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Advantages of Command Line Interface in Dell EMC OpenManage Essentials

This Dell EMC technical white paper describes the command line interface (CLI) of OpenManage Essentials (OME).

Abstract

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Revisions

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Acknowledgements

Contents

1 Overview

Many customers choose to use OpenManage Essentials (OME) without the Graphical User Interface (GUI). OME provides a CLI (Command Line Interface) that enables you to define and manipulate discovery range information, to create custom groups, add and remove devices from custom groups, and initiate discovery and inventory.

Note that the CLI functionality is a subset of the OME console functionality. The CLI infrastructure does not provide any extra functionality beyond what is available on the OME console.

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2 PowerShell Extension

The OME CLI infrastructure is an extension to the PowerShell command shell. Windows PowerShell is an interactive prompt and scripting environment that can be used independently, or in combination, and is used by a system administrator. Unlike most shells, which accept and return text, Windows PowerShell is built on top of the .NET Framework Common Language Runtime (CLR) and the .NET Framework and accepts and returns .NET Framework objects. Many system administrators are familiar with PowerShell commands and feel very comfortable using PowerShell's infrastructure; common practices and WRT-defining commands make CLI functionality of the OME much easier to adopt.

2.1 Authentication

CLI authentication uses the same methodology as the OME console. A single sign-on is used to access the OME console and the CLI commands can only be run by a user who is a member of the OMEAdministrators group. Note that the CLI infrastructure is available on the management station only. The CLI capability is not available remotely.

2.2 Discovery or inventory task control through CLI syntax

From the PowerShell CLI, you can use three commands:

- `Add <command>`
- `Remove <command>`
- `Set <command>`

These three are the approved PowerShell command verbs that must prefix any new commands. The following conventions are used in the following paragraphs:

- **[**…**]**: an optional value - **<**…**>**: user provided input - '|' logical „or".
  - –**Range <name> | -RangeList <rangeList.xml>**: you can only provide the -Range or -RangeList switch on the command line but not both.

2.3 Discovery configuration profile template

Several discovery configuration range or discovery configuration group commands require a template that defines the various parameters and the associated protocol values. This template can be individually modified and submitted as part of the CLI argument input parameter. The input parameter is consistent for all the commands that create discovery configuration ranges or groups, and it is **Profile <profile.xml file>**. The template is given here:

```
<DiscoveryConfiguration>
  <ICMPConfig>
    <Timeout>400</Timeout>
    <Retries>1</Retries>
  </ICMPConfig>
  <SNMPConfig Enabled="True">
  <SNMPV1V2CConfig Enabled="True">
      <GetCommunity>public</GetCommunity>
      <SetCommunity></SetCommunity>
    </SNMPV1V2CConfig>
    <SNMPV3Config Enabled="True">
```

```
            <SNMPV3Username>user1</SNMPV3Username>
            <SNMPV3AuthenticationProtocol>SHA1</SNMPV3AuthenticationProtocol>
            <SNMPV3EncryptionProtocol>AES</SNMPV3EncryptionProtocol>
        </SNMPV3Config>
        <Timeout>4</Timeout>
        <Retries>2</Retries>
    </SNMPConfig>
    <WMIConfig Enabled="False">
        <UserName></UserName>
    </WMIConfig>
    <StoragePowerVaultConfig Enabled="False"></StoragePowerVaultConfig>
    <StorageEMCConfig Enable="False">
        <UserName>
        </UserName>
        <Port>443</Port>
    </StorageEMCConfig>
    <WSManConfig Enabled="False">
        <UserId></UserId>
        <Timeout>2</Timeout>
        <Retries>4</Retries>
        <Port>623</Port>
        <SecureMode Enabled="False" SkipNameCheck="False" TrustedSite="False">
            <CertificateFile></CertificateFile>
        </SecureMode>
    </WSManConfig>
    <IPMIConfig Enabled="False">
        <UserName></UserName>
        <KGKey></KGKey>
        <Timeout>5</Timeout>
        <Retries>2</Retries>
    </IPMIConfig>
 <RESTConfig Enabled="False">
        <UserName>root</UserName>
        <Timeout>60</Timeout>
        <Retries>2</Retries>
        <Port>443</Port>
        <SecureMode Enabled="False"></SecureMode>
    </RESTConfig>
</DiscoveryConfiguration>
```
The same template can be used for creating a discovery configuration range or discovery configuration group.

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2.4 Protocol credentials

If protocols are enabled that require credentials (WMI, IPMI, WSMan, REST, and EMC) for security reasons, the password cannot be stored in the XML file. If the user enables protocols in profile.xml that require credentials, the password will be prompted by the CLI.

Optional Flags

- `wmiPassword <wmi password>`
- `ipmiPassword <ipmi password>`
- `wsmanPassword <wsman password>`
- `emcPassword <emc password>`
- `RESTPassword <REST password>`
- `SNMPV3AuthenticationPassword <authentication password>`
- `SNMPV3EncryptionPassword <encryption password>`

2.5 Default action

From the console, the default action for adding a discovery range or discovery range group is **Discover and Inventory** and the default action for adding a discovery range or a discovery range group is **No Action**. In other words, any discovery configuration ranges or groups that are added from the CLI will not automatically be submitted for discovery and inventory. You have to run the `Set-RunDiscovery` or `Set-RunDiscoveryInventory` command that is explained later in this technical white paper to perform the discovery and inventory operations.

2.6 Range list template

The commands that create or modify discovery configuration groups can use a file that defines the ranges as an input parameter. This can be a comma-delimited list or ranges.

However, in this case, the input list is an XML file that initially defines the name of the ranges. Having an XML file allows future updates to add additional information related to each range without having to rewrite the parsing algorithm.

```
<DiscoveryConfigurationRanges>
  <Range Name=""/>
  <Range Name=""/>
  <Range Name=""/>
</DiscoveryConfigurationRanges>
```

2.7 Access the OpenManage Essentials CLI

To access the OME CLI, from the **Start** button, navigate to **Dell OpenManage Applications → Essentials**, and select **Essentials Command Line Interface** as shown in figure 1.

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Figure 1   CLI Access Point

2.8   View CLI Help of OpenManage Essentials

There is built-in help for each of the OME CLI commands. To get syntax related information, enter:

```
help <ome-cli-command>
```

This entry provides short syntax information of the command. At the end, details about getting more detailed information is provided. See the screen shot.

Figure 2   CLI Help Example

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3 Discovery and inventory commands

The following functionality is provided by the PowerShell command line interface:

- Create a discovery range
- Remove a discovery range
- Create a discovery range group
- Remove a discovery range group
- Enable discovery range / discovery range group
- Disable discovery range / discovery range group
- Create a discovery exclude range
- Remove a discovery exclude range
- Run a discovery range – discovery only (also per device)[range name]
- Run a discovery range – discovery and inventory only
- Run a discovery range – inventory only
- Run a discovery range – status polling
- Run a discovery range group – discovery only (also per device)[range name]
- Run a discovery range group – discovery and inventory only
- Run a discovery range group – inventory only
- Run a discovery range group – status polling
- Get status execution progress of a discovery range
- List devices discovered in a given discovery range
- List ranges / List range groups

Details on each command are discussed in the following sections.

3.1 Create discovery range

- `PS> Add-DiscoveryRange  –Profile <profile.xml> -Range <range>`
- `PS> Add-DiscoveryRange  –Profile <profile.xml> -RangeList  <ranges in xml>`
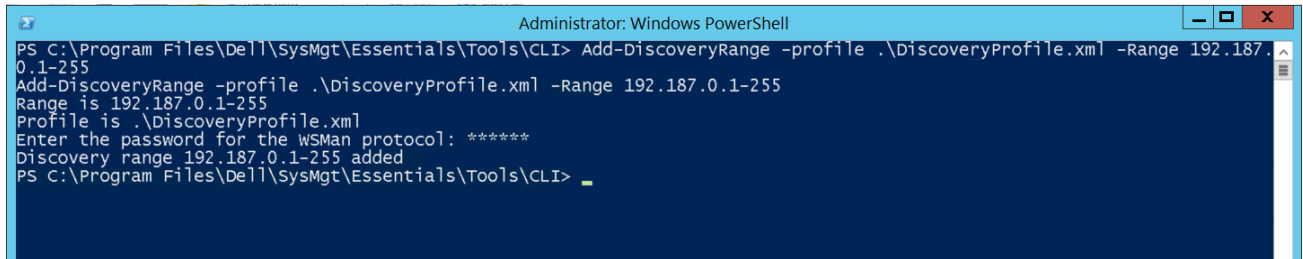- `PS> Add-DiscoveryRange  –Profile <profile.xml> -RangeListCSV  <ranges in CSV format>`

3.2 Optional Flags

- `wmiPassword <wmi password>`
- `ipmiPassword <ipmi password>`
- `wsmanPassword <wsman password>`
- `emcPassword <emc password>`
- `RESTPassword <REST password>`
- `SNMPV3AuthenticatiAdd-onPassword <authentication password>`
- `SNMPV3EncryptionPassword <encryption password>`

The above flags are required if the corresponding section in the profile.xml is enabled. If a password flag is passed to a protocol that is not enabled in the profile.xml, it is ignored.

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3.3   Input parameters

- <profile.xml> is a protocol definition associated with the discovery range. The OME discovery profile template defines the entire variable set that can be entered by using the UI discovery configuration wizard.
- OME installs a sample discovery protocol profile file that is located in C:\Program Files\Dell\SysMgmt\Essentials\Tools\CLI\ and it is named DiscoveryProfile.xml. Start with this template and customize it in a text editor to turn on the desired protocols.
- A sample range list XML and CSV files are also provided in the same directory location. Enter the desired ranges for discovery using the XML/CSV templates as a guide.

Figure 3   Adding Discovery Range

Output

- A message indicating the operation was successful, or
- A Failure message

Note—Unlike adding a range using the OME console, the range added by the CLI will not automatically be submitted for discovery. To submit the range for discovery and inventory, run one of the following two commands:

- `Set-RunDiscovery`, or
- `Set-RunDiscoveryInventory`

3.4   Remove discovery range

- `PS> Remove-DiscoveryRange  -Range <range>`
- `PS> Remove-DiscoveryRange -RangeList <ranges in xml>`

Input Parameters

- Either a range name to remove, or a list of ranges to remove, specified in an XML file

Output

- A message indicating the operation was successful, or
- A Failure message

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Figure 4   Removing Discovery Range

3.5   Create discovery range group

- `PS> Add-DiscoveryRangeGroup –Profile <profile.xml> -GroupName <group name> RangeList <list.xml>`

Input Parameters

- A discovery configuration profile file, the name of the group to create, a list or ranges to add to the group

Output

- A message indicating the operation was successful, or
- A Failure message

Note—This command may be partially successful if the group was created, but not all ranges were added possibly because of malformed range names, or range names that already exist. The command provides relevant feedback to the user.

Figure 5   Adding Discovery Range Group

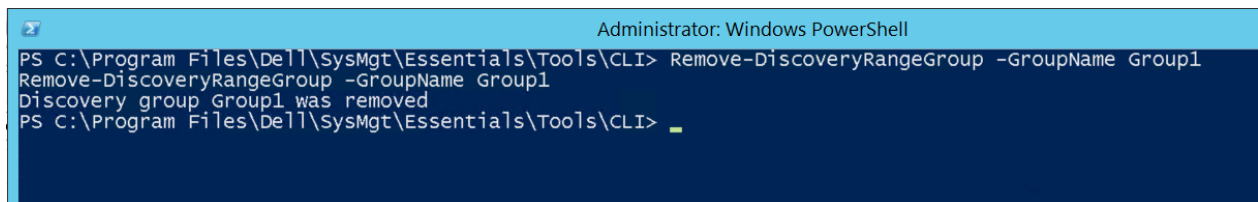## 3.6   Remove discovery range group

- `PS> Remove-DiscoveryRangeGroup –GroupName <groupName>`

Input Parameter

- The group name to be removed

Output

- A message indicating the operation was successful, or
- A Failure message

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```
Administrator: Windows PowerShell
PS C:\Program Files\Dell\SysMgt\Essentials\Tools\CLI> Remove-DiscoveryRangeGroup -GroupName Group1
Remove-DiscoveryRangeGroup -GroupName Group1
Discovery group Group1 was removed
PS C:\Program Files\Dell\SysMgt\Essentials\Tools\CLI> _
```

Figure 6   Removing Discovery Range Group

3.7   Enable discovery range or discovery range group

The enabling or disabling a discovery range, or range group, relates to the software being able to discover and/or inventory it. An enabled group can be discovered and inventoried manually, as well automatically, by the discovery scheduler. A disabled discovery range/ range group cannot be discovered or inventoried.

- `PS> Set-Enable-DiscoveryRange – Range <rangeName> | -RangeList <rangeList.xml>`
- `PS> Set-Enable-DiscoveryRangeGroup –GroupName <groupName>`
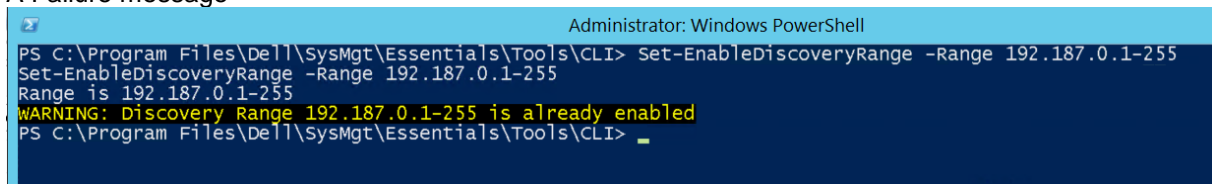
Input Parameter

- The range name, a range list or a discovery group name to be enabled

Output

- A message indicating the operation was successful, or

A Failure message

```
Administrator: Windows PowerShell
PS C:\Program Files\Dell\SysMgt\Essentials\Tools\CLI> Set-EnableDiscoveryRange -Range 192.187.0.1-255
Set-EnableDiscoveryRange -Range 192.187.0.1-255
Range is 192.187.0.1-255
WARNING: Discovery Range 192.187.0.1-255 is already enabled
PS C:\Program Files\Dell\SysMgt\Essentials\Tools\CLI> _
```

Figure 7   Enable Discovery Range

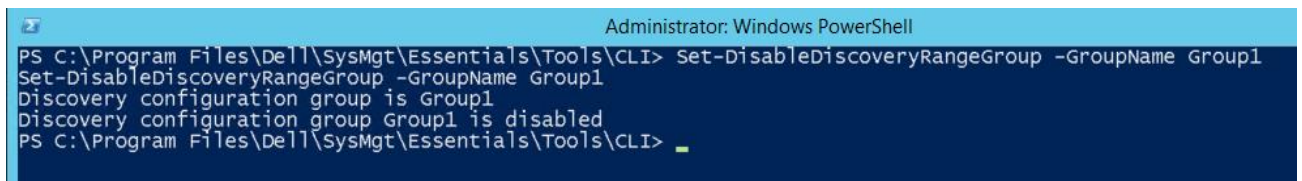## 3.8   Disable discovery range or discovery range group

- `PS> Set-Disable-DiscoveryRange – Range <rangeName> | -RangeList <rangeList.xml>`
- `PS> Set-Disable-DiscoveryRangeGroup –GroupName <groupName>`

Input Parameter

- The range name, a range list or a discovery group name to be disabled

Output

- A message indicating the operation was successful, or
- A Failure message

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Figure 8   Disabling discovery range group

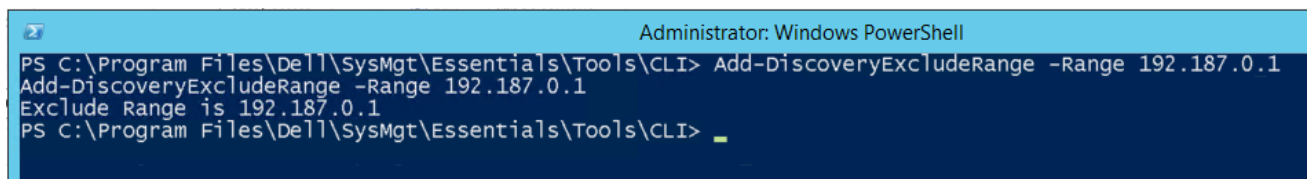## 3.9   Create discovery exclude range
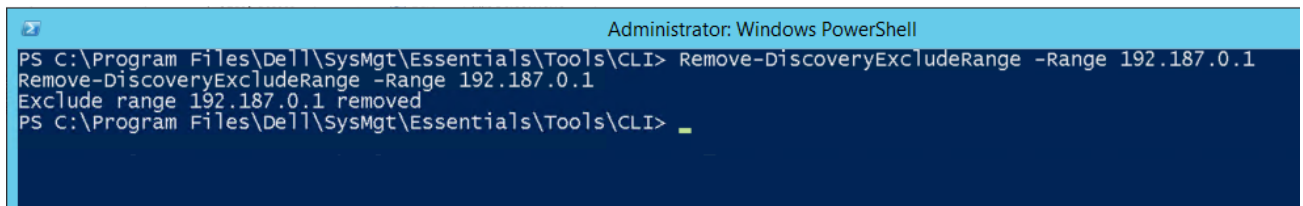
- `PS> Add-DiscoveryExcludeRange –Range<range>`
- `PS> Add-DiscoveryExcludeRange –RangeList <ranges in xml>`

Input Parameters

- An exclude range name
- A list of exclude ranges names in an XML file

Ouput

- A message indicating the operation was successful
- For each range that could not be added, an explanation is returned:
    - Exclude Range <range> exists already

Figure 9   Adding discovery exclude range

3.10   Remove discovery exclude range

- `PS> Remove-DiscoveryExcludeRange –Range <range>`
- `PS> Remove-DiscoveryExcludeRange –RangeList <ranges in xml>`

Input Parameters

- An exclude range name
- A list of exclude ranges names in an XML file

Output

- A message indicating the operation was successful
- For each range that could not be removed, an explanation is returned:
    - Exclude Range <range> does not exist

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Figure 10   Removing discovery exclude range

3.11   Run a discovery range or group: discovery, inventory, discovery & inventory, or status polling

- PS> Set-RunDiscovery   -Range <rangeName> | -RangeGroup < rangeGroupName> | -RangeList <rangeList.xml>
- PS> Set-RunInventory   -Range <rangeName> | -RangeGroup < rangeGroupName> | -RangeList <rangeList.xml>
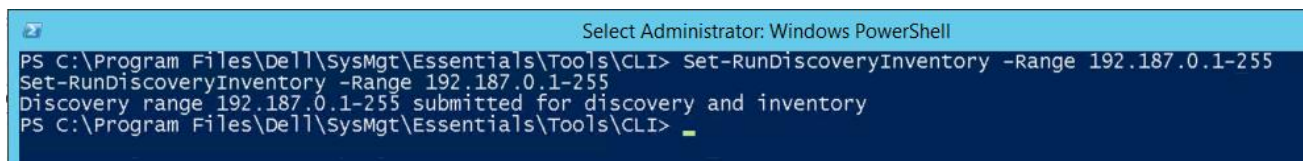- PS> Set-RunDiscoveryInventory   -Range <rangeName> | -RangeGroup < rangeGroupName> | -RangeList <rangeList.xml>
- PS> Set-RunStatusPoll   -Range <rangeName> | -RangeGroup < rangeGroupName> | -RangeList <rangeList.xml>

Input Parameters

- An individual range name
- An individual range group
- A range list of individual ranges

Note—A range list of discovery range groups is currently not supported.

Output

- A message indicating the operation was successful, or
- For each range that has a condition as outlined below, a line will be printed on the console
    - Failed: Range/Range Group does not exist
    - Failed: Range/Range Group currently disabled
    - Failed: <other system error>

Figure 11   Execute discovery and inventory

3.12   Get status execution progress of a discovery range
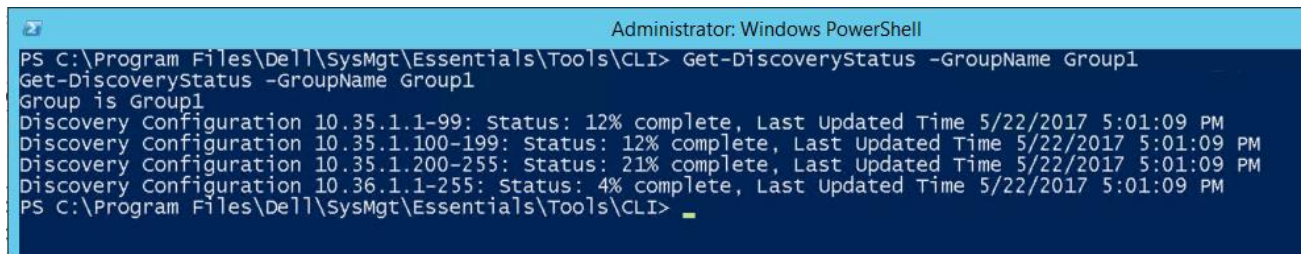
- PS> Get-DiscoveryStatus -Range <rangeName>
- PS> Get-DiscoveryStatus -RangeList <rangeList.xml>
- PS> Get-DiscoveryStatus -GroupName <group name>

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Input Parameters

- <rangeName> The name of the range to execute as shown in the OME discovery portal
- <rangeList.xml> a list of the ranges to get status for
- <group name> The discovery range group name to get execution status for

Output

- Progress information for each range is returned. If a discovery range group is specified, then progress information for each discovery range belonging to the discovery group is returned, or
- A Failure message

Figure 12   Getting discovery status

4 Device group management

The CLI for device group management supports the following functionality:

- Create a custom device group hierarchy [static only]
- Add devices to a custom group
- Remove devices from a custom group
- List device membership in a given custom group
- Delete group (hierarchical)

4.1 Device list details

Some of the commands requires you to provide a list of devices to create/add to, or remove from a device group. A comma-delimited list of device names is sufficient however, it limits extensibility and expandability in the future. Instead, a simple XML template is used to provide a list of devices. A sample XML file format is here:

```
<DeviceList>

  <Device Name=""/>

  <Device Name=""/>

  . . . . . . .

</DeviceList>
```

4.2 Create custom device group

- PS> Add-CustomGroup –Group <groupName> –[DeviceList <deviceList.xml | Devices <comma separated list of devices>]

Input Parameters

- <*groupName*>: This is a hierarchical definition of the group name that will show up in the tree. For example, if the <groupName> is „MyServers', then the group named **MyServers** will appear under root node. If the <groupName> is **Data Centers/Austin/DownTown** then the group hierarchy is built out as needed

Output

- A message indicating the operation was successful, or
- A failure message

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Figure 13   Adding custom group

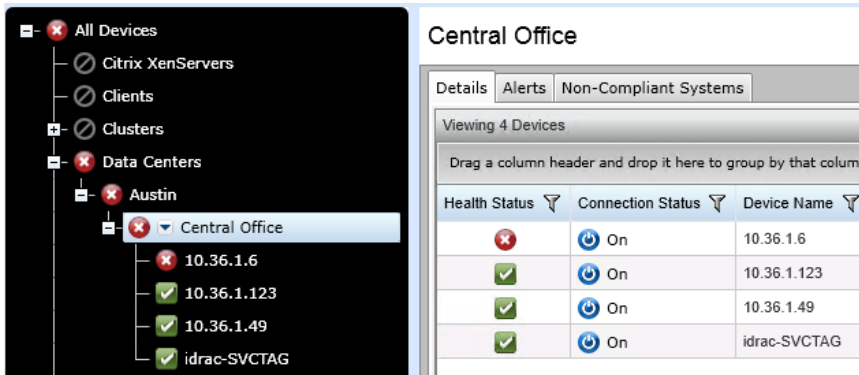Figure 14   Added group in console

4.3   Add devices to a custom group

- PS> Add-DevicesToCustomGroup –Group <groupName> -DeviceList <deviceList>
  | -Devices <comma delimited list of devices>

Input Parameters:

- Group name
- A list of devices that will comprise membership of the group

Note: If the device is not currently discovered and available in the device table in the database, the device name will be ignored.

Output

- Success, or
- Warning: Some devices will not be added to the group, or
- A failure message

Figure 15   Adding devices to custom group

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4.4   Remove devices from custom group

- `PS> Remove-DevicesFromCustomGroup –Group <groupName> -DeviceList <deviceList.xml> | -Devices <comma delimited list of devices>`
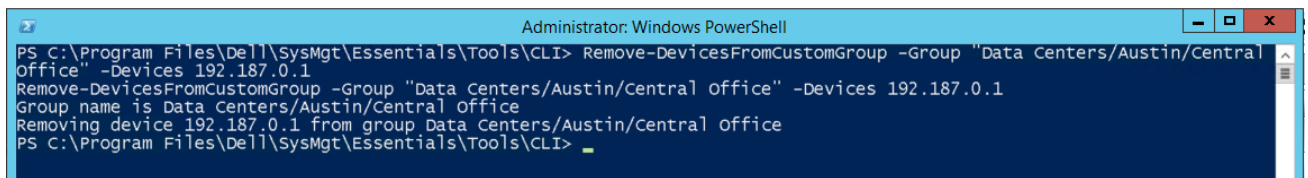
Input Parameters

- Group Name to remove devices from
- A list of devices to remove

Output

- Success, or

Note: If any of the devices specified in the device list are not members of the group, the devices are ignored and a warning message is displayed.

- A failure message

Figure 16   Removing devices from custom group

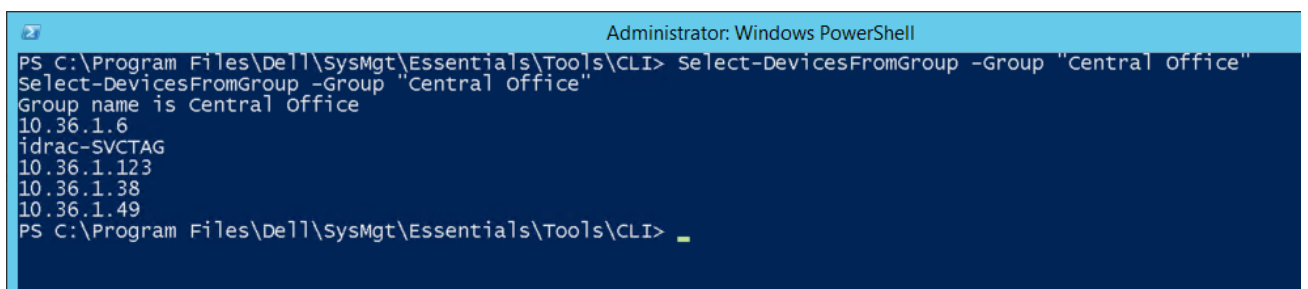## 4.5   Listing device membership

- `PS> Select-DevicesFromGroup –Group <groupName>`

Input Parameters

- Group Name

Output

- A list of device comprising the group one per line, or
- A failure message

Figure 17   Listing devices in a custom group

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4.6 Deleting group
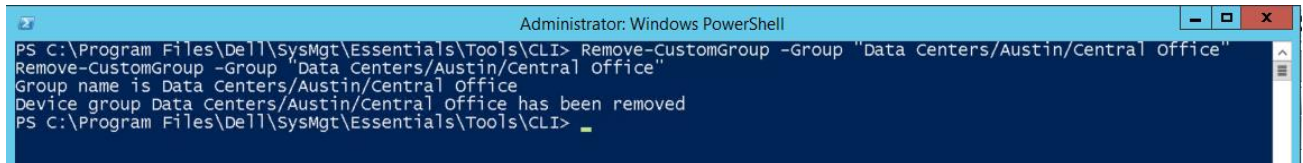
- `PS> Remove-CustomGroup – Group <groupName>`

Input Parameters

- Group Name

Output

- Success, or
- A failure message

```
PS C:\Program Files\Dell\SysMgt\Essentials\Tools\CLI> Remove-CustomGroup -Group "Data Centers/Austin/Central Office"
Remove-CustomGroup -Group "Data Centers/Austin/Central Office"
Group name is Data Centers/Austin/Central Office
Device group Data Centers/Austin/Central Office has been removed
PS C:\Program Files\Dell\SysMgt\Essentials\Tools\CLI>
```

Figure 18   Remove custom group

5 Known issues

Issue: Optional flags for passing passwords from command line are not working.

Solution: Do not pass the flag for password(s). If the selected protocol(s) require(s) password, it will be prompted.

A Technical support and resources

Dell.com/support is focused on meeting customer needs with proven services and support.

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