

**Dell Server PRO Management Pack 3.0.1 for Microsoft  
System Center Virtual Machine Manager  
User's Guide**



# Notes, Cautions, and Warnings



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



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



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

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# Introduction


This document is intended for system administrators who use the Dell Server PRO Management Pack (Dell PRO Pack) to monitor Dell systems and take remedial action when an inefficient system is identified.

The Dell PRO Pack 3.0.1 integrates with the following:


- Microsoft System Center 2012 R2 Operations Manger
- Microsoft System Center 2012 SP1 Operations Manger
- Microsoft System Center 2012 Operations Manger
- Microsoft System Center Operations Manager 2007 R2
- Microsoft System Center 2012 R2 Virtual Machine Manager (VMM)
- Microsoft System Center 2012 SP1 Virtual Machine Manager (VMM)
- Microsoft System Center 2012 Virtual Machine Manager (VMM)


This integration enables you to proactively manage virtual environments and ensure high availability of your Dell systems.

To implement PRO Pack, see the *Dell Server PRO Management Pack 3.0.1 for Microsoft System Center Virtual Machine Manager Installation guide*.

 **NOTE:** All references to Operations Manager in this document is applicable to Microsoft System Center 2012 R2 Operations Manager, Microsoft System Center 2012 SP1 Operations Manger, Microsoft System Center 2012 Operations Manger, and Microsoft System Center Operations Manager 2007 R2, unless otherwise specified.

Also, see [Features and Functionalities](#).

 **CAUTION:** Due to the possibility of data corruption and/or data loss, it is recommended that the procedures in this document should be performed only by personnel with knowledge and experience of using the Microsoft Windows operating system and all supported versions of Operations Manager and Virtual Machine Manager.

 **NOTE:** The readme contains information on the software and management station requirements, and known issues of Dell Pro Pack 3.0.1. The readme, **DellIMPv301\_PROPack\_Readme.txt**, is packaged in the self-extracting executable file **Dell\_PROPack\_v3.0.1\_A00.exe**. However, for the latest readme, see [dell.com/OMConnectionsEnterpriseSystemsManagement](http://dell.com/OMConnectionsEnterpriseSystemsManagement) and then search for **Dell Server Pro Management Pack 3.0.1 for Microsoft System Center Virtual Machine Manager**.

## What's New in This Release

This release of PRO Pack supports the following:

- Microsoft System Center 2012 R2 Operations Manger
- Microsoft System Center 2012 R2 Virtual Machine Manager (VMM)

## Overview

Operations Manager uses PRO-enabled Management Pack to collect and store information on Dell hardware along with a description of their health status. Dell PRO Pack works with Operations Manager and VMM 2012 to manage Dell

physical devices and their hosted virtual machines (VMs) using this available health information. Dell PRO Pack recommends remedial actions when monitored objects transition to an unhealthy state (for example, virtual disk failure or predictive drive error), by leveraging the monitoring and alerting capabilities of Operations Manager and remediation capabilities of VMM.

Also see:

[Features and Functionalities](#)

[Understanding PRO Tip Management](#)

[Alerts and Recovery Actions](#)

## Related Terms

- *A managed system* is a Dell system running the Dell OpenManage Server Administrator (OMSA), which is monitored and managed using Operations Manager and VMM. It is managed locally or remotely using supported tools.
- *A management station* or *managing station* is a Microsoft Windows based Dell system that has the Operations Manager and VMM installed to manage virtual workloads.

## What is a PRO Tip

PRO (Performance and Resource Optimization) Tip is a feature that monitors the virtual infrastructure and provide alerts when there is an opportunity to optimize the usage of these resources. A PRO Tip window contains the description of the event that generated the PRO Tip and the suggested remedial action. This feature allows you to perform a load-balance of VMs between physical hosts, when specific threshold values are reached. Alternatively, you can migrate VMs when a hardware failure is detected.

The **PRO Tip** window in the VMM Administrator console enables you to view active PRO Tips for the host groups. The Operations Manager console displays the corresponding alerts as well, to ensure a consistent monitoring experience.

You can manually implement the recommended action mentioned in the PRO Tip. You can also configure the PRO tip to automatically implement the recommended action.

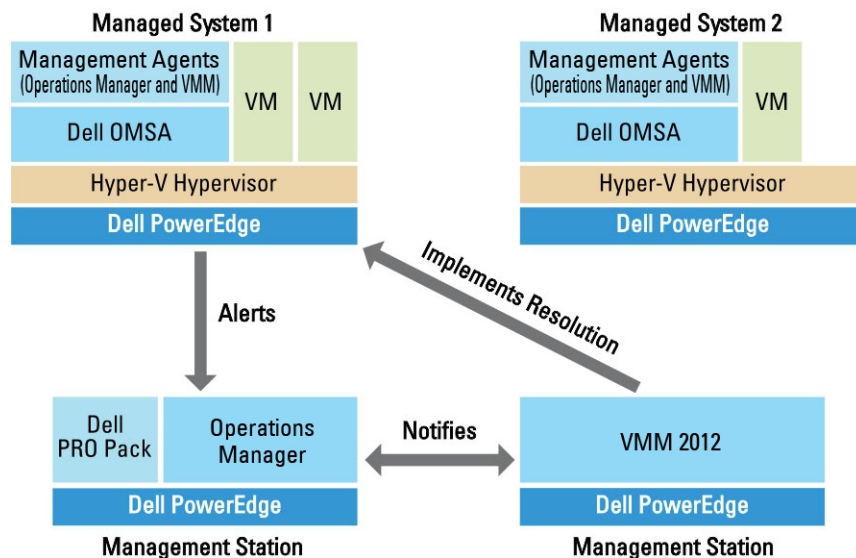
## Features and Functionalities

Dell PRO Pack:

- Performs PRO-management of Dell PowerEdge systems running Microsoft Hyper-V platforms, by continually monitoring the health of the physical and virtual infrastructure.
- Works with Operations Manager and VMM to detect events such as loss of power supply redundancy, higher temperature than threshold values, system storage battery error, virtual disk failure, and so on. For more information on events supported by Dell PRO Pack, see [Alerts and Recovery Actions](#).
- Generates PRO Tip when the monitored hardware moves to an unhealthy state.
- Performs VM live migration with no downtime. For more information, see [VM Live Migration](#).
- Overrides Dell PRO Pack default recovery actions. For more information, see [Overriding Recovery Actions](#).
- Minimizes downtime by implementing the remedial action provided on PRO Tips. The two remedial actions are:
  - **Restrict:** In this mode, it is recommended that servers are made temporarily unavailable for placing new VMs till the maintenance tasks are complete.
  - **Restrict and migrate:** In this mode, it is recommended that all running VMs are migrated from an unhealthy server to a healthy server to prevent loss of service. For more information, see [Implementing Recovery Actions](#).

## Understanding PRO Tip Management

This section explains a typical Dell PRO Pack setup and the sequence of events involved in PRO tip management.



**Figure 1. Interaction of Components**

In the figure, a group of PowerEdge systems act as the managed systems and two PowerEdge systems act as management stations hosting the Operations Manager and VMM. OMSA generates alerts with corresponding severity when there is a transition to an unhealthy state. Dell PRO Pack monitors the same alerts for PRO. Dell PRO Pack maps the OMSA alerts with its remedial action.

The following table describes the sequence of events that occur in PRO Tip management.

| Sequence Number | Event  |
|-----------------|--|
| 1               | Operations Manager agents on the host are enabled to detect the warning, error, or failure alerts that are generated by OMSA.  |
| 2               | Alert is sent to Operations Manager.   |
| 3               | Operations Manager console displays active PRO alerts.   |
| 4               | Operations Manager notifies the alert and the associated PRO Tip ID to VMM.  |
| 5               | VMM displays a corresponding entry in the <b>PRO Tip</b> window with remedial action.  |
| 6               | Implement the PRO Tip to enable recovery action on the managed system by placing the managed system in the <b>Restrict</b> mode or <b>Restrict and Migrate</b> mode. |
| 7               | VMM notifies Operations Manager about the successful completion of the recovery action.  |
| 8               | The VMM console displays the status of the PRO Tip as <b>Resolved</b> after it is successfully implemented.  |
| 9               | PRO Tip disappears from VMM <b>PRO Tip</b> window.   |
| 10              | PRO Active alert disappears from Operations Manager.   |

For more information on the type of events and the associated remedial actions, see [Alerts and Recovery Actions](#).

## Supported Operating Systems

The Dell PRO Pack supported operating systems on the managed system and management station are as follows:

### Managed system:

The managed system for PRO Pack is a Virtual Machine Manager Server. For more information, see [technet.microsoft.com/en-us/library/gg610649.aspx](http://technet.microsoft.com/en-us/library/gg610649.aspx).

**Management station:**

For the list of supported configurations of Operations Manager and VMM, see the following:

- Operations Manager 2012 R2 or Operations Manager 2012 SP1 or Operations Manager 2012 - [technet.microsoft.com/en-us/library/hh205990.aspx](http://technet.microsoft.com/en-us/library/hh205990.aspx)
- Operations Manager 2007 R2 - [technet.microsoft.com/en-us/library/bb309428.aspx](http://technet.microsoft.com/en-us/library/bb309428.aspx)
- System Center 2012 R2 Virtual Machine Manager or System Center 2012 SP1 Virtual Machine Manager or System Center 2012 Virtual Machine Manager - [technet.microsoft.com/en-us/library/gg610562.aspx](http://technet.microsoft.com/en-us/library/gg610562.aspx)

# Using Dell Performance Resource Optimization Pack

This chapter suggests steps to use PRO Pack.

## Planning The Environment For PRO Tips

You can plan for enabling the PRO Monitors that are relevant for the environment. By default, all the PRO Monitors are disabled in the Dell PRO Pack. For the list of alerts and the recovery actions, see [Alerts and Recovery Actions](#). Select the alerts that you want to enable. Using OpsMgr Authoring Console (or) Authoring Pane in OpsMgr Console, create an override for the management packs that enables the relevant PRO Monitors.

Steps for enabling the PRO Monitors are as follows:

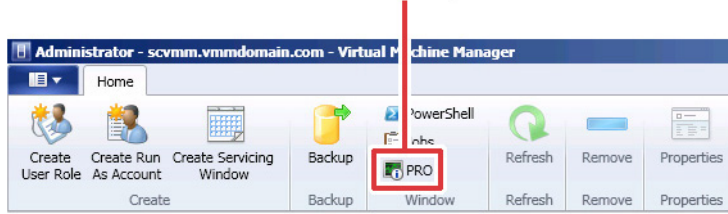
1. Launch OpsMgr console.
2. From the navigation pane, click **Authoring**.
3. In the **Authoring** tab, select **Management Pack Objects** → **Monitors**.
4. Click **Change Scope** at the top of the screen.  
The **Scope Management Pack Objects** screen is displayed.
5. Select **View all targets** and in **Look for** enter **Dell PRO**.
6. Select **Dell PROPack Class for Discovery** and click **OK**.
7. Expand **Entity Health** → **Availability**.
8. From the listed monitors, right-click the monitors you want to enable, and select **enable** → **Overrides** → **Override the Monitors** → **For all objects of class: Dell PROPack Class for Discovery**.  
The **Override Properties** page is displayed.
9. Select **Enabled** and set **Override Value** to **True** and click **OK**.  
To view the Dell PRO Monitored Servers Health updates, the next cycle of Dell PRO Monitored Servers discovery and monitoring must complete.

## Monitoring Using VMM

You can manage the health of the virtualized environment using PRO Tips displayed on the VMM console.

To see the **PRO Tip** window, click the **PRO** menu on the toolbar, as shown in the following figure.

Click the PRO Tips menu.



Alternatively, if you select the **Show this window when new PRO Tips are created** option in the **PRO Tip** window, the window automatically opens on the VMM console when a PRO Tip is generated.

The **PRO Tip** window displays information such as source, tip, and state of the PRO Tip in a tabular format. The window also displays description of the problem that triggered the alert, the cause, and the suggested remedial action for recovery.

## Implementing Recovery Actions

The **PRO Tip** window provides an option to either implement or dismiss the recommended action. If you select **Implement**, VMM implements one of the recovery tasks described below, based on the nature of the alert.

### Placing the Host in Restrict Mode

Placing a host in **Restrict** mode prevents assignment of workload to the host until the problem is solved. In this mode, the host still receives alerts on the Operations Manager and associated PRO Tips on the VMM.

The system health conditions that can trigger the maintenance are non-critical hardware alerts on the virtualization host such as, ambient chassis temperature warning on a Dell PowerEdge virtualization host system.

### Migration of Virtual Machines

The PRO Tip management pack uses VMM algorithms to move VMs from the affected system to a healthy one. For more information on the VMM algorithms, see the Microsoft documentation at [technet.microsoft.com/en-us/library/hh801542.aspx](http://technet.microsoft.com/en-us/library/hh801542.aspx).

The requirements for identifying a healthy system and moving the VMs are as follows:

- **Hardware requirements** — Requirements that a host must meet to run VMs. For example, sufficient memory and storage.
- **Software requirements** — Requirements if met by the host, allows a virtual machine to perform more optimally. For example, CPU allocation, network bandwidth, network availability, disk IO bandwidth, and free memory.

VMM assigns a star rating to hosts in a range of zero to five. If a hardware requirement is not met, for example, insufficient hard disk and memory capacity, the host automatically gets zero star and VMM does not allow you to place a VM on that host.

The system health conditions that trigger migration of VMs are hardware failure alerts on a virtualization host, such as virtual disk failure and predictive drive error. Dell PRO Pack migrates VMs with the **Running** status. It does not migrate VMs with status such as **Stop**, **Pause**, and **Saved**. This is based on the star rating of the associated servers.

After you successfully implement the recovery task, the following changes take place:

- The status of PRO Tip changes to **Resolved** and the PRO Tip entry moves out of the **PRO Tip** window.
- Corresponding alert disappears in the Operations Manager **Alert View**.
- An entry is displayed in the **Jobs** section on the VMM console. This entry displays the status of the job as **Completed**, as shown in the following figure.

The screenshot shows the VMM Jobs console with a list of jobs and a detailed view of the 'Refresh host cluster' job.

| Name                                      | Status    | Start Time          | Result Name                   | Owner                |
|---|-----------|---------------------|-------------------------------|----------------------|
| Refresh host cluster                      | Completed | 2/2/2009 2:33:19 PM | WIN-7X611FEN9FX.scedo...      | SCEDOM\administrator |
| Change properties of virtual machine host | Completed | 2/2/2009 2:33:16 PM | WIN-7X611FEN9FX.scedo...      | SCEDOM\administrator |
| Refresh virtual machine                   | Completed | 2/2/2009 2:32:59 PM | vm1                           | NT AUTHORITY\SYSTEM  |
| Set state of a PRO tip                    | Completed | 2/2/2009 2:30:01 PM | Dell Server has lost power... | SCEDOM\administrator |
| Move virtual machine from WIN-7X611F...   | Completed | 2/2/2009 2:29:46 PM | vm1                           | SCEDOM\administrator |
| Change properties of virtual machine host | Completed | 2/2/2009 2:29:43 PM | WIN-7X611FEN9FX.scedo...      | SCEDOM\administrator |
| Set state of a PRO tip                    | Completed | 2/2/2009 2:29:08 PM | Dell Server has lost power... | SCEDOM\administrator |
| Implement the fix for a PRO tip           | Completed | 2/2/2009 2:28:21 PM | Dell Server has lost power... | SCEDOM\administrator |
| Refresh virtual machine                   | Completed | 2/2/2009 2:28:11 PM | vm1                           | NT AUTHORITY\SYSTEM  |

| Property                  | Previous Value                      | New Value                           |
|---------------------------|-------------------------------------|-------------------------------------|
| <b>Host Volume - F:\</b>  |                                     |                                     |
| <b>Volume capacity</b>    | 598922489856                        | (none)                              |
| <b>Volume capacity</b>    | (none)                              | 598922489856                        |
| <b>Volume free space</b>  | 598023901184                        | (none)                              |
| <b>Volume free space</b>  | (none)                              | 598023901184                        |
| <b>Volume mount point</b> | F:\*\{?}\Volume{271b71ea-dd38-11... | (none)                              |
| <b>Volume mount point</b> | (none)                              | F:\*\{?}\Volume{271b71ea-dd38-11... |

PRO Tip implementation of moving VMs can fail if no other healthy hosts are available in the host group or host cluster. In such a case, the **PRO Tip** window displays the **state** of the corresponding PRO Tip as **Failed**, and the reason is elaborated in the **Error** section. The status of the corresponding entry in the **Jobs** section on the VMM console is also displayed as **Failed**.

**NOTE:** In the PRO Tip window the failure message is updated dynamically. However, to refresh the data, you have to click outside the PRO Tip window and then click again to bring the window in focus.

If you select **Dismiss**, the PRO Tip is not executed and the following changes take place:

- The PRO Tip is removed from the VMM PRO Tip console.
- The alert in Operations Manager is removed from the **Dell Server PRO Alerts**.

For more information, see [Using Health Explorer to Reset Alerts](#).

## VM Live Migration

As a connected user, during live migration, you can migrate a VM from one node of a Windows Server 2008 R2 failover cluster to another node in the same cluster without any downtime or interruption.

The difference in quick migration and live migration is that there is a downtime in quick migration whereas, there is no downtime in live migration.

**NOTE:** Windows Server 2008 Hyper-V supports quick migration. Windows Server 2008 R2 Hyper-V supports both quick migration and live migration.

## Related Documentation and Resources

This chapter gives the details of documents and resources to help you work with the Pro Pack 3.0.1

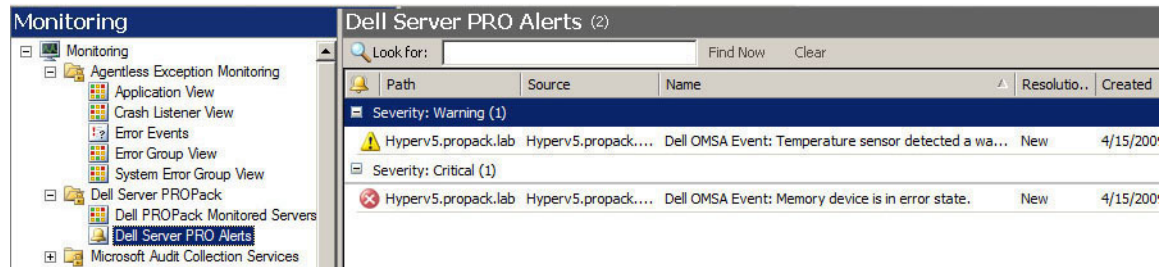
### Alerts View

Displays Dell PRO specific alerts in a tabular format with information on the severity level, source, name, resolution state, and, date and time of creation.

To access the **Alert View**:

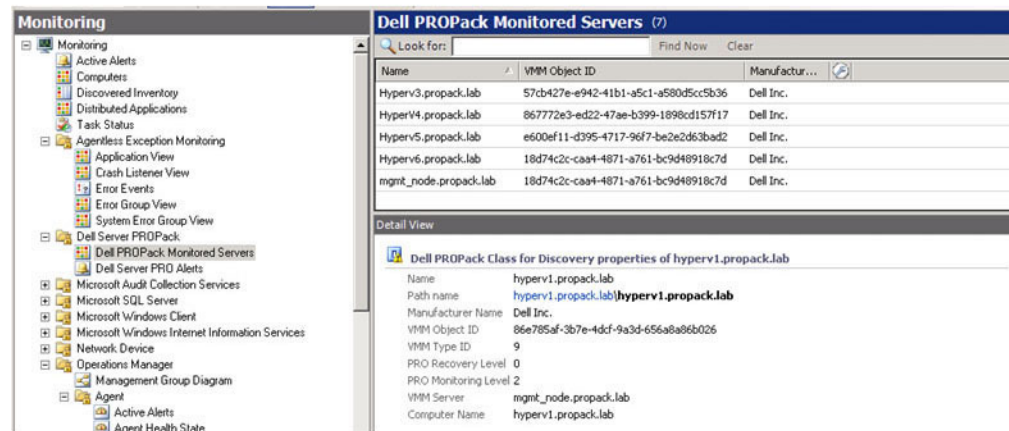
1. Launch the Operations Manager console.
2. Select the **Monitoring** tab.
3. From **Dell Server PRO Pack**, select **Dell Server PRO Alerts**.

The alerts are displayed on the right-side of the screen, as shown in the following figure.



## State View

Displays the discovered Dell system objects in a tabular format. The State View displays objects with the name, path, storage health of the Dell system, and so on. You can personalize the State View by defining which objects to display and how the data is displayed.



## Using Health Explorer to Reset Alerts

Health Explorer enables you to view and take action on alerts. When you select **Dismiss** in the **PRO Tip** window, the alert is removed from it.

To manually reset the alert:

1. On the **Actions** menu, click **Health Explorer**.
2. Right-click the alert that you want to close.
3. Select **Reset Health**. The alert disappears from the PRO Tip window.

# Overriding Recovery Actions


PRO Pack 3.0.1 supports two recovery actions. The following flag values trigger the respective recovery action:

- **1: For migration**
- **2: For placing the server in restricted mode**


You can override the default recovery action by changing the default recovery action flag value. For example, change the recovery flag value from **2** to **1** using the overrides option provided in Operations Manager console. After overriding the default value to **1**, and implementing PRO Tip, recovery action triggers migration of VMs from the host. If you enter any other value other than **1** and **2**, PRO Tip implementation fails, and an error message is displayed.

To override the recovery action:

1. Click the **Authoring** tab in Operations Manager.
2. Browse to **Authoring** → **Management Pack Objects** → **Monitors**
3. Search for the Dell PRO Pack monitors.
4. Select the monitor which you intend to override.
5. Right-click and select **Overrides** → **Override Recovery** → **<monitor>**.
6. Select the **Override** check box.
7. Change the value of **Override Value**.

 **NOTE:** When you select **Enable**, Operations Manager performs an auto-implementation for the unit monitor. Since this involves VMM migration, review and set the values accordingly.

8. Select the **Enforce** option.
9. Click **Apply**

 **CAUTION:** Saving the settings in the default management pack, creates a dependency between PRO Pack and the management pack. When you remove or delete PRO Pack, you must delete the default management pack as well, as it contains default settings for Operations Manager. Hence, it is recommended that you save settings using a new MP.

10. Click **OK**.
11. Generate an alert and PRO Tip.
12. Select **Implement PRO Tip**.

This verifies that the overridden recovery action is successful.



Figure 2. Override Properties

## Alerts and Recovery Actions

The following table lists the alerts and the recommended remedial actions:

| Dell Event ID | Alert Description on Operations Manager and PRO Tip in VMM | Severity | Alert Cause  | Dell PRO Tip Recommended Remedial Action |
|---------------|--|----------|--|--|
| 1053          | <b>Temperature sensor detected a warning value</b>         | Warning  | A temperature sensor on the backplane board, system board, CPU, or drive carrier in the specified system exceeded its warning threshold value. | Restrict                                 |
| 1054          | <b>Temperature sensor detected a failure value</b>         | Error    | A temperature sensor on the backplane board, system board, CPU, or drive carrier in the specified system exceeded its failure threshold value. | Restrict and Migrate                     |
| 1104          | <b>Fan sensor detected a failure value</b>                 | Error    | A fan sensor in the specified system detected the failure of one or more fans.   | Restrict                                 |
| 1154          | <b>Voltage sensor detected a failure value</b>             | Error    | A voltage sensor in the specified system exceeded its failure threshold value.   | Restrict and Migrate                     |
| 1203          | <b>Current sensor detected a warning value</b>             | Warning  | A current sensor in the specified system exceeded its warning threshold value.   | Restrict                                 |
| 1204          | <b>Current sensor detected a failure value</b>             | Error    | A current sensor in the specified system exceeded its failure threshold value.   | Restrict and Migrate                     |
| 1305          | <b>Redundancy degraded</b>                                 | Warning  | A power supply sensor reading in the specified system exceeded a warning threshold.  | Restrict                                 |
| 1306          | <b>Redundancy lost</b>                                     | Error    | A power supply has been disconnected or has failed.  | Restrict                                 |

| <b>Dell Event ID</b> | <b>Alert Description on Operations Manager and PRO Tip in VMM</b> | <b>Severity</b> | <b>Alert Cause</b>   | <b>Dell PRO Tip Recommended Remedial Action</b> |
|----------------------|---|-----------------|--|---|
| 1353                 | <b>Power supply detected a warning</b>                            | Warning         | A power supply sensor reading in the specified system exceeded definable warning threshold.  | Restrict  |
| 1354                 | <b>Power supply detected a failure</b>                            | Error           | A power supply has been disconnected or has failed.  | Restrict  |
| 1403                 | <b>Memory Device Status Warning</b>                               | Warning         | A memory device correction rate exceeded an acceptable value.  | Restrict  |
| 1404                 | <b>Memory Device Error</b>  | Error           | A memory device correction rate exceeded an acceptable value, a memory spare bank was activated, or a multibit ECC error occurred.   | Restrict and Migrate                            |
| 1703                 | <b>Battery sensor detected a warning value</b>                    | Warning         | A battery sensor in the specified system detected that a battery is in a predictive failure state.   | Restrict  |
| 2048                 | <b>Device Failed Error</b>  | Critical        | A storage component such as a physical disk or an enclosure has failed. The failed component may have been identified by the controller while performing a task such as a rescan or a check consistency. | Restrict and Migrate                            |
| 2056                 | <b>Virtual Disk Failed</b>  | Critical        | One or more physical disks included in the virtual disk have failed.   | Restrict and Migrate                            |
| 2057                 | <b>Virtual Disk Degraded Warning</b>                              | Warning         | This alert message occurs when a physical disk included in a redundant virtual disk fails.   | Restrict  |

| <b>Dell Event ID</b> | <b>Alert Description on Operations Manager and PRO Tip in VMM</b> | <b>Severity</b> | <b>Alert Cause</b>  | <b>Dell PRO Tip Recommended Remedial Action</b> |
|----------------------|---|-----------------|---|---|
| 2076                 | <b>Virtual Disk Check Consistency Failed</b>                      | Critical        | A physical disk included in the virtual disk failed or there is an error in the parity information.             | Restrict and Migrate                            |
| 2082                 | <b>Virtual Disk Rebuild Failure</b>                               | Critical        | A physical disk included in the virtual disk has failed or is corrupt.  | Restrict  |
| 2083                 | <b>Physical Disk Rebuild Failed</b>                               | Critical        | A physical disk included in the virtual disk has failed or is corrupt.  | Restrict  |
| 2094                 | <b>Predictive Failure reported</b>                                | Warning         | The physical disk is predicted to fail.   | Restrict  |
| 2100                 | <b>Temperature exceeded Maximum Warning Threshold</b>             | Warning         | The physical disk enclosure is too hot. A variety of factors can cause the excessive temperature.               | Restrict  |
| 2101                 | <b>Temperature dropped below Minimum Warning Threshold</b>        | Warning         | The physical disk enclosure is too cool.  | Restrict  |
| 2102                 | <b>Temperature exceeded Maximum Failure Threshold</b>             | Critical        | The physical disk enclosure is too hot. A variety of factors can cause the excessive temperature.               | Restrict and Migrate                            |
| 2103                 | <b>Temperature dropped below the Minimum Failure Threshold</b>    | Critical        | The physical disk enclosure is too cool.  | Restrict and Migrate                            |
| 2112                 | <b>Enclosure shutdown</b>   | Critical        | The physical disk enclosure is either hotter or cooler than the maximum or minimum allowable temperature range. | Restrict and Migrate                            |
| 2122                 | <b>Redundancy degraded</b>  | Warning         | One or more of the enclosure components has failed. For example, a fan or                                       | Restrict  |

| <b>Dell Event ID</b> | <b>Alert Description on Operations Manager and PRO Tip in VMM</b> | <b>Severity</b> | <b>Alert Cause</b>  | <b>Dell PRO Tip Recommended Remedial Action</b> |
|----------------------|---|-----------------|---|---|
| 2123                 | <b>Redundancy Lost</b>  | Warning         | power supply may have failed.<br>A virtual disk or an enclosure has lost data redundancy.   | Restrict and Migrate                            |
| 2125                 | <b>Controller cache pinned for missing or offline VD</b>          | Warning         | Controller getting disconnected from its VD, while IO is happening  | Restrict  |
| 2129                 | <b>BGI (Back Ground Initialization) Failed Error</b>              | Critical        | BGI of a virtual disk has failed.   | Restrict  |
| 2137                 | <b>Communication Time-out Warning</b>                             | Warning         | The controller is unable to communicate with an enclosure.  | Restrict and Migrate                            |
| 2145                 | <b>Controller battery low</b>                                     | Warning         | The controller battery charge is low.   | Restrict  |
| 2169                 | <b>The controller battery needs to be replaced</b>                | Critical        | The controller battery cannot recharge. The battery may have been already recharged the maximum number of times. In addition, the battery charger may not be working. | Restrict and Migrate                            |
| 2171                 | <b>The controller battery temperature is above normal</b>         | Warning         | The room temperature may be too hot. The system fan may also be degraded or failed.   | Restrict  |
| 2174                 | <b>The controller battey has been removed</b>                     | Warning         | The controller cannot communicate with the battery. The battery may be removed or the contact point maye degraded   | Restrict and Migrate                            |
| 2178                 | <b>The controller battery Learn cycle has timed out</b>           | Warning         | The controller battery must be fully charged before the Learn cycle can begin.  | Restrict  |

| <b>Dell Event ID</b> | <b>Alert Description on Operations Manager and PRO Tip in VMM</b>                       | <b>Severity</b> | <b>Alert Cause</b>   | <b>Dell PRO Tip Recommended Remedial Action</b> |
|----------------------|---|-----------------|--|---|
| 2187                 | <b>Single-bit ECC error limit exceeded on the controller DIMM</b>                       | Warning         | The controller memory is malfunctioning.   | Restrict and Migrate                            |
| 2201                 | <b>A global hot spare failed</b>  | Warning         | The controller is not able to communicate with a disk that is assigned as a global hot spare. The disk may have failed or been removed.                      | Restrict  |
| 2203                 | <b>A dedicated hot spare failed</b>   | Warning         | The controller is not able to communicate with a disk that is assigned as a dedicated hot spare.   | Restrict  |
| 2206                 | <b>The only hot spare available is a SATA disk. SATA disks cannot replace SAS disks</b> | Warning         | The only physical disk available to be assigned as a hot spare is using SATA technology.   | Restrict  |
| 2207                 | <b>The only hot spare available is a SAS disk. SAS disks cannot replace SATA disks</b>  | Warning         | The only physical disk available to be assigned as a hot spare is using SAS technology.  | Restrict  |
| 2213                 | <b>Recharge count maximum exceeded</b>  | Warning         | A virtual disk or an enclosure has lost data redundancy. In the case of a virtual disk, one or more physical disks included in the virtual disk have failed. | Restrict  |
| 2246                 | <b>The controller battery is degraded</b>   | Warning         | The temperature of the the battery is high. This maybe due to the battery being charged.   | Restrict  |
| 2264                 | <b>A device is missing</b>  | Warning         | The controller cannot communicate with a device. The device may be removed.  | Restrict  |
| 2265                 | <b>A device is in an unknown state</b>  | Warning         | The controller cannot communicate with a   | Restrict and Migrate                            |

| Dell Event ID | Alert Description on Operations Manager and PRO Tip in VMM               | Severity | Alert Cause   | Dell PRO Tip Recommended Remedial Action |
|---------------|--|----------|---|--|
| 2268          | <b>Storage Management communication Error</b>                            | Critical | Storage Management has lost communication with a controller. This may occur if the controller driver or firmware is experiencing a problem.     | Restrict and Migrate                     |
| 2272          | <b>Patrol Read found an uncorrectable media error</b>                    | Critical | The Patrol Read task has encountered an error that cannot be corrected. There may be a bad disk block that cannot be remapped.                  | Restrict and Migrate                     |
| 2273          | <b>A block on the physical disk has been punctured by the controller</b> | Critical | The controller encountered an unrecoverable medium error when attempting to read a block on the physical disk and marked that block as invalid. | Restrict and Migrate                     |
| 2282          | <b>Hot spare SMART polling failed</b>                                    | Warning  | The controller firmware attempted to do SMART polling on the hot spare but was not able to complete the SMART polling.                          | Restrict and Migrate                     |
| 2283          | <b>A redundant path is broken</b>  | Warning  | The controller has two connectors that are connected to the same enclosure.   | Restrict and Migrate                     |
| 2289          | <b>Multi-bit ECC error on controller DIMM</b>                            | Critical | An error involving multiple bits has been encountered during a read or write operation.   | Restrict and Migrate                     |
| 2290          | <b>Single-bit ECC error on controller DIMM</b>                           | Warning  | An error involving a single bit has been encountered during a   | Restrict                                 |

| Dell Event ID | Alert Description on Operations Manager and PRO Tip in VMM | Severity | Alert Cause  | Dell PRO Tip Recommended Remedial Action |
|---------------|--|----------|--|--|
|               |  |          | read or write operation.   |  |
| 2292          | <b>Communication with the enclosure has been lost</b>      | Critical | The controller has lost communication with an enclosure management module (EMM). The cables may be loose or defective. | Restrict and Migrate                     |
| 2293          | <b>EMM (Enclosure Management Module) Failure</b>           | Error    | The failure may be caused by a loss of power to the EMM.   | Restrict and Migrate                     |
| 2298          | <b>The enclosure has a bad sensor</b>                      | Warning  | The enclosure has a bad sensor. The enclosure sensors monitor the fan speeds, temperature probes, and so on.           | Restrict                                 |
| 2299          | <b>Bad PHY</b>   | Critical | There is a problem with a physical connection or PHY.  | Restrict                                 |
| 2300          | <b>Unstable Enclosure Failure</b>                          | Critical | The controller is not receiving a consistent response from the enclosure.  | Restrict and Migrate                     |
| 2301          | <b>Enclosure Hardware Error</b>                            | Critical | The enclosure or an enclosure component is in a Failed or Degraded state.  | Restrict and Migrate                     |
| 2302          | <b>The enclosure is not responding</b>                     | Critical | The enclosure or an enclosure component is in a Failed or Degraded state.  | Restrict and Migrate                     |
| 2306          | <b>Bad block table is 80% full</b>                         | Warning  | The bad block table is the table used for remapping bad disk blocks. This table fills as bad disk blocks are remapped. | Restrict                                 |
| 2307          | <b>Bad block table is full.</b>                            | Critical | The bad block table is the table used for remapping bad disk blocks.   | Restrict                                 |

| <b>Dell Event ID</b> | <b>Alert Description on Operations Manager and PRO Tip in VMM</b>   | <b>Severity</b> | <b>Alert Cause</b>   | <b>Dell PRO Tip Recommended Remedial Action</b> |
|----------------------|---|-----------------|--|---|
| 2310                 | <b>A virtual disk is permanently degraded</b>   | Critical        | A redundant virtual disk has lost redundancy. This may occur when the virtual disk suffers the failure of more than one physical disk. | Restrict and Migrate                            |
| 2312                 | <b>A power supply in the enclosure has an AC failure</b>  | Warning         | The power supply has an AC failure   | Restrict  |
| 2313                 | <b>A power supply in the enclosure has a DC failure</b>   | Warning         | The power supply has a DC failure.   | Restrict  |
| 2314                 | <b>The initialization sequence of SAS components failed during system startup. SAS management and monitoring is not possible.</b> | Critical        | Storage Management is unable to monitor or manage SAS devices.   | Restrict and Migrate                            |
| 2318                 | <b>Problems with the battery or the battery charger have been detected. The battery health is poor.</b>                           | Warning         | The battery or the battery charger is not functioning properly.  | Restrict  |
| 2319                 | <b>Single-bit ECC error on controller DIMM. The DIMM is degrading.</b>  | Warning         | The dual in-line memory module (DIMM) is beginning to malfunction.   | Restrict and Migrate                            |
| 2320                 | <b>Single-bit ECC error. The DIMM is critically degraded.</b>   | Critical        | The DIMM is malfunctioning. Data loss or data corruption may be imminent.  | Restrict and Migrate                            |
| 2321                 | <b>Single-bit ECC error. The controller DIMM is nonfunctional. There will be no further reporting</b>                             | Critical        | The dual in-line memory module (DIMM) is malfunctioning. Data loss or data corruption is eminent.                                      | Restrict and Migrate                            |
| 2322                 | <b>The DC power supply is switched off</b>  | Critical        | The power supply unit is switched off. Either a user switched off the  | Restrict and Migrate                            |

| <b>Dell Event ID</b> | <b>Alert Description on Operations Manager and PRO Tip in VMM</b>                         | <b>Severity</b> | <b>Alert Cause</b>   | <b>Dell PRO Tip Recommended Remedial Action</b> |
|----------------------|---|-----------------|--|---|
| 2324                 | <b>The AC power supply cable has been removed</b>   | Critical        | power supply unit or it is defective.<br>The power cable may be pulled out or removed. The power cable may also have overheated and become warped and nonfunctional. | Restrict and Migrate                            |
| 2327                 | <b>The NVRAM has corrupted data. The controller is reinitializing the NVRAM</b>           | Warning         | The NVRAM has corrupted data. This may occur after a power surge, a battery failure, or for other reasons. The controller is reinitializing the NVRAM                | Restrict and Migrate                            |
| 2328                 | <b>The NVRAM has corrupt data</b>   | Warning         | The NVRAM has corrupt data. The controller is unable to correct the situation  | Restrict and Migrate                            |
| 2329                 | <b>SAS port report</b>  | Warning         | The text for this alert is generated by the controller and can vary depending on the situation.  | Restrict and Migrate                            |
| 2337                 | <b>The controller is unable to recover cached data from the battery backup unit (BBU)</b> | Critical        | The controller was unable to recover data from the cache.  | Restrict  |
| 2340                 | <b>The background initialization (BGI) completed with uncorrectable errors</b>            | Critical        | The background initialization task encountered errors that cannot be corrected.  | Restrict and Migrate                            |
| 2342                 | <b>The Check Consistency found inconsistent parity data. Data redundancy may be lost</b>  | Warning         | The data on a source disk and the redundant data on a target disk is inconsistent.   | Restrict and Migrate                            |
| 2349                 | <b>A bad disk block could not be reassigned</b>   | Critical        | A write operation could not complete   | Restrict  |

| Dell Event ID | Alert Description on Operations Manager and PRO Tip in VMM                                  | Severity | Alert Cause  | Dell PRO Tip Recommended Remedial Action |
|---------------|---|----------|--|--|
|               | during a write operation  |          | because the disk contains bad disk blocks that could not be reassigned. Data loss may have occurred.   |  |
| 2350          | <b>There was an unrecoverable disk media error during the rebuild or recovery operation</b> | Critical | The rebuild or recovery operation encountered an unrecoverable disk media error.   | Restrict                                 |
| 2356          | <b>SAS SMP communications error</b>   | Critical | The text for this alert is generated by the firmware and can vary depending on the situation. The reference to SMP in this text refers to SAS Management Protocol. | Restrict                                 |
| 2357          | <b>SAS expander error</b>   | Critical | There may be a problem with the enclosure. Verify the health of the enclosure and its components.  | Restrict                                 |
| 2387          | <b>Virtual disk bad block medium error is detected</b>                                      | Critical | Virtual disk bad blocks are due to presence of unrecoverable bad blocks on one or more member physical disks   | Restrict and Migrate                     |
| 2396          | <b>The Check Consistency detected uncorrectable multiple medium errors</b>                  | Critical | Medium errors in the physical drives.  | Restrict                                 |
| 2397          | <b>The Check Consistency completed with uncorrectable errors</b>                            | Critical | Medium errors in the physical drives.  | Restrict and Migrate                     |
| 2416          | <b>Disk medium error detected</b>   | Warning  | Disk medium error detected   | Restrict                                 |
| 2417          | <b>There is an unrecoverable medium error detected on virtual disk</b>                      | Critical | Unrecoverable medium error detected on virtual disk.   | Restrict and Migrate                     |

| <b>Dell Event ID</b>  | <b>Alert Description on Operations Manager and PRO Tip in VMM</b> | <b>Severity</b> | <b>Alert Cause</b>          | <b>Dell PRO Tip Recommended Remedial Action</b> |
|---|---|-----------------|-----------------------------|---|
| 2,4 Driver Name: b06bdrv,ebdrv b57w2k,b57nd60x, b57nd60a,l2nd | <b>Dell OMNIC Broadcom Network Interface Link Down</b>            | Critical        | The network link is down.   | Restrict  |
| 13,27,29,70 Driver Name: e1express, e1qexpress, ixgbe, e1000  | <b>Dell OMNIC Intel Network Interface Link Down</b>               | Critical        | Link has been disconnected. | Restrict  |

## Related Documentation and Resources

This chapter gives the details of documents and resources to help you work with the Pro Pack 3.0.1

### Security Considerations


Operations Console access privileges are handled internally by Operations Manager. You can setup this using the **User Roles** option under **Administration Security** feature on the Operations Manager console. The profile of the role assigned to you determines what actions you can perform and which objects you are able to manage. For more information on security considerations, see the documentation for Microsoft System Center 2012 R2 Operations Manager, Microsoft System Center 2012 SP1 Operations Manager, Microsoft System Center 2012 Operations Manager, Microsoft System Center Operations Manager 2007 R2, or the Microsoft Systems Center Essentials 2010 Online Help at [technet.microsoft.com](http://technet.microsoft.com).

### Other Documents You May Need

In addition to this guide, you can access the following guides available at [dell.com/support/manuals](http://dell.com/support/manuals).

- The *Dell OpenManage Server Administrator CIM Reference Guide* documents the Common Information Model (CIM) provider, an extension of the standard management object format (MOF) file. The CIM provider MOF documents supported classes of management objects.
- The *Dell OpenManage Server Administrator Messages Reference Guide* lists the messages that are displayed in your Server Administrator home page Alert log or on your operating system's event viewer. This guide explains the text, severity, and cause of each service alert message that Server Administrator issues.
- The *Dell OpenManage Server Administrator Command Line Interface User's Guide* documents the complete command line interface for Server Administrator, including an explanation of the command line interface (CLI) commands to view system status, access logs, create reports, configure various component parameters, and set critical thresholds.
- *The Glossary* provides information about the terms used in this document.

### Contacting Dell

 **NOTE:** If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

1. Visit [dell.com/support](http://dell.com/support)
2. Select your support category.
3. Verify your country or region in the Choose a Country/Region drop-down menu at the top of page.
4. Select the appropriate service or support link based on your need.