

Dell Storage Appliance Tools (DSAT) and SDK Server Hardware Manager Administrator'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.

Copyright © 2015 Dell Inc. All rights reserved. This product is protected by U.S. and international copyright and intellectual property laws. Dell™ and the Dell logo are trademarks of Dell Inc. in the United States and/or other jurisdictions. All other marks and names mentioned herein may be trademarks of their respective companies.

2015 - 08

Rev. A01

Contents

1 Introduction.....	6
2 Other information you may need	7
For the Dell PowerVault MD3060e	7
For the Dell PowerVault MD1200 Series	7
For the Dell Storage MD1280	8
For the Dell Storage MD1400 Series	8
3 About the Dell Storage enclosure.....	9
4 Installation procedure	10
Server Hardware Management installation – Windows.....	10
MPIO (Multipath I/O).....	10
Graphical installation.....	10
Silent installation.....	10
Uninstalling server hardware management	11
Server Hardware Management Installation –Linux.....	11
DMMP	11
Graphical installation.....	11
Silent installation.....	12
Console uninstallation.....	12
5 Server hardware command line interface.....	13
Using the command line interface.....	13
Command syntax structure.....	14
Command help	16
Identifying installed HBAs.....	16
PERC or MegaRaid controllers	16
Identifying enclosures and EMMs.....	17
Identifying enclosures.....	17
Identifying drives.....	18
Updating drives.....	19
Updating EMM firmware.....	19
6 CLI reference.....	21
Commands listed by type.....	21
Drive commands.....	21
Blink drive.....	21

Drive power.....	22
List commands.....	22
List adapters.....	22
List physical enclosures.....	23
List drives.....	23
List EMMs.....	24
List drawers.....	25
List EMM slots.....	25
List drive slots.....	26
List fans.....	27
List power supplies.....	27
List temperature sensors.....	28
List voltage sensors.....	29
List current sensors.....	29
List failed drives.....	30
Informational commands.....	31
Show adapter information.....	31
Show drive information.....	31
Show enclosure information.....	32
Show firmware file information.....	33
View event log	34
7 Update commands.....	35
Update drive firmware.....	35
Update EMM firmware.....	36
Update Adapter.....	37
Status Adapter.....	38
Global Topology.....	38
8 Server Hardware Manager Monitor.....	40
Local log file.....	40
Windows event log	40
Linux syslog.....	40
SNMP.....	41
Events.....	41
9 The Dell Storage enclosure ReST API.....	43
Accessing the ReST service.....	43
Device inventory.....	44
Adapters.....	45
Enclosures.....	45
EMMs.....	45

Drives slots.....	45
EMM slots.....	45
Drawers	45
Fans.....	46
Voltage sensors.....	46
Current sensors.....	46
Device actions.....	46
Update firmware.....	47
Validate firmware file.....	47
10 Microsoft System Center Operations Manager Management Pack	48
Overview of the Dell Storage PowerTools Server Hardware Manager SCOM management pack	48
Installing Dell Storage PowerTools Server Hardware Manager SCOM Management Pack.....	48
Views created	54
Severity Level Indicators	55
11 Getting help.....	57
Contacting Dell.....	57

Introduction

 **CAUTION: See the Safety, Environmental, and Regulatory Information document for important safety information before following any procedures listed in this document.**

An enclosure containing physical disks accessed through EMMs (Enclosure Management Modules) is called a storage enclosure. A storage enclosure includes various hardware components, such as physical disks, EMMs, fans, and power supply units (PSUs).

One or more host servers attached to the storage enclosure can access the data on the storage enclosure. You can also establish multiple physical paths between the hosts and the storage enclosure so that loss of any single path (for example, through failure of a host server port) does not result in loss of access to data on the storage enclosure.

The storage enclosure is managed by the Server Hardware Management software running on a host server. On the host server system, the management software and the storage enclosure communicate management requests and event information by using in-band SAS connections.

Terminology

This document familiarizes you with the functions of the Server Hardware Management software. The Server Hardware Management Software is comprised of two major components:


- Server Hardware Manager CLI (shcli) — This component provides a command-line interface (CLI) used to obtain device and status information of storage and hardware components. In addition, you can use the shcli for firmware updates of Enclosure Management Modules (EMMs) and hard disk drives (HDDs) and solid-state drives (SSDs) within the enclosure and system drives.
- Server Hardware Monitor — This component runs continuously, monitoring and logging the status of storage components, including enclosures, adapters, HBAs, EMMs, drives, and EMM components (fans, power supplies, temperature sensors, and more).

The document is organized into two major sections. The first section of this document describes the CLI commands required to perform certain common task . The second section is a reference to all CLI commands ordered by type.

Other information you may need


 **WARNING:** See the safety and regulatory information that shipped with your system. Warranty information may be included within this document or as a separate document.

Any media that ships with your system that provides documentation and tools for configuring and managing your system, including those pertaining to the operating system, system management software, system updates, and system components that you purchased with your system.

 **NOTE:** All the documents, unless specified otherwise, are available at Dell.com/support/manuals.

Before you begin, make sure you have the following documentation handy.

If you are connecting another supported enclosure, see the corresponding guides as needed for installation, configuration, and troubleshooting.

 **NOTE:** Always check for updates on Dell.com/support/manuals and read the updates first, because they often supersede information in other documents.

For the Dell PowerVault MD3060e

- *Rack Installation Instructions* — Describes how to install your system into a rack. This document is also shipped with your rack solution.
- *Dell PowerVault MD3060e Storage Enclosure Deployment Guide* — Provides information about deploying the storage system in the direct attached architecture.
- *Dell PowerVault MD3060e Support Matrix* — Provides information about the software and hardware compatibility matrices for the storage enclosure.
- For the full name of an abbreviation or acronym used in this document, see the Dell Glossary – Version 2 Glossary at Dell.com/support/manuals.

For the Dell PowerVault MD1200 Series

- The rack documentation included with your rack solution describes how to install your system into a rack.
- The *Getting Started Guide* provides an overview of system features, setting up your system, and technical specifications.
- The OpenManage Server Administrator documentation provides information about managing your storage solution using the storage management service within the server administrator.
- The *Dell PowerEdge RAID Controller (PERC) H830 and Dell 12Gb SAS HBA User's Guide* provides information about configuring RAID.

For the Dell Storage MD1280

- The rack documentation included with your rack solution describes the process of installing your system into a rack.
- The *Dell Storage MD1280 Service Guide* provides information about enclosure service and maintenance. This document is available online at dell.com/support/home.
- The *Getting Started Guide* provides information about initial setup tasks and technical specifications of the Dell MD1280 Storage Enclosure. This document is available online at Dell.com/support/home.

For the Dell Storage MD1400 Series

- The rack documentation included with your rack solution describes how to install your system into a rack.
- The *Getting Started Guide* provides an overview of system features, setting up your system, and technical specifications.
- The OpenManage Server Administrator documentation provides information about managing your storage solution using the storage management service within the server administrator.
- The *Dell PowerEdge RAID Controller (PERC) H830 and Dell 12Gb SAS HBA User's Guide* provides information about configuring RAID.

About the Dell Storage enclosure

This chapter describes the storage enclosure concepts, which help in configuring and operating the Dell storage enclosures. The **shmccli** uses a number of terms to describe objects on which the software performs actions.

See the *Dell Storage PowerTools and SDK Support Matrix* for information on supported enclosures.



NOTE: For detailed descriptions about the enclosure features, see the *Owner's Manual* for the specific enclosure.

Installation procedure


When connecting the storage enclosure to a Dell PowerEdge server, the server must have a supported SAS HBA installed. See the *Dell Storage Appliance Tools (DSAT) and SDK Server Hardware Manager Administrator's Guide* for information about supported SAS Host-bus Adapters (HBAs). If the host is connected to the storage enclosure by using multiple paths (two or more SAS connections), the host must have multipath configured. For more information about multipath configuration, refer to the documentation related to the server operating system (OS).

The Dell Storage Enclosures are compatible with Windows and Linux operating systems (OSs). For more information about the specific OSs supported, see the *Dell Storage Enclosure Support Matrix* on Dell.com/support.

Server Hardware Management installation — Windows

MPIO (Multipath I/O)

You must configure Windows MPIO for the Server Hardware Management Software to recognize the hardware. For more information about MPIO configuration procedures, see Microsoft documentation related to MPIO for configuration procedures.

 **NOTE:** Dell recommends the Failover Only policy.

Graphical installation

1. Download the **Server Hardware Management Software** installation package from Dell.com/support.
2. Go to the download directory of the installer.
3. Double-click the installation program — `ServerHardwareManagement-x.x.x.x-windows-installer.exe`.
4. Complete the on-screen instructions and accept the End User License Agreement.

 **NOTE:** Installation of the SNMP monitoring service is optional.

Silent installation

1. Download the Server Hardware Management Software installation package from Dell.com/support.
2. Run appropriate commands at the CLI as an administrator.

 **NOTE:** The CLI must be an administrator prompt for proper use of the CLI.

3. Go to the download directory of the extracted installer.

4. Run the installation program by running the command:
`ServerHardwareManagement-x.x.x.x-windows-installer.exe --mode unattended`
or, modify `options.installer` and run with switch `--options C:\path\to\installer.options` for a non-default install.

This command installs the Server Hardware Management Software with all the default settings. The default installation directory is **C:\Program Files\Dell\ServerHardwareManagement**.

5. Accept all End User License Agreements.

 **NOTE:** There is no Windows console mode installation.


Uninstalling server hardware management

1. Run the command prompt as an administrator.
2. Navigate to the installation directory.
3. The default directory is `C:\Program Files\Dell\ServerHardwareManagement`.
4. Run the uninstallation program `ServerHardwareManagement_uninstall.exe`. For silent uninstallation: `ServerHardwareManagement_uninstall.exe --mode unattended` Windows Explorer.
5. To uninstall a software application, on the taskbar, click **Start** → **Control Panel** → **Programs and Features**.
6. Click the program **ServerHardwareManagement**.
7. Click **Uninstall**.
8. Complete the on-screen instructions to complete the uninstallation.

Server Hardware Management Installation –Linux


DMMP

For the Server Hardware Management Software to recognize the hardware properly, Linux Device Mapper Multipath (DMMP) must be configured. See the Linux documentation for proper DMMP configuration.


 **NOTE:** Dell recommends the Failover Policy.

Graphical installation

1. Download the Server Hardware Management Software installation package from **Dell.com/support**.
2. Navigate to the download directory of the installer.
3. Double-click the installation program `ServerHardwareManagement-x.x.x.x-<OS>-installer`.
4. Follow the on-screen instructions and accept the End User License Agreement.

 **NOTE:** You can choose to start the SNMP monitoring service after installation is complete.

Silent installation

 **NOTE:** Linux installation requires full 'root' user rights. Console installation is no longer available. Instead, run the installer with switch `--mode unattended` for the default installation. A default installation requires no arguments.

1. Download the Server Hardware Management Software installation package from **Dell.com/support**.
2. Navigate to the directory containing the extracted installer.
3. Run the command:

```
ServerHardwareManagement-x.x.x.x-<OS>-installer --mode unattended
```

This command installs the Server Hardware Management Software with all the default settings..


4. Accept all End User License Agreements. The default installation directory is `/opt/Dell/ServerHardwareManagement`.
5. To change the installation directory, uncomment and edit the following line in the `installer.options` file:

```
;prefix=/opt/dell/ServerHardwareManagement
```
6. To start the SNMP daemon after installation, set the value `SNMP` to 1.

```
SNMP=1
```
7. Run the command:

```
ServerHardwareManagement-x.x.x.x-<OS>-installer --mode unattended -options /path/to/installer.options
```


Console uninstallation

 **NOTE:** Linux uninstallation requires full root user permissions

 **NOTE:** The `shmcli` log file remains after uninstallation.




1. Run the terminal and navigate to the installation directory.
The default directory is: **`/opt/dell/ServerHardwareManagement`**.
2. Run the command:

```
ServerHardwareManagement_uninstall. For silent uninstallation:  
ServerHardwareManagement_uninstall --mode unattended.
```
3. Follow the on-screen instructions to complete the uninstallation.

 **NOTE:** Dell recommends you to read through the information in the `README.txt` file because it has important information regarding your product.

Server hardware command line interface

This guide is intended for system administrators, developers, and engineers who need to use the Server Hardware Command Line Interface (**shmcli**) and its associated commands. For more information, see the hardware and software manuals that shipped with the system.

-  **NOTE:** The name of the executable was changed to shmcli. For backward compatibility, during the installation, the older named executable (secli) is installed. The secli executable will be deprecated and will no longer be included in a later version of the product. Make sure to change scripts and usage from secli to shmcli.
-  **NOTE:** CLI commands do not have interactive warnings for destructive commands.
-  **NOTE:** Always check for updates on [Dell.com/support](https://www.dell.com/support) and read the update first, because they often supersede the information in other documents.

The Server Enclosure CLI is a software application that enables storage installers, developers, and engineers to monitor and update storage enclosures and HDDs or SSDs. By using the CLI, commands can run from an OS prompt, such as the Microsoft Windows command prompt, or a Linux operating system terminal.

Use the shmcli to perform the following functions:

- Display status information about the objects in the system.
- Update storage device firmware (EMM and drives).

Using the command line interface

A CLI command consists of the following elements:

- Runnable name — shmcli
- Command
- Path to the target
- Additional arguments

The following syntax is the general form of a CLI command:

```
shmcli command [path-to-target-object] {additional-arguments}
```

Where,

`shmcli` — invokes the command-line interface.

`command` — is the action the utility runs.

`path-to-target-object` — is the list of arguments that defines the target object command applies to.

Command syntax structure

The commands for the Storage Enclosure CLI have a number of mandatory and optional input parameters. Those parameters, in turn, can also have more than one valid attribute. However, each parameter can accept only one valid value for each run. This section outlines the symbols used in the syntax of each command in this document and the syntax layout in the `shmcli` help.

Table 1. Command syntax structure

Input Parameter	Description
<code>a b</code>	Pipe symbol indicating alternative (“a” or “b”)
<i>italicized-words</i>	Input value
<code>[...]</code>	Optional input
<code><></code>	Enclosed input value is required for parameter


Table 2. Parameter list


Parameter Name	Description	Valid Values
<code>-a</code>	Represents target adapter	SAS WWID or Adapter Index
<code>-d</code>	Represents target drive	WWN (World Wide Name), Enclosure Slot Index, Drawer Slot Index, Serial Number, or Drive OS Path.
<code>-w</code>	Represents target enclosure drawer	Drawer Index (0, 1, 2, 3, or 4)
<code>-s</code>	Represents target enclosure slot	Enclosure Slot Index
<code>-startDate</code>	Target start date	StartDate in the format of MM/DD/YY
<code>-endDate</code>	Target end date	EndDate in the format of MM/DD/YY
<code>-event</code>	Type of event to view from the event log	EventType (INFO, CRITICAL, ERROR, WARN)
<code>-count</code>	Number of events to view	LatestEventCount numeric value (1-1000)
<code>-outputformat</code>	Format of output data from <code>shmcli</code> command	SupportedOutputFormats (xml, json)
<code>-enc</code>	Represents target physical enclosure	Enclosure Index or WWN
<code>-emm</code>	Represents target EMM	WWN or EMM Index
<code>-file</code>	Represents target firmware file for updating a drive or EMM	Firmware update file location and name

Table 3. Description of values for parameters

	Description	Valid for Parameter
Absolute Path to Firmware File	Represents the absolute filepath to a valid drive or EMM firmware file	Valid value for <code>-file</code> parameter
Adapter Index	Represents the enumerated index value for installed supported HBAs	Valid value for <code>-a</code> parameter
SAS WWID	Represents the device specific SAS WWID of the installed supported HBAs	Valid value for <code>-a</code> parameter
Device ID	Enumerated reference value that represents a target drive or EMM	Valid value for <code>-d</code> and <code>-emm</code> parameters
Drawer Index	Represents reference value for logical grouping of drives into drawers	Valid value for <code>-w</code> parameter
Encl Index (Enclosure Index)	Represents reference value for enclosures attached to a specified adapter	Valid value for <code>-enc</code> parameter
WWN (Worldwide Name)	Represents unique value that identifies a unique drive, EMM, or enclosure	Valid value for <code>-d</code> , <code>-emm</code> , and <code>-enc</code> parameters
Enclosure Slot Index	Reference value that represents a target drive	Valid value for <code>-d</code> and <code>-s</code> parameter
Drawer Slot Index	Represents reference value for a drive slot in a specified drawer	Valid value for <code>-d</code> parameter
EMM Index (Enclosure Management Module Index)	Represents the reference value for EMMs in an specific enclosure	Valid value for <code>-emm</code> parameter
StartDate	Starting date to view logs in the format of MM/DD/YY	Valid value for <code>-startDate</code> parameter
EndDate	End date to view logs in the format of MM/DD/YY	Valid value for <code>-endDate</code> parameter
EventType	Type of event to view (INFO, CRITICAL, ERROR, or WARN)	Valid value for <code>-event</code> parameter
LatestEventCount	Numeric value between 1-1000	Valid value for <code>-count</code> parameter
SupportedOutputFormats	Supported out file formats: xml, json	Valid value for <code>-outputformat</code> parameter
Serial Number	Unique identifier for the physical disk drive.	Valid value for <code>-d</code> parameter

	Description	Valid for Parameter
Drive OS Path	Unique path to drive provided by the OS.	Valid value for -d parameter

 **NOTE:** Ensure the console window is able to fit at least 150 characters for each line to view the output properly.

 **NOTE:** The output screenshots shown in the following procedures are examples and may be slightly different from the actual output depending on the version of your Server Hardware Management Software.

Command help

To get a list of all available commands:

```
shmcli -help
```

To get help for a specific command

```
shmcli [command] -help
```

Identifying installed HBAs

Many shmcli commands require a respective adapter as an input parameter. To get the proper values for this parameter, run the following command:

```
shmcli list adapters
```

The following output is displayed:

```
list adapters - Executing command..
Adapter#      ProductName      WWID      FW. Rev
-----
0             SAS9207-8e      500605b008915cf0  18.00.00
1             SAS9207-8e      500605b008914e00  18.00.00
```

Figure 1. Running the shmcli command to identify HBAs

Note and record the values displayed in the Adapter# column, because this represents the Adapter Index and also the WWID/SASAddresses column for the respective supported HBAs.

PERC or MegaRaid controllers

The SHM system provides support for drives connected by using a PERC or MegaRaid controller. This functionality is not available by default. A system library must be installed.

- Windows – copy the storelib.dll file from the C:\Program Files\Dell\ServerHardwareManager\Extras\Storelib folder to the C:\Program Files\Dell\ServerHardwareManager\ServerHardwareManagerCLI folder.
- Linux – install the RPM file located in /opt/dell/ServerHardwareManager/storelib using OS commands.
- ESX – install the RPM file that will be packaged along with the shmcli utility.

To remove support:

- Windows – remove the storelib.dll file in the C:\Program Files\Dell\ServerHardwareManager\ServerHardwareManagerCLI folder.
- Linux – uninstall the storelib RPM installed by using OS commands.
- ESX – uninstall the storelib RPM installed by using OS commands.

Identifying enclosures and EMMs

Identifying enclosures

For other management actions, you must provide information for a respective enclosure or EMM. These values are presented with respect to a specific adapter value provided.

To identify the attached enclosures to a specific adapter, run the following command:

```
shmcli list enclosures -a=<(SASAddress | AdapterIndex)>
```

Output

For enclosures:

```
list physical enclosures - Executing command..
-----
```

Encl Index	Name	Service Tag	Disk Status	Pwr Sply Sts	Temp Sens Sts	Volt Sens Sts	Fan Status	WWN
0	MD3060e	PN_P1PRF	OK	OK	OK	OK	OK	50080e5175a1a000

Figure 2. Identifying enclosures

Identifying EMMs

To identify the attached EMMs to a specific adapter, run the following command:

```
shmcli list emms -a=<(SASAddress | AdapterIndex)>
```

For EMMs:

```
list emms - Executing command..
-----
```

Encl WWN	EMM Slot#	Vendor	Status	Rev	Serial	WWN
50080e5205457000	1	DELL	OK	0395	6.0GWembly60 Tr	50080e53d4a62025
50080e520545d000	0	DELL	OK	0395	6.0GWembly60 Tr	50080e53d4ae2025

Figure 3. Identifying attached EMMs

Notate the Enclosure Slot Index and the WWN columns. These values are required for required command parameters.

Identifying drawers

Verify the status and number of drives in the drawers of an enclosure by running the following command:

```
shmcli list drawers -a=<(SASAddress | AdapterIndex)> -enc=<(WWN | EnclIndex)>
```

```
list drawers - Executing command..
-----
```

Drawer#	Status	Drawer Open	#HDD
0	OK	NO	4
1	OK	NO	4
2	OK	NO	8
3	OK	NO	12
4	OK	NO	12

Figure 4. Drawer 0 is the top draw or the only drawer for the enclosure.

Identifying drives

When identifying drives, there are other optional parameters that you can include to narrow the scope of the drives to obtain information from. You can identify drives from the adapter (all down-chain enclosures attached to a specified HBA), all the drives in a specific enclosure, or all the drives in a specified drawer in a specified enclosure. To get information about all the drives visible to an adapter, run the following command:

To get information about all the drives on the machine:

```
shmcli list drives
```

To get information about all the drives visible to an adapter:

```
shmcli list drives -a=<(SASAddress | AdapterIndex)>
```

For all the drives visible to an adapter:

```
list drives - Executing command..
Enc Slot  Drwr/Slot  Vendor      ProductId      Serial          Size  Rev  WWN
-----
0         00 / 00     SEAGATE     ST330006S0SS  Z295E07V       2.73TB  RS16  5000c50055be7690
3         00 / 03     SEAGATE     ST330006S0SS  Z295DYLF       2.73TB  RS16  5000c50055bea23c
6         00 / 06     SEAGATE     ST330006S0SS  Z290YP6X       2.73TB  RN08  5000c50034d010f0
9         00 / 09     SEAGATE     ST330006S0SS  Z295DVHJ       2.73TB  RS16  5000c50055bea000
12        01 / 00     SEAGATE     ST330006S0SS  Z295E00T       2.73TB  RS16  5000c50055be7da4
15        01 / 03     SEAGATE     ST330006S0SS  Z290YSPS       2.73TB  RN08  5000c50034cf42fc
18        01 / 06     SEAGATE     ST330006S0SS  Z295E18X       2.73TB  RS16  5000c50055be562c
21        01 / 09     SEAGATE     ST330006S0SS  Z295DZVP       2.73TB  RS16  5000c50055be01c4
```

Figure 5. Identifying drives visible to an adapter

To get information about all the drives in a specific enclosure:

```
shmcli list drives -a=<(SASAddress | AdapterIndex)> -enc=<(WWN | EnclIndex)>
```

Output

For all the drives in a specific enclosure:

```
list drives - Executing command..
Enc Slot  Drwr/Slot  Vendor      ProductId      Serial          Size  Rev  WWN
-----
0         00 / 00     SEAGATE     ST330006S0SS  Z295E07V       2.73TB  RS16  5000c50055be7690
3         00 / 03     SEAGATE     ST330006S0SS  Z295DYLF       2.73TB  RS16  5000c50055bea23c
6         00 / 06     SEAGATE     ST330006S0SS  Z290YP6X       2.73TB  RN08  5000c50034d010f0
9         00 / 09     SEAGATE     ST330006S0SS  Z295DVHJ       2.73TB  RS16  5000c50055bea000
12        01 / 00     SEAGATE     ST330006S0SS  Z295E00T       2.73TB  RS16  5000c50055be7da4
15        01 / 03     SEAGATE     ST330006S0SS  Z290YSPS       2.73TB  RN08  5000c50034cf42fc
18        01 / 06     SEAGATE     ST330006S0SS  Z295E18X       2.73TB  RS16  5000c50055be562c
21        01 / 09     SEAGATE     ST330006S0SS  Z295DZVP       2.73TB  RS16  5000c50055be01c4
```

Figure 6. Identifying drives in a specific enclosure

To get information about all the drives in a drawer within an enclosure:

```
shmcli list drives -a=<(SASAddress | AdapterIndex)> -enc=<(WWN | EnclIndex)> -w=<DrawerIndex>
```

Output

For all the drives in a drawer within an enclosure:

```
list drives - Executing command..
Enc Slot  Drwr/Slot  Vendor      ProductId      Serial          Size  Rev  WWN
-----
24        02 / 00     SEAGATE     ST330006S0SS  Z290T15A       2.73TB  RN08  5000c50034d5eb58
27        02 / 03     SEAGATE     ST330006S0SS  Z295DYL1       2.73TB  RS16  5000c50055bea1f4
30        02 / 06     SEAGATE     ST330006S0SS  Z295E0G4       2.73TB  RS16  5000c50055be6da8
33        02 / 09     SEAGATE     ST330006S0SS  Z290TG86       2.73TB  RN08  5000c50034b535bc
```

Figure 7. Identifying drives in a drawer within an enclosure

The relevant information to record from the `list drives` command are the Enclosure Slot Index and the WWN. These values are required to perform actions on a specific drive such as updating the firmware or making the LED of a drive to blink for identification purposes.

Updating drives

You can update drive firmware by using the information provided from running other `shmcli` commands. You can find the latest drive firmware for supported drives at Dell.com/support. **Dell recommends stopping all I/O between the server and the attached enclosures containing the drives that you want to update.** By default, if the command entered updates multiple drives, the `shmcli` updates the drives one at a time. If the multi argument is entered at the CLI, the `shmcli` updates the drives simultaneously – currently in sets of 100.

To update a single drive if the WWN of the drive is known:

```
shmcli update drive -d=<(WWN)> -file=<FW.FilePath>
```

To update all drives visible to a specified adapter:

```
shmcli update drive -a=<(SASAddress | AdapterIndex)> -file=<FW.FilePath>
```

To update all the drives in a specified enclosure:

```
shmcli update drive -a=<(SASAddress | AdapterIndex)> -enc=<(WWN | EnclIndex)> -file=<FW.FilePath>
```




To update all the drives in a specified drawer:

```
shmcli update drive -a=<(SASAddress | AdapterIndex)> -enc=<(WWN | EnclIndex)> -w=<DrawerIndex> -file=<FW.FilePath>
```

To update a single drive:



```
shmcli update drive -d=<(WWN | EnclosureSlotIndex | DrawerSlotIndex | Serial Number | Drive OS Path)> -file=<FW.FilePath>
```

A summary of the update process is displayed to you after the command completes running.

-  **NOTE:** When attempting to update multiple drives, the specified firmware file is used on all drives within the scope of the command. Drives compatible with the firmware file are updated while incompatible drives fail gracefully.
-  **NOTE:** If the firmware file path contains spaces, enclose the filepath in double quotation marks (“”). For example, `-file="C:\My Files\my firmware.fwh"`
-  **NOTE:** Only firmware files with the `.fwh` extension are supported for updating drives by using the `shmcli`.


Updating EMM firmware

1. Download the latest firmware package from Dell.com/support.
2. Stop all I/O between the server and the attached enclosures containing the EMMs you intend to update.


-  **NOTE:** After this update process begins, you may lose access to the drives or enclosures connected to the update target. The EMM does not respond to commands again until it is back online.
-  **NOTE:** If you have more than one storage enclosure in a daisy-chain, Dell recommends you to update the EMMs starting in the lowest tier of the chain and working back, up to the top enclosure.

3. Run the following command:

```
shmcli update emm -a=<(SASAddress | AdapterIndex)> -enc=<(WWN | EnclIndex)>  
-emm=<(WWN | EMMIndex)> -file=<FW.FilePath>
```

 **NOTE:** The progress of the firmware transfer is indicated in the console.

4. The EMM updates the firmware and restarts.

 **NOTE:** This process may take up to five minutes.

CLI reference

This section lists all the commands available for managing your storage enclosure.

Commands listed by type

Drive commands

Blink drive

Description

Helps visually locate the specified SCSI device by initiating a blink, or ending an existing blink session.

Command syntax

```
shmcli (blink drive | blinkdrive | bd) (-a=<(SAS WWID | AdapterIndex)> [-enc=<(WWN | EnclIndex)> [-w=<DrawerIndex>]] -d=<(WWN | EnclosureSlotIndex | DrawerSlotIndex | Serial Number | Drive OS Path)> [-off] | -d=<(WWN | Serial Number | Drive OS Path)> [-off] | [-h])
```

Parameters

Table 4. Drive commands

Parameter	Description
-a	Specify the adapter to use for the command. This can be either SASAddress or AdapterIndex.
-enc	Specify the enclosure to use for the command. This is either WWN or EnclIndex.
-w	Specify the drawer index used for the command.
-d	Specify the drive used for the command. This can be any of the following: <ul style="list-style-type: none"> • WWN – Can be used anytime. • Enclosure Slot Index – Use if drawer argument is not being used for the command. • Drawer Slot Index (Index of the drive in the specific drawer)-Use if drawer argument is used for the command. • Serial Number - Can be used anytime. • Drive OS Path - Can be used anytime.

Parameter	Description
-off	Disable the blink mode for the device by running the command.
-h	Provides more information about the command, description, and usage.

Command examples

- `blink drive -a = 1 -enc = 1 -w = 0 -d = 4`
- `blink drive -a = 1 -enc = 1 -d = //./PHYSICALDRIVE50 -off`
- `blink drive -a = 500abcdefgh12345 -enc = 1 -w = 0 -d = 4`
- `blink drive -d = 500a123456789012`

Drive power

Description

Turns off or turns on of the drive in the specified enclosure slot number.

Command syntax

```
shmcli (drive power | drivepower | dp) (-a=<(SAS WWID | AdapterIndex)> -
enc=<(WWN | EnclIndex)> -s=<EnclosureSlotIndex> [-on | -off] | [-h])
```

Parameters

Table 5. Drive power status

Parameter	Description
-a	Specify the adapter used for the command. This can be either SAS WWID or AdapterIndex.
-enc	Specify the enclosure used for the command. This can be either WWN or EnclIndex.
-s	Specify the Enclosure Slot Index used for the command. This is retrieved by the <code>list drives</code> or <code>info drive</code> command.
-on	Turns on the drive on the specified enclosure slot.
-off	Turns off the drive on the specified enclosure slot.
-h	Provides additional information about the command, description, and usage.

List commands

List adapters

Description

This command lists the adapters accessible from the host.

Command syntax

```
shmcli (list adapters | listadapters | la) [-  
outputformat=<SupportedOutputFormats>] [-h]
```

Parameters

Table 6. List adapters

Parameter	Description
-h	Provides more information about the command, description and usage.
-outputformat	You can specify the following output formats: xml or json

List physical enclosures

Description

Shows the list of physical enclosures and related information for the specified adapter. Default output (no adapter input specified) lists all enclosures accessible by every supported adapter in the local system.

Command syntax

```
shmcli (list physical enclosures | list enclosures | listphysicalenclosures |  
lpe) [-a=<(SAS WWID | AdapterIndex)>] | [-h]
```

Parameters

Table 7. List physical enclosure

Parameter	Description
-a	Specify the adapter used for the command. This is either SAS WWID or AdapterIndex.
-h	Provides more information about the command, description, and usage.
-outputformat	You can specify the following output formats: xml or json.

Command examples

- `list physical enclosures`
- `list physical enclosures -a = 1`
- `list physical enclosures -a = 500abcdefgh12345`

List drives

Description

Shows the list of HDDs or SSDs and related information for the specified device. If no device is specified to obtain drives for, all drives accessible by supported adapters in the local system are listed.

Command syntax

```
shmcli (list drives | listdrives | ld) ([-a=<(SAS WWID | AdapterIndex)>] [-  
enc=<(WWN | EnclIndex)> [-w=<DrawerIndex>]] [-
```

```
outputformat=<SupportedOutputFormats>] [-verbose] | -enc=<WWN> [-w=<DrawerIndex>] [-outputformat=<SupportedOutputFormats>] [-verbose] | [-h])
```

Parameters

Table 8. List hard disk drive

Parameter	Description
-a	Specify the adapter used for the command. This is either SAS WWID or I.
-enc	Specify the enclosure used for the command. This is either WWN or EnclIndex.
-w	Specify the drawer index used for the command.
-h	Provides more information about the command, description, and usage.
-outputformat	You can specify the following output formats: xml or json.

Command examples

- `list drives`
- `list drives -a = 1`
- `list drives -a=1 -enc=0`
- `list drives -a=1 -enc=0 -w=2 -verbose`
- `list drives -enc=500a123456789012 -outputformat=xml`

List EMMs

Description

This command lists the EMMs (Expansion Management Module) accessible from the specified adapter.

Command syntax

```
shmcli (list emms | listemms | le) (-a=<(SAS WWID | AdapterIndex)> [-enc=<(WWN | EnclIndex)>] [-outputformat=<SupportedOutputFormats>] | -enc=<WWN> [-outputformat=<SupportedOutputFormats>] | [-h])
```

Parameters

Table 9. List EMMs

Parameter	Description
-a	Specify the adapter used for the command. This is either SAS WWID or AdapterIndex.
-enc	Specify the enclosure used for the command. This is either WWN or EnclIndex.
-h	Provides more information about the command, description, and usage.

Parameter	Description
-outputformat	You can specify the following output formats: xml or json.

Command examples

- `list emms -a = 1`
- `list emms -a = 1 -enc = 0`
- `list emms -a = 500abcdefgh12345`
- `list emms -enc = 500a123456789012 -outputformat = xml`

List drawers

Description

This command lists the drawers accessible from the specified enclosure. Depending on your enclosure, you may have one drawer or multiple drawers.

Command syntax

```
shmcli (list drawers | listdrawers | ldraw) (-a=<(SAS WWID | AdapterIndex)> -enc=<(WWN | EnclIndex)> [-outputformat=<SupportedOutputFormats>] | -enc=<WWN> [-outputformat=<SupportedOutputFormats>] | [-h])
```

Parameters

Table 10. List drawers

Parameter	Description
-a	Specify the adapter used for the command. This is either SAS WWID or AdapterIndex.
-enc	Specify the enclosure used for the command. This is either WWN or EnclIndex.
-h	Provides more information about the command, description, and usage.
-outputformat	You can specify the following output formats: xml or json.

Command examples

- `list drawers -a = 1 -enc = 500a123456789012`
- `list drawers -a = 1 -enc = 0`
- `list drawers -enc = 500a123456789012 -outputformat = xml`

List EMM slots

Description

This command lists the EMM Slots and associated information for the specified enclosure.

Command syntax

```
shmcli (list emm slots | listemmslots | lemmslots) (-a=<(SAS WWID | AdapterIndex)> -enc=<(WWN | EnclIndex)> [-
```

```
outputformat=<SupportedOutputFormats>] | -enc=<WWN> [-
outputformat=<SupportedOutputFormats>] | [-h])
```

Parameters

Table 11. List EMM slots

Parameter	Description
-a	Specify the adapter used for the command. This can be either SAS WWID or AdapterIndex.
-enc	Specify the enclosure used for the command. This can be either WWN or EnclIndex.
-h	Provides more information about the command, description, and usage.
-outputformat	You can specify the following output formats: xml or json.

Command examples

- `list emm slots -a = 1 -enc = 500a123456789012`
- `list emm slots -a = 1 -enc = 0`
- `list emm slots -enc = 500a123456789012 -outputformat = xml`

List drive slots

Description

This command lists the HDD slots and associated information for the specified enclosure.

Command syntax

```
shmcli (list drive slots | listdriveslots | lds) (-a=<(SAS WWID |
AdapterIndex)> -enc=<(WWN | EnclIndex)> [-
outputformat=<SupportedOutputFormats>] [-verbose] | -enc=<WWN> [-
outputformat=<SupportedOutputFormats>] [-verbose] | [-h])
```

Parameters


Table 12. List hard disk drive slots

Parameter	Description
-a	Specify the adapter used for the command. This can be either SAS WWID or AdapterIndex.
-enc	Specify the enclosure used for the command. This is either WWN or EnclIndex.
-h	Provides more information about the command, description, and usage.
-outputformat	You can specify the following output formats: xml or json.

Command examples

- `list drive slots -a = 1 -enc = 500a123456789012`

- `list drive slots -a = 1 -enc = 0`
- `list drive slots -enc = 500a123456789012 -outputformat = xml`
- `list drive slots -a = 1 -enc = 500a123456789012 -verbose`

 **NOTE:** On Linux systems, if the verbose argument is supplied, a column labeled Logical Vols is displayed, showing the logical drive mappings of the physical disk drive. For these values to be discovered correctly, the following system items must be installed and configured: Device Mapper Multipath and Smartmontools.

List fans

Description

This command lists the fans accessible from the specified enclosure.

Command syntax

```
shmcli (list fans | listfans | lf) (-a=<(SAS WWID | AdapterIndex)> -enc=<(WWN | EnclIndex)> [-outputformat=<SupportedOutputFormats>] | -enc=<WWN> [-outputformat=<SupportedOutputFormats>] | [-h])
```

Parameters

Table 13. List fans

Parameter	Description
-a	Specify the adapter used for the command. This can be either SAS WWID or AdapterIndex.
-enc	Specify the enclosure used for the command. This can be either WWN or EnclIndex.
-h	Provides more information about the command, description, and usage.
-outputformat	You can specify the following output formats: xml or json.

Command examples

- `list fans -a = 1 -enc = 500a123456789012`
- `list fans -a = 1 -enc = 0`
- `list fans -enc = 500a123456789012 -outputformat = xml`

List power supplies

Description

This command lists the power supply units (PSUs) accessible from the specified enclosure.

Command syntax

```
shmcli (list power supplies | listpowersupplies | lps) (-a=<(SAS WWID | AdapterIndex)> -enc=<(WWN | EnclIndex)> [-outputformat=<SupportedOutputFormats>] | -enc=<WWN> [-outputformat=<SupportedOutputFormats>] | [-h])
```

Parameters

Table 14. List power supply devices

Parameter	Description
-a	Specify the adapter used for the command. This can be either SAS WWID or AdapterIndex.
-enc	Specify the enclosure used for the command. This is either WWN or EnclIndex.
-h	Provides more information about the command, description, and usage.
-outputformat	You can specify the following output formats: xml or json.

Command examples

- `list power supplies -a = 1 -enc = 500a123456789012`
- `list power supplies -a = 1 -enc = 0`
- `list power supplies -enc = 500a123456789012 -outputformat = xml`

List temperature sensors

Description

This command lists the temperature sensors accessible from the specified enclosure.

Command syntax

```
shmcli (list temp sensors | listtemperaturesensors | lts) (-a=<(SAS WWID | AdapterIndex)> -enc=<(WWN | EnclIndex)> [-outputformat<SupportedOutputFormats>] | -enc=<WWN> [-outputformat=<SupportedOutputFormats>] | [-h])
```

Parameters

Table 15. List temperature sensors

Parameter	Description
-a	Specify the adapter used for the command. This is either SAS WWID or AdapterIndex.
-enc	Specify the enclosure used for the command. This is either WWN or EnclIndex.
-h	Provides more information about the command, description, and usage.
-outputformat	You can specify the following output formats: xml or json.

Command examples

- `list temp sensors -a = 1 -enc = 500a123456789012`
- `list temp sensors -a = 1 -enc = 0`
- `list temp sensors -enc = 500a123456789012 -outputformat = xml`

List voltage sensors

Description

This command lists the voltage sensors accessible from the specified enclosure.

Command syntax

```
shmcli (list voltage sensors | listvoltageensors | lvs) (-a=<(SAS WWID | AdapterIndex)> -enc=<(WWN | EnclIndex)> [-outputformat=<SupportedOutputFormats>] | -enc=<WWN> [-outputformat=<SupportedOutputFormats>] | [-h])
```

Parameters

Table 16. List voltage sensors

Parameter	Description
-a	Specify the adapter used for the command. This can be either SAS WWID or AdapterIndex.
-enc	Specify the enclosure used for the command. This is either WWN or EnclIndex.
-h	Provides more information about the command, description, and usage.
-outputformat	You can specify the following output formats: xml or json.

Command examples

- `list voltage sensors -a = 1 -enc = 500a123456789012`
- `list voltage sensors -a = 1 -enc = 0`
- `list voltage sensors -enc = 500a123456789012 -outputformat = xml`

List current sensors

Description

Lists the current sensors accessible from the specified enclosure.

Command syntax

```
shmcli (list current sensors | listcurrentsensors | lcs) (-a=<(SAS WWID | AdapterIndex)> -enc=<(WWN | EnclIndex)> [-outputformat=<SupportedOutputFormats>] | -enc=<WWN> [-outputformat=<SupportedOutputFormats>] | [-h])
```

Parameters

Table 17. List current sensors

Parameter	Description
-h, -help	Provides more information about the command, description, and usage.
-outputformat	You can specify the following output formats: xml or json.
-a, -adapter	Specify the adapter used for the command. This is either SAS WWID or the AdapterIndex.
-enc	Specify the enclosure is used for the command. This is either WWN or the EnclosureIndex.

Command examples

- `list current sensors -a = 1 -enc = 500a123456789012`
- `list current sensors -a = 1 -enc = 0`
- `list current sensors -enc = 500a123456789012 -outputformat = xml`

List failed drives

Description

Lists the drives that have been predicted to fail and/or drives which have returned errors through system calls. The output describes the call attempted and the SCSI error codes returned.

Command syntax

```
secli (list failed drives | lfd) ([-a=<(SAS WWID | AdapterIndex)>] [-enc=<(WWN | EnclIndex)> [-w= <DrawerIndex>]] [-outputformat=<SupportOutputFormats>] [-verbose] | -enc=<WWN> [-outputformat=<SupportedOutputFormats>] [-verbose] | [-h])
```

Parameters

Table 18. List failed drives

Parameter	Description
-a	Specify the adapter used for the command. This is either SAS WWID or AdapterIndex.
-enc	Specify the enclosure used for the command. This is either WWN or EnclIndex.
-w	Specify the drawer index used for the command.
-h	Provides more information about the command, description, and usage.
-outputformat	You can specify the following output formats: xml or json.

Command examples

- `list failed drives`
- `list failed drives -a=0`
- `list failed drives -enc=500a123456789012`

Informational commands

Show adapter information

Description

This command provides information about the specified adapter and status or count of the attached devices.

Command syntax

```
shmcli (info adapter | infoadapter | ia) (-a=<(SAS WWID | AdapterIndex)> [-outputformat=<SupportedOutputFormats>] | [-h])
```

Parameters

Table 19. Adapter information

Parameter	Description
-a	Specify the adapter used for the command. This is either SAS WWID or AdapterIndex.
-h	Provides more information about the command, description, and usage.
-outputformat	You can specify the following output formats: xml or json.

Show drive information

Description

This command provides detailed information for the specified HDD.

Command syntax

```
shmcli (info drive | infodrive | id) (-a=<(SAS WWID | AdapterIndex)> [-enc=<(WWN | EnclIndex)> [-w=<DrawerIndex>]] -d=<(WWN | EnclosureSlotIndex | DrawerSlotIndex | Serial Number | Drive OS Path)> [-outputformat=<SupportedOutputFormats>] [-smart] | -d=<(WWN | Serial Number | Drive OS Path [-outputformat=<SupportedOutputFormats>])> [-smart] | [-h])
```

Parameters

Table 20. Drive information

Parameter	Description
-a	Specify the adapter used for the command. This is either SAS WWID or AdapterIndex.
-enc	Specify the enclosure used for the command. This is either WWN or EnclIndex.
-w	Specify the drawer index used for the command.
-d	Specify the hard disk drive used for the command. This can be any of the following: <ul style="list-style-type: none">• WWN – Can be used anytime.• Serial Number – Can be used anytime.• Drive OS path – Can be used anytime.• Drawer Slot Index (Index of the drive in the specific drawer) – Use if drawer argument is used for the command.• Enclosure Slot Index – Use if drawer argument is not being used for the command
-outputformat	You can specify the following output formats: xml or json.
-h	Provides more information about the command, description, and usage.
-smart	Display the S.M.A.R.T attribute data for the specific physical drive.

Command examples

- `info drive -a = 500abcdefgh12345 -enc = 1 -w = 0 -d = 4`
- `info drive -a = 1 -enc = 1 -d = //./PHYSICALDRIVE50 -smart -outputformat = xml`
- `info drive -d = 500a123456789012`

Show enclosure information

Description

This command provides detailed information for the specified enclosure.

Command syntax

```
shmcli (info enclosure | infoenclosure | ie) (-a=<(SAS WWID | AdapterIndex)> -enc=<(WWN | EnclIndex)> [-outputformat=<SupportedOutputFormats>] | -enc=<WWN> [-outputformat=<SupportedOutputFormats>] | [-h])
```


Parameters

Table 21. Enclosure information

Parameter	Description
-a	Specify the adapter used for the command. This is either SAS WWID or AdapterIndex.
-enc	Specify the enclosure used for the command. This is either WWN or EnclIndex.
-h	Provides more information about the command, description, and usage.
-outputformat	You can specify the following output formats: xml or json.

Command examples

- `info enclosure -a = 1 -enc = 500a123456789012`
- `info enclosure -a = 1 -enc = 0`
- `info enclosure -enc = 500a123456789012 -outputformat = xml`

Show firmware file information

Description

This command provides detailed information for the specified Firmware File such as its type and properties.


Command syntax

```
shmcli (info firmware | infofirmware | ifw) (-file=<FW.FilePath> [-outputformat=<SupportedOutputFormats>] | [-h])
```

Parameters

Table 22. Firmware File information

Parameter	Description
-file	Specify the file at the given path used for the command.
-outputformat	You can specify the following output formats: xml or json.
-h	Provides more information about the command, description, and usage.

 **NOTE:** If the filename contains special characters, you must enclose the file path within escaped double quotation marks.

View event log

Description

View all or part of the contents of the event log file based on date range and logging level.

Command syntax

```
shmcli (view log | vlog) ([-startDate=<StartDate> -endDate=<EndDate> -  
event=<EventType>] | [-event=<EventType> -count=<LatestEventCount>] | [-h])
```

Parameters

Table 23. View event log

Parameter	Description
-h	Provides more information about the command, description, and usage.
-startDate	Display logs recorded on or after this date. Acceptable format is MM/DD/YY.
-endDate	Display logs recorded no later than this date. Acceptable format is MM/DD/YY.
-count	Display the latest number of events of a specified category. The viewable count of latest events can be a value ranging from 1 through 1000.
-event	Display logs of the given event severity type. This could be either of the following: INFO, CRITICAL, ERROR, WARN. Logs are printed irrespective of the severity level, if this argument is not provided.

Update commands

Update drive firmware

Description

This command updates the firmware version of the specified drives by using the provided firmware file. This command also verifies the integrity of the firmware file before applying the firmware.

Command syntax

```
shmcli (update drive | updatedrive | ud) (-a=<(SAS WWID | AdapterIndex)> [-enc=<(WWN | EnclIndex)> [-w=<DrawerIndex>]] [-d=<(WWN | EnclosureSlotIndex | DrawerSlotIndex | Serial Number | Drive OS Path)>] (-file=<FW.FilePath> [-force] | -directory=<FW.DirectoryPath>) [-show] [-multi] | -enc=<WWN> [-w=<DrawerIndex>] [-d=<(WWN | EnclosureSlotIndex | DrawerSlotIndex | Serial Number | Drive OS Path)>] (-file=<FW.FilePath>[-force] | -directory=<FW.DirectoryPath>) [-show] [-multi] | -d=<(WWN | EnclosureSlotIndex | DrawerSlotIndex | Serial Number | Drive OS Path)> (-file=<FW.FilePath>[-force] | -directory=<FW.DirectoryPath>) [-show] [-multi] | [-h])
```

Parameters


Table 24. Update drive firmware

Parameter	Description
-a	Specify the adapter used for the command. This is either SAS WWID or AdapterIndex.
-d	Specify the HDD used for the command. This can be any of the following: <ul style="list-style-type: none"> • WWN—Can be used anytime. • Serial Number—Can be used anytime. • Drive OS path—Can be used anytime. • Enclosure Slot Index—Use if drawer argument is not used for the command. • Drawer Slot Index (Index of the drive in the specific drawer)— Use if drawer argument is used for the command. • Enclosure Slot Index—Use if drawer argument is not being used for the command.
-enc	Specify the enclosure used for the command. This is either WWN or EnclIndex.
-w	Specify the drawer index used for the command.
-file	Specify the file at the given path used for the command.

Parameter	Description
-h	Provides additional information about the command, description, and usage.
-show	Display the list of drives that are updated using the specified firmware file. The drives are not updated if this option is used.
-directory	Specify the directory path containing firmware files used for the command.
-force	Using this option updates the drive firmware with the firmware file provided, regardless of the drive's firmware version being equal to or newer compared to the firmware file.
-multi	Using this option causes drive updates to happen simultaneously, increasing overall update speed significantly. The speed increase is apparent during multi drive updates.

Command examples

- `update drive -a = 1 -enc = 1 -w = 2 -file = C:\Users\Administrator\firmware\upgrade.fwh`
- `update drive -enc = EnclosureWWN -file = C:\Users\Administrator\firmware\upgrade.fwh -force`
- `update drive -a = 1 -directory = C:\Users\Administrator\firmware -multi`
- `update drive -d = DriveWWN -directory = C:\Users\Administrator\firmware -show`

 **NOTE:** If the directory or filename contains special characters, you must enclose the file path within escaped double quotation marks.

Update EMM firmware

Description

This command updates the firmware version of the specified EMM (Expansion Management Module) using the provided firmware file. This command also verifies the integrity of the firmware file before applying the firmware.

 **NOTE:** Default behavior of the command uses the `-wait` functionality.


Command syntax

```
shmcli (update emm | updateemm) (-a=<(SAS WWID | AdapterIndex)> -enc=<(WWN | EnclIndex)> -emm=<(WWN | EMMIndex)> -file=<FW.Filepath> | -emm=<WWN> -file=<FW.Filepath> | [-nowait] | [-h])
```

Parameters

Table 25. Update EMM firmware

Parameter	Description
-a	Specify the adapter used for the command. This can be either SAS WWID or AdapterIndex.
-enc	Specify the enclosure used for the command. This can be either WWN or EnclIndex.
-emm	Specify the EMM used for the command.
-file	Specify the file at the given path used for the command.
-h	Provides additional information about the command, description and usage.
-wait	(default) If provided, the application will wait to return until after the updated EMM is automatically turned on again .
-nowait	If provided, the application returns immediately upon sending the firmware to the device. The device may not be available for some duration of time while it is applying the update.

 **NOTE:** If the file name contains special characters, you must enclose the file path within escaped double quotation marks.

Command examples

- `update emm -a = 500abcdefgh12345 -enc = 1 -emm = 0 -file = C:\Users\Administrator\firmwares\emm_upgrade.esm`
- `update emm -enc = 500rg67890123456 -emm = 500a123456789012 -file = C:\Users\Administrator\firmwares\emm_upgrade.esm`
- `update emm -emm = 500a123456789012 -file = C:\Users\Administrator\firmwares\emm_upgrade.esm`

Update Adapter

Description

After running the following command, the updated firmware file's version is installed.


Command syntax

```
shmcli (update adapter | updateadapter) ( -a=<(SAS WWID | AdapterIndex)> -file=<FW.FilePath> | [-h])
```

Parameters

Table 26. Update Adapter

Parameter	Description
-h, -help	Provides additional information about the command, description, and usage.
-outputformat	Following output format(s) can be specified: xml, json.
-a, -adapter	Specify the Adapter to be used for the command. This can either be the SAS WWID or the Adapter Index.
-file	Specify the file at the given path used for the command.

 **NOTE:** If the filename contains special characters; it is required to enclose the file path within escaped double quotation marks.

Status Adapter

Description

Shows information about the specified adapter status including PHY and expander information.

Command syntax

```
shmcli (status adapter | statusadapter | sa) (-a=<(SAS WWID | AdapterIndex)> [-outputformat=<supportedOutputFormats>] | [-h])
```

Parameters

Table 27. Status Adapter

Parameter	Description
-h, -help	Provides additional information about the command, description, and usage.
-outputformat	Following output format(s) can be specified: xml, or json.
-a, -adapter	Specify the Adapter to be used for the command. This can either be the SAS WWID or the Adapter Index.

Global Topology

Description

Shows a global list of all objects in the system. Output is displayed only in XML format.

Command syntax

```
shmcli (global topology | global top | gt) [-h]
```

Parameters

Table 28. Global Topology

Parameter	Description
-h, -help	Provides more information about the command, description, and usage.

Server Hardware Manager Monitor

The Server Hardware Manager monitors the storage enclosure and informs you about state changes of its elements.

The Server Hardware Manager Monitor presents events to you in the following types:

- Local log files on Linux and Windows
- Windows Event Log
- Linux Syslog

The Server Hardware Manager runs automatically upon installation.

Local log file

The local log contains events detected by the Server Hardware Manager Monitor service on Windows and Linux. This log includes warnings and critical events. The contents of this file is viewed in the following directories:

Table 29. Log file location

Operating System	Location
Windows	C:\Users\Default\Dell\ServerHardwareManager\logs\ServerHardwareManagerMonitor.log
Linux	var/log/dell/ServerHardwareManager/ServerHardwareManagerMonitor.log

 **NOTE:** The local log files are intended for support purposes and may be hidden by default on your system.

Windows event log

The Event Log File contains all events detected by the Server Hardware Manager Monitor service on Windows. This log includes warning and critical events. The contents of this file is viewed in the Windows Event Viewer.

Linux syslog

The syslog contains all events detected by the Server Hardware Manager Monitor service on Linux. This log includes warning and critical events. The contents of this file is viewed in the syslog.

SNMP

SNMP is another avenue the Server Hardware Manager Monitor uses to present events to the user. Only critical events are sent by using SNMP. The Server Hardware Manager Monitor sends traps to destinations that are contained in the Server Hardware Manager Monitor configuration file (SHM.config).

SNMP traps are only generated for critical events.

The Server Hardware Manager Monitor configuration file is located in the installation directory. The following is the default location of the configuration files.

Table 30. Log File Location

Operating System	Log File Location
Windows	c:\Program Files\Dell\ServerHardwareManager\StorageEnclosureMonitor\ServerHardwareManagerMonitor\SHM.config
Linux	/opt/dell/ServerHardwareManager/ServerHardwareManagerMonitor/bin/SHM.config

Although the Server Hardware Manager Monitor runs automatically upon installation, you must configure a trap destination in the configuration file for SNMP to function correctly. A trap destination has the following format:


```
ip=ipaddress[:port]
```

For example:

```
ip=192.168.1.1:1050
```

- Address — The IP address of the destination
- Port — Port on the target machine the trap receiver listens

Refer to the documentation of the trap listener for the port number it uses. If no port is specified, Storage Enclosure Monitor sends traps to the default port— 162.

 **NOTE:** After any changes are made to the SNMP configuration file, you must stop and start the serviceor daemon for changes to take effect.

Events

The Server Hardware Manager Monitor logs all event types. However, SNMP sends only critical events to the trap destination. This list outlines the critical or warning events:

- Power Supply Unit (PSU)
 - PSU is removed
 - DC voltage goes out of range of safe operating values
 - DC current goes out of range of safe operating values
- Fan is removed
- Temperature Sensor

- Temperature of enclosure is above/below critical threshold
- Voltage Sensor
 - Voltage goes above or below a critical threshold
 - AC power failure
 - DC power failure
- Drawer
 - Drawer is opened (warning)
 - Drawer control module has failed
- EMM is removed
- EMM is connected
- Drive removed
- Drive is flagged as predicted to fail (SMART).
- Adapter PHY connection status change.
- Adapter PHY link rate value change.
- Drive is installed (warning).
- Physical Enclosure is connected.
- Physical Enclosure is removed.
- Fan state change (warning)
- Fan state is critical.
- Current Sensor critical states.

The Dell Storage enclosure ReST API

The Server Hardware Management software v1.2 added support for the Representational State Transfer (ReST) API. The ReST service is accessible from a client device and from a Web browser. ReST access is enabled by default.

The Dell storage enclosures support the following ReST operations:

- Device inventory using the GET commands available in the Server Hardware Management Command-Line Interface (SHMCLI)
- Device actions:
 - Updating firmware
 - Validating firmware
 - Blinking a drive
 - Turning off a drive

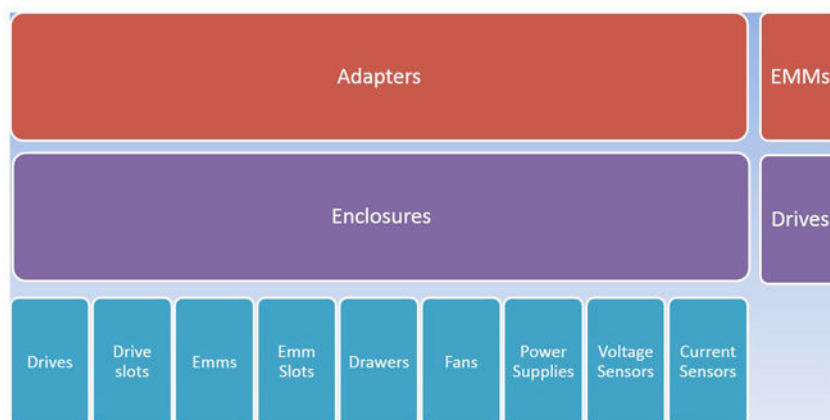


Figure 8. Storage enclosure ReST queries are built into the device hierarchy

Accessing the ReST service


The base URL for a ReST request is in the following format:

```
http://<host>:<port>/api/<Program_Space>/<version>
```

Table 31. Accessing the ReST service

Parameter	Description
Host	The address of the host running the ReST server. This address can be the Fully Qualified Domain Name (FQDN) of the host or an IP address.
Port	The port number opened for ReST traffic. The default port is 8012.
Program_Space	The application namespace: "SEM".
Version	The major working version number. Currently "1.0".

For example, the base URL <http://127.0.0.1:8012/api/SEM/1.0/> is used to access the ReST server locally.

 **NOTE:** For the remainder of this chapter, [base_url] is used in place of the base URL syntax.

To obtain information about different devices, you must use the following ReST query:


```
[base_url]/<item_group>
```


To obtain information about a single device, you must use the following ReST query:

```
[base_url]/<item_group>/<index | wwid>
```

The <item_group> variable represents the different types of devices contained within the storage enclosure. Following are the item_group values (device types):

- adapters²
- currentsensors
- drawers
- drives^{1, 2}
- driveslots
- enclosures²
- emms¹
- emmslots
- fans
- locks
- powersupplies
- voltagesensors

 **NOTE:** ¹ EMM and drive item groups are queried at a higher level without having to reference an adapter or enclosure.

 **NOTE:** ²Adapters, enclosures, and drives are the only item groups that can provide more detail on a single device in the item group by specifying an index value or World Wide ID (WWID).

Device inventory

All GET commands available in the SHMCLI are implemented in the ReST API. The information returned from a ReST query is different from the output of a SHMCLI command. ReST API calls return output equivalent to the output of shmcli information commands.

The URL syntax for device queries is described here:

Adapters

Provides information about all adapters:

```
[base_url]/adapters
```

Provides information about a specified adapter:

```
[base_url]/adapters/<(index | wwid)>
```

Enclosures

Provides information about all enclosures attached to a specific adapter:

```
[base_url]/a/<(index | wwid)>/enclosures
```

Provides information about a specified enclosure attached to a specified adapter:

```
[base_url]/a/<(index | wwid)>/enclosures/<(index | wwid)>
```

EMMs

Provides information about all EMMs:

```
[base_url]/a/<(index | wwid)>/emms
```

Provides information about all EMMs in a specified enclosure:

```
[base_url]/a/<(index | wwid)>/enclosures/<(index | wwid)>/emms
```

Provides information about all drives attached to a specified adapter:

```
[base_url]/a/<(index | wwid)>/drives
```

Provides information about all drives in a specified enclosure:

```
[base_url]/a/<(index | wwid)>/enclosures/<(index | wwid)>/drives/
```

Provides information about single drive in a specified enclosure:

```
[base_url]/a/<(index | wwid)>/enclosures/<(index | wwid)>/drives/<index>
```

Drives slots

Provides information about all drive slots in a specified enclosure:

```
[base_url]/a/<(index | wwid)>/enclosures/<(index | wwid)>/driveslots
```

EMM slots

Provides information about all EMM slots in a specified enclosure:

```
[base_url]/a/<(index | wwid)>/enclosures/<(index | wwid)>/emmslots
```

Drawers

Provides information about all drawers in a specified enclosure:

```
[base_url]/a/<(index | wwid)>/enclosures/<(index | wwid)>/drawers
```

Fans

Provides information about all fans in a specified enclosure:

```
[base_url]/a/<(index | wwid)>/enclosures/<(index | wwid)>/fans Power supplies
```

Provides information about all power supplies in a specified enclosure:

```
[base_url]/a/<(index | wwid)>/enclosures/<(index | wwid)>/powersupplies
```

Voltage sensors

Provides information about all voltage sensors in a specified enclosure:

```
[base_url]/a/<(index | wwid)>/enclosures/<(index | wwid)>/voltageensors
```

Current sensors

Provides information about all EMM slots in a specified enclosure:

```
[base_url]/a/<(index | wwid)>/enclosures/<(index | wwid)>/currentsensors
```

Device actions

Certain devices can have actions performed on them such as updating firmware or blinking a drive's LED. Also, firmware files can be validated. These device actions require additional options at the end of the URL for a device inventory query:

```
[base_url]/<item_group>/<(index | wwid)>/?action=<whattodo>&<option>=<opt>
```

The additional options to the URL for device actions are described here:

- ?action=<whattodo> - what action to perform: update, blink, or get.
- <option> = <opt> - an argument for the action to be performed.


Following are the options available:

- For updates, File=<file>; for example, ?action=update&File=file.fwh
- For blinking drives, toggle=ON/OFF -; for example, ?action=blink&toggle=ON

Specifying file paths

File paths in Windows can either be percent encoded or entered with forward slashes. The following are examples of valid Windows filepaths for a firmware file:

- C:%5Cdrivefirmwares%5CSeagate%22firmwares%5Cmyfirmwarefile.fwh
- C:/drivefirmwares/Seagate%22firmwares/myfirmwarefile.fwh.

 **NOTE:** '%5C' is the encoding for Windows '\ ' and '%22' represents spaces in the path name.

Here is an example of a valid Linux filepath for a firmware file:

```
/home/user/drivefirmwares/Seagate%22firmwares/myfirmwarefile.fwh.
```

Blink drive

To toggle blink on a single drive:

```
[base_url]/adapters/<(index | wwid)>/enclosures/<(index | wwid)>/drive/<(index | wwid)>?action=blink&toggle=<ON | OFF>
```

To toggle blink on all drives within a specified enclosure:

```
[base_url]/adapters/<(index | wwid)>/enclosures/<(index | wwid)>/drive/?action=blink&toggle=<(ON | OFF)>
```

Update firmware

Table 32. Update firmware

Drive Update	Query Syntax
Single drive with a firmware file	<pre>[base_url]/adapters/<(index wwid)>/enclosures/<(index wwid)>/drives/<(index wwid)>?action=update&File=<Path to firmware file></pre>
Force an update to a single drive with a firmware file	<pre>[base_url]/adapters/<(index wwid)>/enclosures/<(index wwid)>/drives/<(index wwid)>?action=update&File=<Path to firmware file>&force=on</pre>
Update all drives within a specified enclosure with a firmware file	<pre>[base_url]/adapters/<(index wwid)>/enclosures/<(index wwid)>/drives?action=update&File=<Path to firmware file></pre>
Force an update to all drives within a specified enclosure with a firmware file	<pre>[base_url]/adapters/<(index wwid)>/enclosures/<(index wwid)>/drives?action=update&File=<Path to firmware file>&force=on</pre>
Update all drives within a specified enclosure with a firmware file (multi-threaded)	<pre>[base_url]/adapters/<(index wwid)>/enclosures/<(index wwid)>/drives?action=update&File=<Path to firmware file>&multi=on</pre>
Single enclosure management module (EMM) with a firmware file	<pre>[base_url]/adapters/<(index wwid)>/enc/<(index wwid)>/emm/<(index wwid)>?action=update&File=<Path to firmware file></pre>

Validate firmware file


The following command provides the user with information about a specified firmware file:

```
[base_url]/?firmwarefile=<path to firmware file>
```

Microsoft System Center Operations Manager Management Pack

This section describes the activities that you can perform by using Dell Storage PowerTools Server Hardware Manager SCOM management pack.

The integration of Dell Server Management Pack Suite with Microsoft System Center 2012 R2 Operations Manager, Microsoft System Center 2012 SP1 Operations Manager, Microsoft System Center 2012 Operations Manager, or Microsoft System Center Operations Manager 2007 R2, and environment enables you to manage, monitor, and also ensure the availability of Dell devices.


 **CAUTION:** To avoid data from getting corrupted, data loss, or both; complete the procedures in this document only if you have proper knowledge and experience in using Microsoft Windows operating system and Microsoft System Center 2012 R2 Operations Manager, Microsoft System Center 2012 SP1 Operations Manager, and Microsoft System.

Overview of the Dell Storage PowerTools Server Hardware Manager SCOM management pack

The Dell Dell Storage PowerTools Server Hardware Manager SCOM management pack enables you to:

- Discover supported HBAs
- Discover supported connected JBOD enclosures, installed enclosure elements, and installed physical storage
- Monitor the discovered objects

Installing Dell Storage PowerTools Server Hardware Manager SCOM Management Pack

 **NOTE:** The Server Hardware Manager REST server must be running on the system that is monitored.

1. Start the Microsoft System Center Operations Manager application.
2. Click **Administration** view.
3. In the left pane, click **Management Packs**.
4. In the upper-right corner of the **Management Packs** page, under the **Actions** section, click **Import Management Packs**.

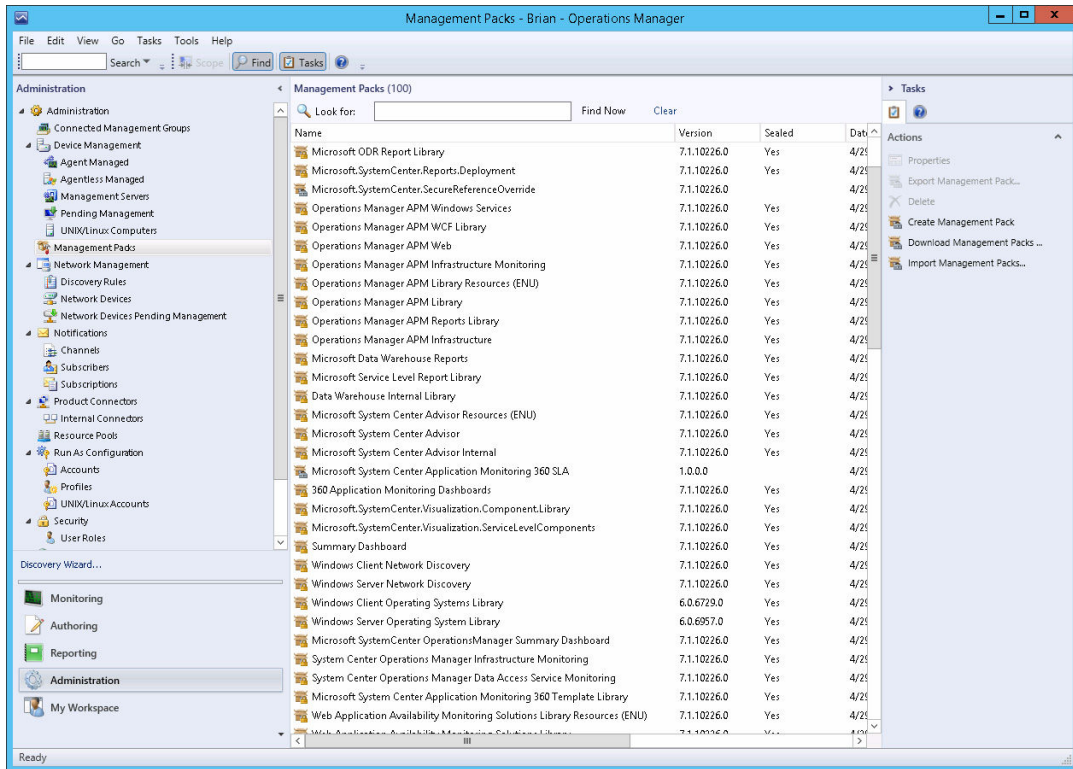


Figure 9. Management Packs

5. Click **Add**, and then click **Add from disk**.

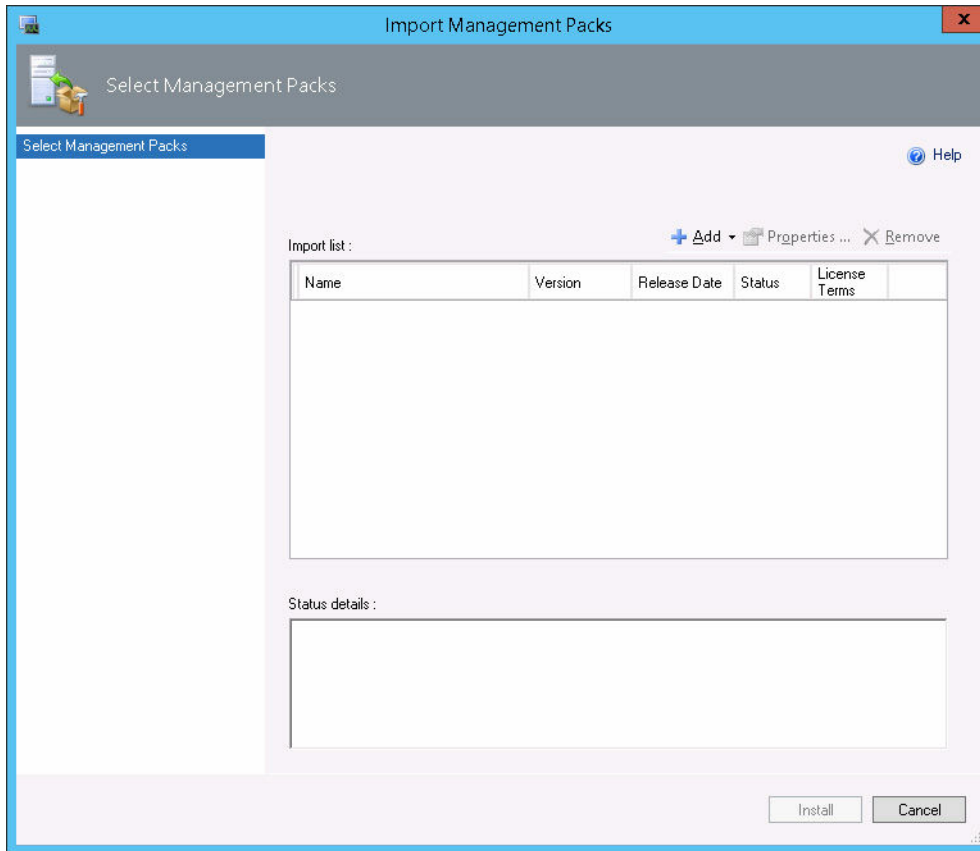


Figure 10. Import Management Packs

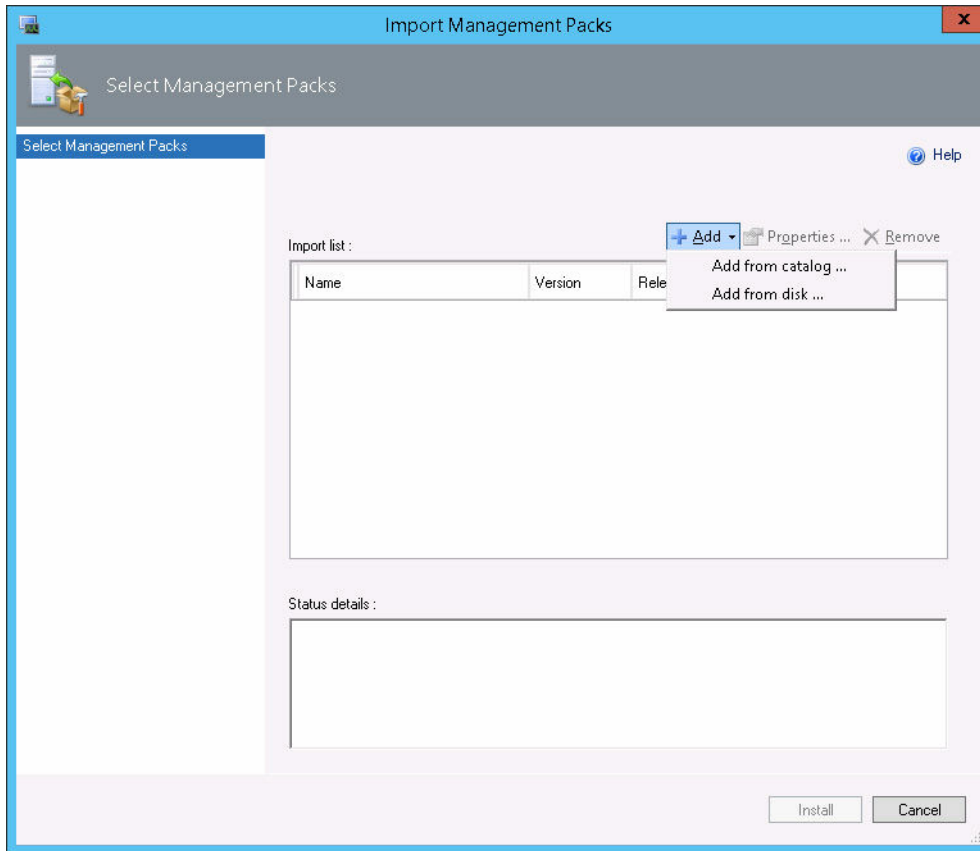


Figure 11. Import Management Packs

6. The **Online Catalog Connection** dialog box is displayed. Click **No**.

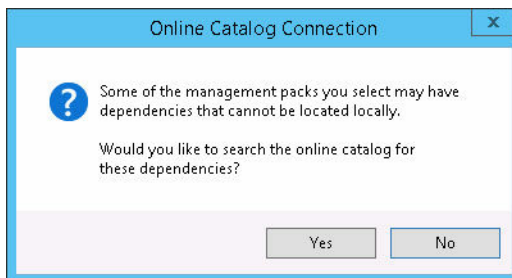


Figure 12. Online Catalog Connection

7. Navigate to the **SCOM** folder within the SHM installation folder hierarchy. By default, the location is **C:\Program Files\Dell\ServerHardwareManager\Extras\SCOM**. Select the **PowerToolsShmScom.mpb** file, and then click **Open**.
8. **PowerToolsShmScom** is displayed in the Import List. Click **Install** to install the management pack.

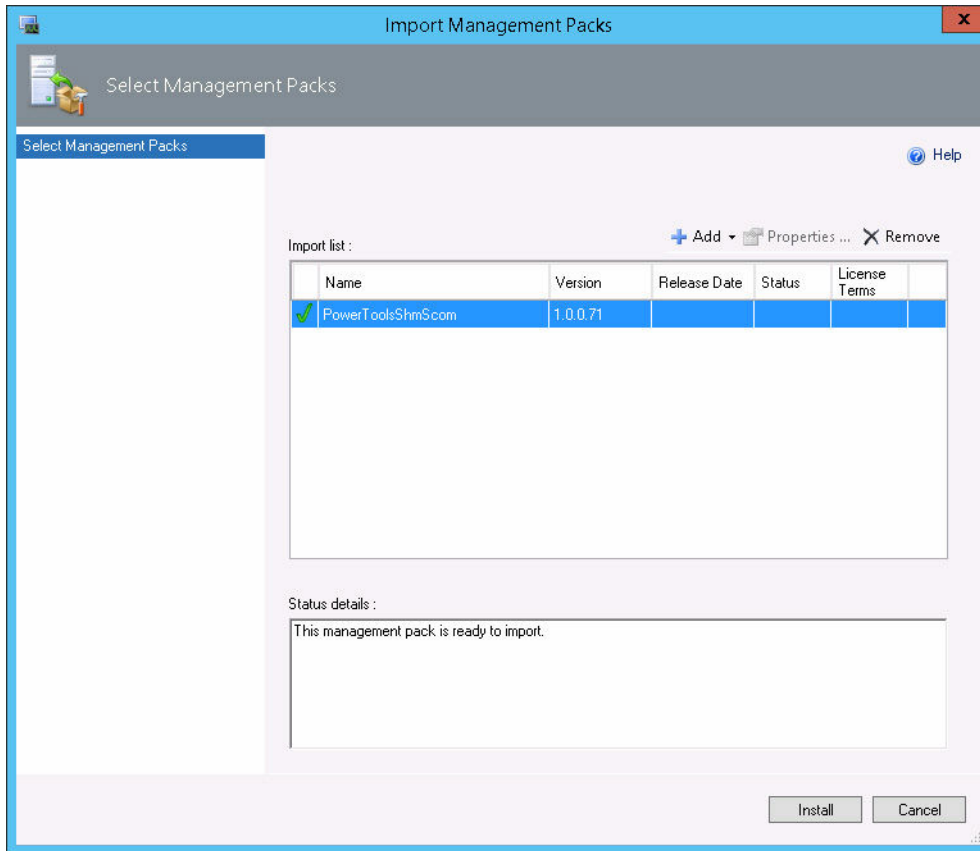


Figure 13. Import Management Packs

9. The following message is displayed.
Imported upon successful installation

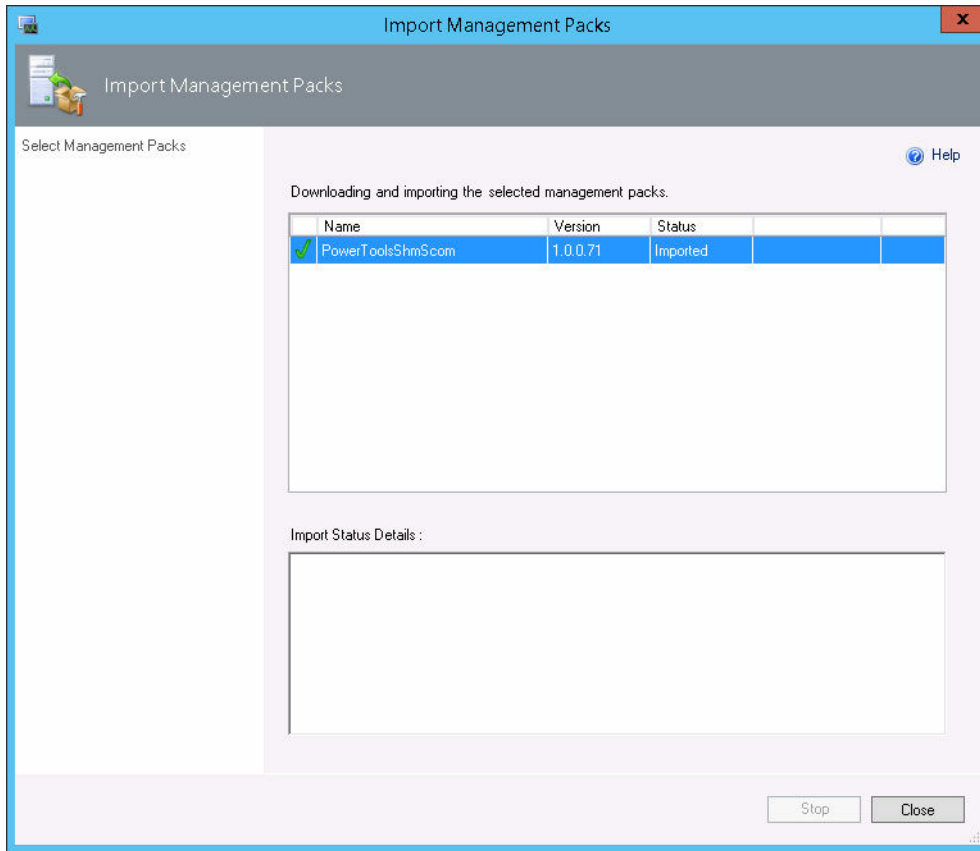
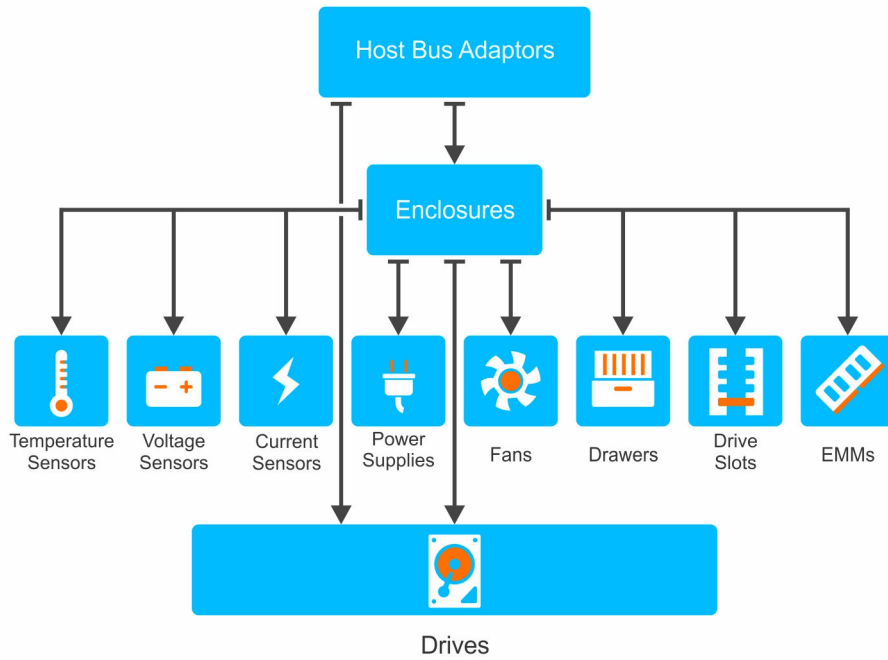


Figure 14. Import Management Packs



The above diagram displays the objects discovered. All objects are monitored for state except for Host Bus Adaptors. The connection arrows denote container relationships between objects.

Views created

The following views are created during the installation of the management pack. The views are created in Dell Storage PowerTools SHM in the **Monitoring** section of the Microsoft Operations Manager application.

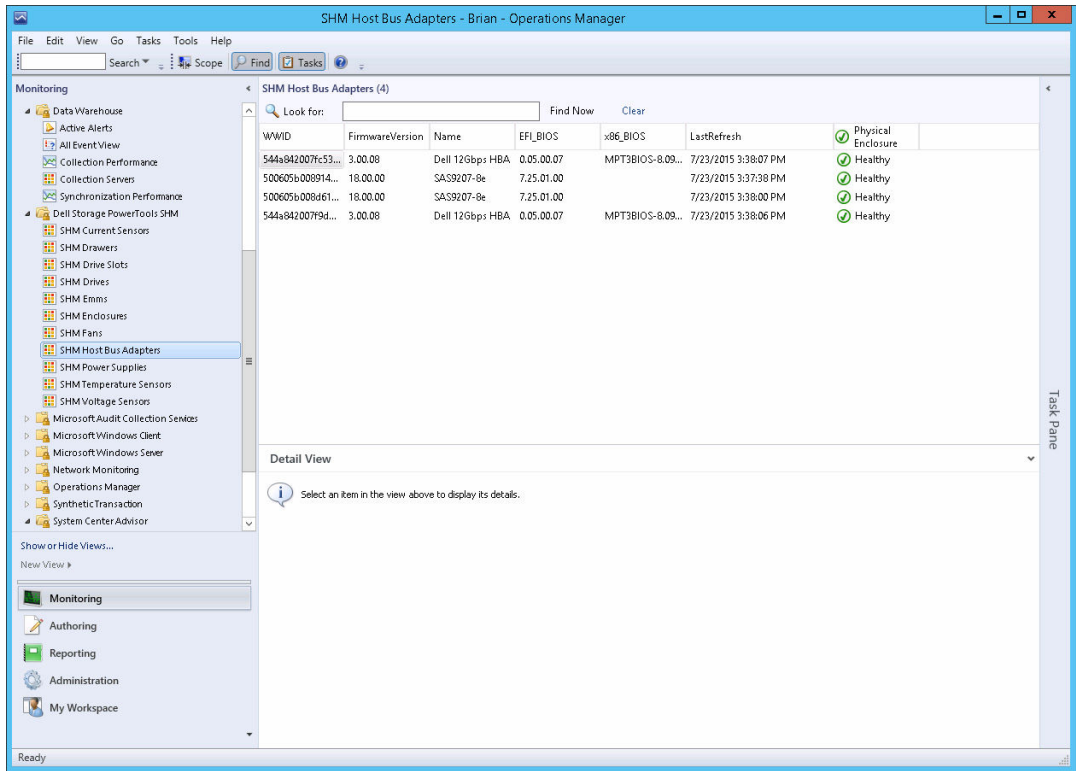







Figure 15. SHM Host Bus Adapters

- SHM Host Bus Adapters
- SHM Enclosures
- SHM Emms
- SHM Fans
- SHM Temperature Sensors
- SHM Current Sensors
- SHM Voltage Sensors
- SHM Power Supplies
- SHM Drawers
- SHM Drive Slots
- SHM Drives

Severity Level Indicators

The following table lists the icons that indicate the state severity levels of the discovered Dell devices on the OpsMgr console.

Table 33. Security Level Indicators

Icon	Severity Level
	Normal/OK – The component is working as expected.
	Warning/Noncritical – A probe or other monitoring device has detected a reading for the component that is above or below the acceptable level. The component may still be functioning, but it could fail. The component may also be functioning in an impaired state.
	Critical/Failure/Error – The component has either failed or failure is imminent. The component requires immediate attention and may need to be replaced. Data loss may have occurred.
	The health status is not applicable for the specific component.
	The service is unavailable.

Getting help

Contacting Dell

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

1. Go to **Dell.com/support**.
2. Select your country from the drop-down menu on the bottom right corner of the page.
3. For customized support:
 - a. Enter your system Service Tag in the **Enter your Service Tag** field.
 - b. Click **Submit**.The support page that lists the various support categories is displayed.
4. For general support:
 - a. Select your product category.
 - b. Select your product segment.
 - c. Select your product.The support page that lists the various support categories is displayed.