

Dell™ Server PRO Management Pack 1.0
For Microsoft® System Center
Virtual Machine Manager 2008
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

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

The integration of Dell PROPack with System Center Operations Manager (SCOM) 2007 SP1/ System Center Essential (SCE) 2007 SP1 and System Center Virtual Machine Manager (SCVMM) 2008, enables you to proactively manage virtual environments and ensure high availability of your Dell systems.



CAUTION: Due to the possibility of data corruption and/ or data loss, Dell recommends that the procedures in this document should be performed only by personnel with knowledge and experience of using the Microsoft® Windows® operating system and the Systems Center Operations Manager 2007/ System Center Essentials 2007.



NOTE: Read Dell PROPack readme file, DellPROMP1.0_Readme.txt, which contains the latest information about software and management station requirements, in addition to information about known issues. You can find the readme packaged in the self-extracting executable - Dell.Connections.PROPack. It is also posted on the Systems Management documentation page on the Dell Support website at support.dell.com.

Overview

System Center Operations Manager (SCOM) 2007/ System Center Essentials (SCE) 2007 uses Management Packs to collect and store information on hardware and applications along with a description of their health status. Dell PROPack works with SCOM/SCE and System Center Virtual Machine Manager (SCVMM) 2008 to manage Dell physical devices and their hosted virtual machines using this available health information. Dell PROPack 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 SCOM/SCE and remediation capabilities of SCVMM.

Related Terms

- A *managed system* is a Dell system running Dell™ OpenManage™ System Administrator and monitored and managed using SCOM/SCE and SCVMM. It can be managed locally or remotely through a supported Web browser.
- A *management station* (or) *managing station* can be a Microsoft® Windows®-based Dell system which is used to manage virtualized infrastructures.

What is a PRO Tip?

PRO (Performance and Resource Optimization) Tip is a feature that enables monitoring of your virtualized infrastructure and alerting when there is an opportunity to optimize the usage of these resources. A *PRO Tip* window consists of the description of the event that produced the PRO Tip and suggested remedial action. This feature allows you to load-balance virtual machines between physical hosts when specific thresholds, such as temperature of CPU, are exceeded. Alternatively, you can migrate virtual machines when a hardware failure is detected.

The PRO Tip window in the SCVMM Administrator console enables you to view active PRO Tips for the host groups. The SCOM/SCE console displays the corresponding alerts as well, to ensure a consistent monitoring experience.

You can implement the recommended action mentioned in the PRO Tip manually or automatically.

Feature Highlights

The Dell PROPack 1.0:

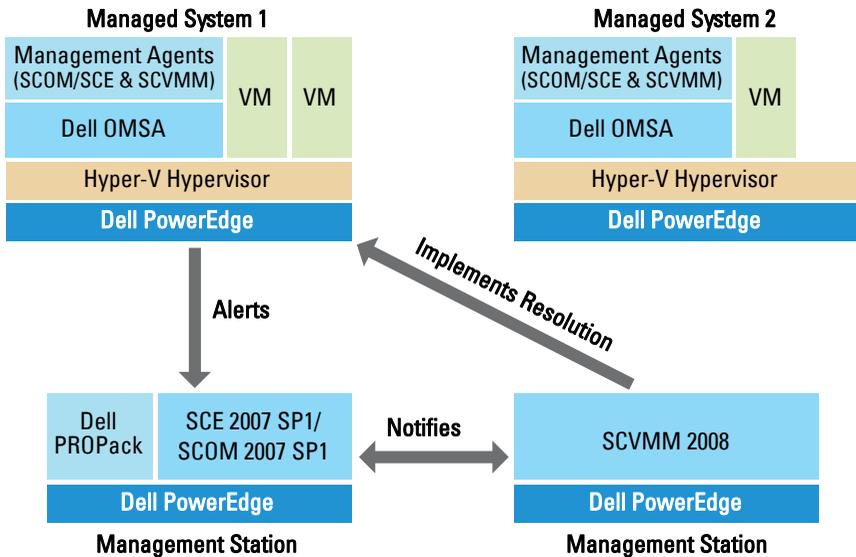
- Simplifies management of physical and virtual machines on Dell PowerEdge™ systems running Windows Server 2008 x64 Hyper-V operating system with SCVMM 2008, by continually monitoring the health of your virtual infrastructure.
- Works with SCOM/SCE and SCVMM to detect events such as loss of power supply redundancy, higher temperature than threshold values, system storage battery error, virtual disk failure, and so on. For more information on events supported by Dell PROPack, see "Alert Cause and Recovery Action".

- Generates PRO Tip when the monitored hardware move to an unhealthy state. The PROTip can be:
 - a remedial action, such as movement of virtual machines.
 - a recommended action, such as placing of host into maintenance mode. You can then choose to take remedial action, such as migrate the virtual machines to another healthy host.
- Minimizes downtime by implementing the remedial action provided on PRO Tips, if so configured.

Understanding PRO Tip Management

To help you understand how Dell PROPack works, this section explains a typical setup and the sequence of events involved.

Figure 1-1. Interaction of Components



In the figure, a group of Dell PowerEdge systems are the managed systems. Two Dell PowerEdge systems act as management stations hosting the SCOM/SCE and SCVMM. Dell OpenManage Server Administrator

generates relevant severity alerts for monitored objects when there is a transition to an unhealthy state. The Dell PROPack contains a mapping between Server Administrator alerts and the associated PRO Tip.

The following table describes the sequence of events that occur in generating and handling of a typical PRO Tip.

Table 1-1. Sequence of events with description

Sequence Number	Event
1	SCOM/SCE agents installed on the host detect the warning, error, or failure alerts that are logged by Dell OpenManage Server Administrator.
2	Alert is sent to SCOM/SCE.
3	SCOM/SCE console displays active PRO specific alert.
4	SCOM/SCE notifies the alert and the associated PRO Tip ID to SCVMM.
5	SCVMM displays a corresponding entry in the PRO Tip window.
6	You can choose to implement the recovery action on the respective managed system.
7	SCVMM notifies SCOM/SCE about the successful completion of the recovery action.
8	The status of the PRO Tip is displayed as "Resolved" on the SCVMM console after successful implementation of the PRO Tip.

For more information on the types of events and the associated remedial actions, see "Alert Cause and Recovery Action".

Supported Operating Systems

For the detailed Operating Systems support matrix, see the Dell PROPack readme file, DellPROMP1.0_Readme.txt. You can find the readme packaged in the self-extracting executable - Dell_PROPack_1.0.0_A00.exe. It is also posted on the Systems Management documentation page on the Dell Support website at support.dell.com.

Other Documents You May Need

Besides this *User's Guide*, you might need to refer to the following guides available on the Dell Support website at support.dell.com:

- The *Dell OpenManage Installation and Security User's Guide* provides detailed installation procedures and step-by-step instructions for installing, upgrading, and uninstalling Server Administrator for each supported operating system.
- The *Dell OpenManage Software Quick Installation Guide* provides an overview of applications that you can install on your management station (console) and on your managed systems. This document also provides procedures for installing your console and managed system applications on systems running supported operating systems.
- The *Dell OpenManage Server Administrator Compatibility Guide* provides compatibility information about Server Administrator installation and operation on various hardware platforms (or systems) running supported operating systems.
- 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 *Dell OpenManage Server Administrator Storage Management User's Guide* is a comprehensive reference guide for configuring and managing local and remote storage attached to a system. This document is also available in HTML and PDF formats on the *Dell Systems Management Tools and Documentation* DVD and from the Storage Management console as online help.

The *Dell Systems Management Tools and Documentation* DVD contains a readme file for Server Administrator and additional readme files for other systems management software applications found on the DVD.

See the Dell Support website at support.dell.com for documentation on virtualization solutions.

Obtaining Technical Assistance

If at any time you do not understand a procedure described in this guide, or if your product does not perform as expected, different types of help are available. For more information see "Getting Help" in your system's *Installation and Troubleshooting Guide* or the *Hardware Owner's Manual*.

Additionally, Dell Enterprise Training and Certification is available; see www.dell.com/training for more information. This service might not be offered in all locations.

Getting Started With Dell PROPack

Minimum Requirements

To implement the Dell PROPack, you must ensure that the following minimum execution environment exists:

- Management Station running:
 - System Center Operations Management (SCOM) 2007 SP1/ System Center Essentials (SCE) 2007 SP1 installed on a supported hardware and operating system.
 - System Center Virtual Machine Manager (SCVMM) 2008 installed on a supported hardware and operating system.
- Managed System running:
 - Microsoft Hyper-V hosts on any Dell PowerEdge systems ranging from x8xx to xx1x (both inclusive).
 - Dell OpenManage Server Administrator version 5.3 to 5.5 on x8xx to xx0x systems and Dell OpenManage Server Administrator version 6.0.1/6.0.2 on xx1x systems. You can download the latest version of Dell OpenManage Server Administrator from the Dell Support website at support.dell.com.



NOTE: For the list of supported operating systems for SCOM/SCE and SCVMM see the Microsoft website.

Installing SCOM/SCE and SCVMM Agents

When you use the setup to monitor your infrastructure, SCOM/SCE and SCVMM agents installed on the hosts enable data transfer between the managed system and management stations. Agents of both SCVMM and SCOM/SCE are installed manually or automatically during the discovery process on all Hyper-V hosts.

Integrating SCOM/SCE with SCVMM

For the setup to support Dell PROPack, SCOM/SCE must be integrated with SCVMM. For detailed description of the steps see the Microsoft TechNet Library.

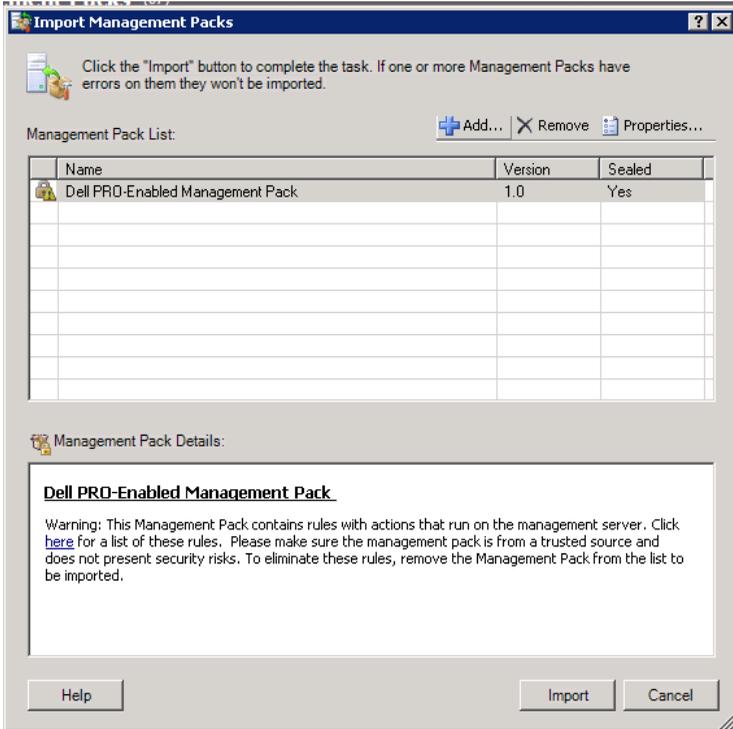
Importing Dell PROPack

Dell PROPack for the 1.0 release is provided in a sealed format as a .mp file. To import the Dell PROPack do the following:

- 1 Download the **Dell_PROPack_1.0.0_A00.exe** from Dell website/ftp site to a removable media storage or local repository.
- 2 Unzip the file and locate the **Dell.Connections.PROPack.mp** file.
- 3 Open the SCOM/SCE console.
- 4 Right-click **Management Packs** in the **Administration** tab.
The **Select Management Pack to import** screen is displayed.
- 5 Browse to the location of **Dell.Connections.PROPack.mp** and select the file.
- 6 Click **Open**.

The **Import Management Packs** screen is displayed with a warning message in the **Management Pack Details** section, as shown in Figure 2-1. SCOM/SCE displays this generic warning as a part of the security process when you manually install any Management Pack. For more information on how you can change the security settings for installing Management Packs manually, see the Microsoft TechNet Library.

Figure 2-1. Security Warning Message



7 Click **Import**.

A confirmation dialog box is displayed.

8 Click **Yes**.

For alerts and PRO Tips to be generated, ensure SCVMM discovery happens and SCVMM objects are displayed in the State View. For more information on the State View, see "Monitoring Using PRO Specific Alerts on SCOM/SCE".

Configuring PRO Tips

The Dell systems and virtual infrastructure are monitored for either Critical only or both Critical and Warning alerts. A Warning alert is generated when a reading for the component is above or below the acceptable level.

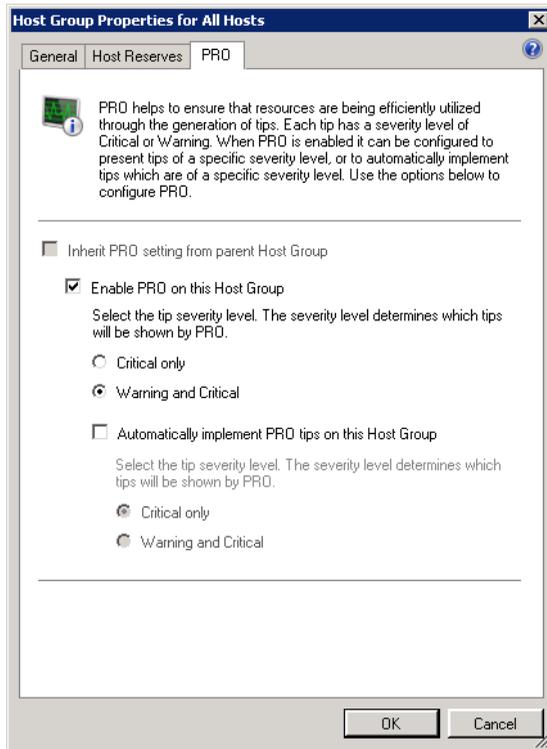
The component may still be functioning, but it could potentially fail. Or, the component may be functioning in an impaired state. A Critical alert is generated when the component has either failed or failure is imminent. By default, the monitoring level is set to "Warning and Critical".

To enable ProTips for both Warning and Critical alerts and automatic implementation of ProTips do the following:

- 1 Open the SCVMM console.
- 2 In the **Host Groups** section, right-click **All Hosts** and select **Properties**.

The **Host Groups Properties for All Hosts** window appears, as shown in Figure 2-2.

Figure 2-2. Configuring PRO Tips



- 3 Select the **PRO** tab and select the **Enable PRO on this Host Group** option.
- 4 By default, the monitoring level is set to **Warning and Critical**, which means that the application will display PRO Tips generated for both Warning and Critical alerts. To restrict the PRO Tips to Critical alerts only, select the **Critical only** option.
- 5 Select the **Automatically implement PRO tips** option.
By default, the automation level is set to **Critical only**, which means that PRO Tips with a Critical severity level are automatically implemented. For all PRO Tips to be implemented automatically, select the **Warning and Critical** option.
- 6 Click **OK** to save your settings.

Testing the Setup Using Scenarios

To confirm that the imported Dell PROPack is fully functional create the scenarios listed in the two tables and check if the activities listed under Expected System Response column are carried out.

Scenario 1 - The backplane board temperature exceeds its warning threshold value on a managed system.

Table 2-1. Checking recovery action for warning alert conditions.

Your Actions	Expected System Response
Generate a temperature alert warning on the managed system, such that the backplane board temperature exceeds its warning threshold limit. The event id is 1053 with the source being OpenManage Server Administrator.	<ul style="list-style-type: none"> • Dell PROPack generates the corresponding alert in SCOM/SCE. • SCOM/SCE passes an alert associated with the PRO Tip to SCVMM. • PRO Tip appears in the SCVMM PRO Tip window.
Select the Implement option in the PRO Tip window.	Places the host in maintenance mode.

Table 2-1. Checking recovery action for warning alert conditions. (continued)

Your Actions	Expected System Response
Verify that the host is placed in the maintenance mode and the PRO Tip resolved the alert.	<ul style="list-style-type: none"> • After successful implementation of the PRO Tip, its status is changed to "Resolved" and PRO Tip entry is moved out of the PRO Tip window. • Corresponding alert disappears in the SCOM/SCE Alert View.
Select the Dismiss option instead of the Implement option in the PRO Tip window.	PRO Tip is dismissed. No recovery task is performed. The corresponding PRO Tip entry is moved out of the PRO Tip window.

Scenario 2 - the backplane board temperature exceeds its failure threshold value on a managed system.

Table 2-2. Checking recovery action for failure alert conditions.

Your Actions	Expected System Response
Generate a temperature alert on the managed system, such that the backplane board temperature exceeds its failure threshold limit. The event id is 1054 with the source being OpenManage Server Administrator.	<ul style="list-style-type: none"> • Dell PROPack generates the corresponding alert in SCOM/SCE. • SCOM/SCE passes an alert associated with the PRO Tip to SCVMM. • PRO Tip appears on the SCVMM PRO Tip window.
Select the Implement option in the PRO Tip window.	<p>The recovery actions execute as follows:</p> <ul style="list-style-type: none"> a Sets the host in maintenance mode. b Determines the list of virtual systems running on the unhealthy host using the built-in Microsoft host rating algorithm. c Determines the best-rated healthy host. d Moves the virtual machine to best-rated host. e Repeats this action until no more running virtual machines exist on the unhealthy host.

Table 2-2. Checking recovery action for failure alert conditions. (continued)

Your Actions	Expected System Response
Verify that the virtual systems are moved to a healthy host and PRO Tip resolved the alert.	<ul style="list-style-type: none">• After successful implementation of the PRO Tip, its status is changed to "Resolved" and PRO Tip entry is moved out of the PRO Tip window.• Corresponding alert disappears in the SCOM/SCE Alert View.
Select the Dismiss option instead of the Implement option in the PRO Tip window.	No action is taken and virtual systems are not moved. The corresponding PRO Tip entry is moved out of the PRO Tip window.

Uninstalling PROPack

You can uninstall PROPack by deleting it in the SCOM/SCE console. When you delete PROPack, all the settings and thresholds associated with it are removed from SCOM/SCE. Also, the .mp file for PROPack is deleted from the hard disk of the management station.

To uninstall PROPack do the following:

- 1 Open the SCOM/SCE console.
- 2 Select **Administration**→**Management Packs**.
- 3 In the **Management Packs** pane, right-click Dell Server PRO Management Pack and then click **Delete**.

Security Considerations

Operations Console access privileges are handled internally by SCOM/SCE. This can be setup using the **User Roles** option under **Administration** → **Security** feature on the SCOM/SCE 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 *Microsoft Operations Manager 2007 SPI/ Microsoft Systems Centre Essentials SPI online help*.

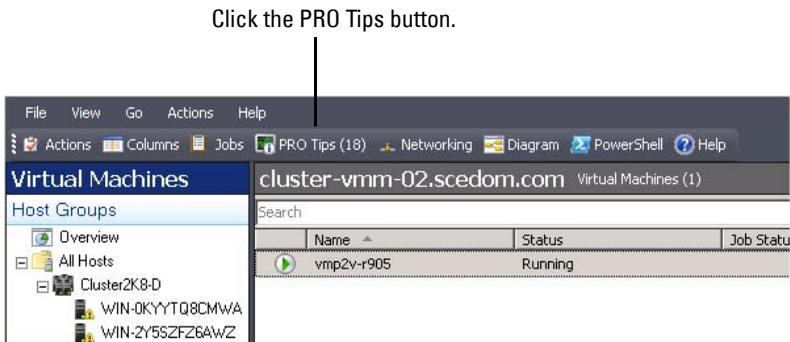
Using Dell PROPack

Monitoring Using SCVMM

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

To see the PRO Tip window, click the **PRO Tips** button on toolbar located below the main menu, as shown in Figure 3-1. The button also shows the number of active PRO Tips in brackets.

Figure 3-1. PRO Tip Button on the SCVMM Console

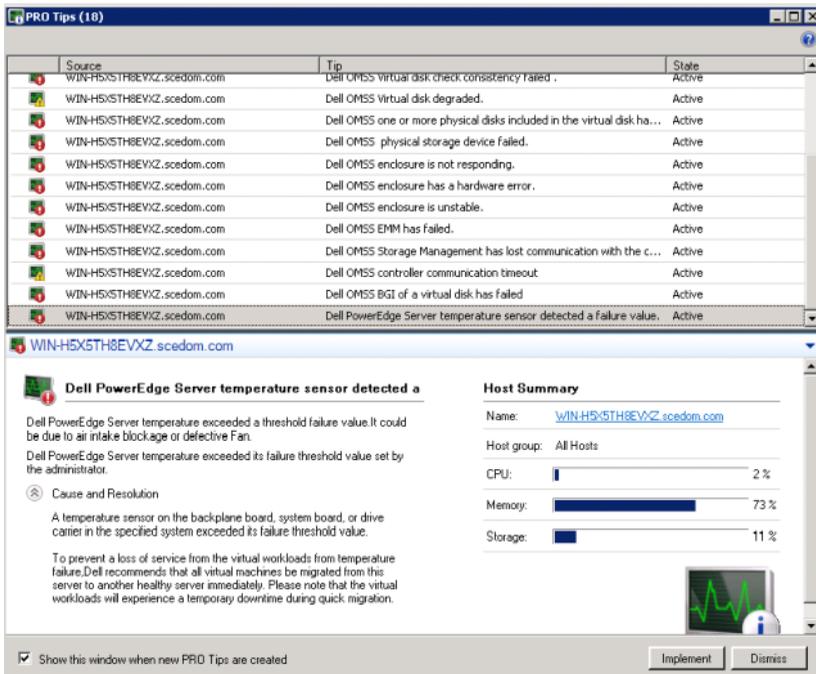


Alternatively, if you select the **Show this window when new PRO Tips are created** option in the PRO Tip window, the window opens automatically on the SCVMM console when a PRO Tip is generated.

The PRO Tip window displays information in a tabular format about the source, tip (a concise statement of the problem associated with the host machine), and state.

Below the table you can see a description of the problem that triggered the alert, along with the cause and suggested remedial action for recovery.

Figure 3-2. PRO Tip Window



Implementation of Recovery Actions

The PRO Tip window provides an option to either implement or dismiss the recommended action. If you select the **Implement** option, one of these recovery tasks may be executed based on the type of alert:

Placing the host in maintenance mode

Placing a host in maintenance mode prevents future assignment of workload to the host until the problem is resolved.

When a host is placed in the maintenance mode, it still receives alerts in SCOM/SCE and associated PRO Tips in SCVMM.

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

Moving of virtual machines

The PRO Tip management pack uses SCVMM algorithms to move virtual machines from the affected system to a healthy one. The placement requirements for identifying a healthy system and moving the virtual machines are as follows:

- **Hard requirements** - these are requirements that a machine hosting the virtual machines must meet in order to run - sufficient memory and storage.
- **Soft requirements** - these are requirements that if met by the host, allows a virtual machine to perform more optimally - CPU allocation, network bandwidth, network availability, disk IO bandwidth, and free memory.

SCVMM assigns a star rating to hosts in a range of zero to five. If a hard requirement is not met (for example, not enough hard disk and memory capacity), the host automatically gets zero stars and SCVMM does not allow you to place a virtual machine on that host.

The system health conditions that trigger migration of virtual machines are hardware failure alerts on a virtualization host such as virtual disk failure and predictive drive error. Dell PROPack migrates virtual machines that have status "Running". No other virtual machines with status like "Stop", "Pause" and "Saved state" are migrated.

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

- PRO Tip status is changed to "Resolved" and PRO Tip entry is moved out of the PRO Tip window.
- Corresponding alert disappears in SCOM/SCE Alert View.
- An entry is displayed in the **Jobs** section on the SCVMM console. This entry shows the status of the job as "Completed", as shown in the Figure 3-3.

Figure 3-3. Completed Job

The screenshot shows the SCVMM 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
Host Volume - F:\		
Volume capacity	598922489856	(none)
Volume capacity	(none)	598922489856
Volume free space	598023901184	(none)
Volume free space	(none)	598023901184
Volume mount point	F:*\{?}\Volume{271b71ea-df38-11...	(none)
Volume mount point	(none)	F:*\{?}\Volume{271b71ea-df38-11...

PRO Tip implementation of moving virtual machines 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 SCVMM console also displays 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 the **Dismiss** option, the PRO Tip is not executed and the following changes take place:

- The PRO Tip is removed from the SCVMM PRO Tip console.
- The alert in SCOM/SCE is removed from the **Dell Server PRO Alerts**.

Monitoring Using PRO Specific Alerts on SCOM/SCE

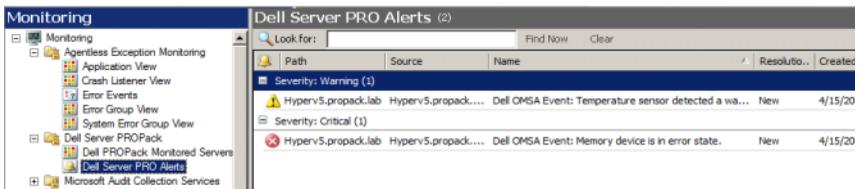
You can monitor the physical devices in your network using the SCOM/SCE console.

The SCOM/SCE console provides the following views:

- **Alert View** - The Alert View on the SCOM/SCE console displays Dell PRO specific alerts in a tabular format with information on the severity level, source, name, resolution state, along with the date and time of creation. To access the Alert View do the following:
 - a Open SCOM/SCE console.
 - b Select the **Monitoring** tab.
 - c Select **Dell Server PRO Alerts** from **Dell Server PRO Pack**.

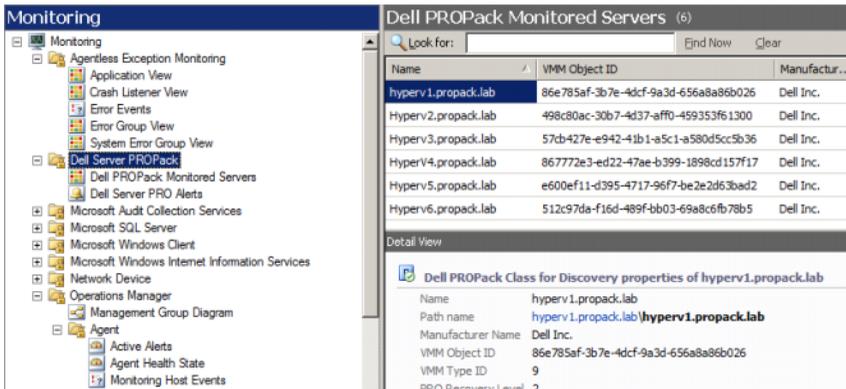
The alerts are displayed on the right-side of the screen, as shown in Figure 3-4.

Figure 3-4. Alert View



- **State View** - The State View displays the Dell system objects discovered 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 you want displayed and customizing how the data looks.

Figure 3-5. State View



For more information on creating a State View see the Microsoft website.

Using Health Explorer to Reset Alerts

Health Explorer enables you to view and take action on alerts. When you select the **Dismiss** option in the PRO Tip window the alert is removed from the PRO Tip window. However, to reset this alert manually in the Health Explorer do the following:

- 1 Open the **Health Explorer** window from the **Actions** pane.
- 2 Right-click the alert that you want to close.
- 3 Select **Reset Health**.

Alert Cause and Recovery Action

The following table lists the alert and the corresponding recommended remedial action:

Table 3-1. Alert Cause and Recovery Action

Dell Event ID	Alert Description in SCOM/ SCE & PRO Tip in SCVMM	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.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.
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.	In SCVMM, PRO Tip implementation migrates running virtual machines from unhealthy host to healthy host(s).
1104	Fan sensor detected a failure value.	Error	A fan sensor in the specified system detected the failure of one or more fans.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.
1154	Voltage sensor detected a failure value.	Error	A voltage sensor in the specified system exceeded its failure threshold value.	In SCVMM, PRO Tip implementation migrates running virtual machines from unhealthy host to healthy host(s).

Table 3-1. Alert Cause and Recovery Action (continued)

Dell Event ID	Alert Description in SCOM/ SCE & PRO Tip in SCVMM	Severity	Alert Cause	Dell PRO Tip Recommended Remedial Action
1203	Current sensor detected a warning value.	Warning	A current sensor in the specified system exceeded its warning threshold value.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.
1204	Current sensor detected a failure value.	Error	A current sensor in the specified system exceeded its failure threshold value.	In SCVMM, PRO Tip implementation migrates running virtual machines from unhealthy host to healthy host(s).
1305	Redundancy degraded.	Warning	A power supply sensor reading in the specified system exceeded a warning threshold.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.
1306	Redundancy lost.	Error	A power supply has been disconnected or has failed.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.

Table 3-1. Alert Cause and Recovery Action (continued)

Dell Event ID	Alert Description in SCOM/ SCE & PRO Tip in SCVMM	Severity	Alert Cause	Dell PRO Tip Recommended Remedial Action
1353	Power supply detected a warning.	Warning	A power supply sensor reading in the specified system exceeded definable warning threshold.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.
1354	Power supply detected a failure.	Error	A power supply has been disconnected or has failed.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.
1403	Memory Device Status Warning	Warning	A memory device correction rate exceeded an acceptable value.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.
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.	In SCVMM, PRO Tip implementation migrates running virtual machines from unhealthy host to healthy host(s).

Table 3-1. Alert Cause and Recovery Action (continued)

Dell Event ID	Alert Description in SCOM/ SCE & PRO Tip in SCVMM	Severity	Alert Cause	Dell PRO Tip Recommended Remedial Action
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.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.
2048	Device Failed Error.	Error	A storage component such as a physical disk or an enclosure has failed.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.
2056	Virtual Disk Failed Warning.	Error	One or more physical disks included in the virtual disk have failed.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.
2057	Virtual Disk Degraded Warning	Warning	This alert message occurs when a physical disk included in a redundant virtual disk fails.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.

Table 3-1. Alert Cause and Recovery Action (continued)

Dell Event ID	Alert Description in SCOM/ SCE & PRO Tip in SCVMM	Severity	Alert Cause	Dell PRO Tip Recommended Remedial Action
2076	Virtual Disk Check Consistency Failed.	Error	A physical disk included in the virtual disk failed or there is an error in the parity information.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements
2077	Virtual Disk Format Failed Warning.	Error	A physical disk included in the virtual disk failed.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements
2082	Virtual Disk Rebuild Failure	Error	A physical disk included in the virtual disk has failed or is corrupt.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements
2083	Physical Disk Rebuild Failed	Error	A physical disk included in the virtual disk has failed or is corrupt.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements

Table 3-1. Alert Cause and Recovery Action (continued)

Dell Event ID	Alert Description in SCOM/ SCE & PRO Tip in SCVMM	Severity	Alert Cause	Dell PRO Tip Recommended Remedial Action
2100	Temperature exceeded Maximum Warning Threshold	Warning	The physical disk enclosure is too hot. A variety of factors can cause the excessive temperature.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements
2101	Temperature dropped below Minimum Warning Threshold	Warning	The physical disk enclosure is too cool.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements
2102	Temperature exceeded Maximum Threshold Value	Error	The physical disk enclosure is too hot. A variety of factors can cause the excessive temperature.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements
2103	Temperature dropped below the Minimum Failure Threshold.	Error	The physical disk enclosure is too cool.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements

Table 3-1. Alert Cause and Recovery Action (continued)

Dell Event ID	Alert Description in SCOM/ SCE & PRO Tip in SCVMM	Severity	Alert Cause	Dell PRO Tip Recommended Remedial Action
2129	BGI (Back Ground Initialization) Failed Error	Error	BGI of a virtual disk has failed.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements
2137	Communication Time-out Warning	Warning	The controller is unable to communicate with an enclosure.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements
2268	Storage Management communication Error	Error	Storage Management has lost communication with a controller.	In SCVMM, PRO Tip implementation migrates running virtual machines from unhealthy host to healthy host(s).
2293	EMM (Enclosure Management Module) Failure	Error	The failure may be caused by a loss of power to the EMM.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.

Table 3-1. Alert Cause and Recovery Action (continued)

Dell Event ID	Alert Description in SCOM/ SCE & PRO Tip in SCVMM	Severity	Alert Cause	Dell PRO Tip Recommended Remedial Action
2300	Unstable Enclosure Failure	Error	The controller is not receiving a consistent response from the enclosure.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.
2301	Enclosure Hardware Error.	Error	The enclosure or an enclosure component is in a Failed or Degraded state.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.
2302	Enclosure Component Failed	Error	The enclosure or an enclosure component is in a Failed or Degraded state.	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.

Table 3-1. Alert Cause and Recovery Action (continued)

Dell Event ID	Alert Description in SCOM/SCE & PRO Tip in SCVMM	Severity	Alert Cause	Dell PRO Tip Recommended Remedial Action
2314	SAS (Serial Attached SCSI) Components Failure.	Error	Storage Management is unable to monitor or manage SAS devices.	In SCVMM, PRO Tip implementation migrates running virtual machines from unhealthy host to healthy host(s).
2328	NVRAM (Non Volatile Random Access Memory) has corrupt data.	Error	The NVRAM has corrupt data. The controller is unable to correct the situation	In SCVMM, PRO Tip implementation places the host in Maintenance mode so that it is no longer available for new virtual machine placements.

Appendix A - Known Limitations in Dell PROPack

These are the known limitations in Dell PROPack:

1 How does Dell PROPack handle failure in SCOM/SCE/SCVMM infrastructure?

The SCE/SCOM-SCVMM infrastructure has multiple software services (for example, management station, SQL server, and so on) leading to a complex distributed setup. The exact communication between these services and the associated failure is handled by the infrastructure itself and is an internal design care of SCOM/SCE-SCVMM infrastructure. There are no specific interfaces that SCOM/SCE exposes for the management pack to make use of. Hence the Dell PROPack design is independent of these considerations.

2 What happens when multiple alerts are generated for a sensor of the same severity type?

Dell OpenManage Server Administrator logs events to the Windows System Event log. Dell PROPack subscribes, as its data source, to the Windows System Event Log. These events can be Informational, Warning or Critical in severity type.

Each state transition (except for informational) generates a corresponding PRO Tip in SCVMM and an alert log in SCOM/SCE.

Assume a Dell PowerEdge system's temperature sensor probes crosses warning threshold reading and hence PROPack mechanisms generate the corresponding PRO Tip for Temperature Warning alert. If another sensor of the same host crosses warning threshold reading, you cannot see another PRO Tip for the Temperature Warning alert. Since the PROPack is primarily concerned with the management of virtualization workloads on hosts that generated the alerts, there can be only one outstanding PRO Tip, regardless of the outstanding number of severity events for a given sensor type on a given host.

3 Are there limitations with respect to number of virtual machines and systems that can be managed through Dell PROPack?

The number of hosts and virtual machines that can be managed depends on SCVMM and not Dell PROPack.

4 A security warning message is displayed when you import Dell PROPack. What does this indicate?

The warning message you see is a generic warning that SCOM/SCE provides when you manually install Dell PROPack and is part of its security processes.

Preparing the Management Group for Agents

By default, management groups do not automatically admit manually installed agents into the management group to manage them. This is a security feature. The management group, as a whole, and individual management stations can be configured to place new manually installed agents into the **Pending Management** container, where you can review them and either admit or reject them into the management group. It is also possible to change the default behavior and automatically admit manually installed agents, although this is not recommended for security reasons. For information about how to perform these steps, see the topic "How to Approve an Operations Manager 2007 Agent Installed for a management group Using MOMAgent.msi" in the Microsoft TechNet Library.

5 If the Dell OpenManage Server Administrator service is stopped on any host, why does the State View still display the host instance?

When Dell PROPack and SCVMM discover Dell system instances, the State View displays the host even when OpenManage Server Administrator service is stopped on the host. For SCVMM to "undiscover" the system remove the SCVMM agent from the host.

Appendix B - Microsoft Knowledge Base Articles for Dell PROPack

The following tables list the Microsoft Knowledge Base articles along with the corresponding Knowledge Base IDs. For details see the Microsoft support site at support.microsoft.com.

Required Hotfixes on Managed System

Table B-1. Required Hotfixes for PROPack on Managed System

Applicable System	Description	Microsoft Knowledge Base ID
Hyper-V	Description of the Hyper-V update for issues that may occur when you manage the Hyper-V role on the 64-bit editions of Windows Server 2008 by using SCVMM.	956589
Hyper-V	A Background Intelligent Transfer Service (BITS) client cannot handle files that have paths that contain the volume GUID in Windows Server 2008 or in Windows Vista®.	956774



NOTE: If these hotfixes are missing from a Hyper-V system, the System Center Virtual Machine Manager 2008 Admin Console lists the system status as "Needs Attention". Hotfix 956774 should be installed on the Hyper-V systems and on System Center Virtual Machine Manager 2008 system.

Recommended Hotfixes on Managed System

Table B-2. Recommended Hotfixes for PROPack on Managed System

Applicable System	Description	Microsoft Knowledge Base Link
Hyper-V	Stop error message on a Windows Server 2008 system that has the Hyper-V role installed: "STOP 0x0000001A".	957967
Hyper-V	A wmioprse.exe process may leak memory when a Windows Management Instrumentation (WMI) notification query is used heavily on a Windows Server 2008 or Windows Vista system.	958124
Hyper-V	Memory corruption may occur with the WMI service on a system that is running Windows Server 2008 or Windows Vista SP 1.	954563
Hyper-V	Certain applications become very slow on a Windows Server 2008 or Windows Vista SP 1 system when a certificate with SIA extension is installed.	955805
Hyper-V failover clusters	Recommended hotfixes for Windows Server 2008 clusters.	957311

Recommended Hotfixes on Management Station

Table B-3. Recommended Hotfixes for PROPack on Management Station

Applicable System	Description	Microsoft Knowledge Base Link
System Center Virtual Machine Manager 2008	A wmiprvse.exe process may leak memory when a Windows Management Instrumentation (WMI) notification query is used heavily on a Windows Server 2008 or Windows Vista system.	958124
System Center Virtual Machine Manager 2008	Memory corruption may occur with the WMI service on a system that is running Windows Server 2008 or Windows Vista SP 1.	954563
System Center Virtual Machine Manager 2008	Certain applications become very slow on a Windows Server 2008 or Windows Vista SP 1 system when a certificate with SIA extension is installed.	955805
System Center Virtual Machine Manager 2008	Description of the System Center Virtual Machine Manager 2008 update to address physical to virtual (P2V) issues.	959596

Glossary

The following list defines or identifies technical terms, abbreviations, and acronyms used in this document.

managed system

A managed system is any system that is monitored and managed using SCOM/SCE and SCVMM and running Dell OpenManage Server Administrator. Systems running Server Administrator can be managed locally or remotely through a supported Web browser.

management station

A management station can be any Microsoft® Windows® -based system which is used to manage virtualized infrastructures.

SCOM

Abbreviation for System Center Operations Manager.

task

Tasks are actions that you launch to diagnose or resolve a problem, or to automate repetitive actions. Tasks are launched from the Operations Manager 2007 Operators Console.

SCVMM

Abbreviation for System Center Virtual Machine Manager.

SCE

Abbreviation for System Center Essentials.

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