Dell Server PRO Management Pack 3.0 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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1 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 integrates with the following:

- Microsoft System Center 2012 Operations Manger
- Microsoft System Center 2012 SP1 Operations Manger
- Microsoft System Center Operations Manager 2007 R2
- Microsoft System Center 2012 Virtual Machine Manager (VMM)
- Microsoft System Center 2012 SP1 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 for Microsoft System Center Virtual Machine Manager Installation guide*.

NOTE: All references to Operations Manager in this document is applicable to Microsoft System Center Operations Manager 2007 R2, Microsoft System Center 2012 Operations Manager, and Microsoft System Center 2012 SP1 Operations Manger 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. The readme, **DellMPv30_PROPack_Readme.txt**, is packaged in the self-extracting executable file **Dell_PROPack_v3.0.0_A00.exe**. However, for the latest readme, see **dell.com/OMConnectionsEnterpriseSystemsManagement** and then search for **Dell Server Pro Management Pack 3.0 for Microsoft System Center Virtual Machine Manager**, else see **dell.com/support/Manuals/us/en/04/Product/dell-srvr-pro-mgmt-pck-3.0-for-ms-center-virt-machine-mangr**.

What's New in This Release

This release of PRO Pack supports the following:

- Microsoft System Center 2012 Operation Manger
- Microsoft System Center 2012 SP1 Operation Manger
- Microsoft System Center 2012 Virtual Machine Manager (VMM)

  NOTE: PRO Pack 3.0 does not integrate with older versions of Microsoft System Center Virtual Machine Manager.
- Microsoft System Center 2012 SP1 Virtual Machine Manager (VMM)
- Support for Dell PowerEdge 12th generation servers.

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.

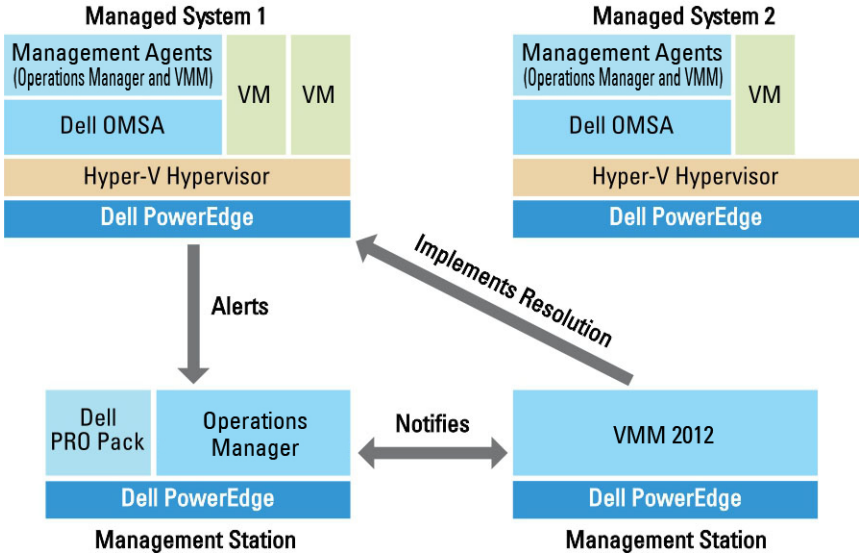


Figure 1. Interaction of Components

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 **PRO Tip** window with remedial action.
6	Implement the PRO Tip to enable recovery action on the managed system by placing the managed system in the **Restrict** mode or **Restrict and Migrate** 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 **Resolved** after it is successfully implemented.
9	PRO Tip disappears from VMM **PRO Tip** window.
10	PRO Active alert disappears from Operations Manger.

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**.

Management station:

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

- Operations Manager 2012 or Operations Manager 2012 SP1 - **technet.microsoft.com/en-us/library/hh205990.aspx**
- Operations Manager 2007 R2 - **technet.microsoft.com/en-us/library/bb309428.aspx**
- System Center 2012 Virtual Machine Manager or System Center 2012 SP1 Virtual Machine Manager- **technet.microsoft.com/en-us/library/gg610562.aspx**

2

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** .

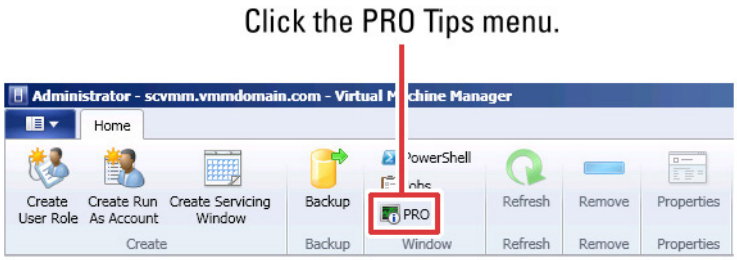
   The **Override Properties** page is displayed.
9. Select **Enabled** and set **Override Value** to **True** and click **OK**.

   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.



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**.

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

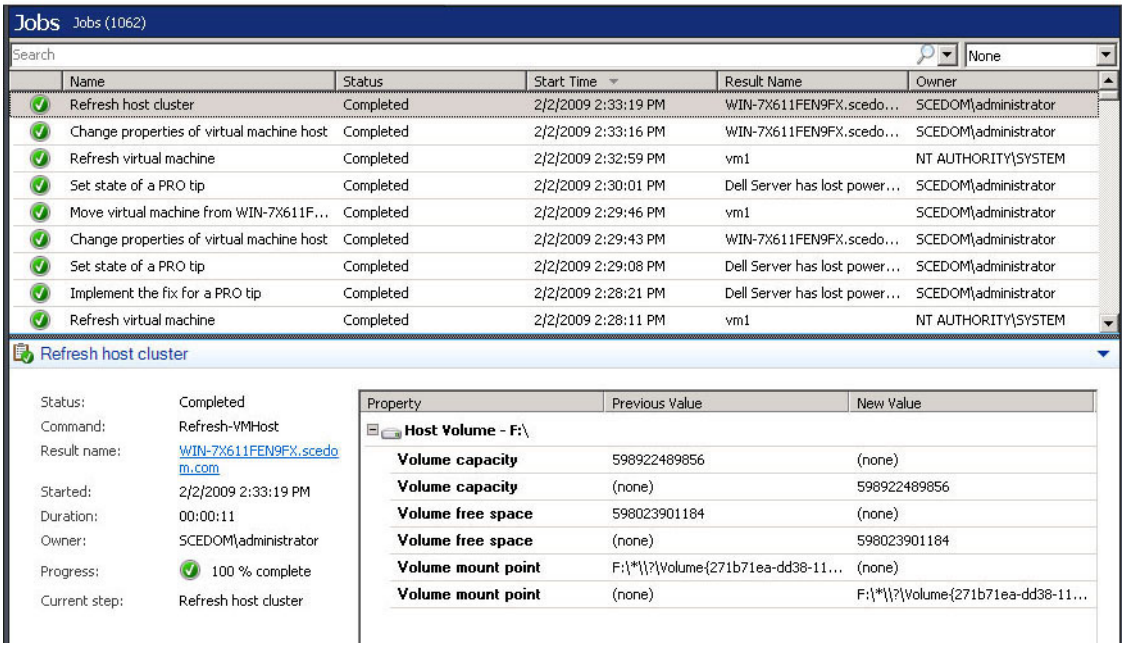
- **Hardware requirements** — Requirements that a host must meet to run VMs. For example, sufficient memory and storage.
- **Software requirements** — Requirements if met by the host, allows a virtual machine to perform more optimally. For example, CPU allocation, network bandwidth, network availability,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



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 display 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

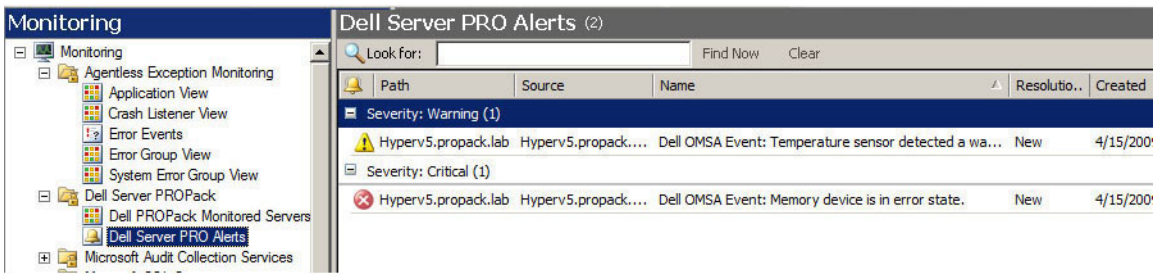
This chapter gives the details of documents and resources to help you work with the Pro Pack 3.0.

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.

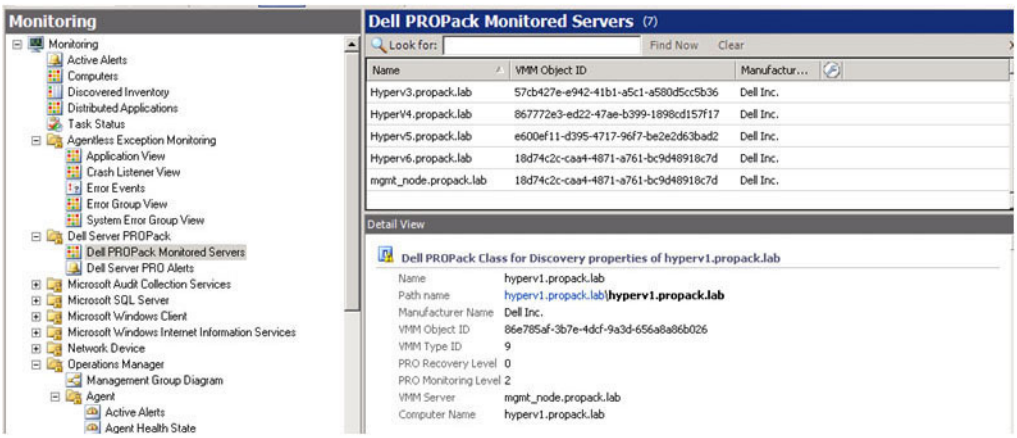
To access the **Alert View**:

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 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.

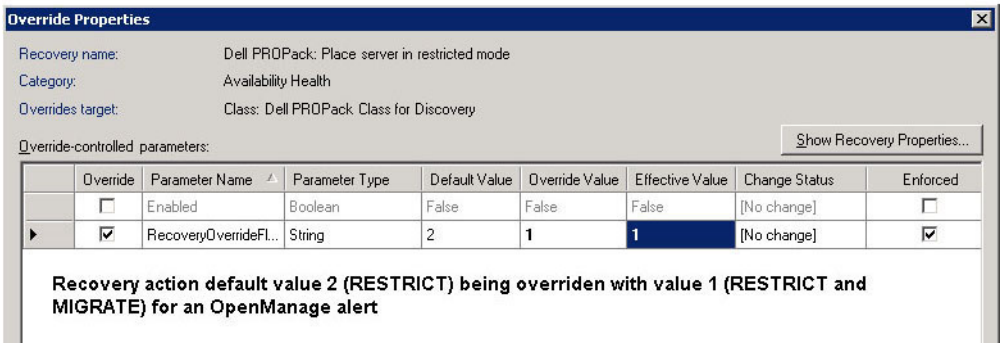


Figure 2. Override Properties

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	**Temperature sensor detected a warning value**	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	**Temperature sensor detected a failure value**	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	**Fan sensor detected a failure value**	Error	A fan sensor in the specified system detected the failure of one or more fans.	Restrict
1154	**Voltage sensor detected a failure value**	Error	A voltage sensor in the specified system exceeded its failure threshold value.	Restrict and Migrate
1203	**Current sensor detected a warning value**	Warning	A current sensor in the specified system exceeded its warning threshold value.	Restrict

Dell Event ID	Alert Description on Operations Manager and PRO Tip in VMM	Severity	Alert Cause	Dell PRO Tip Recommended Remedial Action
1204	**Current sensor detected a failure value**	Error	A current sensor in the specified system exceeded its failure threshold value.	Restrict and Migrate
1305	**Redundancy degraded**	Warning	A power supply sensor reading in the specified system exceeded a warning threshold.	Restrict
1306	**Redundancy lost**	Error	A power supply has been disconnected or has failed.	Restrict
1353	**Power supply detected a warning**	Warning	A power supply sensor reading in the specified system exceeded definable warning threshold.	Restrict
1354	**Power supply detected a failure**	Error	A power supply has been disconnected or has failed.	Restrict
1403	**Memory Device Status Warning**	Warning	A memory device correction rate exceeded an acceptable value.	Restrict
1404	**Memory Device Error**	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	**Battery sensor detected a warning value**	Warning	A battery sensor in the specified system detected that a battery is in a predictive failure state.	Restrict
2048	**Device Failed Error**	Critical	A storage component such as a physical disk or an enclosure has failed. The failed component may have been identified by the	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
			controller while performing a task such as a rescan or a check consistency.	
2056	**Virtual Disk Failed**	Critical	One or more physical disks included in the virtual disk have failed.	Restrict and Migrate
2057	**Virtual Disk Degraded Warning**	Warning	This alert message occurs when a physical disk included in a redundant virtual disk fails.	Restrict
2076	**Virtual Disk Check Consistency Failed**	Critical	A physical disk included in the virtual disk failed or there is an error in the parity information.	Restrict
2082	**Virtual Disk Rebuild Failure**	Critical	A physical disk included in the virtual disk has failed or is corrupt.	Restrict
2083	**Physical Disk Rebuild Failed**	Critical	A physical disk included in the virtual disk has failed or is corrupt.	Restrict
2094	**Predictive Failure reported**	Warning	The physical disk is predicted to fail.	Restrict
2100	**Temperature exceeded Maximum Warning Threshold**	Warning	The physical disk enclosure is too hot. A variety of factors can cause the excessive temperature.	Restrict
2101	**Temperature dropped below Minimum Warning Threshold**	Warning	The physical disk enclosure is too cool.	Restrict
2102	**Temperature exceeded Maximum Failure Threshold**	Critical	The physical disk enclosure is too hot. A variety of factors can cause the excessive temperature.	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
2103	**Temperature dropped below the Minimum Failure Threshold**	Critical	The physical disk enclosure is too cool.	Restrict and Migrate
2112	**Enclosure shutdown**	Critical	The physical disk enclosure is either hotter or cooler than the maximum or minimum allowable temperature range.	Restrict and Migrate
2122	**Redundancy degraded**	Warning	One or more of the enclosure components has failed. For example, a fan or power supply may have failed.	Restrict
2123	**Redundancy Lost**	Warning	A virtual disk or an enclosure has lost data redundancy.	Restrict and Migrate
2125	**Controller cache pinned for missing or offline VD**	Warning	Controller getting disconnected from its VD, while IO is happening	Restrict
2129	**BGI (Back Ground Initialization) Failed Error**	Critical	BGI of a virtual disk has failed.	Restrict
2137	**Communication Time-out Warning**	Warning	The controller is unable to communicate with an enclosure.	Restrict and Migrate
2145	**Controller battery low**	Warning	The controller battery charge is low.	Restrict
2169	**The controller battery needs to be replaced**	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	**The controller battery temperature is above normal**	Warning	The room temperature may be too hot. The system fan may also be degraded or failed.	Restrict

Dell Event ID	Alert Description on Operations Manager and PRO Tip in VMM	Severity	Alert Cause	Dell PRO Tip Recommended Remedial Action
2174	The controller battey has been removed	Warning	The controller cannot communicate with the battery. The battery may be removed or the contact point maye degraded	Restrict and Migrate
2178	The controller battery Learn cycle has timed out	Warning	The controller battery must be fully charged before the Learn cycle can begin.	Restrict
2187	Single-bit ECC error limit exceeded on the controller DIMM	Warning	The controller memory is malfunctioning.	Restrict and Migrate
2201	A global hot spare failed	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	A dedicated hot spare failed	Warning	The controller is not able to communicate with a disk that is assigned as a dedicated hot spare.	Restrict
2206	The only hot spare available is a SATA disk. SATA disks cannot replace SAS disks	Warning	The only physical disk available to be assigned as a hot spare is using SATA technology.	Restrict
2207	The only hot spare available is a SAS disk. SAS disks cannot replace SATA disks	Warning	The only physical disk available to be assigned as a hot spare is using SAS technology.	Restrict
2213	Recharge count maximum exceeded	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

Dell Event ID	Alert Description on Operations Manager and PRO Tip in VMM	Severity	Alert Cause	Dell PRO Tip Recommended Remedial Action
2246	**The controller battery is degraded**	Warning	The temperature of the the battery is high. This maybe due to the battery being charged.	Restrict
2264	**A device is missing**	Warning	The controller cannot communicate with a device. The device may be removed.	Restrict
2265	**A device is in an unknown state**	Warning	The controller cannot communicate with a device. The state of the device cannot be determined.	Restrict and Migrate
2268	**Storage Management communication Error**	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	**Patrol Read found an uncorrectable media error**	Critical	The Patrol Read task has encounted an error that cannot be corrected. There may be a bad disk block that cannot be remapped.	Restrict and Migrate
2273	**A block on the physical disk has been punctured by the controller**	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	**Hot spare SMART polling failed**	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	**A redundant path is broken**	Warning	The controller has two connectors that are	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
			connected to the same enclosure.	
2289	**Multi-bit ECC error on controller DIMM**	Critical	An error involving multiple bits has been encountered during a read or write operation.	Restrict and Migrate
2290	**Single-bit ECC error on controller DIMM**	Warning	An error involving a single bit has been encountered during a read or write operation.	Restrict
2292	**Communication with the enclosure has been lost**	Critical	The controller has lost communication with an enclosure management module (EMM). The cables may be loose or defective.	Restrict and Migrate
2293	**EMM (Enclosure Management Module) Failure**	Error	The failure may be caused by a loss of power to the EMM.	Restrict and Migrate
2298	**The enclosure has a bad sensor**	Warning	The enclosure has a bad sensor. The enclosure sensors monitor the fan speeds, temperature probes, and so on.	Restrict
2299	**Bad PHY**	Critical	There is a problem with a physical connection or PHY.	Restrict
2300	**Unstable Enclosure Failure**	Critical	The controller is not receiving a consistent response from the enclosure.	Restrict and Migrate
2301	**Enclosure Hardware Error**	Critical	The enclosure or an enclosure component is in a Failed or Degraded state.	Restrict and Migrate
2302	**The enclosure is not responding**	Critical	The enclosure or an enclosure component is in a Failed or Degraded state.	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
2306	**Bad block table is 80% full**	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	**Bad block table is full.**	Critical	The bad block table is the table used for remapping bad disk blocks.	Restrict
2310	**A virtual disk is permanently degraded**	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	**A power supply in the enclosure has an AC failure**	Warning	The power supply has an AC failure	Restrict
2313	**A power supply in the enclosure has a DC failure**	Warning	The power supply has a DC failure.	Restrict
2314	**The initialization sequence of SAS components failed during system startup. SAS management and monitoring is not possible.**	Critical	Storage Management is unable to monitor or manage SAS devices.	Restrict and Migrate
2318	**Problems with the battery or the battery charger have been detected. The battery health is poor.**	Warning	The battery or the battery charger is not functioning properly.	Restrict
2319	**Single-bit ECC error on controller DIMM.**	Warning	The dual in-line memory module (DIMM) is beginning to malfunction.	Restrict and Migrate
2320	**Single-bit ECC error**	Critical	The dual in-line memory module (DIMM) is malfunctioning.	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
2321	**Single-bit ECC error. The controller DIMM is nonfunctional. There will be no further reporting**	Critical	The dual in-line memory module (DIMM) is malfunctioning. Data loss or data corruption is eminent.	Restrict and Migrate
2322	**The DC power supply is switched off**	Critical	The power supply unit is switched off. Either a user switched off the power supply unit or it is defective.	Restrict and Migrate
2324	**The AC power supply cable has been removed**	Critical	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	**The NVRAM has corrupted data. The controller is reinitializing the NVRAM**	Warning	The NVRAM has corrupted data. This may ocurr after a power surge, a battery failure, or for other reasons. The controller is reinitializing the NVRAM	Restrict and Migrate
2328	**The NVRAM has corrupt data**	Warning	The NVRAM has corrupt data. The controller is unable to correct the situation	Restrict and Migrate
2329	**SAS port report**	Warning	The text for this alert is generated by the controller and can vary depending on the situation.	Restrict and Migrate
2337	**The controller is unable to recover cached data from the battery backup unit (BBU)**	Critical	The controller was unable to recover data from the cache.	Restrict
2340	**The background initialization (BGI) completed with uncorrectable errors**	Critical	The background initialization task encountered errors	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
			that cannot be corrected.	
2342	**The Check Consistency found inconsistent parity data. Data redundancy may be lost**	Warning	The data on a source disk and the redundant data on a target disk is inconsistent.	Restrict and Migrate
2349	**A bad disk block could not be reassigned during a write operation**	Critical	A write operation could not complete because the disk contains bad disk blocks that could not be reassigned. Data loss may have occurred.	Restrict
2350	**There was an unrecoverable disk media error during the rebuild or recovery operation**	Critical	The rebuild or recovery operation encountered an unrecoverable disk media error.	Restrict
2356	**SAS SMP communications error**	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	**SAS expander error**	Critical	There may be a problem with the enclosure. Verify the health of the enclosure and its components.	Restrict
2387	**Virtual disk bad block medium error is detected**	Critical	Virtual disk bad blocks are due to presence of unrecoverable bad blocks on one or more member physical disks	Restrict and Migrate
2396	**The Check Consistency detected uncorrectable multiple medium errors**	Critical	Medium errors in the physical drives.	Restrict

Dell Event ID	Alert Description on Operations Manager and PRO Tip in VMM	Severity	Alert Cause	Dell PRO Tip Recommended Remedial Action
2397	**The Check Consistency completed with uncorrectable errors**	Critical	Medium errors in the physical drives.	Restrict and Migrate
2416	**Disk medium error detected**	Warning	Disk medium error detected	Restrict
2417	**There is an unrecoverable medium error detected on virtual disk**	Critical	Unrecoverable medium error detected on virtual disk.	Restrict and Migrate
2,4 Driver Name: b06bdrv,ebdrv b57w2k,b57nd60x, b57nd60a,l2nd	**Dell OMNIC Broadcom Network Interface Link Down**	Critical	The network link is down.	Restrict
13,27,29,70 Driver Name: e1express, e1qexpress, ixgbe, e1000	**Dell OMNIC Intel Network Interface Link Down**	Critical	Link has been disconnected.	Restrict

3

Related Documentation and Resources

This chapter gives the details of documents and resources to help you work with the Pro Pack 3.0.

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 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**.

Other Documents You May Need

In addition to this guide, you can access the following guides available at **support.dell.com/manuals**. On the **Manuals** page, click **Software → Systems Management**. Click the appropriate product link on the right-side to access the documents.

- 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**
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.