Notes, cautions, and warnings

A NOTE indicates important information that helps you make better use of your product.

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

A WARNING indicates a potential for property damage, personal injury, or death.
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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 disk drives accessed through Enclosure Management Modules (EMMs) is called a storage enclosure. A storage enclosure includes various hardware components, such as physical disk drives, 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 describes the functions of the Server Hardware Management software. The Server Hardware Management Software consists of two major components:

- **Server Hardware Manager Command Line Interface (SHM CLI)** — This component provides a CLI used to obtain device and status information of storage and hardware components. You can use the SHM CLI 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 (such as fans, PSUs, and temperature sensors).

The document is organized into two major sections. The first section describes the CLI commands required to perform certain common tasks. The second section is a reference to all CLI commands ordered on the basis of command type.
Other information you may need

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

You will need the documentation that ships with your system. It provides information 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.

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

NOTE: Always check Dell.com/support/manuals for the latest version of documentation.

The following sections provide information specific for your product.

Topics:
- Dell EMC Storage and Microsoft Storage Spaces Solution
- Dell EMC PowerVault MD3060e
- Dell EMC PowerVault MD1200 series
- Dell EMC Storage MD1280
- Dell EMC Storage MD1400 series
- Dell EMC PowerVault ME484 JBOD

Dell EMC Storage and Microsoft Storage Spaces Solution

The Dell EMC Storage and Microsoft Storage Spaces (DSMS) solution uses this Administrator’s Guide for the Server Hardware Manager (SHM) CLI. The Dell Storage with Microsoft Storage Spaces Support Matrix, available at Dell.com/support, provides information about supported software, firmware, and hardware versions for the DSMS solution. The DSMS configurations have unique solution SKUs called Solution IDs. These DSMS solution IDs are required when ordering a DSMS configuration, and to access benefits such as performance and sizing, optimized server and storage components, single-payload updates, and solution-level technical support.
The DSMS solution refers to the following models:

- DSMS 630
- DSMS 730
- DSMS 3060e
- DSMS 1400
- DSMS 1420

This solution is described in the following documentation, which you can download from [Dell.com/dsmsmanuals](http://Dell.com/dsmsmanuals).

- Dell Storage with Microsoft Storage Spaces Support Matrix—Provides information about the software and hardware compatibility for Dell EMC Storage with Microsoft Storage Spaces solution.
- Dell Storage with Microsoft Storage Spaces Cabling Guide—Provides guidance and cabling diagrams for supported Dell EMC Storage with Microsoft Storage Spaces configurations.
- Dell Storage with Microsoft Storage Spaces Deployment Guide—Provides guidance about setting up and configuring your solution.
- Dell Storage with Microsoft Storage Spaces Best Practices Guide—Provides guidance about the best practices associated for this solution.

**Dell EMC PowerVault MD3060e**

- Rack Installation Instructions—Describes how to install your system into a rack. This document ships with your rack solution.
- Dell PowerVault MD3060e Storage Enclosure Deployment Guide—Provides information about deploying the storage system in the direct attached architecture.
- Dell Storage Enclosure Support Matrix—Provides information about software and hardware compatibility for the storage enclosure.
- Dell Glossary - Version 2—Provides the full name of abbreviations or acronyms that are used in this document.

**Dell EMC PowerVault MD1200 series**

- Rack Installation Instructions—Describes how to install your system into a rack. This document ships with your rack solution.
- Getting Started Guide—Provides an overview of system features, setting up your system, and technical specifications.
- OpenManage Server Administrator—Provides information about managing your storage solution by using the storage management service within the server administrator.
- Dell PowerEdge RAID Controller (PERC) H830 and Dell 12Gb SAS HBA User’s Guide—Provides information about configuring RAID.
Dell EMC Storage MD1280

- Rack Installation Instructions—Describes how to install your system into a rack. This document ships with your rack solution.
- Dell Storage MD1280 Service Guide—Provides information about enclosure service and maintenance.
- Getting Started Guide—Provides information about initial setup tasks and technical specifications.

Dell EMC Storage MD1400 series

- Rack Installation Instructions—Describes how to install your system into a rack. This document ships with your rack solution.
- Getting Started Guide—Provides an overview of system features, setting up your system, and technical specifications.
- OpenManage Server Administrator—Provides information about managing your storage solution using the storage management service within the server administrator.
- Dell PowerEdge RAID Controller (PERC) H830 and Dell 12Gb SAS HBA User’s Guide—Provides information about configuring RAID.

Dell EMC PowerVault ME484 JBOD

NOTE: Dell EMC Storage ME4 is not part of any Microsoft Storage Spaces Solution.

- Rack Installation Instructions—Describes how to install your system into a rack. This document ships with your rack solution.
- Dell EMC ME4 Series JBOD 5U84 Enclosure Deployment Guide—Provides guidance about setting up and configuring your 5U84 enclosure with JBOD.
- Dell Storage PowerTools Server Hardware Manager Support Matrix and the Dell EMC Storage Enclosure - PowerVault ME484 JBOD Support Matrix—Provide information about the software and hardware compatibility for the ME484 Enclosure storage systems.
- ME4 Series Owner’s Manual — provides information about system hardware features and describes how to troubleshoot the system and install or replace system components.
About the Dell EMC Storage enclosure

This chapter describes how to configure and operate the Dell EMC storage enclosures.

See the Dell Storage PowerTools Server Hardware Manager Support Matrix for information about supported enclosures.

NOTE: For more information about the Dell EMC storage enclosure features, see the Owner’s Manual for the specific enclosure.
Installation procedure

When connecting the storage enclosure to a Dell EMC PowerEdge server, the server must have a supported SAS HBA installed. See the Dell Storage PowerTools Server Hardware Manager Support Matrix for information about supported SAS 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, see the documentation related to the server operating system (OS).

The Dell EMC 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 at Dell.com/support.

Topics:

- Server Hardware Management installation—Windows
- Server Hardware Management Installation—Linux

Server Hardware Management installation—Windows

Multipath I/O (MPIO)

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.

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

About this task

NOTE:

- You must use the CLI administrator command prompt for silent installation.
- There is no Windows console mode installation.

Steps

1. Download the Server Hardware Management Software installation package from Dell.com/support.
2. Run appropriate commands at the CLI as an administrator.
Go to the download directory of the extracted installer.

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`.

Accept all End User License Agreements.

### Uninstalling server hardware management

1. Start 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
   ```

5. To uninstall a software application, on the taskbar, click **Start > Control Panel > Programs and Features**.
6. Click the **ServerHardwareManagement** program.
7. Click **Uninstall**.
8. Complete the on-screen instructions to complete the uninstallation.

### Server Hardware Management Installation—Linux

**Device Mapper Multipath**

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

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

**Graphical installation**

1. Download the Server Hardware Management Software installation package from [Dell.com/support](http://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. Complete the on-screen instructions and accept the End User License Agreement.

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

About this task

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.

Steps
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 of 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

About this task

NOTE:

- Linux uninstallation requires full 'root' user permissions.
- The shmcli log file remains after uninstallation.

Steps
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. Complete the on-screen instructions to complete the uninstallation.

NOTE: Dell EMC recommends that you read the information in the README.txt because it has important information regarding your product.
This guide is intended for system administrators, developers, and engineers who need to use the SHM CLI and its associated commands. For more information, see the hardware and software manuals that are shipped with the system.

### NOTE:
- For Server Hardware Manager 1.7, the secli executable is completely deprecated. The shmcli executable is used to run Server Hardware Manager Command Line Interface. The shmcli maintains the command syntax from secli. You can replace secli with shmcli in any existing scripts.
- CLI commands do not have interactive warnings for destructive commands.
- Check [Dell.com/support](https://Dell.com/support) for the latest versions of the documentation.

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. CLI commands can be run from an OS prompt, such as the Microsoft Windows command prompt, or a Linux operating system terminal.

Use the SHM CLI to perform the following functions:
- Display status information about the objects in the system
- Update storage device firmware (EMM and drives)

Topics:
- Using the CLI
- Command syntax structure
- Identifying installed HBAs
- PERC or MegaRAID controllers
- Identifying enclosures and EMMs
- Updating drives
- Identifying drives

## Using the CLI

A CLI command consists of the following elements:
- Executable 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 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 defines the symbols used in the syntax of each command in this document and the syntax layout in the SHM CLI help.

**Table 1. Command syntax structure**

<table>
<thead>
<tr>
<th>Input Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td>italicized-words</td>
<td>Input value</td>
</tr>
<tr>
<td>[ ]</td>
<td>Optional input</td>
</tr>
<tr>
<td>&lt;&gt;</td>
<td>Enclosed input value is required for parameter</td>
</tr>
</tbody>
</table>

**Table 2. Parameter list**

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Valid Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Indicates target adapter</td>
<td>SAS WWID or Adapter Index</td>
</tr>
<tr>
<td>-d</td>
<td>Indicates target drive</td>
<td>WWN (World Wide Name), Enclosure Slot Index, Drawer Slot Index, Serial Number, or Drive OS Path</td>
</tr>
<tr>
<td>-w</td>
<td>Indicates target enclosure drawer</td>
<td>Drawer Index (0, 1, 2, 3, or 4)</td>
</tr>
<tr>
<td>-s</td>
<td>Indicates target enclosure slot</td>
<td>Enclosure Slot Index</td>
</tr>
<tr>
<td>-startDate</td>
<td>Target start date</td>
<td>StartDate in the format of MM/DD/YY</td>
</tr>
<tr>
<td>-endDate</td>
<td>Target end date</td>
<td>EndDate in the format of MM/DD/YY</td>
</tr>
<tr>
<td>-event</td>
<td>Type of event to view from the event log</td>
<td>EventType (INFO, CRITICAL, ERROR, or WARN)</td>
</tr>
<tr>
<td>-count</td>
<td>Number of events to view</td>
<td>LatestEventCount numeric value (1-1000)</td>
</tr>
<tr>
<td>-outputformat</td>
<td>Format of output data from shmcli command</td>
<td>SupportedOutputFormats (XML, JSON)</td>
</tr>
<tr>
<td>-enc</td>
<td>Indicates target physical enclosure</td>
<td>Enclosure Index or WWN</td>
</tr>
<tr>
<td>-emm</td>
<td>Indicates target EMM</td>
<td>WWN or EMM Index</td>
</tr>
<tr>
<td>-file</td>
<td>Indicates target firmware file for updating a drive or EMM</td>
<td>Firmware update file location and name</td>
</tr>
<tr>
<td>-outputdir</td>
<td>Output directory to place the archived output file</td>
<td>Absolute path to the directory of output archive file</td>
</tr>
</tbody>
</table>
### Table 3. Description of values for parameters

<table>
<thead>
<tr>
<th>Description</th>
<th>Valid for Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute Path to Firmware File</td>
<td>Valid value for the -file parameter</td>
</tr>
<tr>
<td>Adapter Index</td>
<td>Valid value for the -a parameter</td>
</tr>
<tr>
<td>SAS WWID</td>
<td>Valid value for the -a parameter</td>
</tr>
<tr>
<td>Device ID</td>
<td>Valid value for the -d and -emm parameters</td>
</tr>
<tr>
<td>Drawer Index</td>
<td>Valid value for the -w parameter</td>
</tr>
<tr>
<td>Encl Index (Enclosure Index)</td>
<td>Valid value for the -enc parameter</td>
</tr>
<tr>
<td>WWN (Worldwide Name)</td>
<td>Valid value for the -d, -emm, and -enc parameters</td>
</tr>
<tr>
<td>Enclosure Slot Index</td>
<td>Valid value for the -d and -s parameter</td>
</tr>
<tr>
<td>Drawer Slot Index</td>
<td>Valid value for the -d parameter</td>
</tr>
<tr>
<td>EMM Index (Enclosure Management Module Index)</td>
<td>Valid value for the -emm parameter</td>
</tr>
<tr>
<td>StartDate</td>
<td>Valid value for the -startDate parameter</td>
</tr>
<tr>
<td>EndDate</td>
<td>Valid value for the -endDate parameter</td>
</tr>
<tr>
<td>EventType</td>
<td>Valid value for the -event parameter</td>
</tr>
<tr>
<td>LatestEventCount</td>
<td>Valid value for the -count parameter</td>
</tr>
<tr>
<td>SupportedOutputFormats</td>
<td>Valid value for the -outputformat parameter</td>
</tr>
<tr>
<td>Serial Number</td>
<td>Valid value for the -d parameter</td>
</tr>
<tr>
<td>Drive OS Path</td>
<td>Valid value for the -d parameter</td>
</tr>
</tbody>
</table>

**NOTE:**
- Ensure the console window is able to fit at least 150 characters for each line to view the output properly.
- The output screenshots shown in the following procedures are examples and might 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:
To get help for a specific command:

```
shmcli [command] [-help | -h]
```

## Identifying installed HBAs

Many SHM CLI 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:

<table>
<thead>
<tr>
<th>Adapter#</th>
<th>ProductName</th>
<th>WWID</th>
<th>FW. Rev</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SAS9207-8e</td>
<td>500605b008915c0f0</td>
<td>18.00.00</td>
</tr>
<tr>
<td>1</td>
<td>SAS9207-8e</td>
<td>500605b008914e00</td>
<td>18.00.00</td>
</tr>
</tbody>
</table>

*Figure 2. 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 copied to the shmcli executable folder (Windows) or an rpm installed (Linux).

- Windows—Copy the `storelib.dll` file from the `{Installation_base_path}\Dell\ServerHardwareManager\Extras\Storelib` folder to the `{Installation_base_path}\Dell\ServerHardwareManager\ServerHardwareManagerCLI` folder.
- Linux—Install the RPM file located in `{Installation_base_path}/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 `{Installation_base_path}\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:

**Figure 3. Identifying enclosures**

**Identifying EMMs**

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

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

For EMMs:

**Figure 4. Identifying attached EMMs**

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

**Identifying drawers**

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

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

**Figure 5. Drawer 0 is the top drawer or the only drawer for the enclosure.**

### Updating drives

You can update drive firmware by using the information provided from running other SHM CLI commands. For information about the latest drive firmware versions, go to Dell.com/support. Dell EMC 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 SHM CLI updates the drives one at a time. If multi argument is entered at the CLI, the SHM CLI updates the drives simultaneously — currently, in sets of 100.

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

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

To update all drives visible to a specified adapter:

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

To update all the drives in a specified enclosure:

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

To update all the drives in a specified drawer:

```bash
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 displays after the command completes.

**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.
- If the firmware file path contains spaces, enclose the file path in double quotation marks (""). For example, `-file="C:\My Files\my firmware.fwh"`
- Only firmware files with the .fwh extension are supported for updating drives using the SHM CLI.

### Updating EMM firmware

1. Download the latest firmware package from [Dell.com/support](http://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.
- If you have more than one storage enclosure in a daisy-chain, Dell EMC recommends that you update the EMMs starting in the lowest tier of the chain and work back, up to the top enclosure.

3. Run the following command:

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

**NOTE:** The progress of the firmware transfer is indicated in the console.
4. EMM updates the firmware and restarts.

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

### Identifying drives

When identifying drives, there are optional parameters that you can include to narrow the scope of the drives from which to obtain information. 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 commands:

To retrieve information about all of the drives on the server:

```
shmcli list drives
```

To retrieve information about all of the drives visible to an adapter:

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

For all the drives visible to an adapter:

![Figure 6. Identifying drives visible to an adapter](image)
To retrieve information about all of the drives in a specific enclosure:

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

**Output**

For all the drives in a specific enclosure:

```
<table>
<thead>
<tr>
<th>Slot</th>
<th>SASAddress</th>
<th>ProductID</th>
<th>Serial</th>
<th>Size</th>
<th>Rev</th>
<th>WWN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6/0/0</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>2</td>
<td>6/0/1</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>3</td>
<td>6/0/2</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>4</td>
<td>6/0/3</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>5</td>
<td>6/0/4</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>6</td>
<td>6/0/5</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>7</td>
<td>6/0/6</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>8</td>
<td>6/0/7</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>9</td>
<td>6/0/8</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>10</td>
<td>6/0/9</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
</tbody>
</table>
```

**Figure 7. Identifying drives in a specific enclosure**

To retrieve information about all of 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:

```
<table>
<thead>
<tr>
<th>Slot</th>
<th>SASAddress</th>
<th>ProductID</th>
<th>Serial</th>
<th>Size</th>
<th>Rev</th>
<th>WWN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6/0/0</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>2</td>
<td>6/0/1</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>3</td>
<td>6/0/2</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>4</td>
<td>6/0/3</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>5</td>
<td>6/0/4</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>6</td>
<td>6/0/5</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>7</td>
<td>6/0/6</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>8</td>
<td>6/0/7</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>9</td>
<td>6/0/8</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
<tr>
<td>10</td>
<td>6/0/9</td>
<td>SAREGATE</td>
<td>ST3000NM015</td>
<td>2.77TB</td>
<td>E16</td>
<td>5000c0051b7f063c</td>
</tr>
</tbody>
</table>
```

**Figure 8. Identifying drives in a drawer within an enclosure**

Record the Enclosure Slot Index and the WWN provided by the `list drives` command. These values are required to perform actions on a specific drive such as updating the firmware or making the LED of a drive blink for identification purposes.
This section lists all the commands available for managing your storage enclosure. These commands are listed by command 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>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter to use for the command. This can be either SASAddress or AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure to use for the command. This is either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-w</td>
<td>Specifies the drawer index used for the command.</td>
</tr>
<tr>
<td>-d</td>
<td>Specifies the drive used for the command. This can be any of the following:</td>
</tr>
<tr>
<td></td>
<td>- WWN — Can be used anytime.</td>
</tr>
<tr>
<td></td>
<td>- Enclosure Slot Index — Use if drawer argument is not being used for the command.</td>
</tr>
<tr>
<td></td>
<td>- Drawer Slot Index (Index of the drive in the specific drawer)— Use if drawer argument is used for the command.</td>
</tr>
<tr>
<td></td>
<td>- Serial Number—Can be used anytime.</td>
</tr>
<tr>
<td></td>
<td>- Drive OS Path—Can be used anytime.</td>
</tr>
<tr>
<td>-off</td>
<td>Disable the blink mode for the device by running the command.</td>
</tr>
</tbody>
</table>
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 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>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This can be either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure used for the command. This can be either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-s</td>
<td>Specifies the Enclosure Slot Index used for the command. This is retrieved by the <code>list drives</code> or <code>info drive</code> command.</td>
</tr>
<tr>
<td>-on</td>
<td>Turns on the drive on the specified enclosure slot.</td>
</tr>
<tr>
<td>-off</td>
<td>Turns off the drive on the specified enclosure slot.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-h</td>
<td>Provides more information about the command, description and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This is either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
</tbody>
</table>
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>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This is either SAS WWID or I.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure used for the command. This is either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-w</td>
<td>Specifies the drawer index used for the command.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
</tbody>
</table>

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 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>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This is either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure used for the command. This is either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
</tbody>
</table>

Command examples

- `list emms -a = 1`
- `list emms -a = 1 -enc = 0`
- `list emms -a = 500abcdeffgh12345`
- `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)> | -enc=<WWN> [outputformat=<SupportedOutputFormats>] | [-h])
```
Parameters

Table 10. List drawers

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This is either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure used for the command. This is either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This can be either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure used for the command. This can be either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
</tbody>
</table>
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 about 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>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This can be either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure used for the command. This is either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
</tbody>
</table>

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, the Logical Vols column is displayed listing the logical drive mapping of the physical disk drives. 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This can be either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure used for the command. This can be either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
</tbody>
</table>

Command examples

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

List power supply units

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 unit devices

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This can be either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure used for the command. This is either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This is either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure used for the command. This is either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
</tbody>
</table>
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

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

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specify the adapter used for the command. This can be either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specify the enclosure used for the command. This is either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-h, -help</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
<tr>
<td>-a, -adapter</td>
<td>Specify the adapter used for the command. This is either SAS WWID or the AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specify the enclosure is used for the command. This is either WWN or the EnclosureIndex.</td>
</tr>
</tbody>
</table>

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=<SupportOutputFormats>] [-verbose] | [-h])
```

Parameters

**Table 18. List failed drives**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This is either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure used for the command. This is either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-w</td>
<td>Specifies the drawer index used for the command.</td>
</tr>
</tbody>
</table>
Parameter | Description
--- | ---
-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>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This is either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
</tbody>
</table>

Show drive information

Description

This command provides detailed information about 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**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This is either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure used for the command. This is either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-w</td>
<td>Specifies the drawer index used for the command.</td>
</tr>
<tr>
<td>-d</td>
<td>Specifies the hard disk drive used for the command. This can be any of the following:</td>
</tr>
<tr>
<td></td>
<td>• WWN — Can be used anytime.</td>
</tr>
<tr>
<td></td>
<td>• Serial Number — Can be used anytime.</td>
</tr>
<tr>
<td></td>
<td>• Drive OS path — Can be used anytime.</td>
</tr>
<tr>
<td></td>
<td>• Drawer Slot Index (Index of the drive in the specific drawer) — Use if the 'drawer' argument is used for the command.</td>
</tr>
<tr>
<td></td>
<td>• Enclosure Slot Index — Use if drawer argument is not being used for the command</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
<tr>
<td>-smart</td>
<td>Display the S.M.A.R.T attribute data for the specific physical drive.</td>
</tr>
</tbody>
</table>

#### Command examples

- info drive -a = 500abcdefg12345 -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 about 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This is either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure used for the command. This is either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-file</td>
<td>Specify the file at the given path used for the command.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
</tbody>
</table>

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

View MD3060e SAS diagnostics

Description

Displays a list of SAS diagnostic information associated with the supplied enclosure.

Command syntax

```
shmcli 3060ediags (-a=<(SAS WWID | AdapterIndex)> -enc=<(WWN | EnclIndex)> [-outputformat=] | -enc= [outputformat=] | [-h])
```
## Parameters

### Table 24. View MD3060e SAS diagnostics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This is either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure used for the command. This is either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>You can specify the following output formats: XML or JSON.</td>
</tr>
</tbody>
</table>
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 25. Update drive firmware**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This is either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-d</td>
<td>Specifies the HDD used for the command. This can be any of the following:</td>
</tr>
<tr>
<td></td>
<td>• WWN—Can be used anytime.</td>
</tr>
<tr>
<td></td>
<td>• Serial Number—Can be used anytime.</td>
</tr>
<tr>
<td></td>
<td>• Drive OS path—Can be used anytime.</td>
</tr>
<tr>
<td></td>
<td>• Enclosure Slot Index—Use if drawer argument is not used for the command.</td>
</tr>
<tr>
<td></td>
<td>• Drawer Slot Index (Index of the drive in the specific drawer)—Use if drawer argument is used for the command.</td>
</tr>
<tr>
<td></td>
<td>• Enclosure Slot Index—Use if drawer argument is not being used for the command.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure used for the command. This is either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-w</td>
<td>Specifies the drawer index used for the command.</td>
</tr>
<tr>
<td>-file</td>
<td>Specifies the file at the given path used for the command.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides additional information about the command, description, and usage.</td>
</tr>
<tr>
<td>-show</td>
<td>Display the list of drives that are updated by using the specified firmware file. The drives are not updated if this option is used.</td>
</tr>
</tbody>
</table>
Parameter | Description
---|---
-directory | Specifies 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 by 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 26. Update EMM firmware**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>Specifies the adapter used for the command. This can be either SAS WWID or AdapterIndex.</td>
</tr>
<tr>
<td>-enc</td>
<td>Specifies the enclosure used for the command. This can be either WWN or EnclIndex.</td>
</tr>
<tr>
<td>-emm</td>
<td>Specifies the EMM used for the command.</td>
</tr>
<tr>
<td>-file</td>
<td>Specifies the file at the given path used for the command.</td>
</tr>
<tr>
<td>-h</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
<tr>
<td>-wait</td>
<td>(default) If provided, the application waits to return until after the updated EMM is automatically turned on again.</td>
</tr>
<tr>
<td>-nowait</td>
<td>If provided, the application returns immediately after sending the firmware to the device. The device may not be available for use for some duration of time while it is applying the update.</td>
</tr>
</tbody>
</table>
**NOTE:** If the file name contains special characters, you must enclose the file path within escaped double quotation marks.

### Command examples

- `update emm -a = 500abcdefg12345 -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**

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

**Parameters**

**Table 27. Update Adapter**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-h, -help</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>Following output formats can be specified: XML, JSON.</td>
</tr>
<tr>
<td>-a, -adapter</td>
<td>Specifies the adapter to be used for the command. This can either be the SAS WWID or the Adapter Index.</td>
</tr>
<tr>
<td>-file</td>
<td>Specifies the file at the given path used for the command.</td>
</tr>
</tbody>
</table>

**NOTE:** If the filename contains special characters, you must 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**

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

**Parameters**

**Table 28. Status Adapter**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-h, -help</td>
<td>Provides additional information about the command, description, and usage.</td>
</tr>
<tr>
<td>-outputformat</td>
<td>Following output formats can be specified: XML, or JSON.</td>
</tr>
<tr>
<td>-a, -adapter</td>
<td>Specifies the Adapter to be used for the command. This can either be the SAS WWID or the Adapter Index.</td>
</tr>
</tbody>
</table>
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 29. Global Topology

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-h, -help</td>
<td>Provides more information about the command, description, and usage.</td>
</tr>
</tbody>
</table>
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:

- Logging or Monitor service
- SNMP
- SCOM

The following list describes events raised by the monitoring parts of the Server Hardware Manager solution. Not all the enclosure events apply to all enclosure models.

- Status Change – the status of a monitored object changed.
- Device Removed
- Device Installed
- Drive Removed
- Drive Installed
- Drawer Opened – an enclosure drawer was opened
- Drawer Closed – an enclosure drawer was closed
- Enclosure removed
- Enclosure installed
- Emm removed
- Emm installed
- Power Supply removed – an enclosure power supply was removed
- Power Supply installed – an enclosure power supply was installed
- Fan Removed – an enclosure fan was removed
- Fan Installed – an enclosure fan was installed
- Voltage Sensor removed – an enclosure voltage sensor was removed
- Voltage Sensor installed – an enclosure voltage sensor was installed
- Current Sensor removed – an enclosure current sensor was removed
- Current Sensor installed – an enclosure current sensor was installed
- Temperature Sensor removed – an enclosure temperature sensor was removed
- Temperature Sensor installed – an enclosure temperature sensor was installed
- Drawer Removed – an enclosure drawer was removed
- Drawer installed – an enclosure drawer was installed
- Adapter PHY link up
- Adapter PHY link down
- Drive predicted failure detected

Topics:

- Logging or Monitor Service
- Local log file
- Windows event log
- Linux syslog
• Monitor Configuration File
• Logging Functionality Modification Directions
• SNMP
• Events
• JBOD LEDs

Logging or Monitor Service

The Server Hardware Manager Monitor is a service that runs automatically after installation. The service periodically verifies the status of storage hardware components and logs events. By default, the Monitor logs to only a local log file.

NOTE: If any modifications are made to the Monitor or SNMP services, the services must be restarted for the changes to take place.

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 30. Log file location

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>C:\Users\Default\Dell\ServerHardwareManager\logs\ServerHardwareManagerMonitor.log</td>
</tr>
<tr>
<td>Linux</td>
<td>/var/log/dell/ServerHardwareManager/ServerHardwareManagerMonitor.log</td>
</tr>
</tbody>
</table>

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.

Figure 9. Windows event log

Linux syslog

The syslog contains all events detected by the Server Hardware Manager Monitor service on Linux. This log includes warning and critical events.
Monitor Configuration File

NOTE: Modifying the Monitor logging configuration file can disable or disrupt logging functionality. Make a copy of the file before attempting any modifications.

The Monitor logging configuration file is named `ServerHardwareManager_Logger.properties`. It is located in the `ServerHardwareManagerMonitor` subdirectory under the main install directory.

Logging Functionality Modification Directions

To change the log folder location:

- Modify the line starting with `log4cplus.appender.file.File=<fullpath including filename of desired log location.`

To add Linux syslog logging (Linux OS’s only):

- Add `SYSLOG` string to the `log4cplus.rootLogger` entry. For example, `log4cplus.rootLogger=WARN,file,SYSLOG`

SNMP

SNMP is another avenue that 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).

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

NOTE: SNMP traps are generated only for critical events.

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Log File Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>{Installation_base_path}\Dell\ServerHardwareManager\StorageEnclosureMonitor\ServerHardwareManagerMonitor\SHM.config</td>
</tr>
<tr>
<td>Linux</td>
<td>{Installation_base_path}/dell/ServerHardwareManager/ServerHardwareManagerMonitor/bin/SHM.config</td>
</tr>
</tbody>
</table>

Although the Server Hardware Manager Monitor runs automatically after installation, 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 server the trap receiver listens

See 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.

To enable or disable the SNMP server, under the `*[SHMSYSTEM]*` section, if SNMP value is ON, the SNMP server runs; if the value does not exist or is OFF, the server is disabled.
NOTE: After any changes are made to the SNMP configuration file, stop and start the service or 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 more than or less than critical threshold
- Voltage sensor
  - Voltage goes more than or less than 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 is in 'critical' status

JBOD LEDs

The Server Hardware Manager monitoring tool provides the capability to automatically set LED behavior for the 3060e enclosure to indicate drive predicted failure or drive failure. By default, the behavior is turned off.

To turn the behavior on and off:

1. Open the SHM.config file located in the binary folder of the installation.
   - In Windows, the file is located at: Program Files\Dell\ServerHardwareManager\ServerHardwareManagerMonitor.
   - In Linux, the file is located at: /opt/dell/ServerHardwareManager/bin.
2. Under the [SHMSYSTEM] section of the file, add or edit the entry 3060eLEDControl.
   - To turn the behavior on: 3060eLEDControl=ON.
To turn the behavior off: \texttt{3060eLEDControl=OFF}.

\textbf{NOTE:} If the \texttt{3060eLEDControl} item is missing or blank, the behavior by default is off.

3. Save the file.
4. Restart the monitoring service.

If the LED control behavior is turned on, the following LED control will occur:

1. If a drive is reporting a predicted failure state:
   a. The drive slot LED will be set to the Identify state.
   b. The enclosure LED will be set to the Failure state.

2. If a drive is determined to be in a failed state:
   a. The drive slot LED will be set to the Failure state.
   b. The enclosure LED will be set to the Failure state.
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 (SHM CLI)
- Device actions:
  - Updating firmware
  - Validating firmware
  - Blinking a drive
  - Turning off a drive slot within an enclosure

Figure 10. Storage enclosure REST queries are built into the device hierarchy

Topics:
- Modifying REST Configuration
- Accessing the REST service
- SHM REST Resources
- Updating firmware by using REST

Modifying REST Configuration

**NOTE:** Modifying the REST configuration file can disable or disrupt REST functionality.

The Server Hardware Manager REST configuration exists in a file named SHM.config that exists in the ServerHardwareManagerMonitor subdirectory under the main install directory.

- To enable or disable the REST server, under the “[SHMSYSTEM]” section, if REST value is ON, the REST service will run; if the value does not exist or is OFF, the service will be disabled.
- To change the REST server listening IP or Port, under the “[SHMREST]” section of the configuration file, modify the IP value to indicate which IP and port the REST server must bind to. By default, the REST server binds to 127.0.0.1:8012.
Firewall services will most likely need to be modified in order to access the REST server from remote servers.

Accessing the REST service

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

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

Table 32. Accessing the REST service

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host</td>
<td>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.</td>
</tr>
<tr>
<td>Port</td>
<td>The port number opened for REST traffic. The default port is 8012.</td>
</tr>
<tr>
<td>Program_Space</td>
<td>The application namespace: “SEM”.</td>
</tr>
<tr>
<td>Version</td>
<td>The mainly supported version is 1.0 and later.</td>
</tr>
</tbody>
</table>

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

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):

- adapters
- currentsensors
- drawers
- drives
- driveslots
- enclosures
- emms
- emmslots
- fans
- locks
- powersupplies
- voltagesensors

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

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

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

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

Device Inventory

SHM REST resources include device inventory.

/api/SEM/1.0/adapters [GET]
/api/SEM/1.0/adapters{id} [GET]
/api/SEM/1.0/adapters{id}/drives [GET]
/api/SEM/1.0/adapters{id}/drives{id} [GET]
/api/SEM/1.0/adapters{id}/enclosures [GET]
/api/SEM/1.0/adapters{id}/enclosures{id} [GET]
/api/SEM/1.0/adapters{id}/enclosures{id}/drives [GET]
/api/SEM/1.0/adapters{id}/enclosures{id}/drives{id} [GET]
/api/SEM/1.0/adapters{id}/enclosures{id}/drawers [GET]
/api/SEM/1.0/adapters{id}/enclosures{id}/drawers{id}/drives [GET]
/api/SEM/1.0/adapters{id}/enclosures{id}/drawers{id}/drives{id} [GET]
/api/SEM/1.0/adapters{id}/enclosures{id}/fans [GET]
/api/SEM/1.0/adapters{id}/enclosures{id}/powersupplies [GET]
/api/SEM/1.0/adapters{id}/enclosures{id}/voltagesensors [GET]
/api/SEM/1.0/adapters{id}/enclosures{id}/temperaturesensors [GET]
/api/SEM/1.0/adapters{id}/enclosures{id}/emmslots [GET]
/api/SEM/1.0/adapters{id}/enclosures{id}/emms [GET]
/api/SEM/1.0/adapters{id}/enclosures{id}/driveslots [GET]
/api/SEM/1.0/adapters{id}/enclosures [GET]
/api/SEM/1.0/adapters{id}/drives [GET]
/api/SEM/1.0/adapters{id}/drives{id} [GET]
/api/SEM/1.0/adapters{id}/drawers [GET]
/api/SEM/1.0/enclosures/{id}/drawers [GET]

/api/SEM/1.0/enclosures/{id}/drawers/{id}/drives [GET]

/api/SEM/1.0/enclosures/{id}/drawers/{id}/drives/{id} [GET]

/api/SEM/1.0/enclosures/{id}/fans [GET]

/api/SEM/1.0/enclosures/{id}/powersupplies [GET]

/api/SEM/1.0/enclosures/{id}/voltagesensors [GET]

/api/SEM/1.0/enclosures/{id}/temperaturesensors [GET]

/api/SEM/1.0/enclosures/{id}/emmslots [GET]

/api/SEM/1.0/enclosures/{id}/emms [GET]

/api/SEM/1.0/enclosures/{id}/driveslots [GET]

/api/SEM/1.0/emms/{id} [GET]

Firmware Updates

SHM REST resources include firmware updates.

/api/SEM/1.0/adapters/{id}/enclosures/{id}/emms/{id}/firmware [POST]

/api/SEM/1.0/enclosures/{id}/emms/{id}/firmware [POST]

/api/SEM/1.0/emms/{id}/firmware [POST]

/api/SEM/1.0/adapters/{id}/drives/{id}/firmware [POST]

/api/SEM/1.0/drives/{id}/firmware [POST]

/api/SEM/1.0/adapters/{id}/enclosures/{id}/drives/{id}/firmware [POST]

Device Actions

SHM REST resources include device actions.

/api/SEM/1.0/adapters/{id}/drives/{id}/blink/ON|OFF [PUT]

/api/SEM/1.0/drives/{id}/firmware/blink/ON|OFF [PUT]

/api/SEM/1.0/adapters/{id}/enclosures/{id}/drives/{id}/blink/ON|OFF [PUT]

Firmware File Information

SHM REST resources include firmware file information.
Object Aliases

For several of the object types, an alias may be used in place of the full name of the object as indicated in the table here:

Table 33. Object Aliases

<table>
<thead>
<tr>
<th>Object Type</th>
<th>Alias</th>
</tr>
</thead>
<tbody>
<tr>
<td>adapters</td>
<td>a</td>
</tr>
<tr>
<td>enclosures</td>
<td>e</td>
</tr>
<tr>
<td>enclosures</td>
<td>enc</td>
</tr>
<tr>
<td>drives</td>
<td>d</td>
</tr>
</tbody>
</table>

For example, the following two REST calls are equivalent:

http://127.0.0.1:8012/api/SEM/1.0/adapters/0/enclosures/0/drives/10

http://127.0.0.1:8012/api/SEM/1.0/a/0/enc/0/d/10

Device inventory

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

For example,

Get a list of adapters:

[base_url] /api/SEM/1.0/adapters

Get a list of enclosures for a specific adapter:

[base_url] /api/SEM/1.0/adapters/0/enclosures

Get a list of fans for specific enclosure:

[base_url] /api/SEM/1.0/adapters/0/enclosures/0/fans

[base_url] /api/SEM/1.0/enclosures/[WWID]/fans

Get a list of all drives:

[base_url] /api/SEM/1.0/drives

Get a list of drives in a drawer in an enclosure:

[base_url] /api/SEM/1.0/adapters/0/enclosures/0/drawer/2/drives
Device actions

HTTP GET methods

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 include:

- <option> = <opt>: An argument for the action to be performed.

The following options are 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 filenames for a firmware file:

- C:\drivefirmwares\Seagate\myfirmwarefile.fwh
- C:/drivefirmwares/Seagate/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/myfirmwarefile.fwh.
```

HTTP GET methods

**Blink drive**

\[[base_url]/adapters/<(index | wwid)/enclosures/<(index | wwid)/drive/<(index | wwid)/blink/ON\]

\[[base_url]/adapters/<(index | wwid)/enclosures/<(index | wwid)/drive/<(index | wwid)/blink/OFF\]

HTTP PUT methods

**Blink Drive**

\[[base_url]/adapters/<(index | wwid)/enclosures/<(index | wwid)/drive/<(index | wwid)/blink/ON\]

\[[base_url]/adapters/<(index | wwid)/enclosures/<(index | wwid)/drive/<(index | wwid)/blink/OFF\]
Updating firmware by using REST

Update Firmware with GET verb

<table>
<thead>
<tr>
<th>Drive Update</th>
<th>Query Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single drive with a firmware file</td>
<td>[base_url]/adapters/&lt;(index</td>
</tr>
<tr>
<td>Force an update to a single drive with a firmware file</td>
<td>[base_url]/adapters/&lt;(index</td>
</tr>
<tr>
<td>Update all drives within a specified enclosure with a firmware file</td>
<td>[base_url]/adapters/&lt;(index</td>
</tr>
<tr>
<td>Force an update to all drives within a specified enclosure with a firmware file</td>
<td>[base_url]/adapters/&lt;(index</td>
</tr>
<tr>
<td>Update all drives within a specified enclosure with a firmware file (multi-threaded)</td>
<td>[base_url]/adapters/&lt;(index</td>
</tr>
<tr>
<td>Single enclosure management module (EMM) with a firmware file</td>
<td>[base_url]/adapters/&lt;(index</td>
</tr>
</tbody>
</table>

Update Firmware with POST verb

Updating firmware by using an HTTP POST transfers a firmware file from the client server to SHM REST server. The POST request must be encoded as “multipart/form-data”.

[base_url]/api/SEM/1.0/drives/5000c50055bee096/firmware4

[base_url]/api/SEM/1.0/adapter/0/enclosures/0/emms/5000c50012bce496/firmware

Validate firmware file

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

api/SEM/1.0/system/firmware/?file==<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.

Topics:
- Overview of the Dell Storage PowerTools Server Hardware Manager SCOM management pack
- Installing Dell Storage PowerTools Server Hardware Manager SCOM Management Pack
- Views created
- Severity Level Indicators

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

The 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

#### About this task

- **NOTE:** The Server Hardware Manager REST server must be running on the system that is monitored.
- **NOTE:** Dell recommends that you manually uninstall an existing SHM SCOM management pack before installing a new version.

#### Steps

1. Download the Server Hardware Management Software installation package from [Dell.com/support](http://Dell.com/support).
2. Go to the download directory of the installer.
3. Double-click the installation program — `PowerToolsShmScom-x.x.x.x-windowsinstaller.exe`.
4. Complete the on-screen instructions and accept the End User License Agreement.
The above diagram depicts the objects discovered. All objects are monitored for state except HBAs. 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 12. SHM Host Bus Adapters

- SHM Hosts
- 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 35. Severity Level Indicators

<table>
<thead>
<tr>
<th>Icon</th>
<th>Severity Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Green Checkmark]</td>
<td>Normal/OK — The component is working as expected.</td>
<td></td>
</tr>
<tr>
<td>![Warning Exclamation Mark]</td>
<td>Warning/Noncritical — A probe or other monitoring device has detected a reading for the component that is more than or less than the acceptable level. The component may still be functioning, but it could fail. The component may also be functioning in an impaired state.</td>
<td></td>
</tr>
<tr>
<td>![Red X]</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>![Gray Circle]</td>
<td>The health status is not applicable for the specific component.</td>
<td></td>
</tr>
<tr>
<td>![Gray Checkmark]</td>
<td>The service is unavailable.</td>
<td></td>
</tr>
</tbody>
</table>
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 about 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 lower 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.
5. For contact details of Dell Global Technical Support:
   a. Click Global Technical Support.
   b. The Contact Technical Support page is displayed with details to call, chat, or e-mail the Dell Global Technical Support team.