Dell OpenManage Essentials MIB Import Utility
Monitoring Force-10 Switches

Manoj Poonia
Dell | Product Group Enterprise
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Introduction

Dell OpenManage Essentials (OME) is a hardware management application that provides a comprehensive view of Dell systems, devices, and components in the enterprise’s network. Health monitoring in OME has two parts to it:

1. SNMP traps received from the remote device.
2. Health Poll to retrieve the latest status of the remote device.

The *Dell OpenManage Essentials MIB Import utility* allows you to extract trap definitions from SNMP supported device MIB files. The extracted traps can be viewed and edited before importing them into OME. These imported trap definitions help OME to properly classify the incoming traps. To know more about the benefits of importing these trap definitions into OME, refer About Importing Traps section.

Scope

This document provides an overview of the *OME MIB Import Utility*, benefits of importing the trap definitions and interaction of this utility with OME.

About Importing Traps

If you want to monitor (classify incoming SNMP traps) an SNMP supported device that is not currently supported by OME, use the *MIB Import Utility* to import that device’s SNMP trap definitions into OME.

Ensure the following before using this utility:

- The remote device supports SNMP (v1/v2) protocol.
- SNMP services on the remote device are working fine and trap destination points to OME system.
- You have the device specific SNMP MIB files (main MIB and its reference MIBs).
- Validate these specific MIB(s) using a standard MIB compiler tool.

The table below provides a comparison of the traps before and after the definitions are imported into the OME database.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Before Importing the Trap to the OME Database</th>
<th>After Importing the Trap to the OME Database</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can I see traps coming from the device in the OpenManage Essentials alerts portal?</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Will traps have a severity value?</td>
<td>No, the severity is unknown.</td>
<td>Yes</td>
</tr>
<tr>
<td>Will traps have a valid name?</td>
<td>No, the name is unknown.</td>
<td>Yes, the trap name is defined in the MIB.</td>
</tr>
<tr>
<td>Will traps have a valid event</td>
<td>No, the event category name is</td>
<td>Yes, a new category is created</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>category name?</th>
<th>unknown.</th>
<th>by default.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will traps have a description?</td>
<td>Yes, all the description details are present. However, the details are not formatted.</td>
<td>Yes, the description is formatted according to the trap definition.</td>
</tr>
<tr>
<td>Will the trap display the trap variable values?</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Will the trap display the Enterprise OID, Specific OID, and Generic OID?</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Will the trap display additional trap variables which can be used for debugging?</td>
<td>Yes, however, the details are not formatted.</td>
<td>Yes</td>
</tr>
<tr>
<td>Will the trap display the host name or IP address of the device?</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Can I use traps in various alert actions to forward the trap to another management console, execute a task, or filter the unwanted traps?</td>
<td>Yes, but the features are limited. Rules specific to severity, event category, event name, and so on are not possible.</td>
<td>Yes, the traps are defined so all the alert actions are supported based on the trap name, category, severity, and so on.</td>
</tr>
<tr>
<td>Can I perform various UI actions (such as acknowledge, delete and so on) on the traps?</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Will purging of alerts work on the traps?</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Prerequisites

**MIB Import utility** can be installed on a system where OME v1.0.1 is installed.

**Note:**

- Administrative credentials are required to install, uninstall and launch the utility.
- OME should be functional and OME console should have been opened at least once on this system.

### Using MIB Import Utility

MIB Import Utility is a standalone application and can be installed on a system where OME is installed. MIB Import Utility has 4 views which are directly visible on the left hand side panel or can be selected from the “View” menu.
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Available Views

1. **Import MIB**: This view helps in...
   i. Selecting the (SMIv1/SMIv2) MIB
   ii. Parsing the selected MIB
   iii. To view or update its extracted trap definitions
   iv. Importing trap definitions to OME

2. **Remove MIB**: This view helps in...
   i. To view the imported MIBs
   ii. Remove those MIBs (Traps definitions) from OME

3. **MIB Repository**: This view helps in...
   i. To view the list of MIBs which are part of MIB repository
   ii. Adding a single MIB in repository
   iii. Adding a set of MIB(s) in repository

4. **Logs**: This view helps in...
   i. View the MIB parsing logs (for debugging)
   ii. Export these logs to a text file.

**Import MIB**

Select the SNMP supported device MIB which has the required trap definitions. For example, if you want to import Force-10 switch chassis trap definitions to OME, select the f10-chassis.mib file using the “Browse...” button.

You can select *.*.mib, *.*.txt and *.*.my files. If you have any other extension file name, you can rename it to anyone of these and use.
When you parse the Force-10 Chassis MIB for the first time, the utility will show the message below asking to add the required reference MIBs to the MIB repository. The utility bundles various standard reference MIBs which help parsing any MIB which refers to them. In this case only two MIB files are listed in the message because the rest of the required MIBs are already part of the utility MIB repository. To parse the Force-10 chassis MIB, ensure you have added the required reference MIBs to the MIB repository. Refer to MIB Repository to add MIBs to the MIB repository.

You can refer to the Force-10 Chassis MIB Module definition and reference MIBs section to see the force-10 chassis dependencies.

Once you add these required MIBs to the repository, parse the chassis MIB again. The utility will parse the MIB and populate the grid with the parsed trap definitions. You can refer the number of traps parsed in the bottom status bar. Below snapshot shows the parsed f10-chassis.mib file.
This is the first trap defined in the f10-chassis.mib file.

**Figure 5.**

**Force-10 Chassis MIB Trap Definition**

```plaintext
chAlarmCardDown  NOTIFICATION-TYPE

OBJECTS  

  chAlarmVarInteger,  
  chAlarmVarString,  
  chAlarmVarSlot,  
  chAlarmVarPort

STATUS  current

DESCRIPTION  

  "The driver/agent generate this trap when a card operational status is down."

::= { chAlarmMibNotifications 1 }
```

For the above trap definition, the utility has extracted the following information for OME. Some information is added to the above MIB definition which is required by OME for proper classification. Example: MIB module name will be the new event category, trap severity is Normal.
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**Force-10 Chassis MIB Parsed Trap Definition**

You can change the event category, severity and format string of these parsed traps before importing them to OME. Refer to [Import View Components](#) to know more about the editing of these values.

Once you are done with the updates, click on **Import traps to OpenManage Essentials**.

**Note:**

- Multiple selections are allowed in the grid and these checkboxes helps you to change category name and severity of multiple selected trap records at a time. You can also do modification to individual rows.
- Ensure you have unchecked the event category or severity checkboxes if you do not want to override the changes done in the grid for these two columns. If you want to import with the changes (Event Category and Severity) done in the grid, then uncheck these checkboxes.
- Reimport the same MIB: If you want to import trap definitions from a newer version of a previously imported MIB, the utility allows you to do so. You need not remove that MIB.
- Reimport only updates the previously imported trap definitions. It does not remove extra trap definitions which may not be part of the newer version of MIB file.

**Remove MIB**

After you have imported trap definitions from f10-chassis.mib to OME, you can view this part of the imported MIB(s) list on the **Remove MIB** view. If you no longer want these chassis trap definitions in OME, you can remove all of these by selecting a MIB from the list and click **Remove MIB** button.

**Note:**

- Multiple selections of MIB(s) are allowed to remove them from OME.
- Once you remove these trap definitions from OME, all the associated alert actions, filters and views for these traps will not work. You can refer to the [About Importing Traps](#) section for more details.
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- All of the classified and received traps (from this specific SNMP device and traps related to this MIB) in OME will be deleted. Ensure you have acknowledged/resolved all the problems reported in the OME events console for this device/component before you remove the MIB.

**MIB Repository**

The MIB repository consists of MIB(s) which are referenced by your selected MIB file and are required to parse successfully. The utility bundles many standard SNMP reference MIBs as part of its installation which helps parsing a basic MIB file successfully. For example, if you want to parse f10-chassis.mib, you do not need to locate and add standard reference MIBs files (SNMPv2-SMI, SNMPv2-TC, SNMPv2-CONF) to the repository, just the Force-10 specific MIBs (FORCE10-SMI, FORCE10-TC).

You can use **Add a MIB File** to add reference MIB(s) one after the other or keep all the independent reference MIB(s) in a single folder and use **Add the MIB Folder Path**.

**Note:**

- Parsing and validation is done when you add a reference MIB, so check the order when selecting the files.
- Verify the MIBs using a 3rd party MIB compiler.

**Figure 8. Adding MIBs to MIB Repository**
Removing MIBs from MIB Repository
The utility does not provide a way to remove these added reference MIBs. You can upload the latest version of reference MIBs but to remove them you have to manually delete the unwanted reference MIBs from the <Installed Directory>\reference_mibs folder. It is recommended not to delete the standard MIBs which are installed with the utility.

Note:
- Once you remove any reference MIB(s) it is recommended that you close and reopen the utility.
- Uninstallation of the utility removes all of the reference MIBs.

Logs
This view is to verify the parsing and UI logs for debugging purposes. You can export these logs into a text file and share it with the Dell technical support team if required.

Imported Force-10 chassis traps in Essentials
Once you have imported these trap definitions in OME, you can see them by navigating to Manage -> Alerts -> Alert Categories.
1. “Browse” and “Select the MIB file”: To choose the specific MIB.

2. Parse button: To parse the MIB and extract trap definitions.

3. “Category Name” Drop Down List box: This drop down list box has all the category names present in the OME. It allows you to change category names of the parsed trap definitions before importing them in OME. You can select any of the predefined categories or use the newly created category name (default selection). MIB module will be new category name (in the above example it is F10-CHASSIS-MIB).

4. “Apply the selected event category to all traps” checkbox: This checkbox (selected by default) will help you to change category name for the parsed trap definitions in the grid. The “Traps” grid allows multiple row selections. If you have selected a few rows in the grid and this checkbox is unchecked, changing the category name from the drop down list box will change category name only for the selected rows. If this checkbox is checked, then changing category name from the list box will update the category name for all of the rows.
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**Event Details**

Category Name: F10-CHASSIS-MIB

Note: This checkbox overrides any individual selection/modification you have done in the grid. If you want to keep those changes make sure this checkbox is unselected before you import data into OME.

5. “Severity” Drop down List Box: This drop down list box has all the severity levels defined in OME. It allows you to change the severity of the parsed traps before importing them in OME.

6. “Apply the selected severity to all traps” checkbox: This checkbox (selected by default) will help you to change severity for the parsed trap definitions in the grid. The “Traps” grid allows multiple selections of rows. If you have selected a few rows in the grid and this checkbox is unchecked, changing the severity from the drop down list box will change severity only for the selected ones. If this checkbox is checked, then changing severity from the list box will update the severity for all the rows.

Note: This checkbox overrides any individual selection/modification you have done in the grid. If you want to keep those changes make sure this checkbox is unselected before you import data into OME.

7. “Traps” Grid:

   a. Various Grid Columns

   **Figure 10. Traps Grid**

   ![](Traps Grid.png)

   i. **Name:** Trap name.

   ii. **Category Name:** Event categories where you want to define these trap definitions. This is an editable field. You can change the category name using this drop down list box or use the above mentioned generic drop down list box.

   iii. **Severity:** Event Severity which you want to see it in the OME event console when this specific trap comes from the remote SNMP device. This is an editable
field. You can change the severity using the drop down list box or use the above generic “Severity” drop down list box. You may see a new entry (By Varbind Value) in this drop down and selected by default if the MIB traps are enumeration based variables. Also refer to “Severity Configuration by Value” section.

iv. **Format String**: This field helps OME to show the event description for the incoming SNMP alerts. OME parses the trap variables and replace those values in this format string. Variables are “1” based so first trap variable will be placed for $1. This is an editable field and you can remove the unwanted contents or variables from this field.

v. **Enterprise OID**: Event SNMP Enterprise OID.

vi. **Generic Trap ID**: Event SNMP Generic OID.

vii. **Specific Trap ID**: Event SNMP Specific OID.

viii. **Category ID**: Unique number which is used internally.

ix. **Package ID**: Unique number which is used internally.

x. **Description**: Trap description which is taken from the MIB. This is different from Format String and OME is not using this to show description for the received SNMP traps in event console.

xi. **Node Type**: This field says whether traps are of TRAP-TYPE or NOTIFICATION-TYPE.

b. **Filters**: Every column header has a built in filter which can be used to view specific trap definitions.

Figure 11. 

Grid Column Filters

<table>
<thead>
<tr>
<th>Name</th>
<th>Category Name</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>chAlarmCardDown</td>
<td>= equal to</td>
<td></td>
</tr>
<tr>
<td>chAlarmCardUp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>chAlarmCardReset</td>
<td></td>
<td></td>
</tr>
<tr>
<td>chAlarmCardOffline</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**c. “Notes” below Grid**: Lists the editable fields and default Severity.

8. **“Import traps to OpenManage Essentials” button**: This will import all of the updated values in the grid and “Severity Configuration by value” for the specific traps. It requires OME to be installed locally irrespective of whether the OME database is local or remote or using different SQL Authentication method or different DB named instance.
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9. **Status Bar**: There is the status bar at the bottom of the window which reports the last operation performed in the utility.

**Severity Configuration By Value**

*Note*: Force-10 MIBs do not have traps having trap variable based severity. This section can be used for MIBS which have such trap definitions. Below is an example to explain this behavior.

An SNMP trap definition may have trap variables which determine the severity for that particular trap. The utility attempts to parse those trap variables and gives you the option to select one of those variable. Once imported to OME, OME uses these specific trap variable values to determine the trap severity and classify it in the console.

Example:

```snmp
SNMP trap definition example showing trap variable based Severity

DellStatus ::= INTEGER {
  other(1),     -- status is not one of the following:
  unknown(2),   -- status of object is unknown (not known or monitored)
  ok(3),        -- status of object is OK |normal
  nonCritical(4), -- status of object is noncritical (warning)
  critical(5),  -- status of object is critical (failure)
  nonRecoverable(6) -- status of object is non-recoverable (dead)
}

alertCurrentStatus OBJECT-TYPE
SYNTAX        DellStatus
ACCESS        read-only
STATUS        mandatory
DESCRIPTION
"5000.0010.0004 Current status of object causing the alert."
 ::= ( alertVariables 4 )

alertSystemUp TRAP-TYPE
ENTERPRISE  baseboardGroup
VARIABLES   ( alertSystem,
               alertTableIndex0ID,
               alertMessage,
               alertCurrentStatus,
               alertPreviousStatus,
               alertData )
DESCRIPTION
"Server Administrator has completed its initialization."
 ::= 1001
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Notice that \textit{alertSystemUp} trap is using total 6 variables, and \textit{alertCurrentStatus} and \textit{alertPreviousStatus} variables are having possible 6 status values (defined by DellStatus). After parsing you will see this record in the grid as follows. “By Varbind value” severity will be selected by default (instead of “Normal”).

You can launch the “severity configuration by value” dialog box by double clicking on the severity grid cell. See that this specific alertSystemUp trap has 2 possible trap variables which have associated status values. Those are present in the “Select the variable” drop down list box. By default the first variable ($4 \rightarrow \text{alertCurrentStatus}$) will be selected. The grid in the dialog box will show the possible variable values (DellStatus enumeration values). By default, the severity for all these values is “Normal”, but you can change the severity and click “Ok” to save them.

- **Severity**: Severity of the trap variable values.
  - For example, for “$4$” variable and Object Id “1”, you have updated the severity to “Warning” and then imported data to OME.
  - Now when “alertSystemUp” trap comes from the remote device to OME, OME will read the $4^{th}$ variable of this trap, in this case alertCurrentStatus, and reads its value, if value is “1” then OME will display this trap as “Warning”.

- **Object Value**: Shows possible enumerations string values. For example: DellStatus.
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- Object ID: Shows possible enumerations integer values. For example: values mentioned in (X) for DellStatus.
- Trap Variable: This is enumerations based variables part of the trap. For example: alertCurrentStatus and alertPreviousStatus.

Severity Configuration By Value Dialog Box - Severity Selection

<table>
<thead>
<tr>
<th>Severity</th>
<th>Object Value</th>
<th>Object D</th>
<th>Trap Var</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>other</td>
<td>1</td>
<td>$4</td>
</tr>
<tr>
<td>Unknown</td>
<td>unknown</td>
<td>2</td>
<td>$4</td>
</tr>
<tr>
<td>Normal</td>
<td>alert</td>
<td>3</td>
<td>$4</td>
</tr>
<tr>
<td>Warning</td>
<td>nonCritical</td>
<td>4</td>
<td>$4</td>
</tr>
<tr>
<td>Critical</td>
<td>critical</td>
<td>5</td>
<td>$4</td>
</tr>
<tr>
<td>Normal</td>
<td>nonRecoverable</td>
<td>6</td>
<td>$4</td>
</tr>
</tbody>
</table>

Note:

- Only one variable can be selected to use as By Varbind value based severity.
- Last saved values will be consumed while importing trap definitions into OME.
- Re-opening the dialog box will show the default values and not the last saved values. Last saved values are present in the background unless you reopen the severity dialog box.
- Severity values changes between various variables on this dialog box will not be saved if you select different variables from the list box.
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Parsing MIBs having Novel NMS Comments

Note: Force-10 MIBs does not have NMS comments. This section can be used for MIBs which have NMS comments. Below is an example to explain the utility's behavior.

Some SNMP MIBs may have NMS comments along with the trap definitions. The utility will consume them to select the default severity for those traps and format string. In the below snapshot, those comments can be seen between DESCRIPTION and specific trap Id (::= 1001).

Note: If you have traps having both NMS comments and enumeration based trap variables, then NMS will take the priority. You can still select By Varbind value severity for those traps from the severity drop down list box for those specific traps.

![Trap Definition having NMS comments](image)

After parsing this trap definition in the utility, the grid row will be as follows:

![Traps](image)

The utility will decide the severity by looking at the "--#SEVERITY" and the format string is formed with the help of "--#SUMMARY" and "--#ARGUMENTS" fields.

Note:

- Currently the utility is taking only 1 variable in the format string.
- 2nd argument means $3 for OME (refer to the above snapshot).
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**Force-10 Chassis MIB Module definition and reference MIBs**

If you open the f10-chassis.mib file in any text editor, the top of the file would have the below contents.

```plaintext
Force-10 Chassis MIB

F10-CHASSIS-MIB DEFINITIONS ::= BEGIN

-- Force 10 Networks, Inc.
-- 1440 McCarthy Blvd
-- Milpitas, CA 95035-7436

-- This module provides authoritative definitions for Force10
-- enterprise Chassis MIB.
--
-- This module will be extended, as needed.
--

IMPORTS

MODULE-IDENTITY, OBJECT-TYPE,
Gauge32, Integer32,
TimeTicks, NOTIFICATION-TYPE,
FROM SNMPv2-SMI

DataAndTime, Counter64,
FROM SNMPv2-TC

MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP,
FROM SNMPv2-CONF

F10Config
FROM FORCE10-SMI

F10SystemPortType, F10SystemCardType, F10ProcessorModuleType,
F10SlotState, F10SwDate, F10MfgDate, F10ChassisMode,
F10ChassisType, F10CustadthdId, F10CardOperStatus,
FROM FORCE10-TC;

--

MIB Module Name: This is the actual MIB name for f10-chassis.mib file. This becomes the new event category name when you parse this MIB in the utility.

Reference MIBs: These are the MIBs which f10-chassis.mib requires to compile and parse in this utility. You need to add these MIBs in the reference repository.

Learn More
Visit [www.delltechcenter.com/ome](http://www.delltechcenter.com/ome)