (1), and then click on the **Configuration** tab (2). In the **Software** panel, select **Security Profile** (3). In **Services**, click **Properties** (4) at the upper-right corner of the screen.

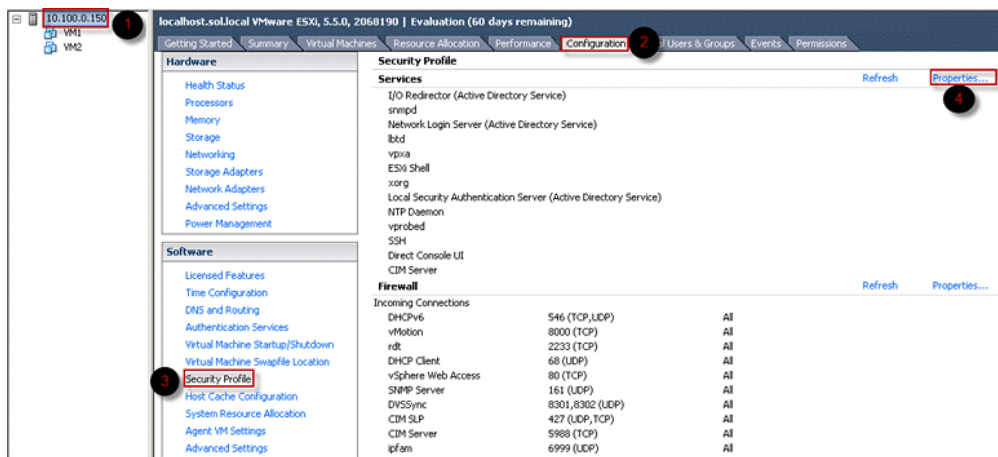


Figure 18. Configuration tab

- a In the **Services properties** window, select **SSH** (1), and then click **Options...** (2)

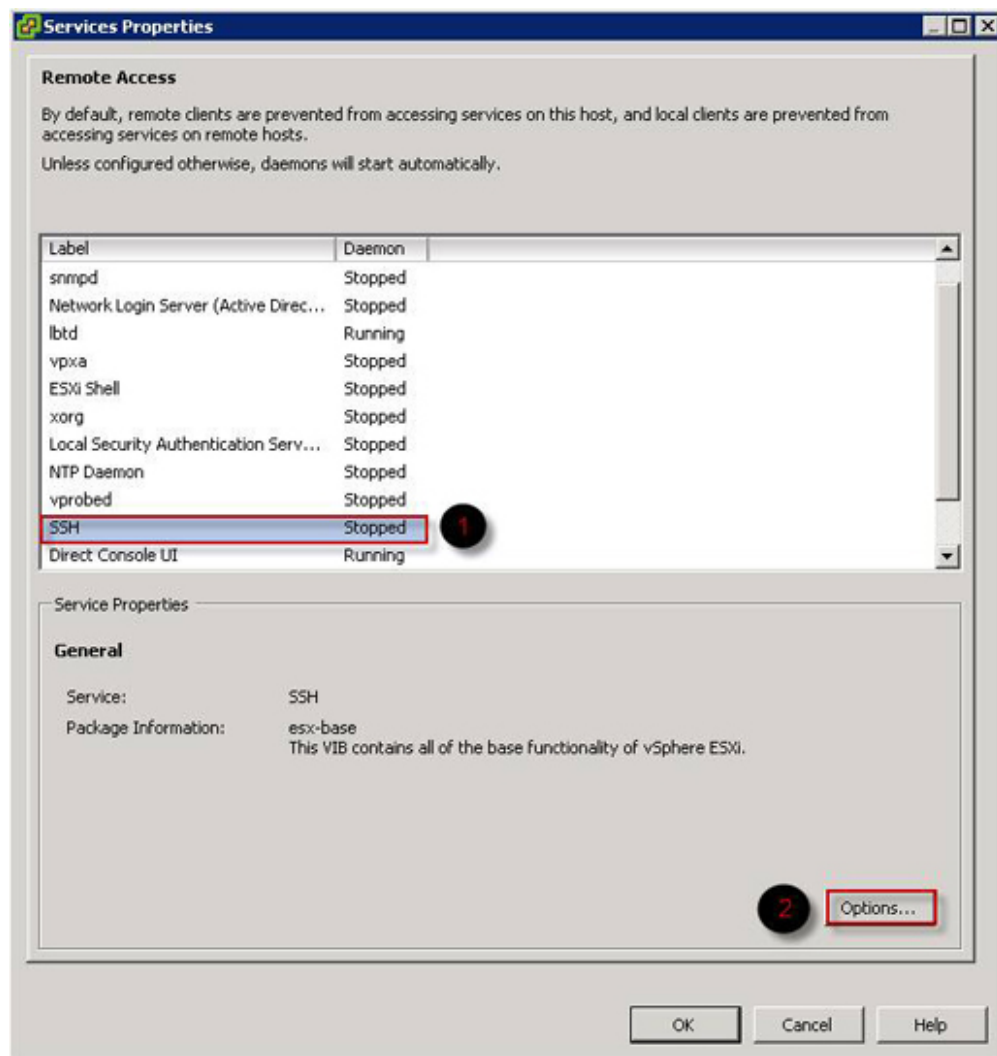


Figure 19. Open SSH Options

- b In the **SSH Options** window, click **Start** (1), and then click **OK** (2) to activate the service.

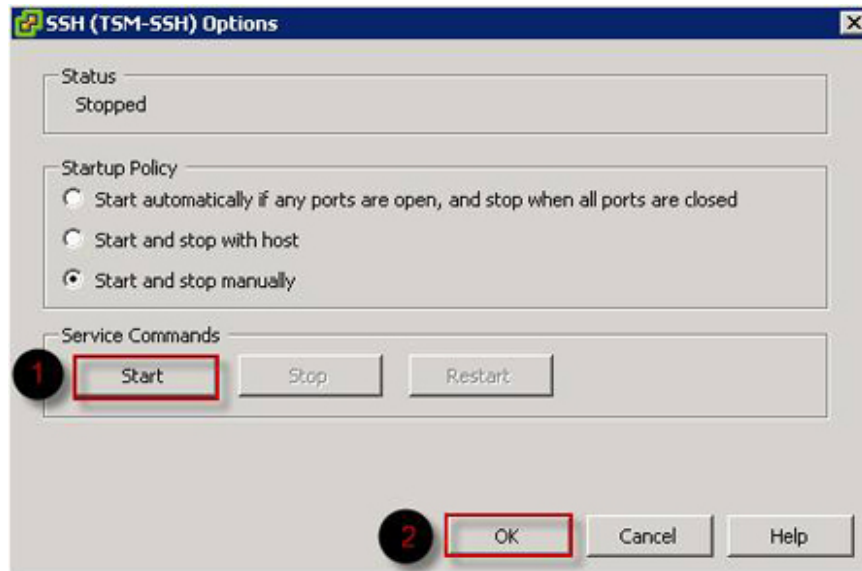


Figure 20. Start SSH Service

- 4 To unzip vmware-esx-perccli, open an SSH connection via PUTTY and run the command: `unzip /vmfs/volumes/datastore1/vmware-esx-perccli-1.05.08.zip`

PUTTY is a free and open-source terminal emulator, serial console and network file transfer application. It supports several network protocols, including SCP, SSH, Telnet, rlogin, and raw socket connection. You can download it from Google. The files vmware-esx-perccli-1.05.08.vib and Readme.txt are now extracted to: `/vmfs/volumes/datastore1/`

⚠ WARNING: Please check the correct path (e.g. datastore1) according to your installation package

- 5 Install PERCCLI by using command: `esxcli software vib install -v /vmfs/volumes/datastore1/vmware-esx-perccli-1.05.08.vib --no-sig-check`

```

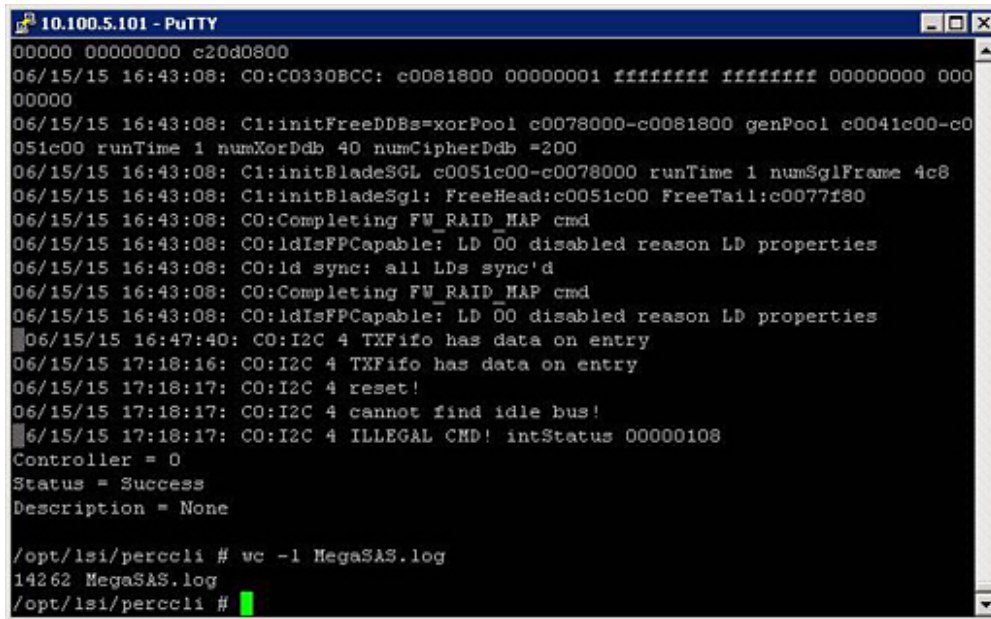
10.100.5.101 - PuTTY
~ # vmware -v1
VMware ESXi 5.5.0 build-2068190
VMware ESXi 5.5.0 Update 2
~ # esxcli hardware platform get
Platform Information
  UUID: 0x4c 0x4c 0x45 0x44 0x0 0x4a 0x50 0x10 0x80 0x4a 0xc3 0xc0 0x4f 0x33 0x
34 0x32
  Product Name: PowerEdge R430
  Vendor Name: Dell Inc.
  Serial Number: CJPJ342
  IPMI Supported: true
~ # esxcli software vib install -v /vmfs/volumes/datastore1/vmware-esx-perccli-1
.05.08.vib --no-sig-check
Installation Result
  Message: Operation finished successfully.
  Reboot Required: false
  VIBs Installed: LSI_bootbank_vmware-esx-perccli-1.05.08_1.05.08-01
  VIBs Removed:
  VIBs Skipped:
~ #

```

Figure 21. Install PERCCLI

- 6 Go to directory `/opt/lsi/perccli` by using command: `cd /opt/lsi/perccli`
- 7 Collect the logs by using command: `./perccli /c0 show termlog`

The log is created with the name: **#### MegaSAS.log**



```
00000 00000000 c20d0800
06/15/15 16:43:08: CO:C0330BCC: c0081800 00000001 ffffffff ffffffff 00000000 000
00000
06/15/15 16:43:08: C1:initFreeDDbs=xorPool c0078000-c0081800 genPool c0041c00-c0
051c00 runTime 1 numXorDdb 40 numCipherDdb =200
06/15/15 16:43:08: C1:initBladeSGL c0051c00-c0078000 runTime 1 numSglFrame 4c8
06/15/15 16:43:08: C1:initBladeSgl: FreeHead:c0051c00 FreeTail:c0077f80
06/15/15 16:43:08: CO:Completing FW_RAID_MAP cmd
06/15/15 16:43:08: CO:ldIsFPCapable: LD 00 disabled reason LD properties
06/15/15 16:43:08: CO:ld sync: all LDs sync'd
06/15/15 16:43:08: CO:Completing FW_RAID_MAP cmd
06/15/15 16:43:08: CO:ldIsFPCapable: LD 00 disabled reason LD properties
06/15/15 16:47:40: CO:I2C 4 TXFifo has data on entry
06/15/15 17:18:16: CO:I2C 4 TXFifo has data on entry
06/15/15 17:18:17: CO:I2C 4 reset!
06/15/15 17:18:17: CO:I2C 4 cannot find idle bus!
06/15/15 17:18:17: CO:I2C 4 ILLEGAL CMD! intStatus 00000108
Controller = 0
Status = Success
Description = None

/opt/lsi/percccli # wc -l MegaSAS.log
14262 MegaSAS.log
/opt/lsi/percccli #
```

Figure 22. Log creation

- 8 Copy MegaSAS.log to datastore by using command: `cp /opt/lsi/percccli/MegaSAS.log /vmfs/volumes/datastore1/`
- 9 Copy the file to desktop with **Datastore Browser**.

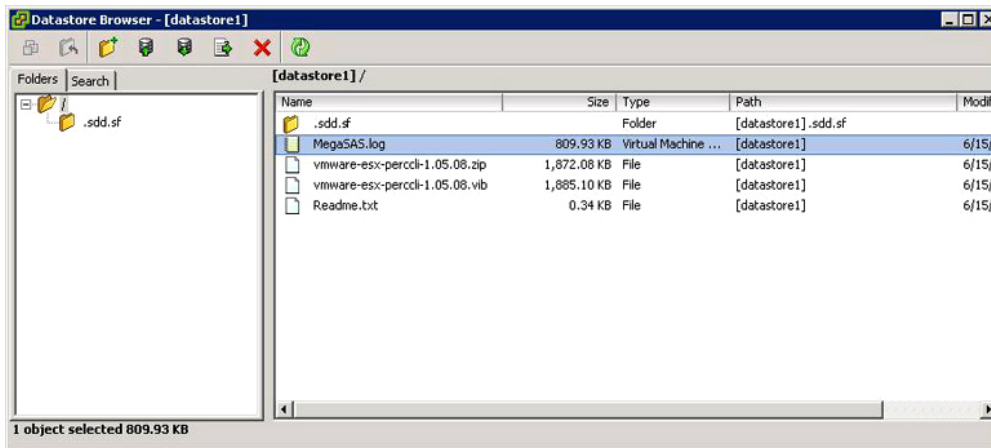


Figure 23. Log file in Datastore Browser

Now the logs are exported on ESXi hosts on the Dell 13th generation PowerEdge servers.

Configuring RAID by using Lifecycle Controller

Prerequisite

If your system has one or more supported PERC RAID controllers with PERC 8 firmware or later, or software RAID controllers, use the RAID Configuration wizard to configure a virtual disk as the boot device.

NOTE: Create boot virtual disk only from a disk drive populated across slots 0–3 of the system. For slot information, see the server Owner's Manual at Dell.com/poweredgemanuals.

Steps

- 1 Launch the **Lifecycle Controller** home page, click **Hardware Configuration**, and then click **Configuration Wizards**.
The **Configuration Wizards** window is displayed.
- 2 In **Storage Configuration Wizards**, click **RAID Configuration**.
- 3 Select the RAID controller to view its current virtual disk configuration and disk attributes. Click **Next**.
- 4 Select the RAID level for the virtual disk that you want to create and click **Next**.
- 5 On the **Select Physical Disks** screen, the default values for **Protocol**, **Media Type**, and **Encryption capability** are displayed.
- 6 Select the required physical disks that you want to include in the virtual disk, and then click **Next**.
- 7 On the **Virtual Disk Attributes** screen, type the virtual disk name.

i | **NOTE:** The virtual disk name should not contain any space or special characters.
- 8 Type the size of the physical disk.
The values for **Stripe Element Size**, **Read Policy**, and **Write Policy** are displayed by default.
- 9 If you want to change the values for **Stripe Element**, **Read Policy** and **Write Policy**, select the required values from the respective drop-down lists.
The **Summary** of virtual disk attributes is displayed.
- 10 Click **Finish**.
- 11 On the **RAID Configuration Warning** window, click **Yes** if you wish to continue with the creation of virtual disk.
The **RAID Configuration window** is displayed. Note that this operation might take approximately one minute to complete.
- 12 When the virtual disk is created successfully, the **RAID Configuration Success** window is displayed. Click **OK**.
You are taken to the **Hardware configuration** window. Click **Back** to go to the home page.
- 13 You can verify, if the RAID operation was successful by checking the events in the **Lifecycle Log**.
 - a Click **View Lifecycle Log History**. The **View Lifecycle Log** window is displayed. Note that this operation might take few minutes.
 - b On the **View Log History** page, you can verify if the RAID operation is successful. For more information about Dell Lifecycle controller, go to [Dell.com/ techcenter/LC](https://www.dell.com/techcenter/LC).

For more information about the Dell Lifecycle Controller RAID Configuration video, go to <https://www.youtube.com/watch?v=JFPmeHNENV4>

Starting and target RAID levels for virtual disk reconfiguration and capacity expansion

After you have created a virtual disk, the possibilities for reconfiguring the virtual disk depend on the controller, RAID level, and available physical disks.

Table 13. Possible scenarios for reconfiguring a virtual disk

Controller	Starting RAID Level	Target RAID Level	Comments
PERC 6/E, PERC 6/I, PERC H800 Adapter, PERC H700 Adapter, PERC H700 Integrated, and PERC H700 Modular, PERC H310 Adapter, PERC H310 Mini Monolithic, PERC H310 Mini Blades, PERC H710 Adapter, PERC H710 Mini Blades, PERC H710 Mini Monolithic, PERC H710P Adapter, PERC H710P Mini Blades, PERC H710P Mini Monolithic, PERC H810 Adapter,	RAID 0	RAID 1	Add a single disk
	RAID 0	RAID 0, RAID 5	Add at least one additional disk.
	RAID 0	RAID 6	RAID 6 requires a minimum of 4 disks. Reconfiguration from RAID 0 to RAID 6 requires at least 2 additional disks even when this exceeds the 4-disk minimum required by RAID 6
	RAID 1	RAID 0	With or without adding additional disks

Controller	Starting RAID Level	Target RAID Level	Comments
PERC H330 Adapter, PERC H330 Mini Monolithic, PERC H330 Mini Blades, PERC H330 Embedded, PERC H730 Adapter, PERC H730 Mini Monolithic, PERC H730 Mini Blades, PERC H730P Adapter, PERC H730P Mini Monolithic, PERC H730P Mini Blades, PERC H730P Slim, PERC H830 Adapter, PERC FD33xD/FD33xS	RAID 1	RAID 5, RAID 6	Add at least one additional disk. RAID 6 requires a minimum of 4 disks.
	RAID 5	RAID 0	With or without adding additional disks
	RAID 5	RAID 5, RAID 6	Add at least one additional disk. RAID 6 requires a minimum of 4 disks.
	RAID 6	RAID 0, RAID 5	With or without adding additional disks
	RAID 6	RAID 6	Add at least one additional disk
	RAID 10	RAID 10	Without adding additional disks
SAS 6/iR	N/A	N/A	N/A
PERC S100, S110, S130, and S300	RAID 0	RAID 0	With or without additional disks
	RAID 1	RAID 1	Without additional disks
	RAID 5	RAID 5	With or without additional disks
	RAID 10	RAID 10	Without additional disks

- ① **NOTE:** The order of the controllers displayed on Storage Management may differ from the order of the controllers displayed in the Human Interface (HII) and PERC Option ROM. The order of the controllers does not cause any limitation.
- ① **NOTE:** When creating virtual disks using software RAID controllers, the information related to the physical disks linked to the virtual disk is enumerated or displayed on Storage Management after a short delay. This delay in displaying the information does not cause any functional limitation. If you are creating partial virtual disks, Dell recommends that you provide Storage Management adequate time between each partial virtual disk creation process.
- ① **NOTE:** RAID 10 virtual disk reconfiguration operation is not supported with Intelligent Mirroring.

Reconfiguring or migrating virtual disks

About this task

Reconfiguring or migrating a virtual disk (VDs) enables you to increase the capacity or change the RAID level of the virtual disk.

- ① **NOTE:** In the PERC BIOS Configuration Utility window, with software RAID S110 and S130 controllers, if a physical disk (SATA SSD or HDD) is removed from a virtual disk and the same physical disk is reinserted (hot plug) into the virtual disk instantly, then the virtual disk state is displayed as Ready or Non RAID (for the PERC S110 and S100) and the physical disk state is displayed as Online. However, if the same physical disk is reinserted after a short delay, then the virtual disk state is displayed as Degraded and the physical disk state is displayed as Ready.

To reconfigure a virtual disk:

Steps

- 1 Review the information in the Starting and Target RAID Levels for Virtual Disk Reconfiguration and Capacity Expansion section in this document.
- 2 In the tree view, locate the controller on which the virtual disk resides. Expand the controller object until the **Virtual Disks** object is displayed.
- 3 Select the **Reconfigure** task from the virtual disk's **Tasks** drop-down list box and click **Execute**.

- 4 Complete the **Reconfigure** task using the Reconfigure wizard.

Starting and target RAID levels for virtual disk reconfiguration and capacity expansion

After you have created a virtual disk, the possibilities for reconfiguring the virtual disk depend on the controller, RAID level, and available physical disks.

Table 14. Possible scenarios for reconfiguring a virtual disk

Controller	Starting RAID Level	Target RAID Level	Comments
PERC 6/E, PERC 6/I, PERC H800 Adapter, PERC H700 Adapter, PERC H700 Integrated, and PERC H700 Modular, PERC H310 Adapter, PERC H310 Mini Monolithic, PERC H310 Mini Blades, PERC H710 Adapter, PERC H710 Mini Blades, PERC H710 Mini Monolithic, PERC H710P Adapter, PERC H710P Mini Blades, PERC H710P Mini Monolithic, PERC H810 Adapter, PERC H330 Adapter, PERC H330 Mini Monolithic, PERC H330 Mini Blades, PERC H330 Embedded, PERC H730 Adapter, PERC H730 Mini Monolithic, PERC H730 Mini Blades, PERC H730P Adapter, PERC H730P Mini Monolithic, PERC H730P Mini Blades, PERC H730P Slim, PERC H830 Adapter, PERC FD33xD/FD33xS	RAID 0	RAID 1	Add a single disk
	RAID 0	RAID 0, RAID 5	Add at least one additional disk.
	RAID 0	RAID 6	RAID 6 requires a minimum of 4 disks. Reconfiguration from RAID 0 to RAID 6 requires at least 2 additional disks even when this exceeds the 4-disk minimum required by RAID 6
	RAID 1	RAID 0	With or without adding additional disks
	RAID 1	RAID 5, RAID 6	Add at least one additional disk. RAID 6 requires a minimum of 4 disks.
	RAID 5	RAID 0	With or without adding additional disks
	RAID 5	RAID 5, RAID 6	Add at least one additional disk. RAID 6 requires a minimum of 4 disks.
	RAID 6	RAID 0, RAID 5	With or without adding additional disks
	RAID 6	RAID 6	Add at least one additional disk
	RAID 10	RAID 10	Without adding additional disks
SAS 6/IR	N/A	N/A	N/A
PERC S100, S110, S130, and S300	RAID 0	RAID 0	With or without additional disks
	RAID 1	RAID 1	Without additional disks
	RAID 5	RAID 5	With or without additional disks
	RAID 10	RAID 10	Without additional disks

NOTE: The order of the controllers displayed on Storage Management may differ from the order of the controllers displayed in the Human Interface (HII) and PERC Option ROM. The order of the controllers does not cause any limitation.

- ① **NOTE:** When creating virtual disks using software RAID controllers, the information related to the physical disks linked to the virtual disk is enumerated or displayed on Storage Management after a short delay. This delay in displaying the information does not cause any functional limitation. If you are creating partial virtual disks, Dell recommends that you provide Storage Management adequate time between each partial virtual disk creation process.
- ① **NOTE:** RAID 10 virtual disk reconfiguration operation is not supported with Intelligent Mirroring.

Foreign Configuration Operations

Foreign configuration is virtual disk data residing on physical disks that have been moved from one controller to another.

The **Foreign Configuration Operations** task provides a preview of the foreign configurations that you can import.

- ① **NOTE:** On the PERC BIOS Configuration Utility screen, foreign configuration operations are not supported on PERC hardware controllers running in HBA mode.
- ① **NOTE:** Foreign Configuration Operations task is available only on PERC 6 and SAS controllers with firmware versions 6.1 and later.
- ① **NOTE:** It is not recommended to remove an external enclosure cable while the operating system is running on the system. Removing the cable could result in a foreign configuration when the connection is re-established.

The **Foreign Configuration Operations** task is displayed only when a controller detects a foreign configuration. Select this option and click **Execute** to display the **Foreign Configuration Preview** page.

The **Foreign Configuration Preview** page provides a preview of the foreign disks and enables you to perform operations such as, importing, recovering, or clearing the foreign disks. You can also import or clear a locked foreign configuration.

If any foreign configurations that are locked by using **Local Key manager (LKM)** are detected, the associated **Encryption Key Identifier** is displayed prompting you to provide the corresponding passphrase to unlock the drives.

To avoid unlocking foreign configurations and to proceed to preview, import, or clear a foreign configuration that has not been locked, on the **PERC BIOS Configuration Utility Foreign Configuration** screen, click **Skip** or **Continue**.

If you do not want to import or clear the foreign configurations, or in case of loss of the associated passphrase of the corresponding **Encryption Key Identifier**, execute the **Instant Encrypt Erase** task for the physical disks.



⚠ **CAUTION:** Executing the Instant Encrypt Erase task erases all data on the physical disk.


Some conditions, such as an unsupported RAID level or an incomplete disk group, can prevent the import or recovery of foreign virtual disks.

Foreign Configuration properties

The following table describes the properties that are displayed on the **PERC BIOS Configuration Utility Foreign Configuration** screen for the Foreign Disks and Global Hot Spares.

Table 15. Foreign Configuration Properties

Property	Definition
Status	<p>These icons represent the severity or health of the storage component.</p> <ul style="list-style-type: none"> •  Normal/OK •  Warning/Non-critical

Property	Definition
	<ul style="list-style-type: none">  Critical/Failure/Error
Name	Displays the name of the foreign configuration and is available as a link. This link enables you to access the physical disks that constitute the foreign disk.
State	<p>Displays the current state of the foreign configuration. Possible values are:</p> <ul style="list-style-type: none"> Ready — The foreign disk can be imported and functions normally after import. Degraded — The foreign disk is in degraded state and rebuilds after import. Failed — The foreign disk has encountered a failure and is no longer functioning. You cannot import the foreign configuration. <p>The foreign configuration may be in degraded or failed state due to any of the following reasons:</p> <ul style="list-style-type: none"> Missing physical disk — One of the physical disk(s) in the potential virtual disk is missing or not available. Missing span — One or more spans of a hybrid virtual disk is missing. Stale physical disks — One or more physical disks in the configuration may contain out-of-date data relating to other disks of that virtual disk. Hence, the data integrity of the imported virtual disk is not intact. Unsupported configuration of the virtual disk — The virtual disk has an unsupported RAID level. Import and Export — The virtual disks available for import exceed the number of virtual disks available for export. Incompatible physical disks — Configuration on the physical disks is not recognized by the RAID firmware. Orphan drive — A physical disk in the foreign configuration has configuration information that matches another physical disk that is already a part of an array (either a foreign or a native array).
Layout	Displays the RAID level of the foreign configuration.
Remarks	<p>Provides information about the foreign virtual disk. If the virtual disk cannot be imported, the reason for failure is displayed.</p> <ul style="list-style-type: none"> Exceeded maximum — The number of virtual disks selected for import has exceeded the maximum number of supported disks. Missing physical disk or Missing span — One or more physical disk(s) or span(s) in the virtual disk to be imported is missing. Unsupported — The selected RAID level is not supported on this controller. Orphan drive — The physical disk has been replaced and is no longer a part of the RAID volume. The configuration should be cleared. Stale physical disk — The physical disk to be imported in the virtual disk has outdated data. Partially foreign — The virtual disk is part of an already existing configuration. Some physical disks in this virtual disk are foreign.
Dedicated Hot Spare	Displays whether the foreign disk is a dedicated hot spare.

Based on the properties information, you can decide whether you want to import, recover, or clear the foreign configuration.

Viewing Patrol Read report

The patrol read report provides information on all the patrol reads performed on the controller in the chronological order. It provides information such as last run time and result. If a patrol read fails, the reason for the failure is displayed.

Setting Patrol Read mode

① | **NOTE:** This task is not supported on PERC hardware controllers running in HBA mode.

Patrol read identifies disk errors in order to avoid disk failures and data loss or corruption. The **Set Patrol Read** task is applicable only for disks used as virtual disks or hot spares.

The **Set Patrol Read** task runs in the background and corrects the disk errors, when possible. When the **Set Patrol Read mode** is set to **Auto**, patrol read is initiated when the controller is idle for a specific period of time and when no other background tasks are active. In this scenario, the patrol read enhances the system performance as disk errors can be identified and corrected when there is no input/output activity on the disk.

The controller adjusts the amount of system resources dedicated for patrol read based on the amount of controller activity that is competing with the Patrol Read task. When the controller activity is high, fewer system resources are dedicated to the patrol read task.

Patrol Read does not run on a physical disk in the following circumstances:

- The physical disk is not included in a virtual disk or is assigned as a hot spare.
- The physical disk is included in a virtual disk that is currently undergoing one of the following:
 - Rebuild
 - Reconfiguration or reconstruction
 - Background initialization
 - Check consistency

In addition, the Patrol Read is suspended during heavy I/O activity and resumes when the I/O is finished.

To set Patrol Read mode, select the desired Patrol Read Mode option. The options available are:

- **Auto** — Initiates the Patrol Read task. After the task is complete, it automatically runs again within a specified period. For example, on some controllers the Patrol Read runs every four hours and on other controllers, the Patrol Read runs every seven days. The Patrol Read task runs continuously on the system starting again within the specified period after each iteration of the task completes. If the system reboots while the Patrol Read task is running in **Auto** mode, the Patrol Read restarts at zero percent (0%). When the Patrol Read task is set to **Auto** mode, you cannot start or stop the task. **Auto** mode is the default setting.

① | **NOTE:** For more information on how often the Patrol Read task runs when in Auto mode, see your controller documentation.

- **Manual** — Enables you to start and stop the Patrol Read task using **Start and Stop Patrol Read**. Setting the mode to **Manual** does not initiate the Patrol Read task. If the system reboots while Patrol Read is running in **Manual** mode, Patrol Read does not restart.
- **Disabled** — Prevents the Patrol Read task from running on the system.

To set Patrol Read mode

Select the desired Patrol Read Mode option. The options available are:

- **Auto** — Initiates the Patrol Read task. After the task is complete, it automatically runs again within a specified period. For example, on some controllers the Patrol Read runs every four hours and on other controllers, the Patrol Read runs every seven days. The Patrol Read task runs continuously on the system starting again within the specified period after each iteration of the task completes. If the system reboots while the Patrol Read task is running in **Auto** mode, the Patrol Read restarts at zero percent (0%). When the Patrol Read task is set to **Auto** mode, you cannot start or stop the task. **Auto** mode is the default setting.

① | **NOTE:** For more information on how often the Patrol Read task runs when in Auto mode, see your controller documentation.

- **Manual** — Enables you to start and stop the Patrol Read task using **Start and Stop Patrol Read**. Setting the mode to **Manual** does not initiate the Patrol Read task. If the system reboots while Patrol Read is running in **Manual** mode, Patrol Read does not restart.
- **Disabled** — Prevents the Patrol Read task from running on the system.

Check Consistency report

The check consistency report provides information on all the consistency checks performed on the controller in a chronological order. It provides information such as last run time and result. If the consistency check fails, it provides the reason for the failure.

Performing a Check Consistency

The **Check Consistency** task verifies the accuracy of the redundant (parity) information. This task only applies to redundant virtual disks. When necessary, the **Check Consistency** task rebuilds the redundant data. If the virtual disk is in a Failed Redundancy state, running a check consistency may return the virtual disk to a Ready state.

Canceling a Check Consistency

The Cancel Check Consistency task stops a check consistency operation while it is in progress.

Pausing a Check Consistency

The Pause Check Consistency task pauses a check consistency while it is in progress.

NOTE: The Pause Check Consistency task updates the virtual disk State property to Resynchronizing Paused immediately. The Progress property may continue to increment for up to three seconds. This time delay occurs because the polling task may take up to three seconds to query the task information and update the display.

Resuming a Check Consistency

The Resume Check Consistency task resumes check consistency after it has been paused.

To locate view Check Consistency report in Storage Management:

- 1 In the **Server Administrator** window, under the system tree, click **Storage**.
- 2 Select **View Check Consistency Report** from the **Select Report** drop-down menu.
- 3 Click **Execute**.

To locate view Check Consistency report in Storage Management

- 1 In the **Server Administrator** window, under the system tree, click **Storage**.
- 2 Select **View Check Consistency Report** from the **Select Report** drop-down menu.
- 3 Click **Execute**.

Virtual disk troubleshooting

Rebuilding of virtual disk does not work

Rebuilding of virtual disk does not work in the following situations:

- The virtual disk is non redundant — For example, a RAID 0 virtual disk cannot be rebuilt because RAID 0 does not provide data redundancy.
- There is no hot spare assigned to the virtual disk — As long as the virtual disk is redundant, to rebuild it:
 - Remove the failed physical disk and replace it. A rebuild automatically starts on the new disk.

- Assign a hot spare to the virtual disk and then perform a rebuild.
- You are attempting to rebuild onto a hot spare that is too small — Different controllers have different size requirements for hot spares.
- The hot spare is unassigned from the virtual disk — This occurs on some controllers if the hot spare is assigned to more than one virtual disk and is being used to rebuild a failed physical disk for another virtual disk.
- The virtual disk includes failed or corrupt physical disks — This situation may generate alert 2083. For information on alert messages, see the *Server Administrator Messages Reference Guide* at Dell.com/support/home.
- The rebuild rate setting is too low — If the rebuild rate setting is quite low and the system is processing a number of operations, then the rebuild may take an unusual amount of time to complete.
- The rebuild is canceled — Another user can cancel a rebuild that you have initiated.

Rebuilding of virtual disk completes with errors

About this task

A rebuild completes with errors when a portion of the disk containing redundant (parity) information is damaged. The rebuild process can restore data from the healthy portions of the disk but not from the damaged portion.

When a rebuild is able to restore all data except data from damaged portions of the disk, it indicates successful completion while also generating alert 2163. For information on alert messages, see the *Server Administrator Messages Reference Guide* at Dell.com/support/home.

The rebuild may also report sense key errors. In this situation, take the following actions to restore the maximum data possible:

Steps

- 1 Back up the degraded virtual disk onto a fresh (unused) tape drive.
 - If the backup is successful — If the backup completes successfully, then the user data on the virtual disk has not been damaged. In this case, you can continue with step 2.
 - If the backup encounters errors — If the backup encounters errors then the user data has been damaged and cannot be recovered from the virtual disk. In this case, the only possibility for recovery is to restore from a previous backup of the virtual disk.
- 2 Perform Check Consistency on the virtual disk that you have backed up onto a tape drive.
- 3 Restore the virtual disk from the tape drive onto healthy physical disks.

Cannot create a virtual disk

You may be attempting a RAID configuration that is not supported by the controller. Check the following:

- How many virtual disks already exist on the controller? Each controller supports a maximum number of virtual disks.
- Is there adequate available space on the disk? The physical disks that you have selected for creating the virtual disk must have an adequate amount of free space available.
- The controller may be performing other tasks, such as rebuilding a physical disk, that must run to completion before the controller can create the new virtual disk.

A virtual disk of minimum size is not visible to Windows Disk Management

If you create a virtual disk using the minimum allowable size in Storage Management, the virtual disk may not be visible to Windows Disk Management even after initialization. This occurs because Windows Disk Management is only able to recognize extremely small virtual disks if they are dynamic. It is advisable to create virtual disks of larger size when using Storage Management.

Virtual disk errors on systems running Linux

About this task

On some versions of the Linux operating system, the virtual disk size is limited to 1TB. If you create a virtual disk that exceeds the 1TB limitation, your system may experience the following behavior:

- I/O errors to the virtual disk or logical drive.
- Inaccessible virtual disk or logical drive.
- Virtual disk or logical drive size is smaller than expected.

If you have created a virtual disk that exceeds the 1TB limitation, you must:

Steps

- 1 Back up your data.
- 2 Delete the virtual disk.
- 3 Create one or more virtual disks that are smaller than 1TB.
- 4 Restore your data from backup.

Irrespective of whether your Linux operating system limits the virtual disk size to 1TB, the virtual disk size depends on the version of the operating system and any updates or modifications that you have implemented. For more information on operating system, see your operating system documentation.

Problems associated with using the same physical disks for both redundant and nonredundant virtual disks

When creating virtual disks, you should avoid using the same physical disks for both redundant and nonredundant virtual disks. This applies to all controllers. Using the same physical disks for both redundant and nonredundant virtual disks can result in unexpected behavior including data loss.

NOTE: SAS controllers do not allow you to create redundant and nonredundant virtual disks on the same set of physical disks.

Troubleshooting memory or battery errors on the PERC controller on Dell PowerEdge servers

Interpreting LCD and Embedded Diagnostic event messages

Issue: The server LCD presents a error message, or an error message is generated when running the Enhanced Pre-Boot System Assessment (ePSA).

Solution: For more information about error messages, see the Dell Event and Error Messages Reference Guide at [Dell.com/openmanagemanuals](https://dell.com/openmanagemanuals) > **OpenManage software**.

The Event Message Reference contains the error and event information generated by firmware and other agents that monitor system components. These events might be logged and displayed on one of the system management consoles, or both logged and displayed.

NOTE: To run the Embedded System Diagnostics (also known as Enhanced Pre-Boot System Assessment):

- 1 As the system boots, press F11.
- 2 Use the up-and-down arrows keys to select **System Utilities > Launch Dell Diagnostics**.

Troubleshooting conditions that lead to error message

NOTE: Troubleshooting the associated events may also prevent the error message from occurring. Error message can occur normally when one of the following conditions occur.

- OS indicates abnormal shutdown.
- OS indicates error occurred (blue screen occurred in Windows).
- Spontaneous power loss condition.

Try the following troubleshooting steps:

- Reboot to OS
If the OS boot is successful, rebooting again should result in no message being displayed.
- Clear Controller Cache
 - Ctrl + M for SCSI controllers (PERC 3, PERC 4).
 - Ctrl + R for SAS/SATA controllers (PERC 5, PERC 6 and newer controllers).
 - Wait for five minutes to allow contents of cache to purge.
 - Reboot back to controller BIOS.

NOTE: If error persists, the likelihood of a hardware error is increased. Contact Dell Technical Support for further troubleshooting steps.

- If error is eliminated, boot to OS.
- If OS boot is still not successful and/or the error persists, this may indicate a problem with the OS. Contact Technical Support for further troubleshooting steps.
- Check the Physical PERC Controller.
 - a Inspect the DIMM and DIMM Socket for Damage.
 - 1 Turn off the system and remove the power cable(s) from the system.
 - 2 Let the system sit for 30 seconds to allow any remaining power to drain.
 - 3 Remove the PERC controller. For information about removing and replacing parts in this system, refer to the user guide located at Dell.com/poweredge manuals.
 - 4 Remove the RAID memory battery. Ensure to reinstall the memory battery after inserting the DIMM.
 - 5 Remove the memory DIMM from the controller, if applicable.
 - 6 Check DIMM socket for any bent pins or other damage. Check the edge connector of the memory DIMM for any damage.
 - b If the controller has embedded memory or the memory socket is damaged, contact Dell Technical Support.
 - c If the memory is damaged, the controller memory may need to be replaced, contact Dell Technical Support.
 - d If there is no damage, replace the memory DIMM and reinstall the controller.
 - e Swap the controller memory with known good memory, if possible.
 - 1 If there is no known good memory available, contact Dell Technical Support.
 - 2 If the error does not occur with the known good memory, contact Dell Technical Support.
 - 3 If the error remains with a known good memory, contact Dell Technical Support.

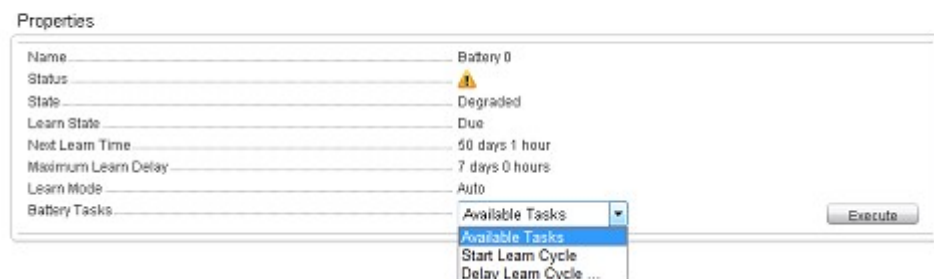
Additional information for troubleshooting memory or battery errors on the PERC controller

A RAID Controller error message is displayed during POST to indicate that the controller's cache does not contain all of the expected information, or it contains data destined for a hard drive that cannot be or has not been written to the drive. The most common reasons why this error may occur are:

- Server did not perform a normal shutdown process – Power loss and/or spontaneous restarts can result in incomplete or corrupted data to remain in cache that cannot be written to a drive.

- Cache memory is defective – Bad cache memory can cause data to become corrupted. This can cause OS-related issues and spontaneous reboots.
- Loss of battery power while server is shutdown – Controllers that do not use NVCACHE (Non-Volatile Cache) memory utilize batteries that can retain the contents of cache for a limited time (24-72 hours) while the server is not powered on. Once the battery drains, the entire contents of cache is lost and the controller recognizes that the cache memory does not contain all of the information expected. Controllers that do utilize NVCache (some H700/H800 controllers and newer controllers such as H710, H710P, H810) are very unlikely to encounter this issue since the battery only needs to maintain power for 30 seconds or less in most cases.
- PERC Battery Maintenance
A PERC battery that is suspected to have failed or has a warning symbol displayed in OpenManage Server Administrator should have a manual Learn Cycle performed. A Learn Cycle causes the battery to discharge and recharge, and restores the battery to a fully functional condition. In some cases, multiple Learn Cycle procedures may be required to restore the battery to an effectively charged state. To perform a manual Learn Cycle, select **Start Learn Cycle** from the **Battery Tasks** drop-down menu in Open Manage Server Administrator (OMSA).

Battery on Controller PERC 6/i Adapter



- Cache Use
Hardware RAID controllers utilize cache (a temporary repository of information) for their normal operation. The normal operation cache comprises DRAM memory, which, like system memory, retains data only when powered on.

Newer controllers utilize NVCache, which is utilized when the server is powered off. NVCache memory contains both DRAM memory (for normal operation) and flash memory (non-volatile). The controllers battery (if operational) powers the DRAM memory during a power loss so that the contents can be copied into the flash memory for indefinite storage.
- The contents of cache can essentially be broken into three parts:
- RAID configuration and metadata - Information about the RAID arrays including configuration information, disk members, role of disks, etc.
 - Controller logs - RAID controllers maintain several log files. Dell technicians rely on the TTY log as the primary log for troubleshooting various RAID and hard drive issues.
 - RAID data - This is the actual data destined to be written to the individual hard drives. Data is written into the cache of the controller in both Write Through and Write Back cache policy modes.

Slicing

Configuring multiple RAID arrays across the same set of disks is called Slicing.

RAID puncture

A RAID puncture is a feature of Dell PowerEdge RAID Controller (PERC) designed to allow the controller to restore the redundancy of the array despite the loss of data caused by a double fault condition. Another name for a RAID puncture is rebuild with errors. When the RAID controller detects a double fault and there is insufficient redundancy to recover the data in the impacted stripe, the controller creates a puncture in that stripe and enables the rebuild to continue.

- Any condition that causes data to be inaccessible in the same stripe on more than one drive is a double fault.
- Double faults cause the loss of all data within the impacted stripe.
- All RAID punctures are double faults but all double faults are NOT RAID punctures.

Causes of RAID puncture

Without the RAID puncture feature, the array rebuild would fail, and leave the array in a degraded state. In some cases, the failures may cause additional drives to fail, and cause the array to be in a non-functioning offline state. Puncturing an array has no impact on the ability to boot to or access any data on the array.

RAID punctures can occur in one of two situations:

- Double Fault already exists (Data already lost).
Data error on an online drive is propagated (copied) to a rebuilding drive.
- Double Fault does not exist (Data is lost when second error occurs).
While in a degraded state, if a bad block occurs on an online drive, that LBA is RAID punctured.

This advantage of puncturing an array is keeping the system available in production till the redundancy of the array is restored. The data in the affected stripe is lost whether the RAID puncture occurs or not. The primary disadvantage of this method is that while the array has a RAID puncture in it, uncorrectable errors will continue to be encountered whenever the impacted data (if any) is accessed.

A RAID puncture can occur in the following three locations:

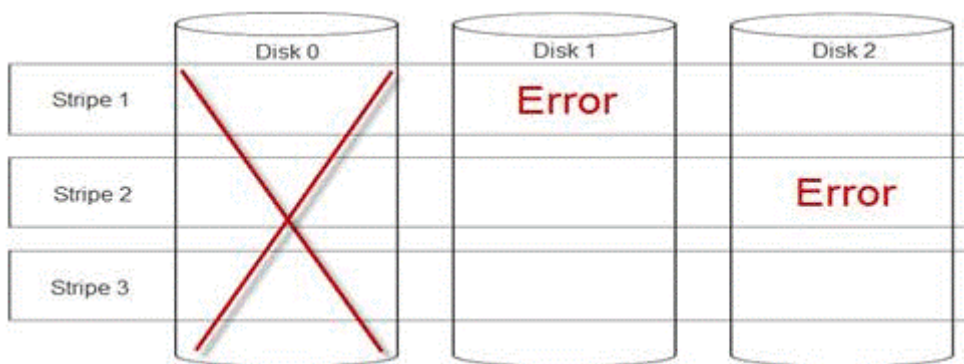
- In blank space that contains no data. That stripe will be inaccessible, but since there is no data in that location, it will have no significant impact. Any attempts to write to a RAID punctured stripe by an OS will fail and data will be written to a different location.
- In a stripe that contains data that isn't critical such as a README.TXT file. If the impacted data is not accessed, no errors are generated during normal I/O. Attempts to perform a file system backup will fail to backup any files impacted by a RAID puncture. Performing a Check Consistency or Patrol Read operations will generate Sense code: 3/11/00 for the applicable LBA and/or stripes.
- In data space that is accessed. In such a case, the lost data can cause a variety of errors. The errors can be minor errors that do not adversely impact a production environment. The errors can also be more severe and can prevent the system from booting to an operating system, or cause applications to fail.

An array that is RAID punctured will eventually have to be deleted and recreated to eliminate the RAID puncture. This procedure causes all data to be erased. The data would then need to be recreated or restored from backup after the RAID puncture is eliminated. The resolution for a RAID puncture can be scheduled for a time that is more advantageous to needs of the business.

If the data within a RAID punctured stripe is accessed, errors will continue to be reported against the affected bad LBAs with no possible correction available. Eventually (this could be minutes, days, weeks, months, and so on), the Bad Block Management (BBM) Table will fill up causing one or more drives to become flagged as predictive failure. As seen in the figure, drive 0 will typically be the drive that gets flagged as predictive failure due to the errors on drive 1 and drive 2 being propagated to it. Drive 0 may actually be working normally, and replacing drive 0 will only cause that replacement to eventually be flagged predictive failure as well.

A Check Consistency performed after a RAID puncture is induced will not resolve the issue. This is why it is very important to perform a Check Consistency on a regular basis. It becomes especially important prior to replacing drives, when possible. The array must be in an optimal state to perform the Check Consistency.

A RAID array that contains a single data error in conjunction with an additional error event such as a hard drive failure causes a RAID puncture when the failed or replacement drive is rebuilt into the array. As an example, an optimal RAID 5 array includes three members: drive 0, drive 1 and drive 2. If drive 0 fails and is replaced, the data and parity remaining on drives 1 and 2 are used to rebuild the missing information on to the replacement drive 0. However, if a data error exists on drive 1 when the rebuild operation reaches that error, there is insufficient information within the stripe to rebuild the missing data in that stripe. Drive 0 has no data, drive 1 has bad data and drive 2 has good data as it is being rebuilt. There are multiple errors within that stripe. Drive 0 and drive 1 do not contain valid data, so any data in that stripe cannot be recovered and is therefore lost. The result as shown in Figure 3 is that RAID punctures (in stripes 1 and 2) are created during the rebuild. The errors are propagated to drive 0.



Puncturing the array restores the redundancy and returns the array to an optimal state. This provides for the array to be protected from additional data loss in the event of additional errors or drive failures.

How to fix a RAID puncture?

Issue: How to fix RAID arrays that have been subjected to a puncture?

Solution: Complete the following steps to resolve the issue:

⚠ WARNING: Following these steps will result in the loss of all data on the array. Ensure that you are prepared to restore from backup or other means prior to following these steps. Use caution so that following these steps does not impact any other arrays.

- 1 Discard Preserved Cache, if it exists.
- 2 Clear foreign configurations, if any.
- 3 Delete the array.
- 4 Shift the position of the drives by one.
Move Disk 0 to slot 1, Disk 1 to slot 2, and Disk 2 to slot 0.
- 5 Recreate the array as desired.
- 6 Perform a Full Initialization of the array (not a Fast Initialization).
- 7 Perform a Check Consistency on the array.

If the Check Consistency completes without errors, you can safely assume that the array is now healthy and the puncture is removed. Data can now be restored to the healthy array.

Preventing problems before they happen and solving punctures after they occur

Dell's RAID controllers contain a number of features to prevent many types of problems and to handle a variety of errors that do occur. The primary job of a RAID controller is to preserve the integrity of the data contained on its array(s). Even in the more extreme cases of damage (such as punctures), the array's data is often available and the server can remain in production. Part of any maintenance plan should be the proactive maintenance of the RAID arrays. Dell's RAID controllers are highly reliable and very good at managing its arrays without user intervention. Disregarding proper maintenance can cause even the most sophisticated technologies to experience problems over time. There are a number of things that can help maintain the health of arrays, and prevent the majority of data errors, double faults and punctures.

It is highly recommended to perform routine and regular maintenance. Proactive maintenance can correct existing errors, and prevent some errors from occurring. It is not possible to prevent all errors from occurring, but most serious errors can be mitigated significantly with proactive maintenance. For storage and RAID subsystems these steps are:

- Update drivers and firmware on controllers, hard drives, backplanes and other devices.

- Perform routine Check Consistency operations (Dell recommends every 30 days).
- Inspect cabling for signs of wear and damage and ensure good connections.
- Review logs for indications of problems.

This doesn't have to be a high level technical review, but could simply be a cursory view of the logs looking for extremely obvious indications of potential problems. Contact Dell Technical Support with any questions or concerns.

Blank or skipped RAID configuration screen during SMTD DVD installation

Issue: Some Seagate drives used as internal server storage shipped with the incorrect Dell firmware and may experience the following symptoms. (External storage is not affected)

- 1 During an installation from System Management Tool and Documentation (SMTD) DVD.
 - If there is no Redundant Array of Independent Disks (RAID) configuration from Ctrl + R and the DVD is booted, it will display a blank white screen where there should be array configuration setup.
 - If there is a RAID configuration from Ctrl + R already present on the drives, it boots to the SMTD DVD but skip the RAID configuration screen. The menu item for RAID configuration in the left window does not appear in the action list. Installation can be completed using this method.
- 2 Enclosure or server hard drives are being configured or added in an existing Linux installation. The drives may not be seen in the Linux browser that is using OpenManage Storage Management to configure the drives or the Vendor ID for the disk drive may appear with garbled characters.

Model	Capacity	Part Number	Correct FW	Shipped FW
ST936751SS	36GB	RN829	SM04	SM07
ST973451SS	73GB	XT764	SM04	SM07
ST973402SS	73GB	HT952	S229	S22B
ST9146802SS	146GB	CM318	S229	S22B
ST373355SS	73GB	GY582	T211	T213
ST3146755SS	146GB	TN938	T211	T213
ST3300555SS	300GB	HT954	T211	T213
ST3400755SS	400GB	GY583	NS25	NS27
ST373455SS	73GB	GY581	S528	S529
ST3146855SS	146GB	HT953	S528	S529
ST3300655SS	300GB	TN937	S528	S529

Solution: If the shipped version in the above chart matches the current drive firmware version then a firmware flash is required.

For drives that are installed in a server with an existing operating system, use the latest Dell Update Package (DUP) to roll-back or update the drives.

For drives that are experiencing the installation problem, use Release R212231 to flash the drives. R212231 will roll-back the drives listed above to the correct firmware version without the need for user input. Create the bootable USB or CD using the `ddp.exe` included in the release.

 **NOTE:** If a drive has a version that is incrementally newer than the shipped version above then a roll-back is not required.

The update will take about 5 minutes plus 1 minute for each additional drive in the server. Restart the server installation after rolling-back the drives.

Troubleshooting thermal issue

Thermal issues can occur due to malfunctioning ambient temperature sensors, malfunctioning fans, dusty heat sinks, and malfunctioning thermal sensors and so on.

To resolve the thermal issues:

- 1 Check the LCD and Embedded System Management (ESM) logs for any additional error messages to identify the faulty component.
- 2 Ensure that airflow to the machine is not blocked. Placing it in an enclosed area or blocking the air vent, can cause it to overheat. If installed in a rack, ensure that the rack cooling system is working normally.
- 3 Check for the ambient temperature is within acceptable levels.
- 4 Check the internal system fans for obstructions and ensure that all fans are spinning properly. Swap any failing fans with a known-good fan for testing.
- 5 Ensure that all the required shrouds and blanks are installed.
- 6 Check if all the fans are functioning properly, the heat sink is installed correctly, and thermal grease is applied.

Server management software issues

This section helps to manage software issues related to the server management.

Topics:

- [How to set up Auto Dedicated NIC feature?](#)
- [How do I configure RAID using operating system deployment wizard?](#)
- [How to set up e-mail alerts?](#)
- [How to export license using iDRAC web interface?](#)
- [How to specify language and keyboard type?](#)
- [How to configure network settings using Lifecycle Controller?](#)
- [What are the different types of iDRAC licenses?](#)
- [What are the differences between iDRAC7 and iDRAC8?](#)
- [Can I upgrade the iDRAC license from express to enterprise and BMC to express?](#)
- [How to activate license on iDRAC?](#)
- [How to find out missing licenses?](#)
- [How to update BIOS on 13th generation PowerEdge servers?](#)
- [Which are the operating systems supported on PowerEdge servers?](#)

How to set up Auto Dedicated NIC feature?

The **Auto Dedicated NIC** feature provides the option to automatically reroute the iDRAC management traffic for the scenarios such as connecting a crash cart or reconfiguring network cables. When this feature is enabled, iDRAC automatically and dynamically detects a system's network mode. It senses the system's network cable configuration and checks if a cable is connected to the system's dedicated NIC port.

This feature was made available with iDRAC7 starting with the firmware version 1.30.30 with an Enterprise license. For the Dell PowerEdge rack and tower servers of 600 series and above, the dedicated NIC port is standard on the system, but requires an iDRAC7 Enterprise license to enable the port. Dell PowerEdge rack and tower servers of series 500 and below comes with an add-in card if ordered with an Enterprise license at the point-of-sale. If an Enterprise license is purchased later than point-of-sale, the add-in card must also be purchased to have the dedicated NIC port.

NOTE: This feature is not available on blade servers.

Enable the Auto Dedicated NIC feature using iDRAC web interface:

- Log on to the iDRAC7 web interface.
- **NOTE:** The system must have a valid Enterprise license.
- Click **Overview**, select **iDRAC Setting**, and then select **Network**.
- In the **Network Settings** section, select the **Auto Dedicated NIC**.

NOTE: Auto Dedicated NIC is disabled by default, this check box is no selected when you first log in to iDRAC7.

① **NOTE:** For the Dell PowerEdge blade servers, the NIC Selection field is always set at Dedicated which means that Auto Dedicated NIC is always disabled and not supported. Auto Dedicated NIC is supported on the Dell PowerEdge tower and rack servers only. A new read-only field Active NIC Interface displays the currently active network interface on the iDRAC7 web interface.

For more information about Auto dedicated NIC feature, see [En.community.dell.com/techcenter/extras/m/white_papers/20275980](https://en.community.dell.com/techcenter/extras/m/white_papers/20275980)

How do I configure RAID using operating system deployment wizard?

You can configure RAID using an operating System deployment wizard on the Dell Lifecycle controller. To configure RAID:

- Launch the Lifecycle Controller.
- In the left pane, click **OS Deployment**.
- On the **OS Deployment** page, click **Deploy OS**.
- On the **Deploy OS** page, click **Configure RAID First**, and then click **Next**.
- The storage controllers available for configuration are displayed in the **RAID Configuration** page.

① **NOTE:** Make sure that the selected controller is not in a non-RAID mode.

- Select a storage controller. The RAID configuration options are displayed.
- Follow the instruction on the screen, complete the RAID setting tasks, and then click **Finish**.

The RAID configuration is applied to the virtual disks.

To create virtual disks using RAID configuration at the preferred RAID level, watch the Dell Lifecycle Controller RAID configuration video on YouTube <https://www.youtube.com/watch?v=JFPmeHNENV4>

How to set up e-mail alerts?

You can set up an e-mail alert message which can be sent to one or more e-mail addresses. When iDRAC senses a platform event, such as an environmental warning or a component failure, an alert message is sent to a designated e-mail address.

To configure e-mail alerts:

- Log in to the iDRAC web interface.
- On the left pane, click **Alerts**.
- Click **SNMP and Email Settings** tab.
- Navigate to the **Destination the Email Addresses** section.
- Select the **State** field, enter the **Destination Email Addresses**, and click **Apply**.

① **NOTE:** Ensure that the platform event filters are configured before configuring the e-mail alert settings.

① **NOTE:** If the mail server is Microsoft Exchange 2007, you must configure the iDRAC domain name to receive alerts from the iDRAC.

How to export license using iDRAC web interface?

To export the license using iDRAC web interface:

- Log in to the iDRAC web interface.
- On the left navigation pane of the **System Summary** screen, click **Licenses**.
- If you have a single license, you can initiate the license export process by directly navigating to the **License Options** drop-down list. If you have multiple licenses, expand the **Licenses** table and navigate to the particular license, and select **Export** from the **License Options** drop-down list.

- Save and click **OK**.

The license is exported successfully. Check your download folder to verify if the export license process is successful.

For more information on the iDRAC licensing feature, see [En.community.dell.com/techcenter/extras/m/white_papers/20067892](https://en.community.dell.com/techcenter/extras/m/white_papers/20067892)

How to specify language and keyboard type?

To specify the language and keyboard type using Lifecycle Controller:

- Launch the Lifecycle Controller.
- On the left pane, click **Settings**.
- On the **Settings** pane, click **Language and Keyboard**.
- From the **Language** drop-down menu, select the language.
- From the **Keyboard Type** drop-down menu, select the keyboard type.
- Click **Finish** to save the new settings.

How to configure network settings using Lifecycle Controller?

About this task

To configure network settings using Lifecycle Controller:

Steps

- 1 Launch the Lifecycle Controller.
- 2 On the left pane, click **Settings**.
- 3 On the **Settings** pane, click **Network Settings**.
- 4 From the **NIC Card** drop-down menu, select the NIC port that you want to configure.

 **NOTE:** You can use only one NIC at a time to communicate with the network.

- 5 From the **IPV4 Network Settings→ IP Address Source** drop-down menu, select one of the following options:
 - **No Configuration**—indicates that the NIC must not be configured.
 - **DHCP**—indicates that the NIC must be configured using an IP address from a DHCP server. If DHCP is selected, a DHCP IP address is displayed on the **Network Settings** page.
 - **Static IP**—indicates that the NIC must be configured using a static IP. Type the **IP Address Properties—IP Address, Subnet Mask, Default Gateway, and DNS Address**. If you do not have this information, contact your network administrator.
- 6 From the **IPV6 Network Settings→ IP Address Source** drop-down menu, select one of the following options:
 - **No Configuration**—indicates that the NIC must not be configured.
 - **DHCPv6**—indicates that the NIC must be configured using an IP address from a DHCPv6 server. If DHCPv6 is selected, a DHCPv6 IP address is displayed on the **Network Settings** page.

 **NOTE:** While configuring DHCP server with IPv6, the configuration fails if you disable forwarding or advertising options.

- 7 Click **Enabled**, and type the **VLAN ID** and **Priority** under **Lifecycle Controller VLAN Settings**.

You cannot configure the VLAN settings of the following NICs:

- Emulex SeaHawk-2 (FH) PCIe Adapter
- Emulex SeaHawk-2 (LP) PCIe Adapter
- Emulex Vindicator-2 rNDC
- Emulex Sea Stallion-2 Mezzanine Card
- Emulex Pave Low-2 bNDC

- Emulex SeaHawk-2 (FH) NIC Only PCIe Adapter
- Emulex SeaHawk-2 (LP) NIC Only PCIe Adapter
- Emulex Vindicator-2 NIC Only rNDC
- Emulex Sea Stallion-2 NIC Only Mezzanine Card
- Emulex Pave Low-2 NIC Only bNDC

8 Click **Next**.

NOTE: If the Lifecycle Controller settings are not correctly configured, an error message is displayed.

NOTE: If you are unable to connect to a network, verify the settings. For information about correct network settings, contact your network administrator.

What are the different types of iDRAC licenses?

There are three types of the iDRAC licenses:

- **Basic Management** — Basic Management which was earlier known as BMC, was the default iDRAC version for the 11th generation of the servers ranging between 200– 500 series.
- **Express** — iDRAC Express is the standard, default offering that is part of the base configuration for 600 series and above. It does not require license installation, back up, or license management. Express offers embedded tools, console integration, and simplified remote access.
 - **Express for Blades** — For the 12th and 13th generation blade servers, there is a new **Express for Blades** iDRAC version. It offers a single-user virtual console session and virtual media in addition to the standard Express offerings.
- **Enterprise** — There are two types of Enterprise licenses, based on the type and the duration.
 - **Evaluation** - This license is for a 30-day trial of certain features. It can be used on any system.

NOTE: This is not recommended for the production environment.

- **Perpetual** - This license is valid for the life of the product. It does not expire and never needs to be renewed. It must be bound to only one service tag at a time.

For more information on the iDRAC licensing feature, see [En.community.dell.com/techcenter/extras/m/white_papers/20067892](https://en.community.dell.com/techcenter/extras/m/white_papers/20067892)

What are the differences between iDRAC7 and iDRAC8?

The overview of the key features and the differences between iDRAC7 and iDRAC8 are compiled in the [En.community.dell.com/techcenter/extras/m/white_papers/20440743](https://en.community.dell.com/techcenter/extras/m/white_papers/20440743). It provides the different licenses that are available for the servers and also includes key features of each license.

Can I upgrade the iDRAC license from express to enterprise and BMC to express?

You can upgrade the iDRAC license from Express to Enterprise or BMC to either Express or Enterprise without having to open the box or install any hardware.

Request for the type of the iDRAC license you require by providing the service tag number of your server. Once you receive the license file in the .xml format, save it in your local drive to replace the license with the existing one.

To upgrade/ replace the existing license:

- Log in to the iDRAC web interface
- On the left navigation pane, click **Overview**, click **Server**, and then click **Licenses**.

- From the **License Options** drop-down list, select **Replace**. Click **Browse** to navigate to the local folder where the license file is saved.
- Select the license file and click **Open**.
- Click **Apply** to upgrade/ replace the new license file.

The purchase of a new PowerEdge server with iDRAC8 is the same as it was with iDRAC7. For the 600 series servers and above, all the hardware required for iDRAC Enterprise is on the motherboard. Not only does this eliminate the possibility of a card unseating during shipping, but it also allows for an upgrade if available. If Enterprise is ordered from Dell at point of sale on 200-500 series servers, the necessary hardware is installed in the factory. This piece of hardware is the Dell Ports card, which sits in a PCIe slot and has the RJ-45 connector for the Dedicated NIC and the slot for the vFlash SD card.

For more information on the iDRAC licensing feature, see [En.community.dell.com/techcenter/extras/m/white_papers/20067892](https://en.community.dell.com/techcenter/extras/m/white_papers/20067892)

How to activate license on iDRAC?

You can manage your licenses by creating your account and access **License Management** portal. It enables you to view your digital licenses, obtain a replacement license, or reassign licenses to different hardware.

To create an account:

- Go to www.dell.com/support/retail/lkm.
- Click **Create an Account**
- Enter the required information and click **Create Account**.
- Click **Sign In**, the end user license agreement is displayed.
- Review the **Dell Software License Agreement**, and click **Yes, I Agree** button. You are redirected to the License Management portal.

To activate the license:

- Log in to the License Management portal.
- Click **Activate Licenses** tab.
- To activate license, navigate to the license and click **Assign License**.

① **NOTE: All the licenses must be associated with the asset. The Activate Licenses tab lists the licenses that must be bound to an asset.**

For more information on the iDRAC licensing feature, see [En.community.dell.com/techcenter/extras/m/white_papers/20067892](https://en.community.dell.com/techcenter/extras/m/white_papers/20067892)

How to find out missing licenses?

If you misplace your original license and need to retrieve the original license, follow the steps to find out missing license:

- Log in to the License Management portal.
- Click **Manage Licenses** tab.

① **NOTE: All the licenses must be associated with the asset. The Manage Licenses tab lists the licenses that are associated with an asset.**

- To download license, navigate to the license and click **Get Key**. **Deliver My License Key** window is displayed.
- To download the license directly to your computer, select **Download** and then click **Submit**. Select **Email** if you want the license key on an email.

For more information on the iDRAC licensing feature, see [En.community.dell.com/techcenter/extras/m/white_papers/20067892](https://en.community.dell.com/techcenter/extras/m/white_papers/20067892).

How to update BIOS on 13th generation PowerEdge servers?

The 13th generation of Dell PowerEdge servers offers various methods namely local or remote, with or without an operating system, to update the system BIOS. The different methods are listed below. You can choose the method that best suits your need and environment.

- Executing the BIOS Dell Update Package (DUP) from within the operating system.
- Using the UEFI-based BIOS flash utility in a preboot environment.
- Using the Lifecycle Controller Platform Update option—F10.
- Using the Update and Rollback feature in the iDRAC web GUI.
- Using the WS-MAN based one to many Remote Update method—Remote Enablement

NOTE: Legacy DOS-based BIOS update utility is no longer supported.

For detailed information about different methods of updating BIOS see [En.community.dell.com/techcenter/extras/m/white_papers/20440526](https://en.community.dell.com/techcenter/extras/m/white_papers/20440526)

Which are the operating systems supported on PowerEdge servers?

Dell collaborates extensively with Microsoft to ensure the consistent and reliable performance of the Microsoft operating systems running on the Dell PowerEdge servers. For more information on the Microsoft Server operating systems supported on specific PowerEdge servers, see [En.community.dell.com/techcenter/extras/m/white_papers/20438149/download.aspx](https://en.community.dell.com/techcenter/extras/m/white_papers/20438149/download.aspx)

Troubleshooting operating system issues

This section helps you troubleshoot operating system issues in your system.

NOTE: If the problem persists, contact Dell Technical Support for further assistance.

Topics:

- Troubleshooting blue screen errors (BSODs)
- Troubleshooting a Purple Screen of Death (PSOD)
- Troubleshooting no boot issues for Windows operating systems
- No POST issues (iDRAC)
- Troubleshooting a No POST situation
- Windows
- VMware
- Linux

Troubleshooting blue screen errors (BSODs)

- 1 Identify the stop code or the stop message when the system displays the blue screen of death.

```
A problem has been detected and windows has been shutdown to prevent damage to your computer.
DRIVER_IRQL_NOT_LESS_OR_EQUAL

If this is the first time you've seen this stop error screen, restart your computer. If this screen appears again, follow
these steps:

Check to make sure any new hardware or software is properly installed. If this is a new installation, ask your hardware or
software manufacturer for any windows updates you might need.

If problems continue, disable or remove any newly installed hardware or software. Disable BIOS memory options such as
caching or shadowing. If you need to use Safe Mode to remove or disable components, restart your computer, press F8 to
select Advanced Startup Options, and then select Safe Mode.

Technical information:
*** STOP: 0x000000D1 (0x0000000C,0x00000002,0x00000000,0xF86B5A89)
*** gv3.sys - Address F86B5A89 base at F86B5000, DateStamp 3dd9919eb
Beginning dump of physical memory
Physical memory dump complete.
Contact your system administrator or technical support group for further assistance.
```

Figure 24. Blue screen of death

- 2 Run the PSA/ePSA diagnostics. For more information, see [PSA/ePSA Diagnostics](#).
- 3 If the diagnostics pass and the issue persists, identify the stage in which the blue screen error occurs.
- 4 If the BSOD occurs during the boot process, check for minimum to POST components. For more information, see [Troubleshooting a No POST situation](#).
If the issue persists, call Dell Technical Support.
- 5 If the BSOD occurs during pre-login, boot into Safe Mode and disable all startup entries. Isolate one startup entry at a time until you find the causing agent.

NOTE: If you are unable to boot into Safe Mode, call Dell Technical Support.

- 6 If the issue persists, check for minimum to POST components. For more information, see No POST .
If the issue persists, call Dell Technical Support.
- 7 If the BSOD occurs intermittently or during post-logon, debug mini crash dump files using WinDbg. For more information, see [Debugging mini crash dump files using by WinDbg in Windows operating system](#).
After debugging, call Dell Technical Support with the minidump file.

Troubleshooting a Purple Screen of Death (PSOD)

For information on Troubleshooting a PSOD, see [Troubleshooting a Purple Screen of Death](#) and [Interpreting a purple screen of death](#).

Troubleshooting no boot issues for Windows operating systems

- 1 Check the hard drive status in the PERC BIOS. For more information, see [Checking hard drive status in the PERC BIOS](#).
- 2 Boot the server in the safe mode.

NOTE: If the server is a domain controller, boot the server in Directory Services Repair Mode (DSRM).

If the server boots successfully, the issue is with an installed driver, application, or service. Proceed to Step 4.

- 3 For Windows Server, you can perform the following recovery options:
 - Use the **bootrec** command to troubleshoot startup issues. For more information, see <https://support.microsoft.com/en-in/kb/927392>.
 - Use the **chkdsk** tool to determine whether there is a disk problem. For more information, see <https://technet.microsoft.com/en-us/library/cc730714.aspx>
 - Use **DiskPart** to verify the status of disk partitions. For more information, see <https://technet.microsoft.com/en-in/library/bb490893.aspx>.
 - Use the **bcdedit** utility to view or modify the boot configuration database (BCD). For more information, see <https://technet.microsoft.com/en-us/library/cc731662.aspx>.

NOTE: For additional recovery console commands, see <https://support.microsoft.com/en-us/kb/326215>.

NOTE: For more troubleshooting steps, see <https://support.microsoft.com/en-us/kb/325375>.

- 4 From within the safe mode or DSRM, use the **msconfig** utility to disable startup applications and non-Microsoft services on the server.
- 5 Reboot the server in the normal mode.
- 6 If the server boots, use the **msconfig** utility to identify the disrupting service or application by enabling services and startup applications one at a time and rebooting the server until the server fails to boot.
- 7 If the issue persists, use Dell's Linux-based OMSA LiveCD to boot the system and run diagnostic tests to determine whether any hardware is malfunctioning.

OMSA LiveCD can also be used to recover data from a server whose operating system does not start.

No POST issues (iDRAC)

This section provides details on troubleshooting iDRAC issues.

“First Boot Device cannot be set” error message is displayed when configuring a boot device during POST.

Description

The error message “First Boot Device cannot be set. Either the system BIOS is out-of-date, or the server needs a reboot for the settings to take effect” displays in the POST mode.

Resolution

Allow the server to completely boot to the OS or turn off the server before setting a vFlash partition to the first boot device. This allows the server to boot to the vFlash partition and the error will no longer be seen.

“Alert! iDRAC6 not responding.. Power required may exceed PSU wattage...” error message is displayed at POST during a reboot.

Description

An error message “Alert! iDRAC6 not responding.. Power required may exceed PSU wattage. Alert! Continuing system boot accepts risk that system may power without warning. Strike the F1 key to continue, F2 to run the system setup program” is displayed at POST during a reboot.

Resolution

Perform the following steps:

- 1 Reboot the server to resolve the issue.
- 2 Remove the AC power for 30 seconds. Once AC power is re-applied, allow two minutes for the iDRAC to complete POST or initialize.
- 3 Check if the Network Adapter is updated to the latest firmware.

Troubleshooting a No POST situation

Power On Self Test (POST) is a series of diagnostic tests that run automatically when you turn on your system. POST tests the memory, the keyboard and the disk drivers. If the test is successful, the computer boots itself, else the system displays an LED error or an error message in the LCD panel. This situation is called No POST.

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.

ℹ NOTE: When removing or replacing parts, always turn off the server, remove the power cord, and wait for ten seconds for the static flea power to drain. Reconnect the power cord, wait for a minute and turn on the server. This allows time for the Baseboard Management Controller (BMC) to power up. Error messages may not be reported correctly if the static flea power is not fully drained. For more information on removing and installing hardware components, see your system's *Owner's Manual* at Dell.com/poweredge manuals.

ℹ NOTE: Ensure that you give enough time for the server to POST. Newer systems may take up to three minutes before any video appears during the POST. During this period, a message on the LCD screen is displayed, which indicates that the server is booting.

Steps

- 1 Check the LCD screen or LED indicators for any error messages.
For more information about the error messages, see the *Dell Event and Error Messages Reference Guide* at Dell.com/openmanagemanuals > **OpenManage software**.
- 2 Ensure that the server is turned on by verifying that the power supply LED glows green.
If the power LED is lit amber, see [Power supply unit indicator codes](#).
- 3 Remove all the Electrostatic Discharge (ESD) from the server.

- a Turn off the server.
- b Disconnect all cables from the server including the power cable.
- c Press and hold the power button for 60 seconds to discharge.
- d Reconnect the power and video cable only.
- e Turn on the server.

If the server fails to POST, proceed to the next step.

- 4 Disconnect all cables from the server including the power cable.
- 5 Bring the server to the minimum configuration for the POST.

NOTE: Minimum to POST configuration is the config that has the minimum components required to complete POST. Typically, the minimum to POST configuration for rack servers is PSU1, CPU1, memory module in A1 slot, and the default riser without expansion cards. For tower servers, the minimum to POST configuration is PSU1, CPU1, and memory module in A1 slot. For modular servers, the minimum to POST configuration is CPU1 and memory module in A1 slot.

- 6 Reconnect the power and video cable only.
 - 7 Attempt to POST the server.
 - a If the server completes the POST, turn off the server and plug the components one at a time until the defective part is found. If you identify the defective part, contact Dell Technical Support with information about the defective part.
 - b If you are unable to identify the defective part, go to the next step.
 - 8 Disconnect the hard drives, optical drives, and tape drives from the server and attempt to POST the server.
 - a If the server completes the POST, plug the hard drives back one at a time until the defective hard drives are found. If you identify the defective part, contact Dell Technical Support with information about the defective part.
 - b If you are unable to identify the defective part, go to the next step.
 - 9 Reseat the control panel connector.
 - 10 Ensure that the processors and heat sinks are seated correctly.
 - 11 If the server does not complete the POST, clear the NVRAM using the jumper.
- For more information, see your system's *Owner's manual* at Dell.com/poweredgemanuals.

Next step

If the issue still persists, contact Dell Technical Support for assistance.

Windows

FAQs

How to resolve the yellow bangs in device manager for Dell 12th Generation Servers?

Description

After installing Windows Server 2012 R2 on Dell PowerEdge 12th Generation Servers, two yellow bangs appear in the Device Manager under Hidden Devices: PCI SIMPLE COMMUNICATIONS CONTROLLER. These devices do not impact the server.

Resolution

Download and install chipset drivers from Dell.com/support for the respective servers.

Why are the USB keyboard and mouse not detected during the Windows Server 2008 R2 SP1 installation?

Cause

This issue occurs because Windows Server 2008 R2 SP1 does not have native USB 3.0 driver support.

Resolution

- 1 In **System Setup**, ensure that the USB 3.0 option on the **Integrated Device Settings** screen is set to **Disable**.

NOTE: By default, the USB 3.0 option is disabled. If enabled, the operating system fails to detect the USB devices such as keyboard, mouse, and USB DVD. Windows Server 2008 R2 SP1 supports out-of-box drivers for USB 3.0, and are available at Dell.com/support.

- 2 Install the drivers after installing the OS

- 3 Restart the system.

- 4 In **System Setup**, ensure that the USB 3.0 option on the **Integrated Device Settings** screen is set to **Enable**.

NOTE: Ensure that you first install the drivers, and then restart the system to enter **System Setup**.

Why does the installation wizard stop responding during the Windows OS installation?

Cause

This issue occurs because the Windows 2008 R2 SP1 does not support Secure Boot.

Resolution:

Before installing Windows 2008 R2 SP1, ensure that the **Secure Boot** option in **System Setup** is set to **Disable**.

NOTE: Secure Boot is supported only on Windows 2012 R2 and Windows 2012 R2 with native storage controller and out-of-box drivers. Secure Boot is supported only in the UEFI mode.

Why does Windows OS installation using Lifecycle Controller, on PowerEdge Servers fail at times with an error message?

Cause

This issue occurs when the size of the drivers exceed the temporary storage space provided by the OS.

Resolution:

Before installing the OS, ensure that there are no add-on devices installed on the system. To avoid removing the hardware manually, you can also disable the PCIe slots in the BIOS configuration utility.

Why does Windows Server 2008 R2 SP1 display a blank screen in UEFI mode after installation?

After installing Windows Server 2008 R2 SP1 in the UEFI mode, either using Lifecycle Controller (LC) or manually, may display a blank screen while booting to the OS.

Cause

This issue occurs because the Windows Server 2008 R2 does not support Graphics Output Protocol (GOP).

Resolution

In the BIOS configuration utility, ensure that Load Legacy Option Rom on the Miscellaneous Settings screen is set to Enable.

Restart your system and boot to the operating system again.

Symptoms

Booting to iSCSI or FCoE fails

Description

When trying to install Windows Server 2012 R2 operating system on an iSCSI or FCOE LUN, you may see a failure either during the operating system installation or at first boot.

Resolution

This is a known issue. This issue has been fixed in operating systems pre-installed by Dell and in the recovery media shipped with your system. For more information, see the knowledge base article **KB2894179** at support.microsoft.com.

VMware

FAQs

Why are VMs configured with Fault Tolerance not in a protected state in ESXi 6.0?

For some PowerEdge systems with AMD 6300 series processor, VMs configured with Fault Tolerance (FT) might not be in a protected state. Sometimes, secondary VM takes more time to attain the protected state. This is a known issue. Affected systems include PowerEdge systems R815, R715 and M915.

Symptoms

Dell PowerEdge Express Flash NVMe PCIe SSD device is not detected during hot-plug in ESXi 6.0

Description

When the Express Flash NVMe PCIe SSD namespace is set as Offline and hot-plug operation is performed in the same slot, the SSD does not initialize and is not detected.

This is a known issue. Perform one of the following steps:

- 1 Reconnect the drive to a different drive slot, if available.
- 2 Restart the sfcdb-watchdog service and reinsert the drive.

Linux

FAQs

Why are network ports displayed as unknown in YaST2 network configuration in SUSE Linux Enterprise?

While configuring a bonding interface, the configured bond-slaves are listed as Unknown Network Device. The YaST installer is unable to write the device name in to the ifcfg files. Delete the existing configuration of previously configured network interfaces.

Symptoms

Unable to boot from iSCSI when static IPv6 address is assigned to the initiator

Description

The SUSE Linux Enterprise Server 12 does not boot from iSCSI over IPv6 address after successful installation, when static IPv6 address is assigned to the initiator.

Resolution

Use Dynamic Host Configuration Protocol (DHCP) address for the initiator.

Getting help

Topics:

- [Contacting Dell](#)
- [Locating Service Tag of your system](#)

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 about 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 lower right corner of the page.
- 3 For customized support:
 - a Enter your system Service Tag in the **Enter your Service Tag** field.
 - b Click **Submit**.The support page that lists the various support categories is displayed.
- 4 For general support:
 - a Select your product category.
 - b Select your product segment.
 - c Select your product.The support page that lists the various support categories is displayed.
- 5 For contact details of Dell Global Technical Support:
 - a Click [Global Technical Support](#).
 - b The **Contact Technical Support** page is displayed with details to call, chat, or e-mail the Dell Global Technical Support team.

Locating Service Tag of your system

Your system is identified by a unique Express Service Code and Service Tag number. The Express Service Code and Service Tag are found on the front of the system by pulling out the information tag. Alternatively, the information may be on a sticker on the chassis of the system. The mini Enterprise Service Tag (EST) is found on the back of the system. This information is used by Dell to route support calls to the appropriate personnel.

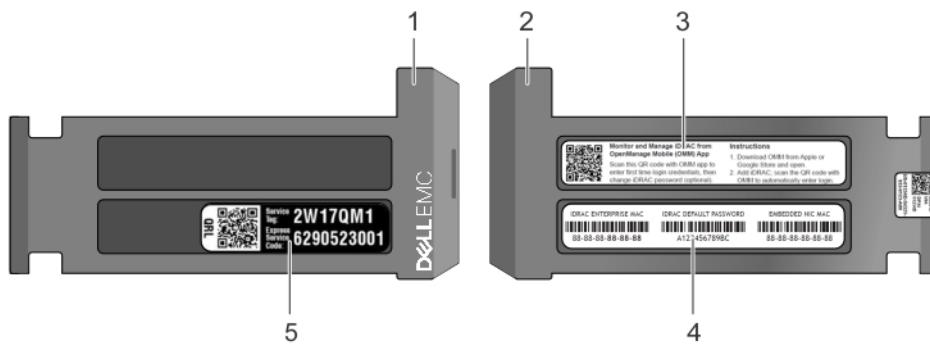


Figure 25. Locating Service Tag of your system

- | | | | |
|---|--------------------------------|---|---------------------------------------|
| 1 | Information tag (top view) | 2 | Information tag (back view) |
| 3 | Open Manage Mobile (OMM) label | 4 | MAC address and secure password label |
| 5 | Service tag label | | |