

Dell Online Diagnostics

Version 2.16

# User's Guide



# Notes and Cautions



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



**CAUTION:** A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.

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# Introduction

Dell Online Diagnostics, a stand-alone suite of diagnostic programs or test modules, allows you to run diagnostic tests on Dell systems in a production environment, and helps you ensure maximum uptime of your Dell systems. Online Diagnostics allows you to run diagnostic tests on chassis and storage components such as hard drives, physical memory, and network interface cards (NICs.) You can use the graphical user interface (GUI) or the command line interface (CLI) to run diagnostic tests on the hardware that Online Diagnostics discovers on your system.

## What's New in this Release

This release of Online Diagnostics supports the following:

- Dell PowerEdge C1100, PowerEdge C1100 MLK, PowerEdge C2100, PowerEdge C6100, PowerEdge C6100 MLK, PowerEdge R715, PowerEdge M710HD, and PowerEdge M610x
- Dell PowerVault NX300 Network-Attached Storage
- New Network Interface Cards for Blade Servers
- Red Hat Enterprise Linux 5.5
- SUSE Linux Enterprise Server 11 SP1
- VMware ESX 4.0 Update 1
- Fibre Channel Controllers

## Supported Operating Systems

For supported operating systems, see the *Readme* of Online Diagnostics. To access the *ReadMe*, on the Dell support website at [support.dell.com/manuals](http://support.dell.com/manuals), click **Software** → **Systems Management** → **Dell Online Diagnostics**.

# Devices Supported by Online Diagnostics

Online Diagnostics provide diagnostics for the following hardware devices:

- CD drives
- DVD drives
- CD-RW/DVD combination drives
- Diskette drives
- Hard drives
- NICs
- Internal modems
- SCSI controllers
- RAID controllers
- Fibre Channel Controllers
- Dell Remote Access Controllers (DRAC 4 and DRAC 5)
- USB controllers
- SAS controllers



**NOTE:** For more information see "Diagnostics for RAID Controllers, SAS Controllers, SCSI Controllers, and Attached Hard Drives"

- Serial ports
- Tape drives
- Tape autoloaders and libraries



**NOTE:** For more information, (see "Diagnostics for Tape Drives, Autoloaders, and Libraries")



**NOTE:** Diagnostic tests for Tape autoloaders and libraries are unavailable on Microsoft Windows Server 2008 operating systems.

- DIMMs
- External storage enclosures

# Diagnostics Features

Online Diagnostics offers the following features:

- **Discovering Devices**

This feature enables Online Diagnostics to enumerate and discover all testable devices on your Dell system. Enumeration occurs when the application is launched. If your system hardware has changed, restart the application to re-enumerate the devices on the system.

- **Device and Test Selection**

This feature enables you to select the devices on which you want to run diagnostic tests and the tests you want to run on the selected device. See "Running Diagnostic Tests."

- **Diagnostic Test Review**

This feature enables you to review the selected diagnostic tests that you want to run. See "Running Diagnostic Tests."

- **Diagnostic Test Status**

This feature enables you to view the status of the diagnostic tests that are running. See "Running Diagnostic Tests."

- **Diagnostic Test Results**

This feature enables you to view the results of the diagnostic tests. See "Running Diagnostic Tests."

- **Help**

This feature allows you to view the help information for the various diagnostic tests and devices. To view a description of a device or a diagnostic test, select the device or the test and select the **Help** tab in the GUI or run the `pediags --help` command in the CLI.

- **Quick Test**

This feature enables you to use a faster algorithm to run a test. See "Configuring the Test Execution Settings."

- **Saving Configuration and Results**

This feature enables you to save the system configuration and test results. See "Using Dell Online Diagnostics."

- **Number of Passes**

This feature enables you to run the selected tests for a specified number of iterations. The minimum value is 1 and the maximum is 20.



**NOTE:** In the CLI mode, Online Diagnostics allows for a maximum number of 999 passes.

- **Run Time**

This feature allows you to specify the duration (in minutes) for which a diagnostic test should run. This feature is available only in the CLI version of Online Diagnostics.



**NOTE:** Tests stop executing after they complete 72 hours or 999 passes, whichever occurs first.

- **Auto Logging**

Online Diagnostics saves the diagnostic test results, in XML format, in an auto-generated file (**result.xml**). The file is available in the `x:\<install_directory>\dell\diagnostics\log` directory (where `x:` is the system drive) for Microsoft Windows operating systems and in `/var/log/dell/diagnostics/log` for Linux operating systems. The maximum size of the log file is 512 KB. Online Diagnostics removes the log entries in a first-in-first-out (FIFO) fashion when the size of the log file reaches the upper limit. Online Diagnostics also saves the hardware configuration in an auto-generated file (**config.xml**), which is available in the same location as **result.xml**.



# Setting Up Dell Online Diagnostics

This section describes the process for setting up Dell Online Diagnostics.

## Before You Begin

- Read the setup requirements and ensure that your system meets or exceeds the minimum requirements.
- Read the Online Diagnostics readme file provided with this application. The readme contains the latest information about Online Diagnostics in addition to information about known issues.

## Things to Remember

- Online Diagnostics is engineered to diagnose hardware problems on individual systems. Online Diagnostics does not address problems that arise at the network level, unless the problem resides with a NIC on a single system.
- The hard drive diagnostic tests are designed to run as low-priority background tasks to limit their effect on other hard drive I/O activity. Because of their low priority, it is recommended that you limit drive activity while running the hard drive diagnostic tests. The tests may run slowly or even stop when another hard drive I/O activity is running simultaneously. However, the tests resume when the hard drive I/O activity stops.
- Online Diagnostics runs concurrently with all other applications running on your system. When you run diagnostic tests, the additional system load is significant and impacts the performance of your system and all running applications. If you are running critical applications that require rapid response or consume significant system resources, take appropriate precautions before running these diagnostics. Close all non-essential applications and run diagnostic tests only during non-peak hours.
- Running Online Diagnostics simultaneously in graphical user interface (GUI) and command line interface (CLI) modes is not supported.

# Setup and Diagnostic Requirements

Online Diagnostics must be set up on each managed system to run diagnostics locally.

## Managed System Requirements

- A minimum of 256 MB RAM
- A minimum of 40 MB free space on the system drive (C: on Windows or /opt on Linux.)
- A supported operating system installed on your Dell system. See "Supported Operating Systems."
- Dell-qualified device drivers and firmware to run diagnostics on RAID controllers, RAID-attached hard drives, tape drives, tape autoloaders, and tape libraries. See the documentation that accompanied your device for more information or access the latest drivers and firmware from the Dell Support website at [support.dell.com](http://support.dell.com). For a list of the latest drivers and firmware versions for RAID controllers, see "Diagnostic Dependencies for Supported RAID Controllers."

## Diagnostic Requirements

- You must be logged in with Administrator privileges to run Online Diagnostics.
- Table 2-1 lists the devices and the dependencies that are required for each operating system to run Online Diagnostics. If these device dependencies are not met, Online Diagnostics exhibits the default behavior described in the table.

**Table 2-1. Device Dependencies**

<b>Device</b>	<b>Operating System</b>	<b>Dependency</b>	<b>Default Behavior (if dependency is not met)</b>
Intel NIC	Microsoft Windows	Intel PROSet management agent or Intel PROSet utility for Microsoft Device Manager. These are installed as an option when Intel Driver is installed. You can download Intel Driver from the Dell Support website at <a href="http://support.dell.com">support.dell.com</a> . For <b>Drivers &amp; Downloads</b> , this appears under the Network category of the selected product.	Intel vendor network tests are not available.

**NOTE:** For supported operating systems, see the *Readme* of Online Diagnostics located on the Dell support website at [support.dell.com/manuals](http://support.dell.com/manuals).

**NOTE:** For systems that have a PCIe Intel network interface card (NIC), Intel PROSet Utility for Microsoft Device Manager is required for the Intel network adapter diagnostics in Microsoft Windows. If you have a PCI-X Intel NIC, install either the Intel PROSet utility for Microsoft Device Manager or the Intel PROSet management agent to enable Intel network adapter diagnostics. If you have any other Dell-supported Intel NIC, you must install the Intel PROSet management agent. If these requirements are not met, the Intel vendor tests will not be available (only the default network diagnostics will be available).

DRAC 4	Microsoft Windows, SUSE Linux Enterprise Server, and Red Hat Enterprise Linux	Dell Remote Access Controller (DRAC) component on Windows and Remote Access Core component on Linux. You can install the DRAC components using the <i>Dell Systems Management Tools and Documentation</i> DVD or download from <a href="http://support.dell.com">support.dell.com</a> .	All tests fail with an internal warning indicating that the drivers and services are not installed.
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**Table 2-1. Device Dependencies (continued)**

<b>Device</b>	<b>Operating System</b>	<b>Dependency</b>	<b>Default Behavior (if dependency is not met)</b>
USB Controllers	Red Hat Enterprise Linux and SUSE Linux Enterprise Server	usbutils package (version 0.11 or above.)	Diagnostic tests for USB devices will not be available.
All supported devices	Red Hat Enterprise Linux and SUSE Linux Enterprise Server	pciutils package (version 2.1.11 or above.)	Online Diagnostics installation fails.
Broadcom NIC	Microsoft Windows	Broadcom Advanced Controller Suite (BACS). BACS is installed as an option when Broadcom Driver is installed. You can download Broadcom Driver from the Dell Support website at <a href="http://support.dell.com">support.dell.com</a> . For <b>Drivers &amp; Downloads</b> , this appears under the Network category of the selected product.	If BACS is not present, the enumerated Broadcom tests fail.
Broadcom NIC	Red Hat Enterprise Linux and SUSE Linux Enterprise Server	bnx2 driver version 1.4.51 or greater. tg3 driver version 3.71 or greater.	Online Diagnostics GUI may not function properly.

**Table 2-1. Device Dependencies (continued)**


<b>Device</b>	<b>Operating System</b>	<b>Dependency</b>	<b>Default Behavior (if dependency is not met)</b>
Emulex Fibre Channel Controller	Linux operating system	<ol style="list-style-type: none"> <li>1. HBAnywhere utility from Emulex. To download this utility, access the Emulex website at <a href="http://www.emulex.com">www.emulex.com</a>. Click <b>Downloads</b> → <b>Dell</b>. Click the adapter model number. Click <b>Linux</b> from the Current Drivers section and download the <b>Applications Kit</b>.</li> <li>2. Install libhbaapi rpm available in the operating system DVD.</li> </ol>	Fibre Channel Controllers are not enumerated and diagnostics tests will not be available.
QLogic Fibre Channel Controller	Linux operating system	<ol style="list-style-type: none"> <li>1. SNIA API for Linux drivers. To download this, access the QLogic website at <a href="http://www.qlogic.com">www.qlogic.com</a>. Click <b>Downloads</b> → <b>Fibre Channel Adapters</b>. Select a model and an operating system and click <b>Go</b>.</li> <li>2. Install libhbaapi rpm available in the operating system DVD.</li> </ol>	Fibre Channel Controllers are not enumerated and diagnostics tests will not be available.




**NOTE:** Memory diagnostics are not supported on the following Dell systems as they do not support IPMI: SC420, SC430, SC440, SC1420, SC1430, and T105.

## Setting Up Diagnostics

The Online Diagnostics installation files, for Microsoft Windows and Linux operating systems, are available at the Dell Support website at [support.dell.com](http://support.dell.com).


 **NOTE:** On Windows Server 2008 (Core) operating systems, Dell Online Diagnostics functions only if Microsoft Visual C++ 2005 Redistributable Package (x86) is installed. The Visual C++ Redistributable Package is available at the Microsoft website [www.microsoft.com](http://www.microsoft.com).


 **NOTE:** Ensure that you accept the End-User License Agreement (EULA) while installing Online Diagnostics.


## Installing Online Diagnostics on Microsoft Windows


Perform the following steps to install Online Diagnostics on systems running supported Microsoft Windows operating systems:


- 1 Run the .exe file to start the installer.  
The **Welcome to the Dell Online Diagnostics 2.x.y Setup Wizard** screen appears.
- 2 Click **Next**.  
The **Dell Software License Agreement** displays.
- 3 Click **I Agree** to accept the terms of the agreement.
- 4 Click **Install** to accept the default directory path or, click **Browse** and navigate to the directory where you want to install Online Diagnostics, and click **Install**.
- 5 Click **Finish**.
- 6 Click **Start**→ **Programs**→ **Online Diagnostics 2.x.y** and select **Online Diagnostics GUI** to run in GUI mode or select **Online Diagnostics CLI** to run in CLI mode. To run Online Diagnostics on Windows Server 2008 (Core) operating systems, run the **StartDiags.exe** program to run the GUI or **pediags.exe** to run the CLI, from `x:\<install_directory>\online_diagnostics\oldiags\bin` where x is the system drive.

 **NOTE:** The option to run Online Diagnostics from the **Start** menu is available only to the Administrator who installed the application. All other Administrators must use the **StartDiags** shortcut inside the installation folder to run the application.


 **NOTE:** On Windows Small Business Server system, Network Administrators do not have full privileges to run Dell Online Diagnostics application. To run the Online Diagnostics application, click **Start**→ **Programs**→ **Online Diagnostics 2.x.y** and right click the **Online Diagnostics GUI** or the **Online Diagnostics CLI** and select **Run as administrator**.

 **NOTE:** On Windows Server 2008 R2 edition or later, a user with administrator privileges will not be able to directly run the Dell Online Diagnostics application. To run Online Diagnostics application, click **Start**→ **Programs**→ **Online Diagnostics 2.x.y** and right click the **Online Diagnostic GUI** or the **Online Diagnostic CLI** and select **Run as administrator**.

 **NOTE:** To uninstall Online Diagnostics, click **Start**→ **Programs**→ **Online Diagnostics 2.x.y**→ **Uninstall** or run the **uninst.exe** file from the **x:\<install\_directory>\online diagnostics**, where **x** is the system drive.

 **NOTE:** Uninstallation of Online Diagnostics requires a minimum free space of 40 KB on your system drive.

To run Online Diagnostics in the CLI mode on Microsoft Windows and Linux operating systems, run the **pediags** program from **x:\<install\_directory>\online diagnostics\oldiags\bin** (where **x** is the system drive.)

 **NOTE:** Always run the **pediags** program from **x:\<install\_directory>\online diagnostics\oldiags\bin**. Do not install and run the **pediags** program from a network-mapped drive. Some network diagnostic tests disconnect the network.

## Installing Online Diagnostics on Linux and ESX

Perform the following steps to install Online Diagnostics on systems running supported Linux or ESX operating systems:

- 1 Extract the **tar.gz** file to a desired location. The extracted files contain an install script (**install.sh**) and the required installation packages.

- 2 Run **install.sh** to install these packages.


The **Dell Software License Agreement** displays.


- 3 Type **Y** to accept the terms of the agreement.

All the files needed to run the application are extracted to the default install directory, **/opt/dell/onlinediags**.

- 4 Run **startDiags.sh** in the **/opt/dell/onlinediags** directory, to launch Online Diagnostics.

 **NOTE:** Do not extract or copy **startDiags.sh** to another directory and attempt running the application.

 **NOTE:** Running Online Diagnostics on a read-only file system is not supported.

 **NOTE:** To uninstall the application, run `uninstall.sh`. This file is located in the installation directory.


The Online Diagnostics GUI, which is a 32-bit application, does not function on Red Hat Enterprise Linux (x86\_64) systems if Compatibility Arch Support packages are missing.

Your Red Hat Enterprise Linux (x86\_64) system may display the following message when you try launching Online Diagnostics:

```
Compatibility Arch Support package(s) [gtk, pango,  
and redhat-artwork] is not installed on this  
system. For details on installing the package(s)  
please refer to the README file.
```

To resolve the issue, perform the following steps:

- 1 Run the Red Hat Package Management Utility (`redhat-config-packages`).
- 2 Select the **Compatibility Arch Support** check box in the **Package Management** window and click **Details**. A new window, **Compatibility Arch Support Details**, displays.
- 3 Select `gtk`, `pango`, and `redhat-artwork` packages for installation and click **Close**.
- 4 Click the **Update** button in the **Package Management** window.

 **NOTE:** Running multiple instances of Online Diagnostics is not supported.



# Using Dell Online Diagnostics

Dell Online Diagnostics can be accessed in two ways: from a graphical user interface (GUI) and from a command line interface (CLI). This section describes both the interfaces.

## Using the GUI

When you launch Online Diagnostics in the GUI mode, the splash screen appears indicating the progress of device-discovery, until enumeration is complete. The splash screen also provides important information related to running Online Diagnostics. Discovery or enumeration of the devices occurs only when the application is launched. If your system hardware has changed, restart the application to re-enumerate the devices on your system.



**CAUTION:** Connecting or removing a USB or a CD/DVD device from a Red Hat Enterprise Linux system or SUSE Linux Enterprise Server while the enumeration is in progress may cause the system to hang.



**NOTE:** If the system fails to discover USB controllers, ensure that the USB Controllers are enabled in the BIOS and USB Controller support is set to **ON with BIOS support** in the BIOS Setup menu.



**NOTE:** GUI mode is not supported on VMware ESX. Only CLI mode is supported.

## Menu Options

The **File** menu provides the following options:

- **Exit:** Use this option to exit the application.
- **Save Configuration:** Use this option to save the configuration details of the devices detected by Online Diagnostics. The configuration details are saved to **config.html**, which is contained in an archive file. You can specify any name for this archive file, for example, **config.zip**. This option is available only when Online Diagnostics is not running any tests. If you have any system or device problems, you can save the configuration details in the **config.zip** file and provide the file when contacting technical support.



**NOTE:** The **Save Configuration** option is available only in the GUI version of Online Diagnostics.

- **Save Results:** Use this option to save the test result details. The test result details are saved to an HTML file (**results.html**), which is contained in an archive file. You can specify any name for this archive file, for example, **results.zip**. You can use this option only after all the tests that are running are complete. When contacting technical support for any system or device problem, you can save the result details and send the file to technical support.



**NOTE:** The **Save Results** option is available only in the GUI version of Online Diagnostics.

The **Help** menu provides the following options:

- **User Guide:** This option allows you to access the *Dell Online Diagnostics User's Guide*, which is available in the HTML format.
- **About:** This option provides the version information of Dell Online Diagnostics running on your system.

## Diagnostics Interface

The Online Diagnostics GUI is divided into two sections:

- Diagnostic Selection
- Diagnostic Information

### Diagnostic Selection





Use this section to select and organize how devices and tests are displayed.

#### Selection Options

Use this list box to organize how tests and detected devices are displayed. You can select any of the three options from this list box.

<b>Group by connection</b>	Use this option to organize the <b>Select Test(s) to Run</b> pane display as a tree structure with the connection as the nodes and with the applicable devices and the tests listed under them.
<b>Group by device</b>	Use this option to organize the <b>Select Test(s) to Run</b> pane display as a tree structure with the devices as the nodes and the tests applicable to each device listed under them. If the device is grayed out, it implies that there are no tests available for the device. However, you can still view the configuration details of the device.
<b>Group by tests</b>	Use this option to organize the <b>Select Test(s) to Run</b> pane display as a tree structure with the tests as the nodes and the applicable devices listed under them.

The following table describes the icons in the **Select Test(s) to Run** pane.

	Indicates a device.
	Indicates a device with a non-critical error or associated warning.
	Indicates a test.
	Indicates a test with a non-critical error or warning associated. A test warning message is displayed on mouseover.

**Select All:** Click this button to select all the devices and tests displayed in the **Select Test(s) to Run** pane.

**Remove All:** Click this button to remove all the selected devices and tests in the **Select Test(s) to Run** pane.

### **Select Test(s) to Run**

Use this section to select the devices and tests to be executed. The section is organized according to the option you selected in the **Selection Options** list box.

If the display is grouped by devices:

- Select the check box next to the device, to select all the tests listed for the device.
- You can also expand the device node and select individual tests that you want to run.

If the display is grouped by tests:

- Select the check box next to the test, to select all the devices listed for the test.
- You can also expand the test node and select the individual devices on which you want to run the tests.



**NOTE:** You can select a device in the **Diagnostic Information** section, and view its corresponding configuration details highlighted in the **Configuration** tab.

## Diagnostic Information

Use this section to view the system configuration and operational status information. In addition, you can run selected tests and view the results of these tests.

### Configuration


Use this tab to view the operational status of the detected devices and their configuration details. To view the configuration details for a device, select the device from the **Select Test(s) to Run** pane. The configuration details of the selected device are highlighted in this page and are listed under the following headings:

**Device Name:** The name of the device.

**Device Attribute:** Lists the device attributes. The following are the device attributes.

<b>Status</b>	Specifies the operational status of the device.
<b>Description</b>	Specifies a brief description.
<b>Class</b>	Specifies the class to which the device belongs. For example, the device COM1 belongs to the class Serial Port.
<b>Location</b>	Specifies the location of the device in the system. For example, system board.
<b>Additional Information</b>	Specifies any additional information. For example, if the device is embedded on the system board, the value <b>Embedded</b> is displayed against this field.

**Value:** Specifies a value against each attribute of a device.

**Additional Device Information:** Provides additional information of a device, if available, under the **Configuration** tab. When an additional device is available, the information icon  appears next to the device name in the **Configuration** tab. Double-click the row to view additional information for the device. See "Appendix" for more information.

## Tests Selected

Use this tab to run the tests you selected in the **Select Test(s) to Run** pane. This tab contains the following sections:

- **Diagnostic Tests Selected:** This list box displays all the tests selected in the **Select Test(s) to Run** pane.
- **Diagnostic Options:** Use this section of the **Tests Selected** tab to run the selected tests. This section contains the following controls:

<b>Run Tests</b>	Starts the selected tests. You can run multiple tests at the same time.
<b>Quick Test</b>	Uses a faster algorithm to conduct a specific test. If no errors are reported after running in <b>Quick Test</b> mode and you still suspect that the tested hardware has problems, it is recommended that you clear (deselect) <b>Quick Test</b> mode and run the same test again.
<b>Number of Passes</b>	Specifies the number of iterations for the selected test. The minimum value is 1 and the maximum is 20.



**NOTE:** Double-click the row of a particular test in the **Status** tab, to view detailed information.

## Status

Use this tab to view the status of the tests that are currently running or have completed execution. **Elapsed Time** and **Overall Progress** appear as part of **Status**. **Elapsed Time** is shown in the format of hh:mm:ss and is the amount of time that elapsed, since the job group of tests started to run. **Overall Progress** is the cumulative progress of all the tests in the current job group.







The status of each test is displayed under the following column headings:

- **ID:** Auto-generated test ID.
- **Device:** The device on which the test is running.
- **Test:** The test being executing.
- **Progress:** Test progress indicated in percentage.
- **Cur. Pass:** Indicates the current pass that is running if you selected the **Number of Passes** option for the test.

- **Total Pass:** Indicates the total number of passes that you specified to run if you selected the **Number of Passes** option for the test.
- **Status:** Indicates the current status of a test. Double-click on a test item to view details that include device name, device description, device location, test name, and test description. The following text indicators specify the test status:

<b>Completed</b>	Specifies that the test has completed.
<b>Suspended</b>	Specifies that the test was suspended. You can suspend a test manually only. Not all diagnostic tests support the <b>Suspend</b> feature.
<b>Aborted</b>	Specifies that the test was aborted. You can abort a test manually only. Not all diagnostic tests support the <b>Abort</b> feature.
<b>Executing</b>	Specifies that the test is running.
<b>Ready</b>	Specifies that the test has not started but has been queued up for execution. You can abort any test when it is in the <b>Ready</b> state.

- **Result:** Specifies the result of a test in the form of symbols. For example, the **Status** column of a test might display **Completed**, but the **Result** column specifies whether the test completed successfully. Double-click a result item to view details such as device name, device description, device location, test name, test description, and the overall result of the test. The following table describes the various icons and the test result indicators they represent:

	The test completed successfully.
	The test is being executed.
	The test was aborted.
	Non-critical errors were encountered during the execution of the test.
	The test failed.
	The test was suspended.

## Result

Use this tab to view the results of the tests executed along with a brief description about the outcome of each test.

The **Result** column in this tab briefly describes the test outcome. In addition, you can double-click anywhere in the row to view the corresponding result message. For example, if a test failed, the **Result** column will display the problem encountered and any actions you must take.

Right-click to bring up the **Delete/Delete All Completed** menu. Select **Delete** to remove the test results of an individual test and **Delete All Completed** to remove all test results of all completed tests from the **Status** tab and the **Results** tab.

## Using the Command Line Interface

To run the application in CLI mode, run `pediags` from `x:\<install_directory>\oldiags\bin`, where **x** is the system drive. In Windows operating systems you can also click **Start**→**Programs**→**Online Diagnostics 2.x.y**→**Online Diagnostics CLI** to run the application in CLI mode.



**CAUTION: Connecting or removing a USB or a CD/DVD device from a Red Hat Enterprise Linux system, SUSE Linux Enterprise Server, or VMware ESX while the enumeration is in progress may cause the system to hang.**

### Primary CLI Commands

The following commands carry out the functions of Online Diagnostics:

- `pediags --help`  
Displays short text help for CLI commands.
- `pediags --show all`  
Lists all device classes and tests available.
- `pediags <DEVICECLASS> --help`  
Displays text help for the `<DEVICECLASS>` you specify. For example, the command `pediags modem --help` displays help information for the devices listed as modems and the different tests associated with the modems. `<DEVICECLASS>` is the package name of the device, for example, `network` and `cddvd`.

- `pediags <DEVICECLASS> --show [device|test|all]`  
`[<Index Options>] [<Details Option>]`  
`[fmt=lst|tbl|xml]`

Displays the list of device classes, tests, or both device classes and tests. The default option is **all**. The option displays both device classes and tests. You can specify index options and choose the format in which you want the output to be displayed. The parameters should follow the particular order in which they are listed above. Format options must always be the last parameter.

For example, the command `pediags network --show test test-index=1,2,3 fmt=tbl`, displays the tests whose index numbers are 1, 2, and 3 in a table format.

If you type the following command, `pediags network --show device device-index=1,2,3 fmt=tbl`, it will display the device classes whose index numbers are 1, 2, and 3 in a table format.

Use `pediags <DEVICECLASS> --show device details=true` to view additional device information, if available.

The `details=true` option works only with "`--show device`". For example, to see additional device information for the SCSI devices, enter `pediags Scsidevdiag --show device details=true`.

- `pediags <DEVICECLASS> --run [<Index Options>]`  
`[<Test Settings>] [fmt=lst|tbl|xml]`

Runs tests on the device class you select. You can specify index options, test settings, and choose the format in which you want the results to be displayed. The parameters should follow the particular order in which they are listed above and format options must always be the last parameter.


In the `<Test Settings>` parameter, you can specify **quicktest** as **true** or **false**. You can also specify the number of iterations or passes for the selected test. `Passes` specifies the number of passes to execute.


For example, the command `pediags network --run test-index=1,2,3 quicktest=true passes=6 fmt=tbl`, runs six iterations of the tests whose index numbers are 1, 2, and 3 on the network device class. The results are then displayed in a tabular format.




- `pediags <DEVICECLASS> --run time= x` (where x is the number of minutes you want the test to run.)

This command allows you to run a diagnostic test for a specified duration. For example, `pediags scsidevdiag --run device-index=1 test-index=1 time=30` runs the diagnostic test whose index is 1 on the SCSI device whose device-index is 1 for 30 minutes. Tests stop executing after they complete 72 hours or 999 passes, whichever occurs first.

 **NOTE:** Runtime of the `passes` parameter is limited to 3 days (72 hours). The minimum number of iterations supported is 1 and the maximum is 999.

 **NOTE:** Always specify the `time` parameter in minutes and enter the `time` parameter after the `--run` parameter.

 **NOTE:** Running the `pediags` command on the device class from two different consoles simultaneously may display the message: `System resources may have already been used by another diagnostics instance.`

## Aborting Online Diagnostics in CLI Mode Using <Ctrl><C>

Using <Ctrl><C> to abort with the `--show` command does not cause the action to abort. When running tests, you may use <Ctrl><C> at any point of time during the execution sequence to stop the test. No output may be available and the test may exit with a blank message. This may occur if the execution of the `pediags` command has been interrupted even before the diagnostic test has started. If you abort a test that has already started, the test may abort with a `Test was aborted by the user` result event if the **Abort** feature is supported by the particular test. For multiple passes, even if the test supports **Abort**, the test may not abort with the `Test was aborted by the user` result event. This might occur because the multiple pass test may have been aborted during the transition from one pass to another.

Tests that do not support the **Abort** feature will always run to completion.

## Scripting With the CLI

The Online Diagnostics CLI allows administrators to write batch programs or scripts to be executed by the operating system. For an enterprise with many systems, an administrator could write a script that runs diagnostic tests on system components to determine their health.

In many cases, the CLI allows a user with a very well-defined task in mind to retrieve information about the system rapidly. You can redirect the diagnostic output to a file using the operating system's redirection feature. You can also use the exit codes explained in the following table when writing scripts.

0	The test has a passed result.
1	The test has a warning result.
2	The test has a failed result.
3	The application failed because of dependency issues or runtime issues.

Exit codes 0, 1, and 2 are applicable for only test execution (irrespective of multiple or single pass). The exit code is the aggregate status of all the tests executed. For example, out of 20 tests, if there is one test result with a warning and another test with a failed result with all other tests being successful, the final exit code will be 2. The exit code for a failed result will take precedence over an exit code for a warning result.

### **Scheduling Diagnostics**


Using your operating system's task-scheduling features, you can schedule Online Diagnostics to run diagnostic tests on your system.

# Running Dell Online Diagnostics in GUI Mode


This section provides step-by-step instructions on running Dell Online Diagnostics in graphical user interface (GUI) mode.


## Running Diagnostic Tests

To run diagnostic tests, perform the following steps:

- 1 Launch the application.
- 2 In the **Diagnostic Selection** section on the left, select the appropriate option from the **Selection Options** drop-down menu.
  - Select the **Group by connection** option to view the connections as nodes with the corresponding devices and tests displayed under each connection.
  - Select the **Group by device** option to list the system devices. All of the tests available for each device are displayed under the device.
    -  **NOTE:** If a device is grayed out, the device does not have any tests available. Configuration information for this device is displayed in the **Configuration** tab.
  - Select the **Group by test** option to list all the available tests with the corresponding devices displayed under each test.
- 3 Select the check boxes corresponding to the tests that you want to run.



In the **Diagnostic Information** section on the right, the **Tests Selected** tab lists the currently selected diagnostic tests. Click **Run Tests** to execute the selected tests.


 **NOTE:** The **Warning** row displays the non-critical icon to indicate that tests with possible non-critical errors have been selected. Double-click the icon to view the test warning.


 **NOTE:** The tests are queued for execution in the order in which they were selected. To stop tests from queuing, click the **Stop** button on the **Queuing Diagnostic Tests** window.


- 4 Click the **Status** tab to monitor the status of the test execution.
  - To abort a running test, right-click the test and select **Abort**. Select **Abort All** to stop all the queued tests.
  - To suspend a running test, right-click the test and select **Suspend**.
  - To resume a suspended test, right-click the test and select **Resume**.


The icons in the **Result** column indicate the status of each test.


- The **In Progress** icon (  ) indicates that the test is currently being executed.
- The **Aborted** icon (  ) indicates that the test was aborted.



 **NOTE:** Not all diagnostic tests support the **Abort** option. If a test's status is **Ready**, it can be aborted. Only tests that support the **Abort** option can be aborted when in the **Executing** state.

- The **Suspended** icon (  ) indicates that the test was suspended and may be restarted again at a later time.

 **NOTE:** Not all diagnostic tests support the **Suspend** feature.

- The **OK** icon (  ) indicates that the test executed successfully and no errors were encountered.

 **NOTE:** The **Abort/Suspend/Abort All** options are not available until a few seconds after queuing is complete. All queued tests must have the **Status** column filled in the table for the **Abort/Suspend/Abort All** option to be available.

- The non-critical icon (  ) indicates that non-critical errors were encountered during the execution of the test.
- The **Critical** icon (  ) indicates that the test has failed.

- 5 Click the **Results** tab to see a brief description of the test execution result. The **Results** column contains a brief description of the results of the tests. You can also double-click anywhere in the row to see the details of a particular test, which is displayed as a pop-up window. For example, if the application encountered a non-critical error while executing a test, the **Results** column displays a brief description of the nature of the error and any actions to take.

## Configuring the Test Execution Settings

You can configure the test execution setting to use a faster algorithm to conduct the test. Perform the following steps:

- 1 Select the tests you want to run in the **Diagnostic Selection** section.
- 2 Click the **Tests Selected** tab in the **Diagnostic Information** section. All the selected tests are displayed.
- 3 Select the **Quick Test** check box in the **Diagnostic Options** section at the bottom. If this option is available for one of the selected tests, the test is run in this mode.



**NOTE:** The **Quick Test** feature is not a supported test mode for all tests. Only a few tests support this feature.



**NOTE:** If no errors are reported after running in **Quick Test** mode and you suspect that the hardware still has problems, it is recommended that you deselect **Quick Test** and run the test again.

- 4 Use the **Number of Passes** option to specify the number of times you want the tests to run. The minimum value is 1 and the maximum is 20.



**NOTE:** The Dell Remote Access Controller (DRAC) diagnostic tests require the RAC software components to be present on your system. See your DRAC user guide for more details.




**NOTE:** Tape Media Test does not support the **Abort** option on LTO-4 drives.




# Supported Devices

This section lists the devices that can be tested using Dell Online Diagnostics.


## Diagnostics for Tape Drives, Autoloaders, and Libraries


 **NOTE:** Install Dell-qualified device drivers to run diagnostic tests on tape drives, tape autoloaders, and tape libraries. See the documentation that accompanied your device. The latest device drivers are available at the Dell Support website at [support.dell.com](http://support.dell.com).

 **NOTE:** On Linux operating systems, diagnostic tests for SATA hard-disks and controllers are not available.


See "Supported Devices" in the Readme for the list of devices supported by Online Diagnostics.


## Diagnostics for RAID Controllers, SAS Controllers, SCSI Controllers, and Attached Hard Drives

 **NOTE:** For a list of firmware requirements that are required for each controller, see "Diagnostic Dependencies for Supported RAID Controllers."

 **NOTE:** See the online help on Dell Online Diagnostics, for more information on controller-specific tests (for example, the Battery test for PERC 4e/DC, PERC 5/i, and PERC 6/i.)

This section lists the diagnostics supported on systems running Microsoft Windows, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, or VMware ESX. Online Diagnostics supports diagnostics for the following RAID, SAS, and SCSI controllers as well as for the hard drives that are attached to RAID, SCSI, and IDE controllers, depending on the installed operating system.


 **NOTE:** Online Diagnostics does not run diagnostic tests on IDE controllers.

 **NOTE:** Online Diagnostics enumerates and displays the diagnostic tests for the hard drives that are connected to SAS 5/iR (Adapter and Integrated), SAS 5/i Integrated, and SAS 6/iR, S100, S300, H200 (Adapter, Integrated, and Modular) controllers. However, diagnostic tests for these controllers themselves are unavailable.

## **Diagnostics Supported on Systems Running Microsoft Windows, Red Hat Enterprise Linux, SUSE Linux Enterprise Server and VMware ESX**

On systems running Windows, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, and VMware ESX, Online Diagnostics supports diagnostics for the following controllers and the hard drives that are attached to these controllers:

 **NOTE:** Microsoft Windows Server 2008 and later does not support PERC 320/DC controllers.

 **NOTE:** The CERC ATA 100 4/CH is not supported on Linux operating systems. It is supported only on Windows operating systems.

 **NOTE:** The SAS 5/E Adapter and SAS 6Gbps HBA support diagnostics test only on connected tape drives.

See "Supported Devices" in the Readme for the list of devices supported by Online Diagnostics.

## **Diagnostic Dependencies for Supported RAID Controllers**

Dell Online Diagnostics requires Dell-qualified device drivers and firmware to run diagnostic tests on RAID controllers, SCSI controllers, and attached hard drives.

System administrators who are responsible for diagnosing their storage devices with the latest installed operating system need a complete matrix showing the elements that are compatible with a particular storage controller. Each version of the storage controller in turn supports a specific array of elements, including:

- Version of the Array Manager, Storage Management Service, or RAID Storage Manager
- Dell system



- Firmware version number required for a particular controller



**NOTE:** For the list of firmware, BIOS, and driver versions for supported RAID Controllers, see the *Dell Systems Software Support Matrix* for OpenManage 6.3. To access the *Dell Systems Software Support Matrix*, on the Dell support website at [support.dell.com/manuals](http://support.dell.com/manuals), click **Software** → **Systems Management** → **Dell OpenManage Releases**.

## Diagnostics for Fibre Channel Controllers

See "Supported Devices" in the Readme for the list of devices supported by Online Diagnostics.



# Appendix

**Table A-1. Additional Device Information for Storage Diagnostics**

<b>Parameter</b>	<b>Description</b>
Total Moves	Total number of AutoLoader moves.
Drive Loads	Number of loads to the drive from magazines and mail slot.
Mailslot Exports	Number of times a cartridge was exported from the system.
Mailslot Imports	Number of times a cartridge was imported into the system.
Magazine Moves	Number of moves between storage slots.
Magazine Loads	Number of times a cartridge was moved from a storage slot to the drive.
Servo Hard Error	Number of unrecoverable errors.
Drive Soft Error	Each field is a count of the number of times a high-level recoverable error was reported for that component.
Rotation Recovery Action	Each field is a count of the number of times recovery actions were required in that axis to perform an operation.
System Moves	Total system moves would include every point-to-point movement that was made regardless of slot.
System Pick Retries	Total Pick-retries regardless of slot.
System Put Retries	Total Put-retries regardless of slot.
Element Total Puts	Total number of cartridge-puts to the element location.
Element Total Picks	Total number of cartridge-picks from the element location.
Element Total Put Retries	Total number of retry-puts to the element indicated by the element address.
Element Total Pick Retries	Total number of retry-pick Operations from the element address.
Firmware	Firmware version on the tape device.

**Table A-1. Additional Device Information for Storage Diagnostics (continued)**

<b>Parameter</b>	<b>Description</b>
Last Clean	Number of hours since the Last-clean was done.
Clean Required	Set to <b>Yes</b> if cleaning-required condition exists.
Replace Cleaning Tape	Set to <b>Yes</b> if cleaning tape needs replacement.
Number of Drive Cleans	Drive cleaning cycle count.
Number of Tape Cleans	Number of cleaning sessions per cartridge.
Power On Hours (POH)	Amount of time a tape drive has been turned on.
Tape Motion Hours/ Cylinder on Hours (COH)	Amount of time the tape drive has been used for backups and restores.
Load Count	Number of times a tape cartridge was loaded. Some drives increment this value when a tape cartridge is inserted and some increment this value when a tape drive is unloaded.
Number of Cleans	Number of cleaning sessions per cartridge.
Time in COH when Incompatible media was last loaded.	Time stamp in COH
Time in POH when the Over temperature condition occurred – returns zeros	Time stamp in POH
Time in POH when the Power issue condition occurred	Time stamp in POH
Total Number of Cleaning	Total number of cleanings that are done using a cleaning tape.
Time since last cleaning	Time stamp in hours.
Time in COH of last emergency eject	Time stamp in COH.

**Table A-1. Additional Device Information for Storage Diagnostics (continued)**

<b>Parameter</b>	<b>Description</b>
Media Type: total time in COH	Total COH for specified media type.
Sense codes (List of latest four Sense Codes)	Various codes and parameter are listed. For example, Sense Key, Additional Sense Code, and Additional Sense Code Qualifier.
Lifetime Meters of Tape Processed	Cumulative physical length of tape that has been written over its lifetime.
Time in MMH since Last Successful Cleaning	Media motion (head) hours since last successful cleaning operation.
Time in MMH since Second Last Successful Cleaning	Media motion (head) hours since second last, successful cleaning operation.
Time in MMH since Third Last Successful Cleaning	Media motion (head) hours since third last, successful cleaning operation.
Power On Hours when Force Reset and/or Emergency Eject occurred	Lifetime Power On Hours when the last operator initiated forced reset and/or emergency eject occurred.
MediaType	Type of media that is loaded at the time the command terminated with Check Condition status else 00h.
DensityCode	Density code of the medium loaded at the time the command terminated with Check Condition status else 00h.
MMHShort	Number of media motion hours at the time the command terminated with Check Condition status.
Repeat Bit	0 - indicates one occurrence of sense key and additional sense code information in the parameter entry. 1 - indicates multiple, consecutive occurrence of sense key and sense code information in the parameter entry.

**Table A-1. Additional Device Information for Storage Diagnostics (continued)**

<b>Parameter</b>	<b>Description</b>
Firmware Version	Firmware version at the time the command terminated with Check Condition status.
MMH Since Last Clean	Media Motion hours since Last Successful Cleaning at the time the command terminated with Check Condition status.
Opcode	Operation Code at the time the command terminated with Check Condition status.
Medium ID Number	If the media is present at the time the command terminated with Check Condition status, MediumID Number contains: 1, Barcode field value 2, Medium Serial Number 3, Vendor-specific value. If media is not present MediumID Number contains 20h.