



# Dell Compellent Storage Center Management Pack 3.0 for Microsoft SCOM 2012/R2 Best Practices

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## Revisions

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## Executive summary

This document provides best practice recommendations and many step-by-step procedures for the following:

- Install and configure the Dell Compellent Storage Center Management Pack 3.0 for Microsoft System Center Operations Manager (SCOM) 2012/R2.
- Uninstall previous versions of the Dell Compellent Management Pack from Windows Server 2012/R2 and SCOM 2012/R2.
- View and close active Storage Center alerts in SCOM 2012/R2.
- Use SCOM 2012/R2 dashboards to view Storage Center data.
- Create Overrides in SCOM for Storage Center monitors, object discoveries, and rules.
- Configure Dell Compellent Enterprise Manager to utilize more system memory in large environments.
- Investigate and troubleshoot problems with the Dell Compellent WMI Provider, Management Pack 3.0, and SCOM 2012/R2.



# 1 Preface

This document is highly technical and is intended for storage and systems administrators who monitor Dell Compellent Storage Center devices from the Microsoft Systems Center Operations 2012 R2 (SCOM) Management Console. Readers should have a good working knowledge of Microsoft SCOM 2012/R2 and the Dell Compellent Storage Center.

## 1.1 Documentation for previous release of the management pack

Dell Compellent best practices for the previous version of Storage Center Management Pack are referenced in Table 1.

Table 1 Documentation for previous version of Dell Compellent Management Pack

Previous Version	Notes	Documents and locations
Management Pack 2.0	Supported on SCOM 2007 and 2012	SCOM 2012 with Dell Compellent Storage Center Management Pack 2.0 <a href="http://en.community.dell.com/techcenter/extras/m/white_papers/20437997.aspx">http://en.community.dell.com/techcenter/extras/m/white_papers/20437997.aspx</a>

## 1.2 Customer support

Dell Compellent provides live support at 1-866-EZSTORE (866.397.8673), 24 hours a day, 7 days a week, 365 days a year. For additional support, email Dell Compellent at [support@compellent.com](mailto:support@compellent.com). Dell Compellent responds to emails during normal business hours.



## 2 Introduction

A brief overview of the major components that comprise the environment is provided in this section.

### 2.1 Dell Compellent Storage Center overview

The Dell Compellent Storage Center is an enterprise-class storage area network (SAN) that lowers capital expenditures, reduces storage management and administration time, provides continuous data availability and enables storage virtualization. Storage Center's Fluid Data Architecture manages data dynamically at the block-level, maximizing utilization, automating tiered storage, simplifying replication and speeding data recovery.

### 2.2 Microsoft System Center Operations Manager 2012 R2

Microsoft System Center Operations Manager (SCOM) 2012 is a tool that can provide comprehensive monitoring for Windows systems, some Unix/Linux systems, network and storage devices. SCOM 2012 provides no single points of failure, and monitors services, devices and operations for many computers and devices from a single console. SCOM enables checks for health, performance and availability for all monitored objects in the environment, and helps identify and resolve problems.

SCOM 2012 R2 added bug fixes, the ability to monitor the health of private clouds, .NET application performance monitoring, IPv6 support, Java application performance monitoring, analysis of Microsoft software installations (via System Center Advisor), and improved UNIX and Linux monitoring. For a complete listing of new features in SCOM 2012 R2, refer to [Microsoft TechNet](#).

### 2.3 Dell Compellent Storage Center Management Pack 3.0

The Dell Compellent Storage Center Management Pack 3.0 for SCOM 2012 is a collection of monitors, rules, tasks, views and reports specifically designed to provide accurate and timely information obtained from Storage Center to the SCOM server. Utilizing the Dell Compellent Storage Center Management Pack, SCOM can monitor active alerts, disk class performance, volume performance, disk class space usage, volume space usage, and controller states for Storage Center.

SCOM traditionally acquires data via the use of a monitoring agent that is installed on a client device, such as a server or workstation. Using the Windows Management Instrumentation (WMI) Provider on the local machine, the SCOM agent collects discovery, performance and usage data from information published to WMI. Using the SCOM Management Console, Systems Administrators can view information collected from installed agents.

Unlike the traditional SCOM data collection model, a monitoring agent cannot be installed locally on a Storage Center controller. In previous versions of the Dell Compellent Storage Center Management Pack, a Storage Center Monitor Service needed to be installed on server monitored by SCOM. The Monitoring Service would collect data from the Storage Center using web-based (API) inquiries. The Monitor Service would act as a WMI Provider and publish collected Storage Center data to WMI in order for the SCOM server to access it via WMI calls.



Rather than querying the Storage Center directly, Management Pack 3.0 uses Dell Compellent Enterprise Manager as the data collector. The Management Pack uses a WMI Provider to query for Storage Center component and performance data from the Enterprise Manager API web service. The WMI provider can be configured to connect to one or more Dell Compellent API endpoints, and can query information from multiple Storage Centers. By utilizing Enterprise Manager as the only data collector, the number of calls to Storage Center that could affect performance is reduced significantly.

## 2.4 SCOM data collection overview

As shown in Table 2, SCOM uses three methods to gather and collect data:

- **Discoveries:** Run every four hours and reports on new information found since the last run. SCOM reports changes to the Storage Center, such as addition of a new controller or new volume creation. When SCOM discovers a new controller, it initiates discoveries of the controller configuration, such as volumes and replications.
- **Performance Collection Tasks:** The default polling interval for these tasks is 15 minutes and collects performance (I/O) data for defined objects in SCOM.
- **Event Collection Tasks:** Run every 60 seconds and collect alerts.

**Note:** Management Pack 3.0 does not use WMI events to collect Storage Center alerts.

In addition to the SCOM defaults, Management Pack 3.0 monitors the status of discovered classes every five minutes, Storage Center alerts are collected every five minutes, and Storage Center usage data (available space, used space) is collected every 12 hours.

Table 2 Data collection methods

Data Collection Method	Default polling interval
Discoveries	Every four hours
Performance collection	Every 15 minutes
Event collection	Every 60 seconds
Storage Center usage	Every 12 hours

**Note:** Default polling intervals can be changed using Overrides in SCOM, or by changing associated values in Enterprise Manager. Section 5 in this document provides information on Overrides.





## 3 Management Pack installation and configuration

Use this section as a supplement to the *Dell Compellent Management Pack 3.0 for Microsoft SCOM Administrator's Guide* found on [Knowledge Center](#).

As mentioned above, Management Pack 3.0 uses Enterprise Manager as the data collector, and uses a WMI Provider to query data from Enterprise Manager. The WMI Provider converts data received from the Dell Compellent API to WMI classes which SCOM uses to collect and display data. The WMI Provider needs to be installed on a physical or virtual server that has visibility to both the Enterprise Manager server as well as the SCOM server. In addition, a SCOM monitoring agent must be installed on the server where the WMI Provider is installed. For information on installing a SCOM monitoring agent, please refer to [Microsoft TechNet](#).

**Note:** As a best practice, the WMI Provider should be installed on the same server as Enterprise Manager in environments with three or fewer monitored Storage Centers. Larger installations may require the use of more than one WMI Provider.

### 3.1 Upgrading from Management Pack 2.0

Because Management Pack 3.0 uses a different data collection method than previous versions, there is no upgrade path from Management Pack 2.0. However, Management Pack 3.0 can be installed and run side-by-side with an existing installation of MP 2.0.

**Note:** Management Pack 3.0 cannot display any data collected from version 2.0 and vice-versa.

### 3.2 Uninstalling the Management Pack from SCOM

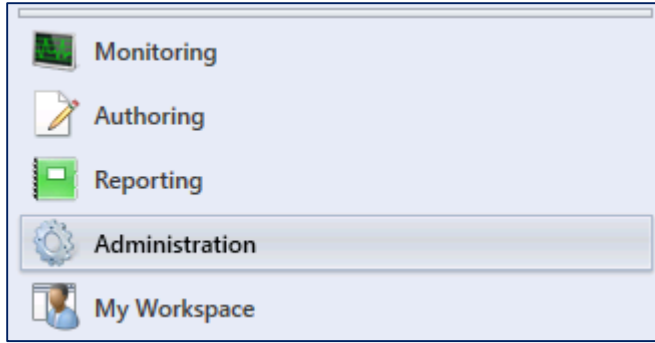
The Management Pack files can be removed from the server by using the **Uninstall a program** option from **Control Panel**. When the files have been removed, the MP must still be removed from SCOM.

**Note:** This process applies to both Management Pack 2.0 and 3.0.

To remove the Management Pack from SCOM:

1. Log on as an administrator to the SCOM server.
2. Open the SCOM Operations Console by going to **Start > Apps > Microsoft System Center 2012 > Operations Console**.
3. In the **Operations Console** click **Administration workspace**.





4. In the Administration menu, select **Management Packs**.

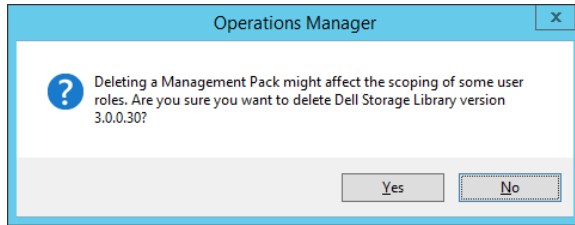


5. In the Management Packs listing, right-click **Dell Storage Library** and select **Delete**.

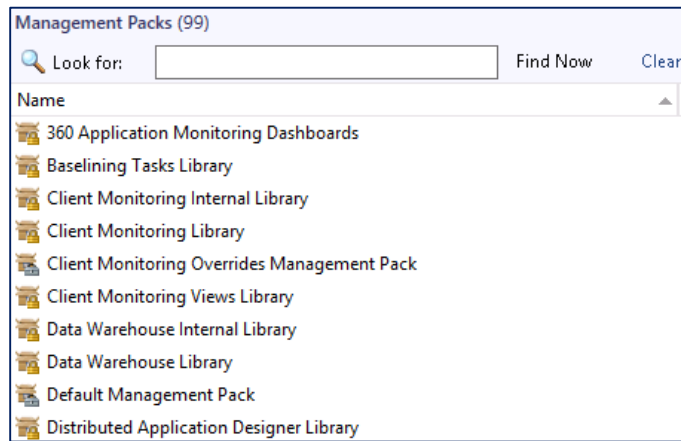
Management Packs (100)					
Look for:	<input type="text"/>	Find Now	Clear		
Name	Version	Sealed	Date Imported	Description	
360 Application Monitoring Dashboards	7.1.10226.0	Yes	2/5/2014 2:16:1...		
Baselining Tasks Library	7.0.8433.0	Yes	2/5/2014 2:08:0...	System Baselining T	
Client Monitoring Internal Library	7.1.10226.0	Yes	2/5/2014 2:14:1...	Microsoft System Ce	
Client Monitoring Library	7.1.10226.0	Yes	2/5/2014 2:09:2...	Microsoft System Ce	
Client Monitoring Overrides Management Pack	7.1.10226.0		2/5/2014 2:14:3...	This management p	
Client Monitoring Views Library	7.1.10226.0	Yes	2/5/2014 2:14:0...	Microsoft System Ce	
Data Warehouse Internal Library	7.1.10226.0	Yes	2/5/2014 2:23:4...	Microsoft System Ce	
Data Warehouse Library	7.1.10226.0	Yes	2/5/2014 2:09:1...	Microsoft System Ce	
Default Management Pack	7.1.10226.0		2/5/2014 2:14:1...	This management p	
<b>Dell Storage Library</b>	3.0.0.30	Yes	3/3/2014 9:17:0...	Dell Storage Library	
Distributed Application Designer	7.0.8433.0	Yes	2/5/2014 2:09:0...	System Center Distri	
Health Internal Library	7.0.8433.0	Yes	2/5/2014 2:09:3...	System Health Intern	
Health Library	7.0.8433.0	Yes	2/5/2014 2:07:4...	System Health Libra	
Image Library (System Center)	7.1.10226.0	Yes	2/5/2014 2:09:3...	Microsoft System Ce	
Image Library (System)	7.5.8501.0	Yes	2/5/2014 2:08:0...	System Image Librar	

6. Click **Yes** to remove the Management Pack.





7. Once it has been removed it will no longer show in the Management Packs window.



## 4 Management Pack components

The Dell Compellent Management Pack 3.0 monitors, collects and displays the following Storage Center information:

- Active alerts
- Performance (through dashboards)
- Controllers
- Disks
- Enclosures
- Replications
- Servers
- Storage types
- Volumes

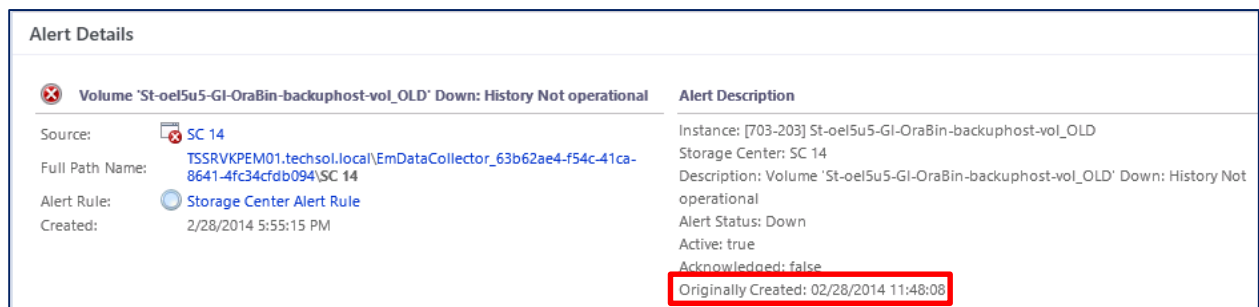
In addition, the Management Pack displays health information for discovered data collectors and WMI Providers. Only components that require special configuration or attention will be covered in this section.

### 4.1 Active alerts

The Storage Center Management Pack discovers new alerts generated by Storage Center every 60 seconds. Alerts are classified into the following severities:

- Informational
- Warning
- Critical

**Note:** The created date shown on an active alert is the time when SCOM discovered the alert. To show the time Storage Center actually created the alert, click the alert and view the **Originally Created** date under the **Alert Description** in the details.



The screenshot shows the 'Alert Details' window for a Storage Center alert. The alert title is 'Volume 'St-oe15u5-GI-OraBin-backuphost-vol\_OLD' Down: History Not operational'. The alert description includes the instance name, storage center, and the full path name. The 'Originally Created' date is highlighted in a red box.

Alert Details	
<b>Volume 'St-oe15u5-GI-OraBin-backuphost-vol_OLD' Down: History Not operational</b>	<b>Alert Description</b>
Source: SC 14	Instance: [703-203] St-oe15u5-GI-OraBin-backuphost-vol_OLD
Full Path Name: TSSRVKPEM01.techsol.local\EmDataCollector_63b62ae4-f54c-41ca-8641-4fc34cdb094\SC 14	Storage Center: SC 14
Alert Rule: Storage Center Alert Rule	Description: Volume 'St-oe15u5-GI-OraBin-backuphost-vol_OLD' Down: History Not operational
Created: 2/28/2014 5:55:15 PM	Alert Status: Down
	Active: true
	Acknowledged: false
	<b>Originally Created: 02/28/2014 11:48:08</b>

Figure 1 Alert details



### 4.1.1 Threshold alerts

SCOM only monitors the status of Storage Center objects, and therefore will not discover or report on threshold alerts created through Enterprise Manager. However, if a defined threshold is met for a Storage Center object (a volume, for example) and that threshold changes the status of the object, SCOM will report back on the status change.

### 4.1.2 Closing alerts

Closing an alert in SCOM does not remove the alert from Storage Center. If an alert still exists on Storage Center, SCOM will re-discover that alert and display it even if that same alert was previously deleted. To effectively remove an alert from SCOM, the underlying issue must be resolved on the Storage Center.

Overrides can be created to ignore specific alerts, change the frequency that SCOM queries Storage Center for alerts, and to only display specific severities. For more information about Overrides, please refer to Section 5 of this document.

## 4.2 Replication monitoring

To monitor Storage Center replication in Enterprise Manager both the source and destination Storage Centers need to be defined. Within the SCOM management pack, replication health status can be viewed in the Storage Centers view. A listing of all the replications is available from the Replication View under the Storage Center Replications folder.

State	Name	Path	SerialNumber	Storage Center Replication
Critical	SC 18	TSSRVKPEM01....	716	Healthy
Critical	SC 14	TSSRVKPEM01....	703	

Figure 2 Storage Center Replication

**Note:** Although both the source and destination Storage Centers need to be defined to view Replication status, SCOM will only show status on the source Storage Center.



Replication View (10)			
Look for:	<input type="text"/>	Find Now	Clear
State	SourceStorage...	DestinationSto...	Name
Healthy	SC 18	SC 14	Replication of 'TSSRV225_WS12DC-R2_VL_Boot'
Healthy	SC 18	SC 14	Replication of 'TSSRV224_WS12DC-R2_VL_Boot'
Healthy	SC 18	SC 14	Replication of 'Dell_R620-G12_WS12DC-R2_VL_Boot_GoldImage'
Healthy	SC 18	SC 14	Replication of 'TSSRV222_WS12R2VL_Boot'
Healthy	SC 18	SC 14	Replication of 'TSSRV223_WS12R2VL_Boot'
Healthy	SC 18	SC 14	Replication of 'TSSRV235_FCoE_Boot'
Healthy	SC 18	SC 14	Replication of 'Dell_R620-G12_W2K8R2Ent_Boot_GoldImage'
Healthy	SC 18	SC 14	Replication of 'Dell_R620-G12_W12DC_Boot_GoldImage'
Healthy	SC 18	SC 14	Replication of 'TSSRV220_WS12R2VL_Boot'
Healthy	SC 18	SC 14	Replication of 'Dell_R320_G12_W12DC_FCoE_Gold_Boot'

Figure 3 Detailed replication information

Clicking on a replication will show more information in the **Detail View** window.

Detail View	
Storage Center Replication properties of Replication of 'TSSRV225_WS12DC-R2_VL_Boot'	
Display Name	Replication of 'TSSRV225_WS12DC-R2_VL_Boot'
Full Path Name	TSSRVKPEM01.techsol.local\EmDataCollector_63b62ae4-f54c-41ca-8641-4fc34fdb094\SC 18\Replication of 'TSSRV225_WS12DC-R2_VL_Boot'
ChildStatus	Up
Deduplication	false
DestinationSerialNumber	703
DestinationStorageCenter	SC 14
DestinationVolume	Repl of TSSRV225_WS12DC-R2_VL_Boot
DestinationVolumeIndex	1209
Index	63
InstanceId	716.63
InstanceName	Replication of 'TSSRV225_WS12DC-R2_VL_Boot'
LiveVolume	false
PauseAllowed	true
QosNode	1GB
QuosNodeIndex	1
ReplDeviceIndex	56
ReplicateActiveReplay	false
ReplicateStorageToLowestTier	true
ReplNodeIndex	56
Simulation	false
SourceStorageCenter	SC 18
SourceVolume	TSSRV225_WS12DC-R2_VL_Boot
SourceVolumeIndex	14914
State	Up
StateMessage	
Status	Up

Figure 4 Replication detail

## 4.3 Dashboards

SCOM dashboards were created to allow quick access to multiple data points. This is particularly useful in troubleshooting scenarios, and when data is contained in different views. Compared to previous versions, SCOM 2012/R2 includes enhancements in the ability to display data through dashboards, making dashboards a very powerful and useful tool.



The Storage Center Management Pack contains the following predefined performance and usage dashboards:

- Storage Center IO Performance
- Storage Center Usage
- Controller IO Performance
- Disk Class IO Performance
- Server IO Performance
- Server Usage
- Volume IO Performance Dashboard
- Volume Usage

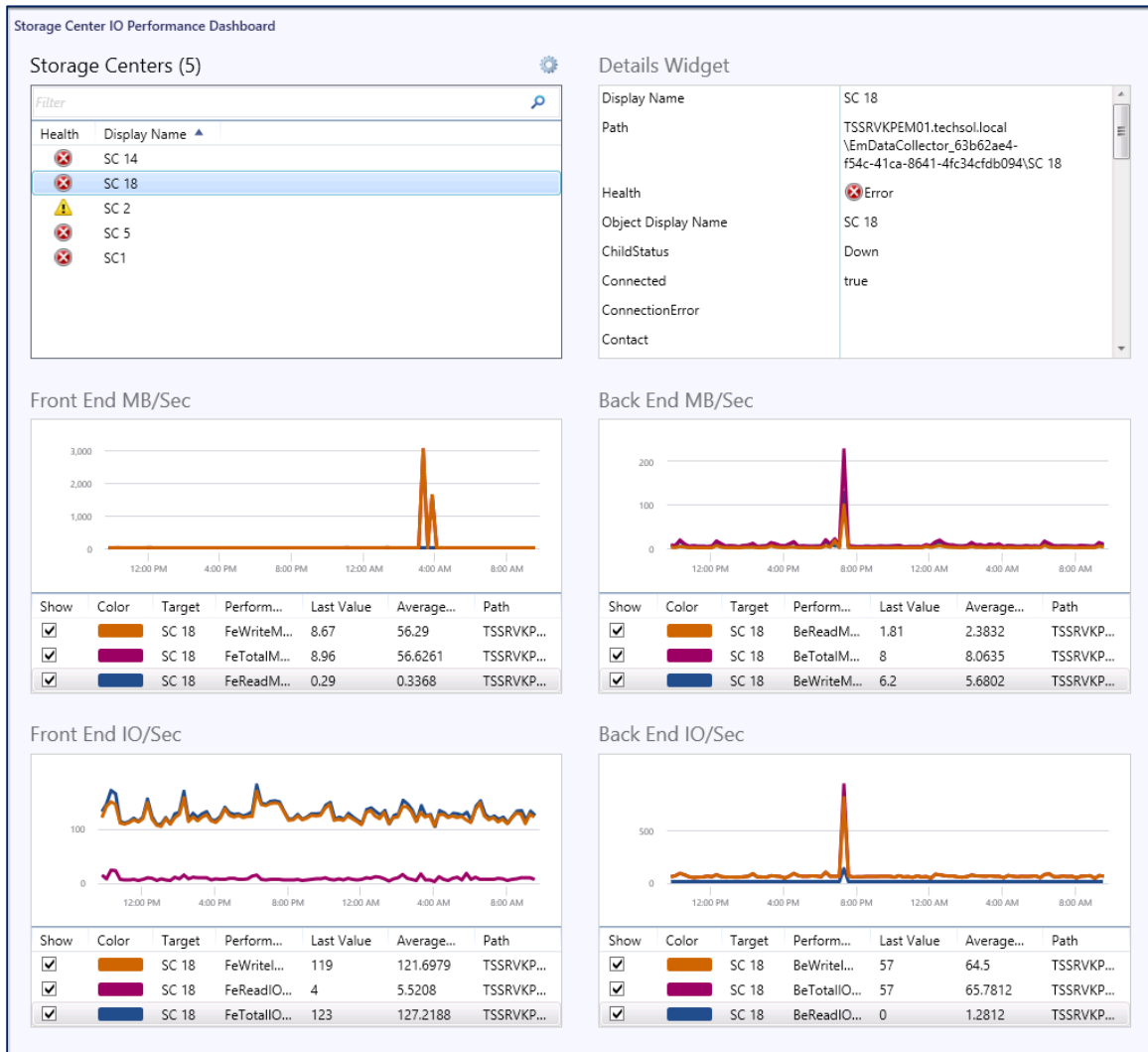


Figure 5 Storage Center IO performance dashboard



**Note:** The Storage Center data displayed in performance dashboards is collected every 15 minutes. Storage Center data displayed in usage dashboards is collected every 12 hours. Both performance and usage collection intervals can be changed with overrides.

## 4.4 WMI Provider

The WMI Provider folder contains health information about any discovered data collectors and WMI Providers. In most cases, the WMI Provider will be installed on the data collector (Enterprise Manager) server, meaning a single SCOM monitoring agent can detect and report the WMI Provider installation and server health information back to SCOM.

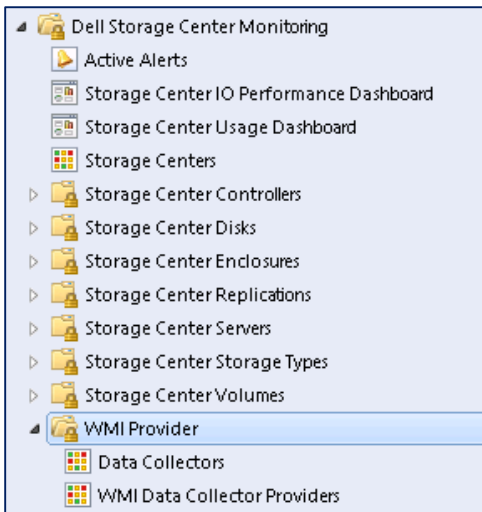


Figure 6 WMI provider folder

The Data Collectors folder will only contain the health status of the Data Collector server defined within the WMI Provider.

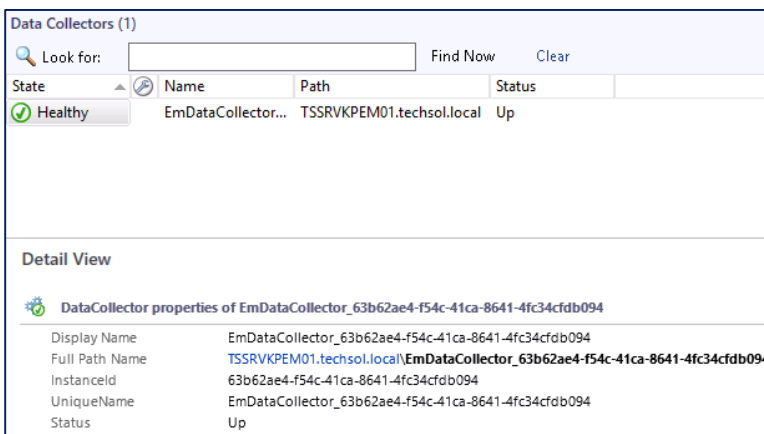


Figure 7 Data collector detail





The WMI Data Collector Providers shows all detected WMI Providers in the environment.

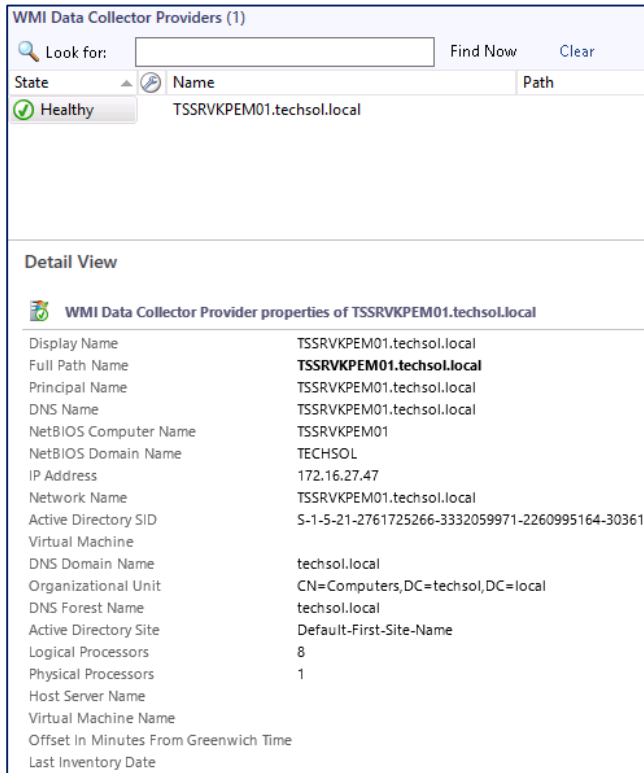


Figure 8 WMI data collector provider details

**Note:** The status of both the Data Collector and WMI Provider must show as healthy for the Management Pack to receive any Storage Center data.

In situations where SCOM cannot communicate with the Data Collector, the entry for the Data Collector will show a greyed out status. In most cases, this indicates a problem with the Microsoft monitoring agent on the Data Collector server, but could be indicative of a problem with the SQL database. Please refer to Section 6 of this document for troubleshooting steps.

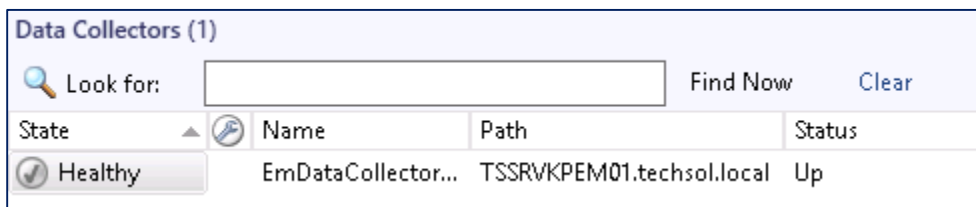


Figure 9 Data collector communication problems



## 5 Overrides

Overrides are used in SCOM to change monitoring settings for monitors, attributes, object discoveries, and rules. Overrides can be applied to individual objects, or groups of objects.

The Dell Compellent Management Pack 3.0 is preconfigured with monitors that do not require any configuration, although overrides can be used to modify the default configuration.

**Note:** Overrides can only be created for targets in the following Dell Compellent Management Pack objects: monitors, object discoveries and rules.

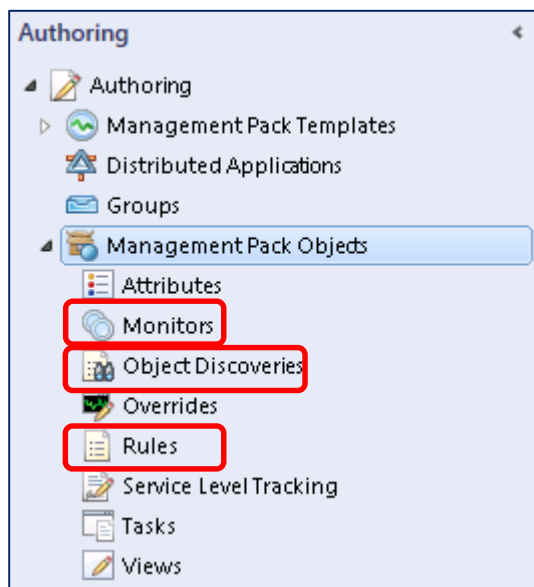


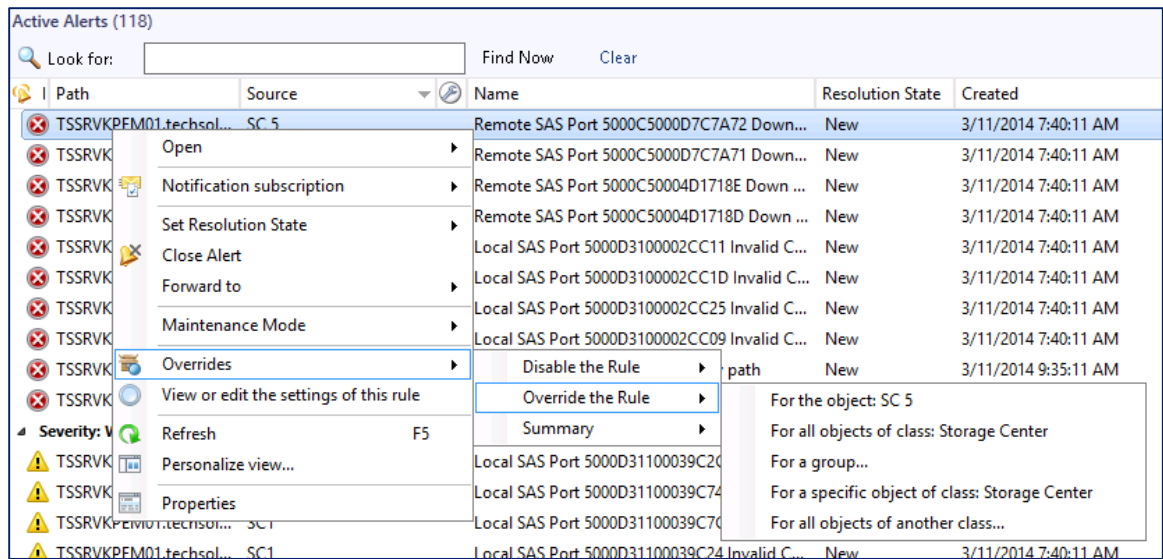
Figure 10 Management pack objects

In SCOM 2012/R2, overrides can be created from the **Monitoring** or **Authoring** pane.

### 5.1 Creating an override from the Monitoring pane

To create an override from the **Monitoring** pane:

1. Right-click an active alert and click **Overrides** > **Override the Rule** and then select an option to create an override for.
  - For the specific alerted object
  - For all objects of the class the object belongs to
  - For a group
  - For a specific object of the current class
  - For all objects of another class



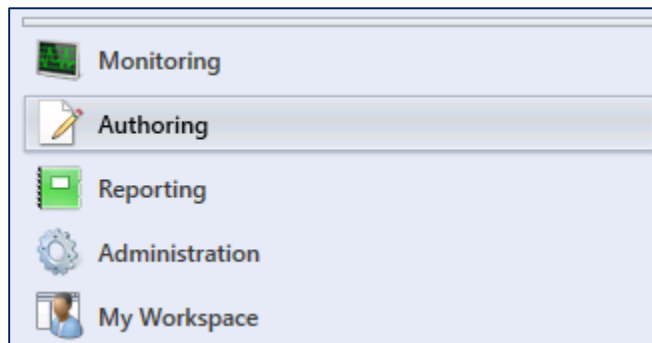
**Note:** Pay careful attention to the option selection. Choosing the wrong option could result in SCOM no longer reporting critical alerts from Storage Center.

For information about setting override properties, refer to Section 5.3.

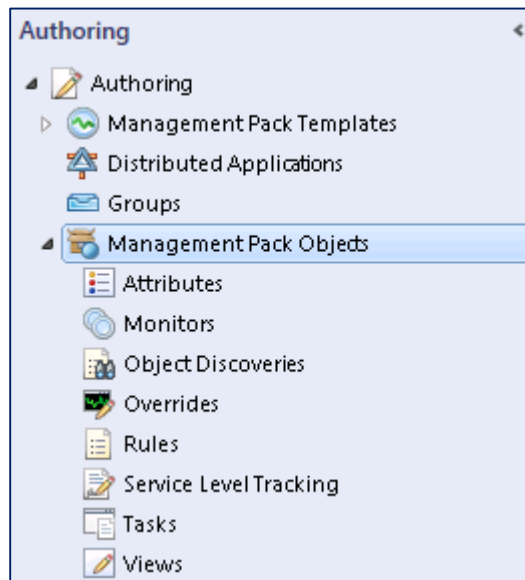
## 5.2 Creating an override from the Authoring pane

To create an override from the Authoring pane:

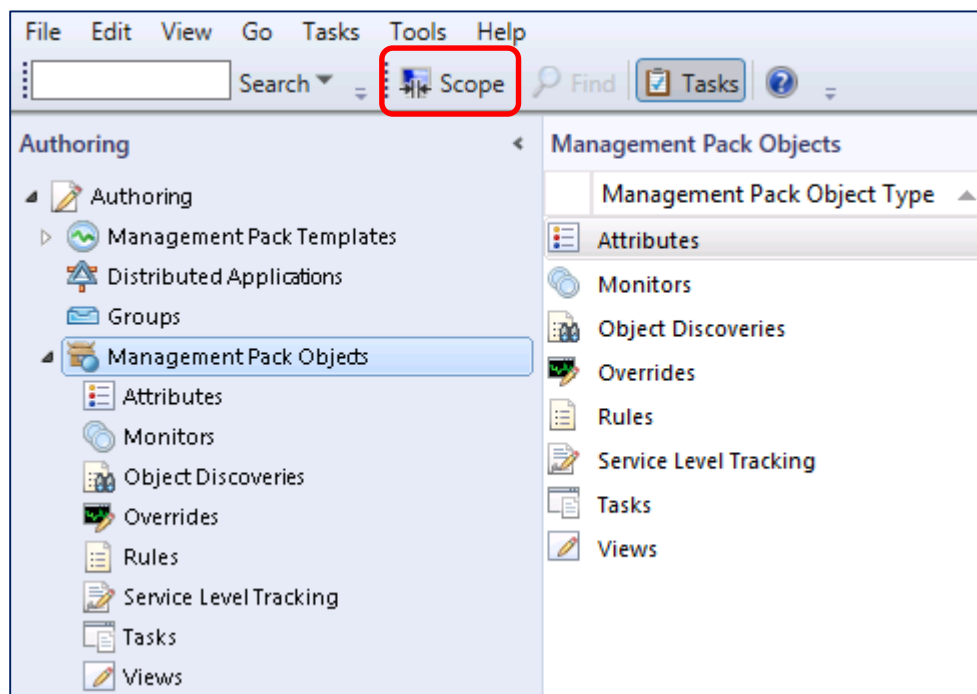
1. From the SCOM Management Console click **Authoring**.



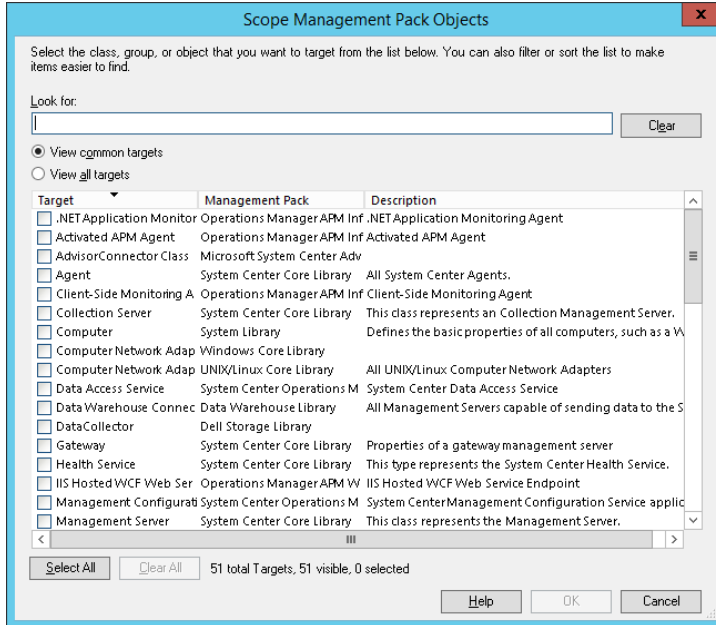
2. Click **Management Pack Objects**.



3. In the **Management Pack Objects** window, click **Scope** on the menu bar.

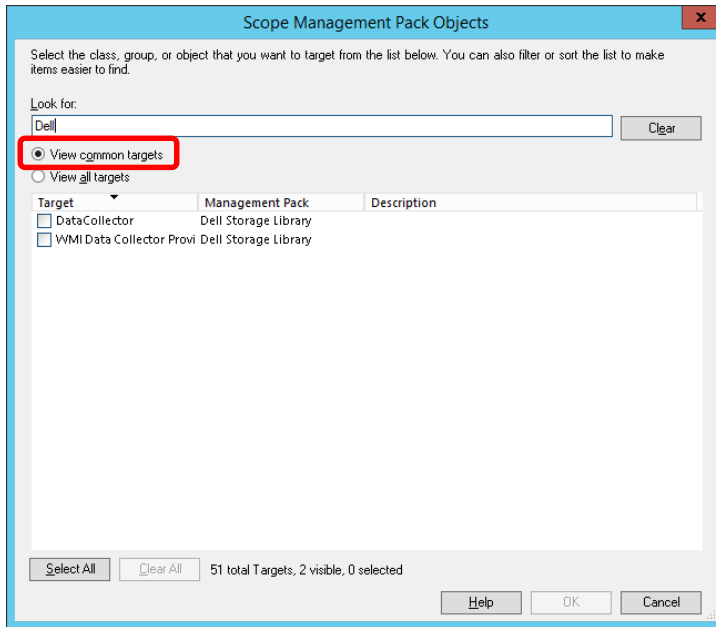


The Scope Management Pack Objects window appears.

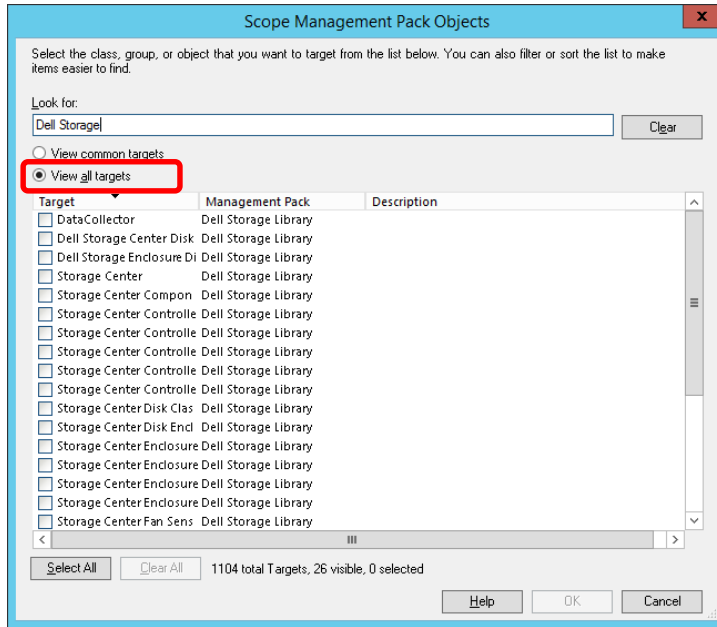


4. Use the **Look for:** field to:

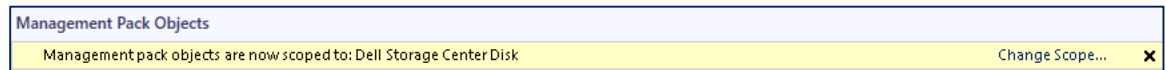
- Filter down to a specific target
  - Sort all targets by Management Pack
- a. To search for a specific target leave the **View common targets** radio button selected and type in a specific target name.



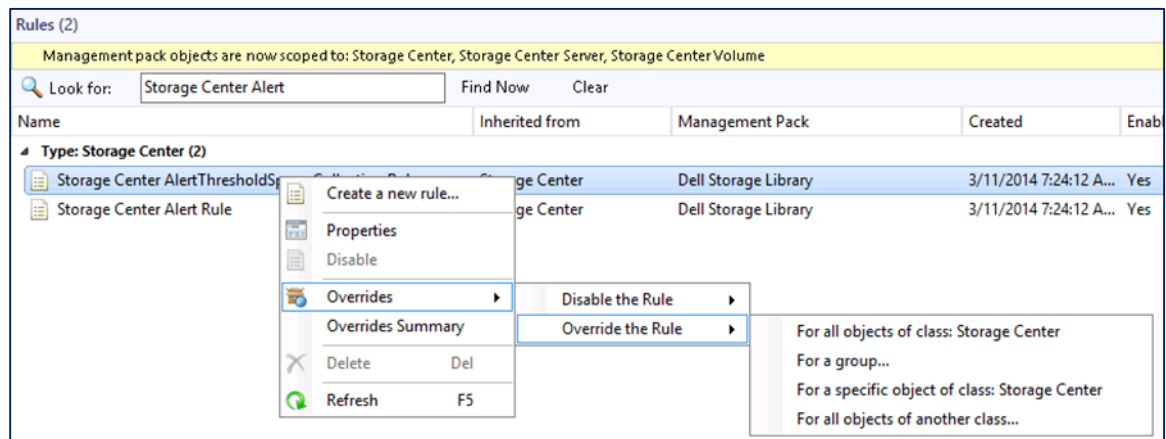
- b. To see all targets of a specific management pack select the **View all targets** radio button and type in the name of the management pack.



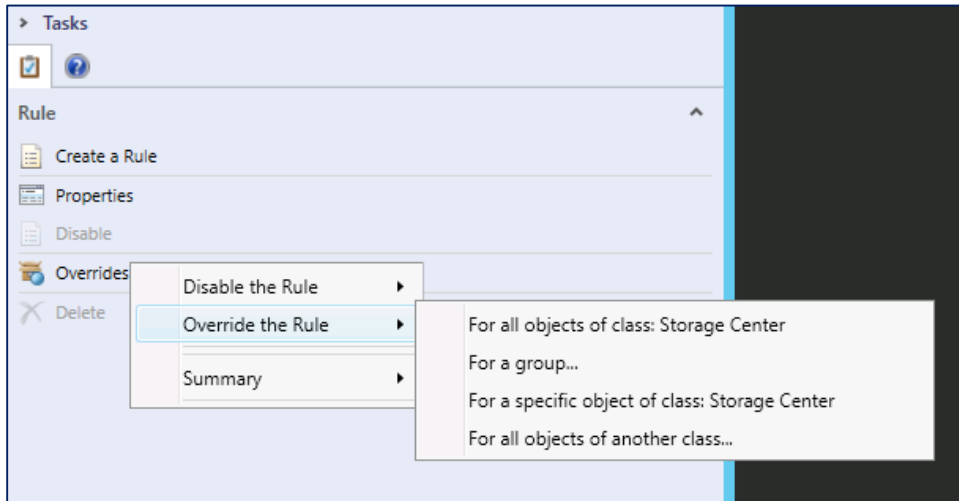
5. Select the Management Pack target(s) to edit and click **OK**.
6. When a scope has been defined, a message similar to the following is displayed in the Management Pack Objects pane:



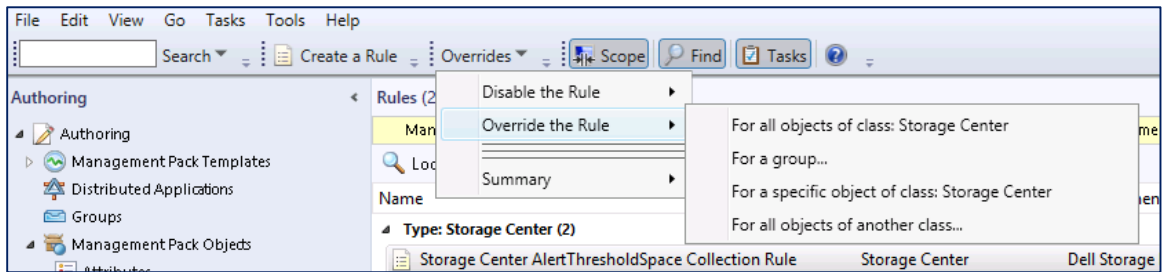
7. To modify the existing scope, click **Change Scope...**
8. Create an override in one of three ways:
  - Right-click on the target, select **Overrides**, and then select **Override the Rule**.



- Select **Overrides** on the **Action** pane, then select **Override the Rule**.



- Click the **Overrides** tab on the menu bar, and then select **Override the Rule**.



9. Select the appropriate override option from the menu.



## 5.3 Setting override properties

An override created from the Authoring or Monitoring panes is ultimately displayed in the **Override Properties** window.

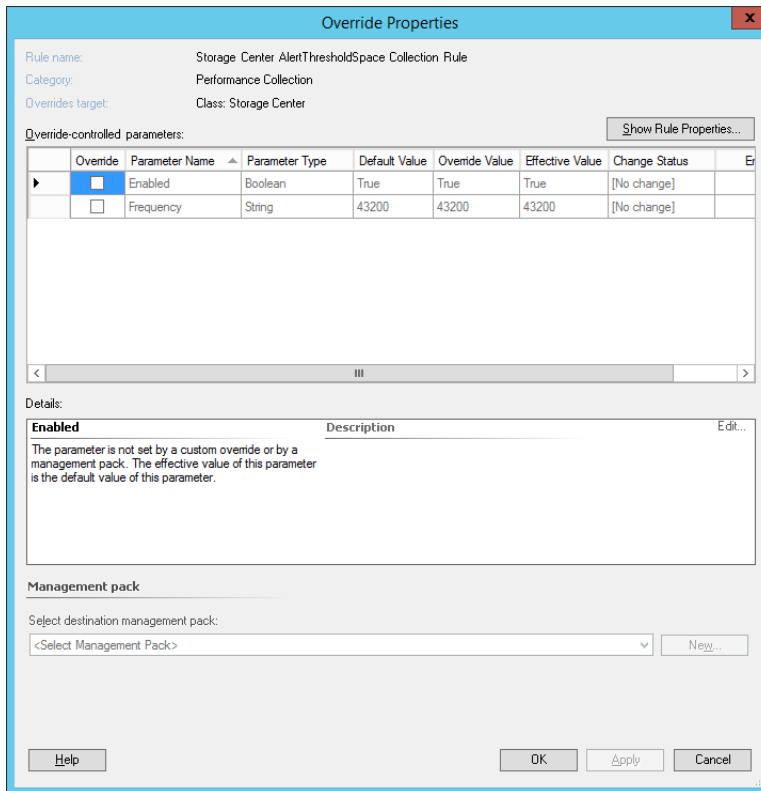
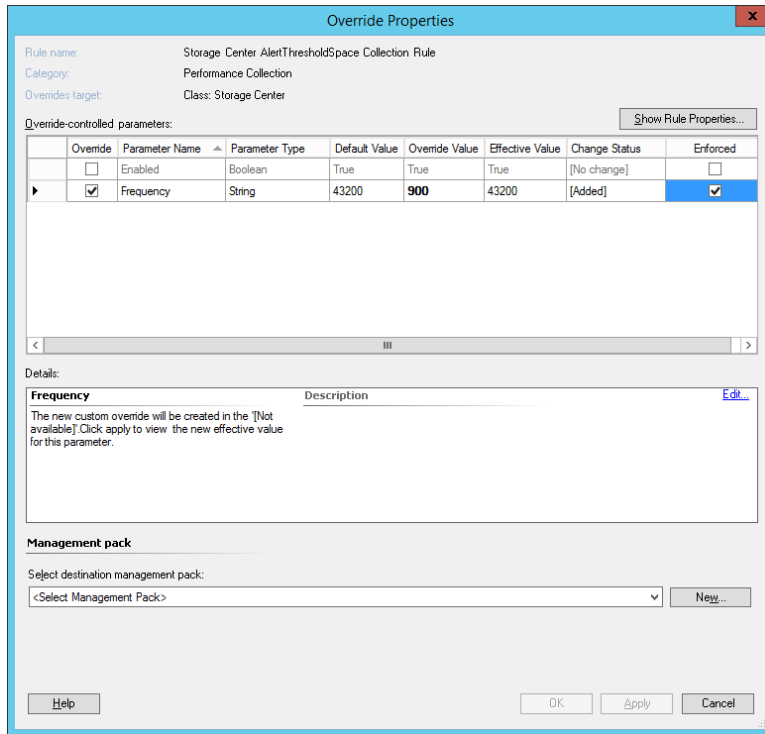


Figure 11 Override properties

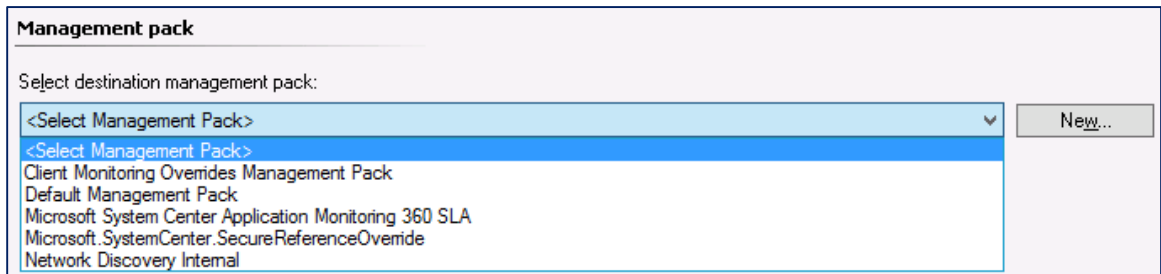
To set an override:

1. Select the parameter(s) to override. A corresponding override value must be applied to the parameter(s). To enable the override, check the **Enforced** box.





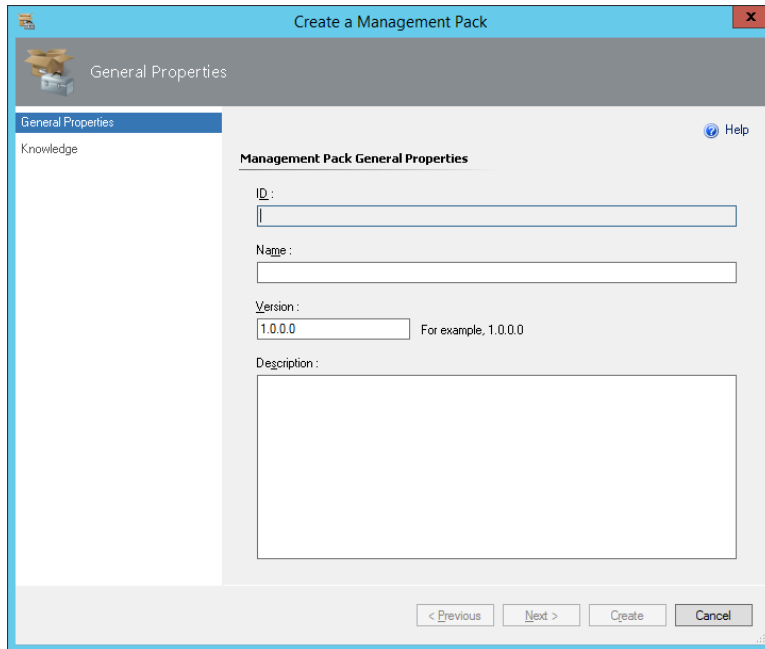
2. Select the override destination management pack.



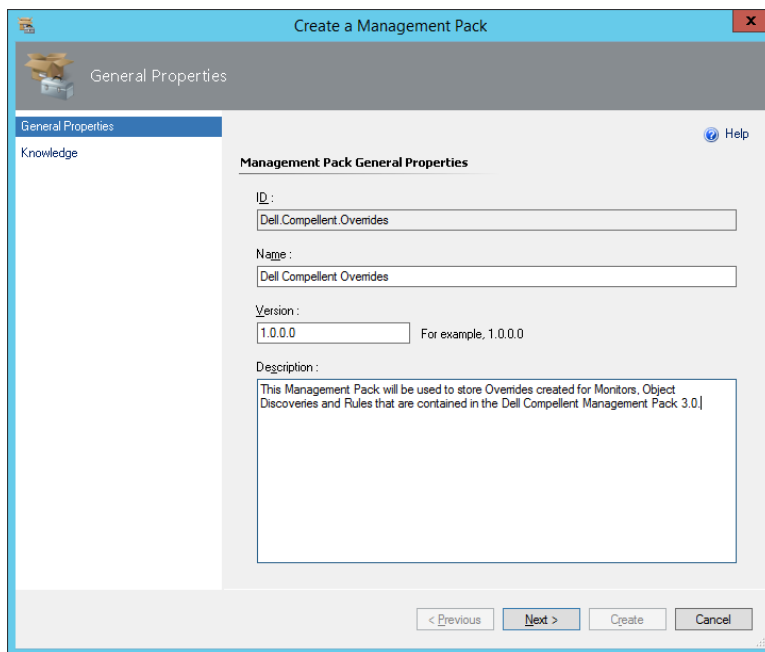
**Note:** Microsoft does not recommend saving overrides to the default Management Pack. As a best practice, create a new management pack to save Overrides.

3. Create a new Management Pack.
  - a. Click **New...**



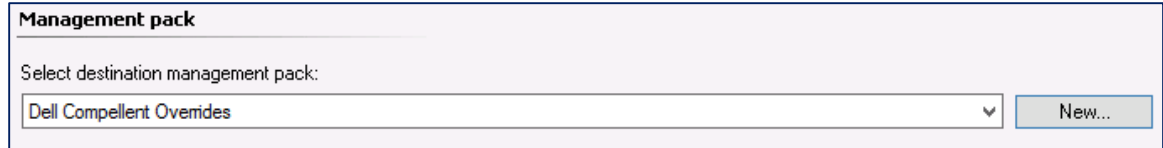


- b. Assign a name to the Management Pack and if desired, assign a version and provide a description. Click **Next**, and on the following screen, click **Create**.



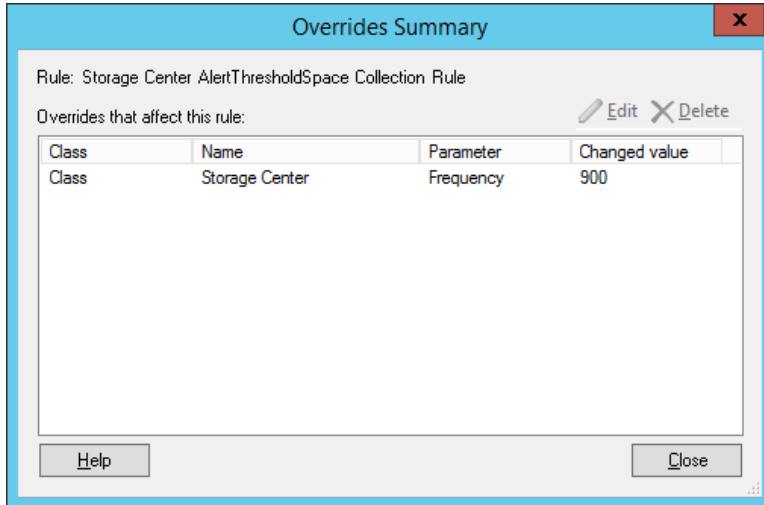
4. Verify that the newly created Management Pack is selected, and click **OK**.



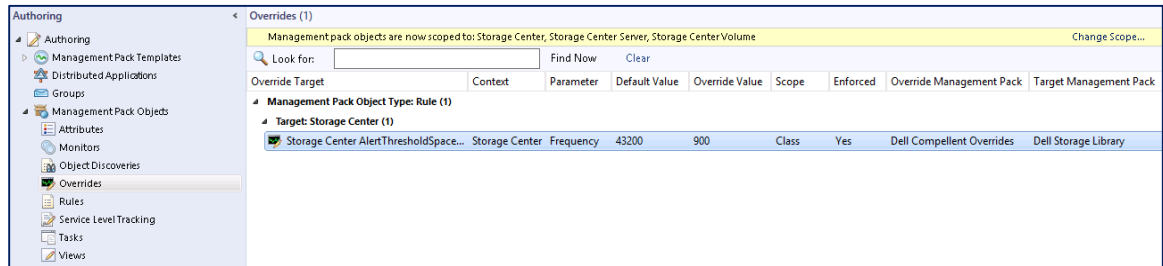


The override takes effect immediately.

- To see effective overrides for a particular monitor, object discovery or rule, right-click the item and select **Overrides Summary**.



- To view all overrides applied to a specific scope, click **Overrides** in the **Management Pack Objects** menu in the **Authoring** pane.



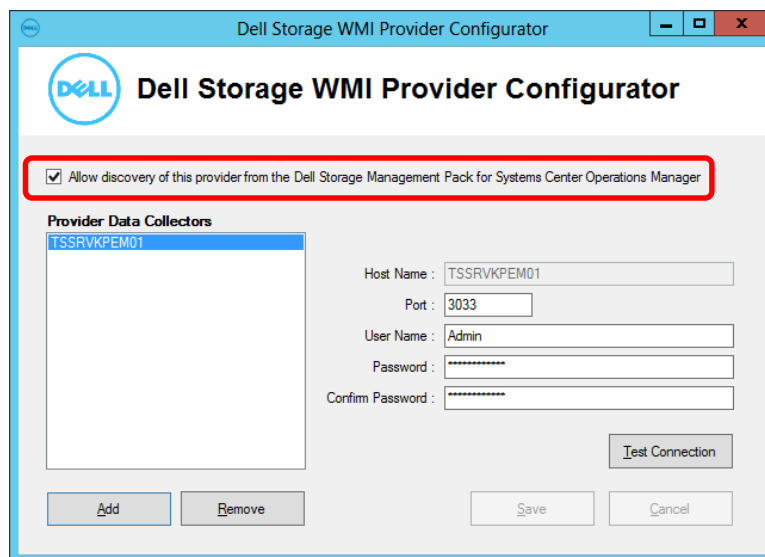
## 6 Troubleshooting

This section provides tips and resources to help identify and resolve common issues with the WMI Provider, Enterprise Manager, SCOM, and SQL server.

### 6.1 Troubleshooting the WMI Provider installation

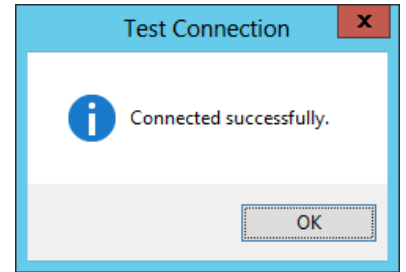
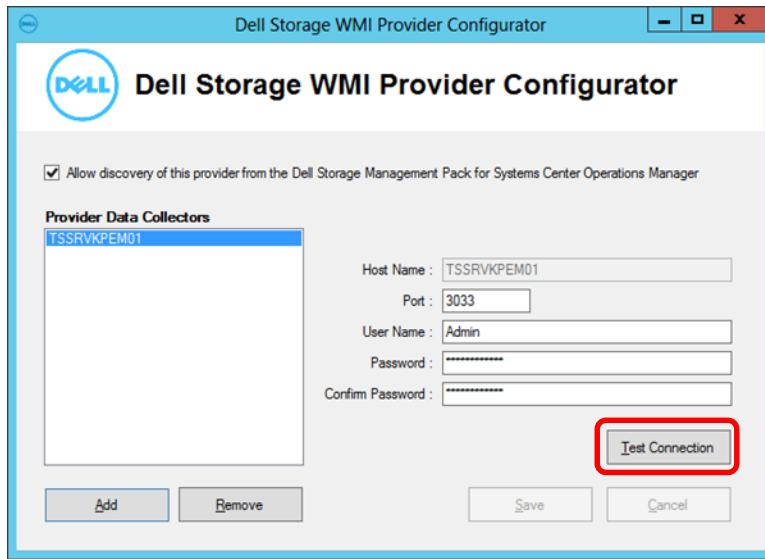
The WMI Provider is the first place to investigate when objects are not being discovered by the Management Pack. The following steps will ensure proper operation of the WMI Provider.

1. Ensure the WMI Provider has been marked for discovery.
  - a. Select the **Allow discovery of this provider from the Dell Storage Management Pack for System Center Operation Manager** check box in the Dell Storage WMI Provider Configurator tool.



2. Test the connection(s) to the Provider Data Collectors.
  - a. Click **Test Connection** in the Dell Storage WMI Provider Configurator tool to validate the connection settings for each of the defined Data Collectors.

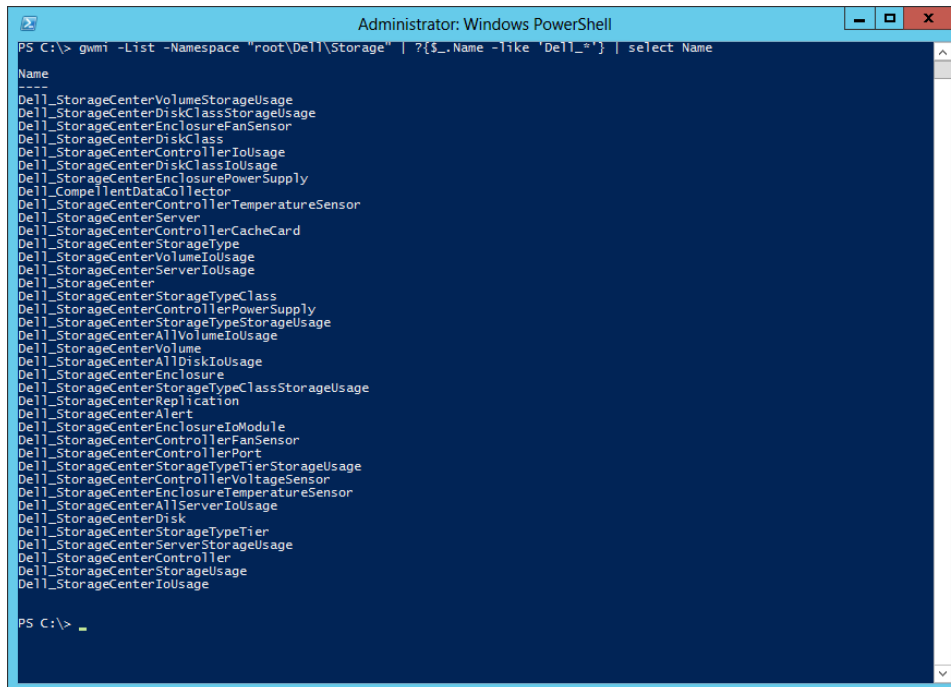




3. Check that the WMI Provider has been correctly registered.
  - a. Log on as an administrator to the WMI Provider server.
  - b. Open PowerShell and type in the command below to ensure a list of classes beginning with the **Dell\_** prefix is displayed.

```
PS C:\> gwmi -List -Namespace "root\Dell\Storage" | ?{$_Name -like 'Dell_*'} | select Name <enter>
```

- c. If the WMI Provider has been correctly registered, the following output is received.



- d. If no class names are returned, the WMI Provider was not correctly registered. To register the provider manually, run the Dell.Storage.WMIConfigurator.exe with the /i switch from within PowerShell (or the command prompt).

```
PS C:\> cd 'C:\Program Files (x86)\Dell\Dell Storage WMI Provider' <enter>
```

```
PS C:\Program Files (x86)\Dell\Dell Storage WMI Provider>
.\Dell.Storage.WMIConfigurator.exe /i <enter>
```

- e. Run the PowerShell **gwmi** command again to verify the Dell WMI Provider classes are displayed.

## 6.2 WMI Provider logging

If SCOM is not receiving the expected data from Enterprise Manager, the WMI Provider log can be referenced to review errors and information. In extreme cases, the WMI Provider can be configured to log full trace information.

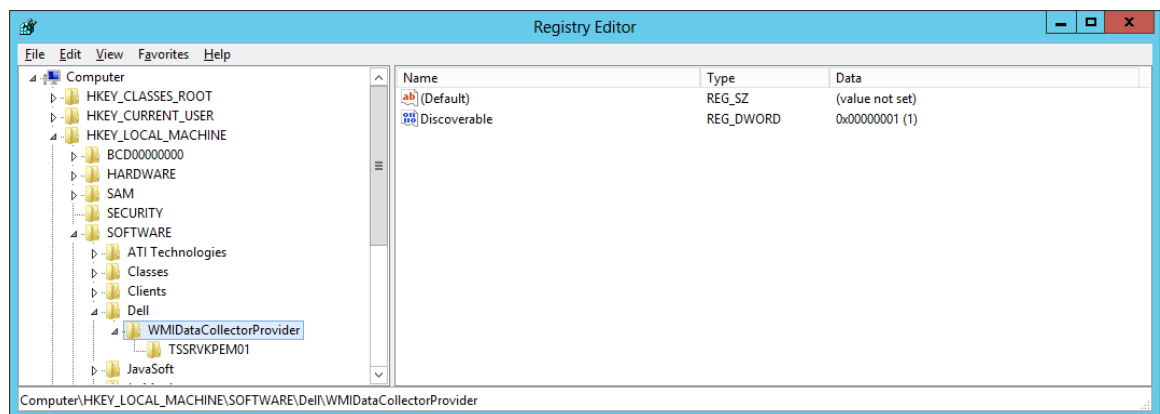
On the server where the WMI Provider is installed, the log is located at C:\Windows\Microsoft.NET\assembly\GAC\_64\Dell.Storage.Instrumentation\v4.0\_3.0.0.x with the log name is Dell.Storage.Instrumentation.txt.

By default, the WMI Provider log is configured to only capture errors. The logging level can be changed through the Windows registry, although not necessary in most cases.

**Note:** As a best practice, make a backup of the Windows registry before making any changes to it.

To change the level of logging for the WMI Provider:

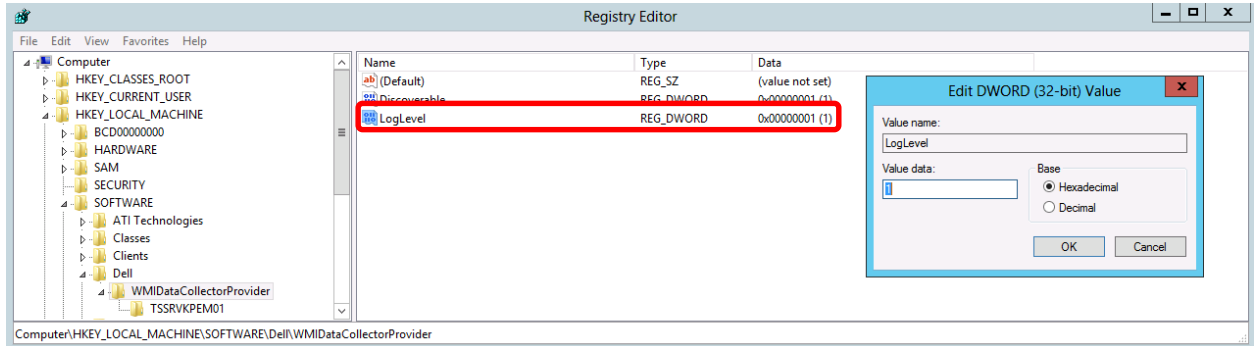
1. Log on with administrator credentials to the Windows 2012/R2 server that is running the WMI Provider.
2. Launch the Registry editor by going to **Start > Run > Regedit**.
3. In the Registry editor navigate to:  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Dell\WMIDataCollectorProvider



4. Right-click **WMIDataCollectorProvider** and select **New > DWORD (32-bit) Value**.
5. Enter **LogLevel** for the name.
6. Right-click on the new entry and select **Modify...**
7. Enter a value and click **OK**.

Value settings are:

- **0**: Errors only (default)
- **1**: Information and errors
- **2**: Trace (including information and errors)



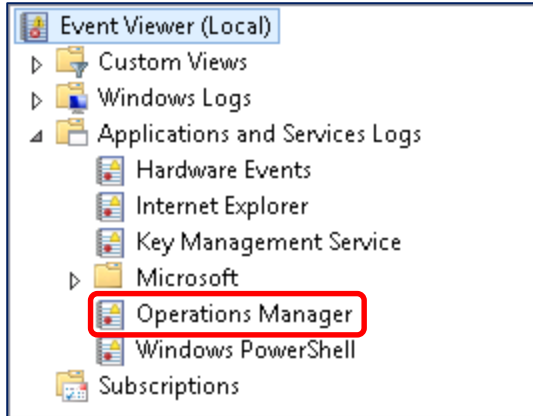
Changes to the log level require the WMI Provider to be reloaded. When the SCOM agent is running, The WMI Provider is reloaded automatically approximately every 5 minutes.

## 6.3 Event viewer logs

If any trouble is experienced with SCOM, another place to look for problems is in the Event Viewer. Windows, SCOM, Enterprise Manager and the WMI Provider all log information and errors to the Event Viewer.

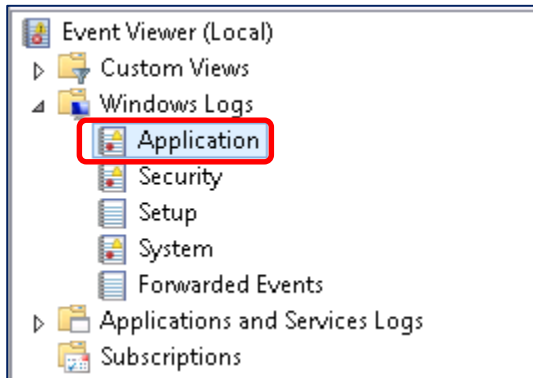
1. Launch the Event Viewer by going to **Start > Control Panel > Administrative Tools > Event Viewer**.
2. SCOM records to the Operations Manager log under the Applications and Services Logs.





**Note:** The Operations Manager log is installed on the SCOM server and on any server running the Microsoft monitoring agent.

3. The WMI Provider records to the Application log under Windows Logs.



If errors are generated from the WMI Provider, the listed source is **Application Error**.

Application Number of events: 936				
Level	Date and Time	Source	Event ID	Task C...
Error	2/21/2014 3:36:33 PM	Application Error	1000	(100)





## 6.4 Enterprise Manager memory settings

Enterprise Manager can be used to monitor multiple Storage Centers throughout the enterprise. As the amount of Storage Centers and data collected increases, Enterprise Manager can suffer performance degradation. This can negatively affect SCOM, as well as other applications that rely on Enterprise Manager as a data collector.

To allow scaling in the amount of Storage Centers monitored, the amount of system memory Enterprise Manager uses can be configured during installation. Memory settings are based on the total number of Storage Centers and/or total volumes to monitor. As shown in the graphic below, Enterprise Manager can be configured to monitor multiple Storage Centers and over 5000 total volumes.

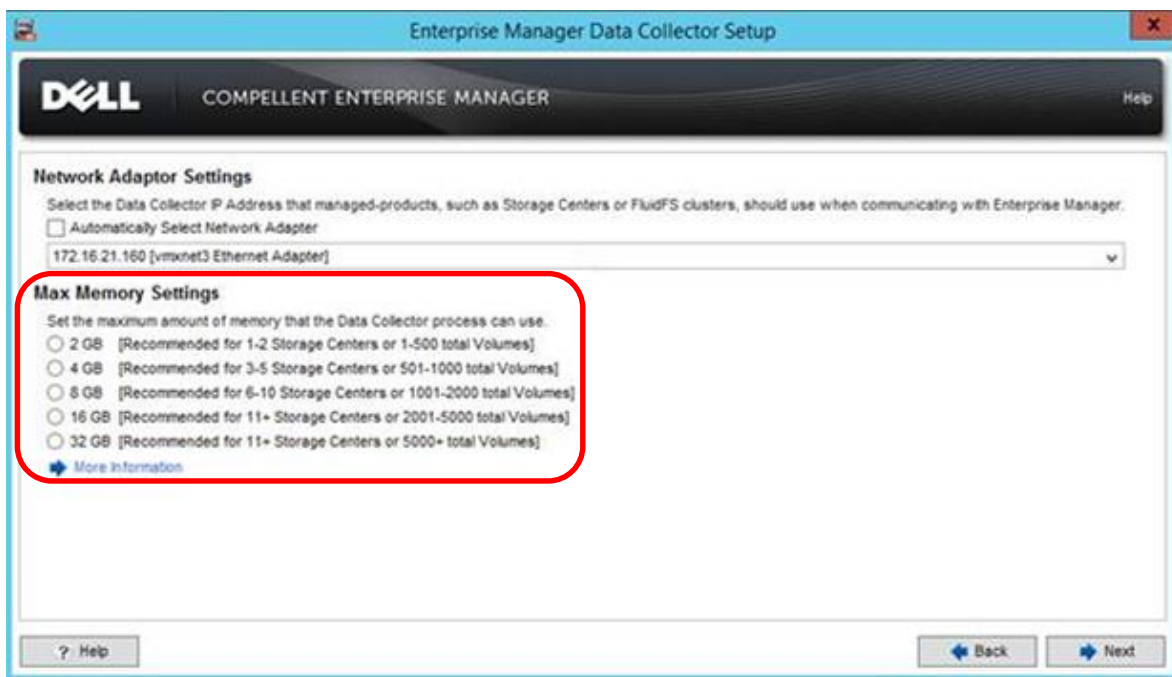


Figure 12 Enterprise Manager memory settings

**Note:** When making changes to memory settings, it is important to consider how much memory is being consumed by the server and other running processes. Make sure that there is enough available memory on the server to match the Enterprise Manager settings. Setting the max memory too low can have adverse effects on Enterprise Manager and applications that use it. Setting the max memory too high can have an adverse effect on the server and all its running applications, as well as potentially cause Enterprise Manager not to start.

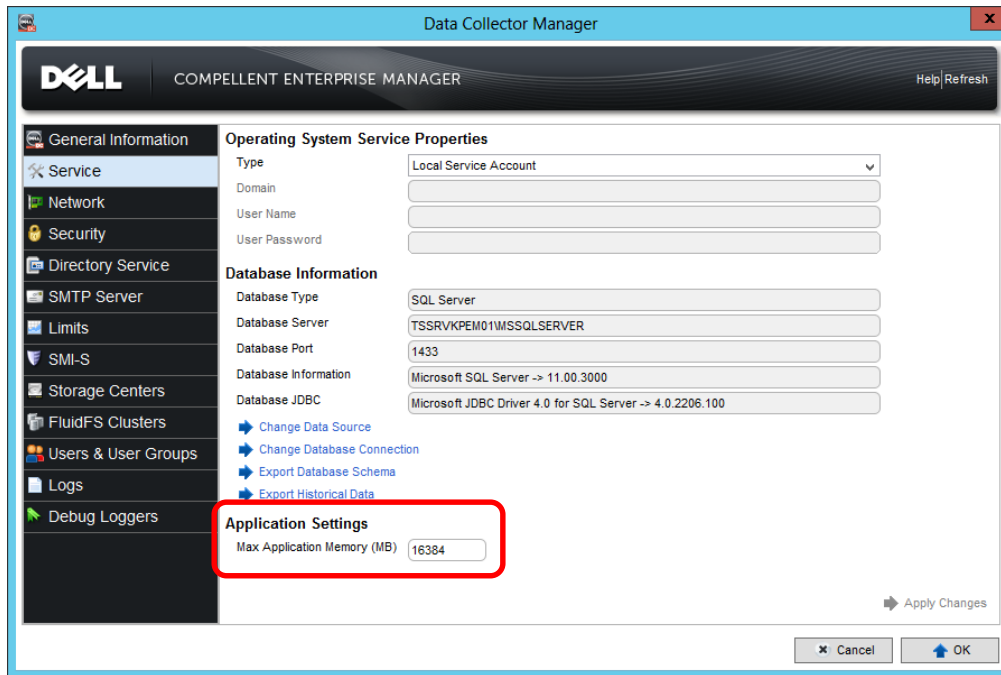
### 6.4.1 Modifying memory settings on an existing Enterprise Manager installation

To modify the maximum amount of memory, Enterprise Manager can use in an existing installation:

1. Open Dell Compellent Enterprise Manager Data Collector Manager.
2. Log on as a user with administrator rights.



3. Select **Service** from the menu on the left side of the window.
4. In **Application Settings**, set the maximum amount of memory that Enterprise Manager can use in MB based upon the amount of Storage Centers and volumes in the environment.



- a. Values for this amount are as follows:
  - **2048** (2 GB): Recommended for 1-2 Storage Centers or 1-500 total volumes
  - **4096** (4 GB): Recommended for 3-5 Storage Centers or 501-1000 total volumes
  - **8192** (8 GB): Recommended for 6-10 Storage Centers or 1001-2000 total volumes
  - **16384** (16 GB): Recommended for 11+ Storage Centers or 2001-5000 total volumes
  - **32768** (32 GB): Recommended for 11+ Storage Centers or 5000+ total volumes
5. Once the memory has been set, click **Apply Changes**. Enterprise Manager will then stop and restart with the new memory settings.



## 6.5 SQL database settings

SCOM requires a SQL database, and will create one during the installation. The size and destination of the database can be set, as shown in Figure 13.

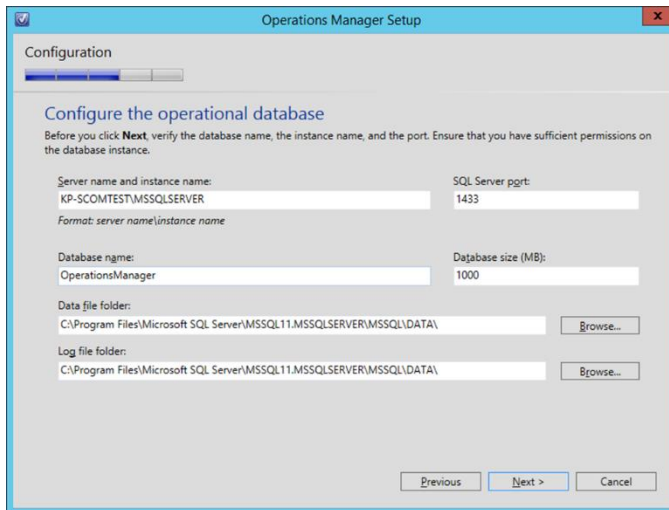


Figure 13 SCOM operational database setup

In most cases, the default database size of 1 GB is too small, especially in environments with multiple storage centers and a high number of volumes.

It should also be noted that by default, the SCOM operational database is not set to autogrow, regardless of what the SQL server defaults are set to.

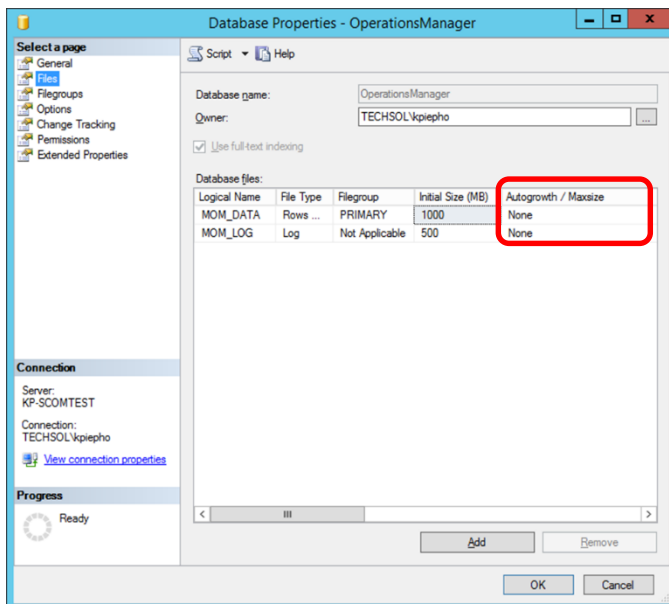


Figure 14 Operations Manager database properties

When the SCOM SQL database reaches its maximum size, SCOM no longer accepts and displays new data. In this case, error 10801 is displayed in the Operations Manager event log showing the following information:

**Discovery data couldn't be inserted to the database. This could have happened because of one of the following reasons:**

- **Discovery data is stale. The discovery data is generated by an MP recently deleted.**
- **Database connectivity problems or database running out of space.**
- **Discovery data received is not valid.**

**Could not allocate space for object in database 'OperationsManager' because the 'PRIMARY' filegroup is full. Create disk space by deleting unneeded files, dropping objects in the filegroup, adding additional files to the filegroup, or setting autogrowth on for the existing files in the filegroup.**

If this error occurs, the database size needs to be increased, or autogrowth needs to be turned on. Please refer to [Microsoft TechNet](#) for information on how to increase the size of a database.

For guidance with SQL Server database sizing for SCOM, please refer to the [Operations Manager 2012 Sizing Helper Tool](#).

### 6.5.1 Using SCOM to monitor SQL server

Because SCOM and SQL are so closely tied together, monitoring of both servers is essential in maintaining the health of the environment.

A SCOM monitoring agent can be installed on the SQL server used by SCOM. Keep in mind that the monitoring agent will only report on the health of the operating system, and does not have any direct hooks into SQL server.

Microsoft offers the System Center Management Pack for SQL Server which allows SCOM to monitor SQL databases, jobs, counters, and more. The SQL server management pack can be downloaded from the [Microsoft Download Center](#).

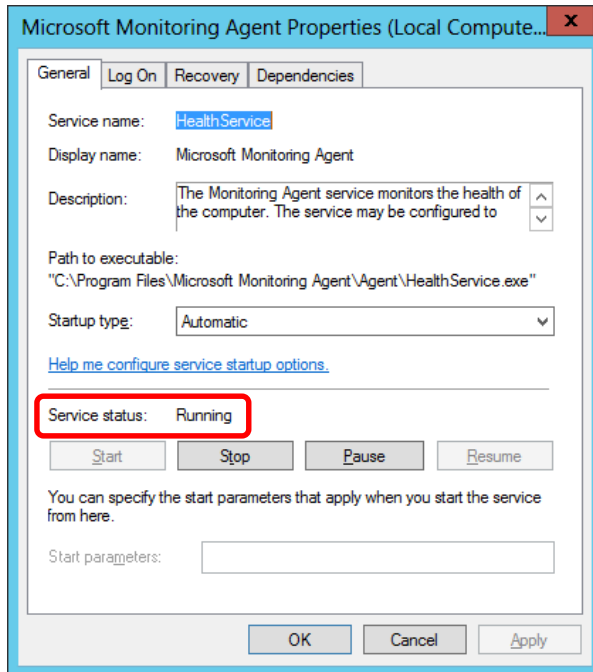
## 6.6 Microsoft monitoring agent

Oftentimes, connection issues between the WMI Provider and SCOM servers can be resolved by simply restarting the Microsoft monitoring agent on the WMI Provider server.

To restart the Microsoft monitoring agent:

1. Log on with administrator credentials to the Windows 2012/R2 server that is running the WMI Provider.
2. Launch services by going to **Start > Control Panel > Administrative Tools > Services**.
3. Right-click on the Microsoft Monitoring Agent service and select **Restart**.
4. Verify the service restarted and is running.





**Note:** If restarting the Microsoft monitoring agent on the WMI provider server does not alleviate the connection issues, the agent can also be restarted on the SCOM server. Be advised that restarting the agent on the SCOM server will stop all data collection within SCOM until the agent is running.



## 7 Conclusion

This document has provided administrators with answers to commonly asked questions associated with the Dell Compellent Storage Center Management Pack 3.0 for SCOM 2012/R2.

For more information, please refer to the documentation listed in "Additional resources" below.



## A Additional resources

Support.dell.com is focused on meeting your needs with proven services and support.

DellTechCenter.com is an IT Community where you can connect with Dell Customers and Dell employees for the purpose of sharing knowledge, best practices, and information about Dell products and installations.

### **Referenced or recommended Dell Compellent publications on Dell TechCenter:**

<http://en.community.dell.com/techcenter/storage/w/wiki/5018.compellent-technical-content.aspx>

- Dell Compellent Storage Center Users Guide
- Dell Compellent Storage Center Management Pack 3.0 for Microsoft SCOM Administrator's Guide
- Microsoft SQL Server Best Practices with Dell Compellent Storage Center
- Windows Server MPIO Best Practices for Dell Compellent Storage Center
- Windows Server 2012 R2 Best Practices for Dell Compellent Storage Center

### **Referenced or recommended Microsoft publications:**

- Operations Manager Overview:  
<http://technet.microsoft.com/en-us/library/hh205987.aspx>
- What's New in System Center 2012 R2 Operations Manager:  
<http://technet.microsoft.com/en-us/library/dn249700.aspx>
- System Center 2012 R2 – Operations Manager Survival Guide:  
<http://social.technet.microsoft.com/wiki/contents/articles/20796.system-center-2012-r2-operations-manager-survival-guide.aspx>
- System Center: Operations Manager Engineering Blog:  
<http://blogs.technet.com/b/momteam/>
- Best practices to use when you configure overrides in System Center Operations Manager:  
<http://support.microsoft.com/kb/943239/en-us>
- System Center Management Pack for SQL Server:  
<http://www.microsoft.com/en-us/download/details.aspx?id=10631>

