# Dell OpenManage Plug-in Version 2.0 for Nagios Core
# User's Guide

# Notes, cautions, and warnings

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

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

**WARNING: A WARNING indicates a potential for property damage, personal injury, or death.**



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# Contents

# 1

# Introduction to Dell OpenManage Plug-in Version 2.0 for Nagios Core

This guide provides information about using the Dell OpenManage Plug-in Version 2.0 for Nagios Core and its various features such as discovering, monitoring, launching consoles, and troubleshooting of the supported Dell devices. The guide also provides details of the supported Dell devices and frequently asked questions by the customer.

This plug-in provides capabilities to monitor Dell devices in environments managed by Nagios Core. This plug-in, gives you complete hardware-level visibility of Dell devices, including overall and component-level health monitoring. The plug-in provides basic inventory information and event monitoring of Dell devices. The plug-in also supports one-to-one web console launch of the supported Dell devices for further troubleshooting, configuration, and management activities.

For more details on device support, see Support matrix in the "*Dell OpenManage Plug-in Version 2.0 for Nagios Core User's Guide*."

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# What is new in Dell OpenManage Plug-in version 2.0

The following table lists the new features and functionality of the Dell OpenManage Plug-in version 2.0:

**Table 1. New features and functionality**

| New Feature | Description |
|---|---|
| Support for new Dell devices | With this version, you can discover and monitor the following new Dell devices:<br>• New launches of 13th generations of Dell PowerEdge servers through Integrated Dell Remote Access Controller (iDRAC) with Lifecycle Controller (LC)<br>• Dell Datacenter Scalable Solutions (DSS)<br>• Dell PowerEdge FX2/FX2s chassis<br>• Dell PowerEdge VRTX chassis<br>• Dell PowerEdge M1000e chassis<br>• Dell EqualLogic PS-Series Storage Arrays<br>• Dell PowerVault MD 34/38 Series Storage Arrays<br>• Dell Compellent Storage Arrays<br>For more details on device support, see Support matrix in the "*Dell OpenManage Plug-in Version 2.0 for Nagios Core User's Guide*." |
| Monitor basic system information including component level | This version provides basic system information including component level details of the following Dell devices:<br>• Dell PowerEdge FX2/FX2s chassis<br>• Dell PowerEdge VRTX chassis<br>• Dell PowerEdge M1000e chassis<br>• Dell EqualLogic PS-Series Storage Arrays<br>• Dell PowerVault MD 34/38 Series Storage Arrays<br>• Dell Compellent Storage Arrays |
| Latest firmware version | This version supports the latest firmware versions for the Dell 12th and later generations of Dell PowerEdge servers (iDRAC7 and iDRAC8). |
| Upgrade to Dell OpenManage Plug-in version 2.0 for Nagios Core | You can upgrade from Dell OpenManage Plug-in Version 1.0 to Dell OpenManage Plug-in Version 2.0. |
| View and monitor SNMP alerts | View and monitor SNMP alerts from the supported Dell devices. |

| New Feature | Description |
|---|---|
| Trap based health monitoring | Trap based health monitoring of the supported Dell devices. |
| Launch Dell device specific consoles | This version supports the launch the following Dell one-to-one consoles to perform further troubleshooting, configuration, or management activities for the supported Dell devices:<br>• **Dell PowerEdge M1000e Chassis Controller Management Console** for Dell PowerEdge M1000e Chassis<br>• **Dell PowerEdge VRTX Chassis Controller Management Console** for Dell PowerEdge VRTX Chassis<br>• **Dell PowerEdge FX2/FX2s Chassis Controller Management Console** for Dell PowerEdge FX2/FX2s Chassis<br>• **Dell Compellent Storage Manager Console** for Dell Compellent Storage Arrays<br>• **Dell EqualLogic Group Manager Console** for Dell EqualLogic PS-Series Storage Arrays |
| View warranty information | This feature allows you to monitor the discovered Dell device's warranty details in the Nagios Core console. You can view the warranty information for all the supported Dell devices. |
| View Knowledge Base (KB) messages | You can get more information about the SNMP alerts through the KB articles associated with those alerts. You can view the KB messages for all the Dell devices except Dell Compellent Storage Arrays and Dell PowerVault MD Storage Arrays. |

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# Key features

The key features of the Dell OpenManage Plug-in Version 2.0 for Nagios Core are as described in the following table.

**Table 2. Key features**

| Feature | Functionality |
|---|---|
| Device discovery | Discovers the supported Dell devices in the Nagios Core console. Once the discovery is complete, host and service definitions are created for each device.<br><br>To discover Dell Servers through iDRAC with Lifecycle Controller, you can opt for either SNMP or WS-MAN protocol. Dell storage is discovered using SNMP protocol. Dell chassis is discovered using WS-MAN protocol. |
| Device information | Displays information about the discovered device (Service Tag, Firmware Version, Device Name, Device Model, and so on) and its components (Physical Disks, Power Supply, Temperature Probe, Voltage Probe, and so on) after a device discovery is successful. You can view this information in the **Hosts** or **Services** view in the Nagios Core console.<br><br>For more information about the device information provided by the Plug-in, see Device Information. |
| Monitor overall health of Dell devices | Monitors the overall health of Dell devices in a scheduled or periodic manner. |
| Component level health of Dell devices | Monitors the health of device components (Physical Disks, Power Supply, Temperature Probe, Voltage Probe, and so on) and displays information about the Dell device component status at scheduled time intervals. |
| Monitor SNMP alerts | Monitors SNMP alerts for Dell devices. This feature displays only the last received SNMP alert.<br><br>To view all received SNMP alerts navigate to **Reports** → **Alerts** → **History** in the Nagios Core console.<br>You can also view the Alert Knowledge Base (KB) information for the supported Dell devices corresponding to an SNMP alert for faster troubleshooting of the respective alert.<br><br>For more information, see **Knowledge Base (KB) messages for the generated alerts** in the *Dell OpenManage Plug-in Version 2.0 for Nagios Core User's Guide*. |

| Feature | Functionality |
| --- | --- |
| Launching device specific consoles | Launches the respective Dell one-to-one consoles to further troubleshoot and manage the supported Dell devices. For more informations, see Launching Dell Device Specific Consoles. |
| Warranty information | Monitors and displays the warranty information for the supported Dell devices in a periodic manner and displays the status in the Nagios Core console. For more information, see Warranty information for Dell devices. |

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# Support matrix

Dell OpenManage Plug-in for Nagios Core supports the Dell devices as listed in the following tables.

## Dell Datacenter Scalable Solutions

**Table 3. Supported Dell Datacenter Scalable Solutions.**

| Dell Datacenter Scalable Solutions (DSS) |
|---|
| DSS 1500 |
| DSS 1510 |
| DSS 2500 |

## Dell PowerEdge Servers

**Table 4. Supported Dell PowerEdge Servers.**

| 12th generation of PowerEdge servers | 13th generation of PowerEdge servers |
|---|---|
| FM120x4 | C4130 |
| M420 | C6320 |
| M520 | FC230 |
| M620 | FC430 |
| M820 | FC630 |
| R220 | FC830 |
| R320 | M630 |
| R420 | M830 |
| R520 | R230 |
| R620 | R330 |
| R720xd | R430 |
| R820 | R530 |
| R920 | R530xd |
| T320 | R630 |
| T420 | R730 |
| T620 | R730xd |

| 12th generation of PowerEdge servers | 13th generation of PowerEdge servers |
|---|---|
| | R930 |
| | T130 |
| | T330 |
| | T430 |
| | T630 |

# Dell Chassis

**Table 5. Supported Dell chassis.**

| |
|---|
| Dell PowerEdge FX2 |
| Dell PowerEdge FX2s |
| Dell PowerEdge VRTX |
| Dell PowerEdge M1000e |

# Dell Compellent Storage Arrays

**Table 6. Supported Dell Compellent Storage Arrays.**

| |
|---|
| Compellent Series 40 |
| Compellent SC4020 |
| Compellent SC8000 |

# Dell EqualLogic PS-Series Storage Arrays

**Table 7. Supported Dell EqualLogic PS-Series Storage Arrays.**

| | |
|---|---|
| EqualLogic PS4100 | EqualLogic PS6100 |
| EqualLogic PSM4110 | EqualLogic PS6210 |
| | EqualLogic PS6500 |
| | EqualLogic PS6510 |

# Dell PowerVault MD Storage Arrays

**Table 8. Supported Dell PowerVault MD Storage Arrays.**

| |
|---|
| PowerVault MD3400 |
| PowerVault MD3420 |
| PowerVault MD3460 |

PowerVault MD3800f

PowerVault MD3800i

PowerVault MD3820f

PowerVault MD3820i

PowerVault MD3860f

PowerVault MD3860i

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# Device discovery and inventory

## About device discovery

You can discover the supported Dell devices with this plug-in in the Nagios Core console. The monitoring protocols for the supported Dell devices are as follows:

- Dell Servers are discovered using SNMP or WS-MAN protocol

  **NOTE:** At a time you can discover a Dell Server using SNMP or WS-MAN protocol and not both. To rediscover a server previously discovered through SNMP protocol with WS-MAN protocol or vice versa, run the discovery script with the `-f` option along with the parameter for the desired protocol.

  For example:

  If a server was discovered using SNMP protocol, but you want to discover the same device using WS-MAN protocol, navigate to `<NAGIOS_HOME>/dell/scripts`, and run the following PERL script:

  ```
  perl dell_device_discovery.pl -H <host or IP Address> -P 2 -f
  ```

  `<NAGIOS_HOME>` is the installed location of Nagios Core and by default, the location of `<NAGIOS_HOME>` is `/usr/local/nagios`.
- Dell Chassis are discovered using WS-MAN protocol. Ensure that you only monitor Dell chassis using local user credentials.
- Dell Storage are discovered using SNMP protocol

You must use **Dell Device Discovery Utility** to discover Dell devices. If the discovery is successful, then for the discovered devices, host and service definition files are created. For a device, it is recommended to have a unique host name and IP address. In Nagios Core, ensure that a host and service definition is not already present for a Dell device that you want to discover.

You can discover devices using any of the following:

- Device's IP address or FQDN
- Subnet with mask
- File containing a list of device IP addresses or FQDNs

**NOTE:** To customize the number of discovery processes that can run simultaneously, based on your requirements, navigate to **Dell_OpenManage_Plugin → resources → dell_pluginconfig.cfg** file and edit the default numerical value for the following parameter:

**process.count**. Its default value is 20.

The recommended value for **process.count** is a value between 1 and 150.

# About Dell device discovery utility

To run the **Dell Device Discovery Utility**, navigate to<NAGIOS_HOME>/dell/scripts, and run the following PERL script:

```
perl dell_device_discovery.pl -h
```

All the available Dell device discovery utility options are displayed.

```
perl dell_device_discovery.pl -H <Host or IP address> | -F <IP address list file> | -S <Subnet with mask> [-P <Protocol>] [-c <Protocol specific config file>] [-t <Service template file>] [-f] [-d]
```

**Table 9. Dell device discovery utility options**

| Options | Short Description | Description |
|---|---|---|
| -h | help | Display help text. |
| -H | host | Host IP address or FQDN name. |
| -S | subnet | Subnet with mask. |
| -F | file | File with absolute path containing list of newline separated IP address or FQDN name. |
| -P | protocol | Protocol used for monitoring. Allowed options 1 (SNMP) and 2 (WS-MAN).<br>If -P is not used, the Dell server will be discovered using SNMP Protocol by default.<br>This value is optional. |
| -c | config file | Protocol specific configuration file.<br>The default file is .dell_device_comm_params.cfg. For more information see About Protocol Parameters. |
| -t | template | Template file with absolute path for customized service monitoring.<br>The default file is dell_device_services_template.cfg |
| -f | force | Force rewrite of config file.<br>This option is used to rediscover an already discovered device. |

| Options | Short Description | Description |
|---|---|---|
| -d | detailed services | All services monitor option based on services defined in service template file.<br>If you run the utility without this option, then the basic three services are created. For more information, see *Table 3. Default services created based on selected protocol.*<br>. |

Based on the options you selected during discovery, the following services are associated with that host:

- If you run `perl dell_device_discovery.pl` without the `-d` option, then only the basic services are created by default and displayed in the user interface under **Services**.

  NOTE: SNMPTT must be configured for you to be able to receive traps.

- If you run `perl dell_device_discovery.pl` with the `-d` option, additional services are created as listed in the the table below, and are displayed in the Nagios Core console under **Services**:

**Table 10. Default services created for Dell servers based on the selected protocol**

| Services | SNMP | WS-MAN Protocol |
|---|---|---|
| **Basic Services** | | |
| Dell Server Overall Health Status | √ | √ |
| Dell Server Information | √ | √ |
| Dell Server Traps | √ | √ |
| **Detailed Services** | | |
| Dell Server Physical Disk Status | √ | √ |
| Dell Server Virtual Disk Status | √ | √ |
| Dell Server Fan Status | √ | √ |
| Dell Server Battery Status | √ | √ |
| Dell Server Intrusion Status | √ | √ |
| Dell Server Network Device Status | √ | √ |
| Dell Server Voltage Probe Status | √ | √ |
| Dell Server Controller Status | √ | √ |
| Dell Server Amperage Probe Status | √ | √ |
| Dell Server CPU Status | √ | X |
| Dell Server Power Supply Status | √ | X |
| Dell Server Temperature Probe Status | √ | √ |
| Dell Server SD Card Status | X | √ |

| Services | SNMP | WS-MAN Protocol |
|---|---|---|
| Dell Server FC NIC Status | X | √ |
| Dell Server Warranty Information | √ | √ |

**Table 11. Default services created for all Dell Chassis based on WS-MAN protocol**

| Services |
|---|
| **Basic Services** |
| Dell Chassis Overall Health Status |
| Dell Chassis Information |
| Dell Chassis Traps |
| **Detailed Services** |
| Dell Chassis Fan Status |
| Dell Chassis Slot Information |
| Dell Chassis I/O Module Status |
| Dell Chassis Power Supply Status |
| Dell Chassis KVM Status |
| Dell Chassis Enclosure Status (This service is applicable to Dell PowerEdge VRTX Chassis only) |
| Dell Chassis Controller Status (This service is applicable to Dell PowerEdge VRTX Chassis only) |
| Dell Chassis Physical Disk Status (This service is applicable to Dell PowerEdge VRTX Chassis only) |
| Dell Chassis Virtual Disk Status (This service is applicable to Dell PowerEdge VRTX Chassis only) |
| Dell Chassis PCIe Devices Status (This service is applicable to Dell PowerEdge VRTX Chassis and Dell PowerEdge FX2/FX2s Chassis only) |
| Dell Chassis Warranty Information |

**Table 12. Default services created for Dell Compellent Storage Arrays based on SNMP protocol**

| Services |
|---|
| **Basic Services** |
| Dell Storage Compellent Overall Health Status |
| Dell Storage Compellent Information |
| Dell Storage Compellent Management Traps |
| Dell Storage Compellent Controller Traps |
| Dell Storage Compellent Controller Overall Health Status |
| Dell Storage Compellent Controller Information |
| **Detailed Services** |
| Dell Storage Compellent Physical Disk Status |
| Dell Storage Compellent Volume Status |
| Dell Storage Compellent Controller Warranty Information |

**Table 13. Default services created for Dell EqualLogic PS-Series Storage Arrays based on SNMP protocol**

| Services |
|---|
| **Basic Services** |
| Dell Storage EqualLogic Member Overall Health Status |
| Dell Storage EqualLogic Member Information |
| Dell Storage EqualLogic Group Information |
| Dell Storage EqualLogic Member Traps |
| **Detailed Services** |
| Dell Storage EqualLogic Member Physical Disk Status |
| Dell Storage EqualLogic Group Volume Status |
| Dell Storage EqualLogic Group Storage Pool Status |
| Dell Storage EqualLogic Member Warranty Information |

**Table 14. Default services created for Dell PowerVault MD Storage Arrays based on SNMP protocol**

| Services |
|---|
| **Basic Services** |
| Dell Storage PowerVault MD Overall Health Status |
| Dell Storage PowerVault MD Information |
| Dell Storage PowerVault MD Traps |
| **Detailed Services** |
| Dell Storage PowerVault MD Warranty Information |

## Choosing the services to monitor for a Dell device

By default, all the available services are created for a Dell device during discovery as supported by the protocol you have selected. If you wish to monitor only specific services for a discovered Dell device while ignoring those services you do not wish to monitor, you can do so by navigating to the **Dell_OpenManage_Plugin → scripts → dell_device_services_template.cfg** file and commenting those services you wish to ignore.

For example:

The default services as listed in the `dell_device_services_template.cfg` file for Dell Servers discovered using WS-MAN protocol are as follows:

- Dell Server SD Card Status
- Dell Server FC NIC Status

If you do not wish to monitor the `Dell Server FC NIC Status` service, simply comment the starting of the line using `#` as follows:

#Dell Server FC NIC Status

This service will not be created for the discovered Dell server in the Nagios Core console.

# About protocol parameters

During discovery, depending on the protocol you have selected, SNMP or WS-MAN, you can set values for the protocol in the parameters file, `.dell_device_comm_params.cfg`.

The `.dell_device_comm_params.cfg` file is present at the following location:**<NAGIOS_HOME>/dell/scripts**. The options provided are:

**Table 15. Parameters file**

| Protocol communication parameters | Description |
|---|---|
| SNMP | |
| `snmp.version` | Use to input the SNMP version. Default version is `2`. |
| `snmp.community` | Use to input the user macro for SNMP community string. |
| `snmp.retries` | Use to input the number of times an SNMP request must be sent when a timeout occurs . Default retry value is 1. |
| `snmp.timeout` | Use to input SNMP timeout value in seconds. Default timeout value is 3 seconds. |
| `snmp.port` | Use to input the SNMP port value. Default SNMP port value is 161. |
| WS-MAN | |
| `wsman.username` | Use to input the user macro for WS-MAN service account user name. |
| `wsman.password` | Use to input the user macro for WS-MAN service account password. |
| `wsman.port` | Use to input the WS-MAN port value. Default value is 443. |
| `wsman.timeout` | Use to input WS-MAN timeout value in seconds. Default timeout value is 60 seconds. |
| `wsman.retries` | Use to input the number of times a WS-MAN request must be sent when a timeout occurs. Default retry value is 2. |

**NOTE:**
You can configure the user macros, `snmp.community`, `wsman.username`, and `wsman.password` in the file `dell_resources.cfg` available at the location: **<NAGIOS_HOME>/dell/resources/**

# Discovering Dell devices

You can discover all the supported Dell devices using this plug-in.

**Prerequisites**:

- If you are using SNMP protocol for discovery, ensure that SNMP version 1 or SNMP version 2 are enabled, community string is set and configured for Servers or Dell Storage devices. For more information see Appendix.
- A secured network connectivity is established between Nagios Core and the device.
- It is recommended that the device must have a resolvable FQDN.
- WS-MAN is enabled and configured for discovering Dell chassis devices
- If you are using WS-MAN protocol, it is recommended that you use non-default account credentials.

To discover Dell devices:

1. Log in to Nagios Core with Nagios administrator privileges.
2. Navigate to the directory `<NAGIOS_HOME>/dell/scripts`
3. Run the Dell Device Discovery Utility with the option: `perl dell_device_discovery.pl -h`
   The script syntax and information on options are displayed. For more information see About Dell Discovery Utility.

   Based on your requirement do the following:

   **NOTE:** Before running the utility, ensure that you have updated protocol related information, for more information see About Protocol Parameters.

   To discover a device using an IP address or FQDN:

   - `perl dell_device_discovery.pl -H <IP address or FQDN name>`

   To discover using subnet with mask:

   - `perl dell_device_discovery.pl -S <Subnet with mask>`

     An example format for subnet with mask: 11.98.149.0/24

   To discover using a list of IP addresses present in a file:

   - `perl dell_device_discovery.pl -F <IP address list file>`
   - For the `-P` option, Opt for a protocol:

     **NOTE:** Ensure that the IP list that you provide in the file is new-line separated.
4. When prompted to confirm the discovery of the Dell device (s), press **Y** and then **Enter** to continue. To exit the discovery process, press any other key followed by **Enter** or press **Enter** to exit.
5. Once the discovery utility script is run, verify the Nagios configuration by running the command `<NAGIOS_HOME>/bin/nagios -v /usr/local/nagios/etc/nagios.cfg`.
6. Ensure that no errors are present and then restart Nagios Core by running the command `service nagios restart`.
7. You can view the logged information in the Log file path: `<NAGIOS_HOME>/var/dell/discovery_<yyyymmddhhmiss>.dbg`

In the filename, <yyyymmddhhmiss> pertains to the time when the log information was gathered; yyyy is the calendar year, mm is month, dd is date, hh is hour of the day, mi is minutes, and ss is seconds.

**After completion of discovery**:

- Dell device Host definition and its service definitions are created in the Nagios server and this is subsequently used for monitoring the Dell devices.

  The discovered Dell devices and their services are displayed in the **Host** view and the **Services** view in the Nagios Core console. Wait for the scheduled service to complete for the service details to be displayed.
- The discovered Dell devices are displayed in the **Map** view in the Nagios Core console.

**Using the -t or the -c options**

The -t option can be used while discovering the Dell devices if you have modified the dell_device_services_template.cfg file, which is the template file for basic or detailed monitoring of Dell devices, according to your requirement and the file is saved in a non-default location.

*Format:*

```
perl dell_device_discovery.pl -H <IP address list file> -t <Complete path of the services template file>
```

The -c option can be used while discovering the Dell devices if you have modified the dell_device_comm_params.cfg file, which is the protocol specific configuration file, according to your requirement and the file is saved in a non-default location.

*Format:*

```
perl dell_device_discovery.pl -H <IP address list file> -c <Complete path of the protocol specific config file>
```

# Device information

## About device information

The Dell device information service provides the basic information about the system. By default this service is polled once a day.

**Table 16. Device Information**

| Service | Status | Description | Attributes Displayed |
|---|---|---|---|
| **Dell Server Information** | The following states are possible:<br>• **OK**<br>• **Unknown**<br>• **Critical**<br>• **Warning** | This service provides the basic device inventory information. | • Server Host FQDN<br>• Model Name<br>• Device Type (iDRAC7 or iDRAC8)<br>• Service Tag<br>• Product Type (Monolithic or Modular)<br>• Chassis Tag |

| Service | Status | Description | Attributes Displayed |
|---|---|---|---|
| | | NOTE: Chassis Tag is applicable only for modular servers and Node ID is applicable only for PowerEdge FM120x4 | • iDRAC Firmware Version<br>• OS Name<br>• OS Version<br>• iDRAC URL<br>• Node Id |
| **Dell Chassis Information** | The following states are possible:<br>• **OK**<br>• **Unknown**<br>• **Critical**<br>• **Warning** | This service provides the basic device inventory information for Dell PowerEdge M1000e, PowerEdge VRTX, and PowerEdge FX2/FX2s chassis. | • Chassis Name<br>• Model Name<br>• Service Tag<br>• CMC Firmware Version<br>• CMC URL |
| **Dell Storage Compellent Controller Information** | The following states are possible:<br>• **OK**<br>• **Unknown**<br>• **Critical**<br>• **Warning** | This service provides the basic device inventory information for Dell Compellent Controller IP | • Controller Name<br>• Model Name<br>• Service Tag<br>• Compellent URL<br>• Primary Controller |
| **Dell Storage Compellent Information** | The following states are possible:<br>• **OK**<br>• **Unknown**<br>• **Critical**<br>• **Warning** | This service provides the basic device inventory information for Dell Compellent Management IP | • Storage Name<br>• Firmware Version<br>• Primary Controller Name<br>• Primary Controller IP<br>• Primary Controller Service Tag<br>• Primary Controller Model<br>• Secondary Controller Name<br>• Secondary Controller IP<br>• Secondary Controller Service Tag<br>• Secondary Controller Model<br>• Compellent URL |
| **Dell Storage EqualLogic Member Information** | The following states are possible:<br>• **OK**<br>• **Unknown**<br>• **Critical**<br>• **Warning** | This service provides the basic device inventory information for the Dell EqualLogic Member. | • Member Name<br>• Product Family<br>• Model Name<br>• Service Tag<br>• Firmware Version<br>• Chassis Type |

| Service | Status | Description | Attributes Displayed |
|---|---|---|---|
| | | | • Disk Count<br>• Capacity (GB)<br>• Free Space (GB)<br>• RAID Policy<br>• RAID Status<br>• Group Name<br>• Group IP<br>• Storage Pool |
| **Dell Storage EqualLogic Group Information** | The following states are possible:<br>• **OK**<br>• **Unknown**<br>• **Critical**<br>• **Warning** | This service provides the basic device inventory information for Dell EqualLogic Groups | • Group Name<br>• Group URL<br>• Member Count<br>• Volume Count |
| **Dell Storage PowerVault MD Information** | The following states are possible:<br>• **OK**<br>• **Unknown**<br>• **Critical**<br>• **Warning** | This service provides the basic device inventory information for Dell PowerVault MD Storage Arrays | • Storage Name<br>• Product ID<br>• Service Tag<br>• World-wide ID |

For attributes information on various components, see About Monitoring Component Health of Dell Devices.

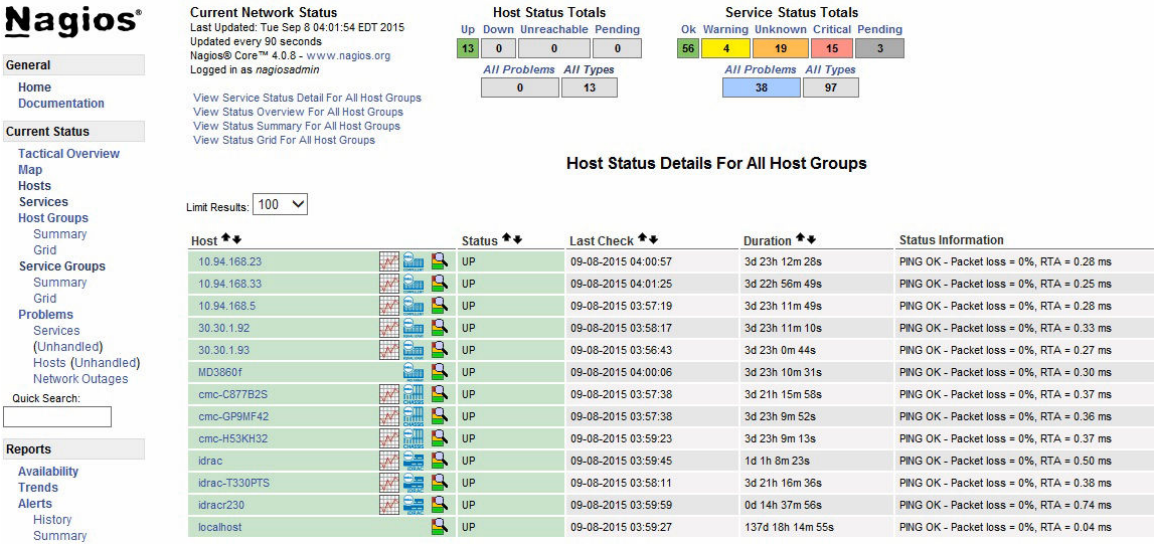
### Viewing device information

To view the information about Dell devices once the **Dell Server Information** service is run, navigate to **Current Status** → **Services** in the Nagios Core console in the left pane. The device information is displayed in the right pane.

## Viewing Dell devices in the Nagios Core console

To view the Dell devices in the Nagios Core console, ensure that the devices are already discovered and inventoried.
You can view the discovered Dell devices in Nagios Core in the **Hosts** or the **Services** view:

1. To view the hosts in the Nagios Core, select **Hosts** under **Current Status** in the left pane.
   The hosts are displayed in the right pane.




2. To view the services associated with the hosts in the Nagios Core, select **Services** under **Current Status** in the left pane.

   The services are displayed in the right pane.

## Service Status Details For All Hosts

Limit Results: 100

| Host | Service | Status | Last Check | Duration | Attempt | Status Information |
|---|---|---|---|---|---|---|
| 10.94.168.23 | Dell Storage Compellent Controller Information | OK | 09-07-2015 04:49:26 | 3d 23h 14m 56s | 1/10 | Controller Name = SN 64924<br>Model Name = CT_SC8000<br>Service Tag = 2D77F2S<br>Compellent URL = https://10.94.168.5<br>Primary Controller = Yes |
| | Dell Storage Compellent Controller Overall Health Status | OK | 09-08-2015 00:54:39 | 3d 23h 9m 43s | 1/10 | Overall Controller = OK |
| | Dell Storage Compellent Controller Traps ? | OK | 09-04-2015 06:16:46 | 3d 21h 47m 36s | 1/1 | NORMAL_6_202 |
| | Dell Storage Compellent Controller Warranty Information | CRITICAL | 09-07-2015 14:04:55 | 3d 16h 59m 27s | 10/10 | #1 ServiceTag = 2D77F2S, Service Level Details = COPOW(9x5) (no description available), Item Number = WXSPE13-COS8, Device Type = COMPELLENT SC8000,1st,2nd,UPG, Ship Date (UTC) = 2012-09-25 14:00:00, Start Date (UTC) = 2015-09-26 14:00:00, End Date (UTC) = 2018-09-26 13:59:59, Days Remaining = 1115<br>#2 ServiceTag = 2D77F2S, Service Level Details = COSWTS (no description available), Item Number = WXSF413-COS8, Device Type = COMPELLENT SC8000,1st,2nd,UPG, Ship Date (UTC) = 2012-09-25 14:00:00, Start Date (UTC) = 2012-09-25 14:00:00, End Date (UTC) = 2015-09-26 13:59:59, Days Remaining = 19<br>#3 ServiceTag = 2D77F2S, Service Level Details = DL (no description available), Item Number = WXTPE13-CO, Device Type = COMPELLENT SC8000,1st,2nd,UPG, Ship Date (UTC) = 2012-09-25 14:00:00, Start Date (UTC) = 2012-09-25 14:00:00, End Date (UTC) = 2015-09-26 13:59:59, Days Remaining = 19<br>#4 ServiceTag = 2D77F2S, Service Level Details = COSWTS (no description available), Item Number = WXSHA93-COS8, Device Type = COMPELLENT SC8000,1st,2nd,UPG, Ship Date (UTC) = 2012-09-25 14:00:00, Start Date (UTC) = 2012-09-25 14:00:00, End Date (UTC) = 2012-12-27 12:59:59, Days Remaining = 0 |
| 10.94.168.33 | Dell Storage Compellent Controller Information | OK | 09-07-2015 05:05:05 | 3d 22h 59m 17s | 1/10 | Controller Name = SN 64925<br>Model Name = CT_SC8000<br>Service Tag = 1D77F2S<br>Compellent URL = https://10.94.168.5<br>Primary Controller = No |
| | Dell Storage Compellent Controller Overall Health Status | OK | 09-08-2015 01:10:18 | 3d 22h 54m 4s | 1/10 | Overall Controller = OK |
| | Dell Storage Compellent Controller Traps ? | PENDING | N/A | 0d 22h 1m 55s+ | 1/1 | Service is not scheduled to be checked... |
| | Dell Storage Compellent Controller Warranty Information | CRITICAL | 09-07-2015 14:15:31 | 3d 22h 48m 51s | 10/10 | #1 ServiceTag = 1D77F2S, Service Level Details = COPOW(9x5) (no description available), Item Number = WXSPE13-COS8, Device Type = COMPELLENT SC8000,1st,2nd,UPG, Ship Date (UTC) = 2012-09-25 14:00:00, Start Date (UTC) = 2015-09-26 14:00:00, End Date (UTC) = 2018-09-26 13:59:59, Days Remaining = 1115<br>#2 ServiceTag = 1D77F2S, Service Level Details = DL (no description available), Item Number = WXTPE13-CO, Device Type = COMPELLENT SC8000,1st,2nd,UPG, Ship Date (UTC) = 2012-09-25 14:00:00, Start Date (UTC) = 2012-09-25 14:00:00, End Date (UTC) = 2015-09-26 13:59:59, Days Remaining = 19<br>#3 ServiceTag = 1D77F2S, Service Level Details = COSWTS (no description available), Item Number = WXSF413-COS8, Device Type = COMPELLENT SC8000,1st,2nd,UPG, Ship Date (UTC) = 2012-09-25 14:00:00, Start Date (UTC) = 2012-09-25 14:00:00, End Date (UTC) = 2015-09-26 13:59:59, Days Remaining = 19<br>#4 ServiceTag = 1D77F2S, Service Level Details = COSWTS (no description available), Item Number = WXSHA93-COS8, Device Type = COMPELLENT SC8000,1st,2nd,UPG, Ship Date (UTC) = 2012-09-25 14:00:00, Start Date (UTC) = 2012-09-25 14:00:00, End Date (UTC) = 2012-12-27 12:59:59, Days Remaining = 0 |

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# Monitor Dell devices

You can monitor the aspects of Dell devices as explained in the following sections.

## Overall health status of the Dell devices

You can monitor the overall health status of the Dell devices in the Nagios Core console. The overall health status is an aggregate status of the components of the supported Dell devices.

### About overall health status

Overall health status of a device is polled periodically based on the configured interval. By default, the Overall Health Status service is scheduled once an hour.

**Table 17. Overall health Status information**

| Service | Status | Description | Attributes Displayed when using WS-MAN | Attributes Displayed when using SNMP |
|---|---|---|---|---|
| **Dell Server Overall Health Status** | The following states are possible for the supported Dell devices:<br>• **OK**<br>• **Warning**<br>• **Unknown**<br>• **Critical** | Provides global health status of Dell servers. | • Overall System<br>• Battery<br>• Memory<br>• Voltage<br>• Storage<br>• Power Supply<br>• Fan | • Overall System<br>• Dell Internal Dual SD Module (IDSDM) Card Unit<br>• Battery<br>• Power Supply<br>• Secure Digital (SD) Card Device<br>• SD Card Unit<br>• Cooling Unit<br>• Fan<br>• Chassis<br>• IDSDM Card Device<br>• Amperage<br>• Power Unit<br>• Voltage<br>• Processor<br>• Temperature<br>• Chassis Intrusion |

| Service | Status | Description | Attributes Displayed when using WS-MAN | Attributes Displayed when using SNMP |
|---|---|---|---|---|
| | | | | • Storage |
| **Dell Chassis Overall Health Status** | | Provides global health status of Dell chassis. | Overall Chassis | NA |
| **Dell Storage EqualLogic Member Overall Health** | | Provides global health status of Dell EqualLogic Storage Arrays. | NA | Overall Member |
| **Dell Storage Compellent Overall Health Status** | | Provides global health status of Dell Compellent Storage Arrays. | NA | Overall Storage Center |
| **Dell Storage Compellent Controller Overall Health Status** | | Provides global health status of Dell Compellent Storage Array's controller. | NA | Overall Controller |
| **Dell Storage PowerVault MD Overall Health Status** | | Provides global health status of Dell PowerVault MD Storage Arrays. | NA | Overall Storage Array |

NOTE: Status of Storage attribute is representative of cumulative health status of storage components like physical disk, virtual disk, controller, and so on.

### Viewing overall health status

Before you monitor the health of the discovered Dell devices in your data center environment, ensure that the discovered devices are reachable.

To view the overall health of Dell devices:

1. In Nagios Core user interface, under **Current Status**, select **Services**.
2. Select the associated service to view the overall health status.

   Health polling of servers is done through iDRAC with LC and the corresponding objects are shown in their respective health service with proper severity health color.

## Monitor component health of Dell devices

You can monitor the health of individual components of the supported Dell devices.

### About monitoring component health of Dell devices

This is a periodic poll based health monitoring of a Dell device's component level health status.

Once the discovery utility is run with the relevant option, the corresponding services are created. These services run periodically and update the overall health of the components. The component's status and information are displayed in the Nagios Core user interface.

The format of the component information in the Status Information column is `<Attribute>=<Value>, <Attribute>=<Value>`.

For example: `Status=CRITICAL, FQDD=Fan.Embedded.1, State=Enabled`

**Table 18. Dell device's component health information**

| Service | Status | Description | Attributes Displayed when using WS-MAN | Attributes Displayed when using SNMP |
|---|---|---|---|---|
| **Dell Server Physical Disk Status** | The following states are possible:<br>• **OK**<br>• **Warning**<br>• **Unknown**<br>• **Critical** | Provides the worst case aggregate health status of the physical disks in Dell servers. | • Status<br>• Fully Qualified Device Descriptor (FQDD)<br>• State<br>• Product ID<br>• Serial No<br>• Size (GB)<br>• FirmwareVersion<br>• Media Type<br>• FreeSpace (GB) | • Status<br>• FQDD<br>• State<br>• Product ID<br>• Serial No<br>• Size (GB)<br>• Media Type<br>• FreeSpace (GB)<br>• FirmwareVersion |
| **Dell Server Virtual Disk Status** | | Provides the worst case aggregate health status of the virtual disks in Dell servers. | • Status<br>• FQDD<br>• State<br>• Size (GB)<br>• WritePolicy<br>• ReadPolicy<br>• Layout<br>• StripeSize<br>• Media Type | • Status<br>• FQDD<br>• State<br>• Size (GB)<br>• WritePolicy<br>• ReadPolicy<br>• Layout<br>• StripeSize<br>• Media Type |
| **Dell Server Fan Status** | | Provides overall health status of the fans in Dell servers. | • Status<br>• FQDD<br>• State<br>• Speed (RPM) | • Status<br>• FQDD<br>• State<br>• Speed (RPM) |
| **Dell Server Battery Status** | | Provides overall health status of the battery in Dell servers. | • Status<br>• Location<br>• State<br>• Reading | • Status<br>• Location<br>• State<br>• Reading |

| Service | Status | Description | Attributes Displayed when using WS-MAN | Attributes Displayed when using SNMP |
|---|---|---|---|---|
| **Dell Server Intrusion Status** | | Provides overall health status of the chassis intrusion in Dell servers. | • Status<br>• Location<br>• State<br>• Reading | • Status<br>• Location<br>• State<br>• Type<br>• Reading |
| **Dell Server Network Device Status** | | Provides the worst case aggregate health status of the NIC in Dell servers. | • ConnectionStatus<br>• FQDD<br>• Name<br>• FirmwareVersion<br>• LinkSpeed | • ConnectionStatus<br>• FQDD<br>• Name |
| **Dell Server CPU Status** | | Provides overall health status of the CPUs in Dell servers. | Not Available | • Status<br>• FQDD<br>• State<br>• Name<br>• CurrentSpeed (GHz)<br>• CoreCount |
| **Dell Server Power Supply Status** | | Provides overall health status of the power supply in Dell servers. | Not Available | • Status<br>• FQDD<br>• CapabilitiesState<br>• OutputWattage (W)<br>• InputWattage (W)<br>• SensorState |
| **Dell Server Temperature Probe Status** | | Provides overall health status of the temperature probe in Dell servers. | Not Available | • Status<br>• Location<br>• State<br>• Reading (degree Celsius)<br>• Reading |
| **Dell Server Voltage Probe Status** | | Provides overall health status of the voltage probe in Dell servers. | Not Available | • Status<br>• Location<br>• State<br>• Reading (V) |

| Service | Status | Description | Attributes Displayed when using WS-MAN | Attributes Displayed when using SNMP |
|---|---|---|---|---|
| | | | | • Reading |
| **Dell Server Controller Status** | | Provides the worst case aggregate health status of the storage controllers in Dell servers. | Not Available | • Status<br>• FQDD<br>• Location<br>• FirmwareVersion<br>• CacheSize (MB) |
| **Dell Server Amperage Probe Status** | | Provides overall health status of the amperage probe in Dell servers. | Not Available | • Status<br>• Location<br>• State<br>• Reading (A) or Reading (W) |
| **Dell Server SD Card Status** | | Provides overall health status of the SD card in Dell servers. | • Status<br>• FQDD<br>• State<br>• WriteProtected<br>• InitializedState<br>• Size (GB)<br>• AvailableSpace (GB) | Not Available |
| **Dell Server FC NIC Status** | | Provides overall health status of the FC NIC in Dell servers. | • ConnectionStatus<br>• FQDD<br>• FirmwareVersion<br>• LinkSpeed<br>• Name | Not Available |
| **Dell Server Warranty Information** | | Provides warranty information status for the Dell servers. | | • ServiceTag<br>• Service Level Details<br>• Item number<br>• Type<br>• Ship Date (UTC)<br>• Start Date (UTC)<br>• End Date (UTC)<br>• Days Remaining |

**Table 19. Dell chassis component health information**

| Service | Status | Description | Attributes Displayed when using WS-MAN |
|---|---|---|---|
| **Dell Chassis Physical Disk Status**<br>Applicable only to Dell PoweEdge VRTX chassis. | The following states are possible:<br>• **OK**<br>• **Warning**<br>• **Unknown**<br>• **Critical** | Provides the worst case aggregate health status of the physical disks in Dell chassis. | • Status<br>• FQDD<br>• Model<br>• PartNumber<br>• Slot<br>• FirmwareVersion<br>• TotalSize (GB)<br>• FreeSpace (GB)<br>• Media Type<br>• SecurityState |
| **Dell Chassis Virtual Disk Status**<br>Applicable only to Dell PoweEdge VRTX chassis. | | Provides the worst case aggregate health status of the virtual disks in Dell chassis. | • Status<br>• FQDD<br>• Name<br>• Media Type<br>• Capacity (GB)<br>• StripeSize<br>• ReadPolicy<br>• WritePolicy<br>• RAIDTypes<br>• BusProtocol |
| **Dell Chassis PCIe Devices Status** | | Provides the worst case aggregate health status of all the Dell chassis PCIe device instances | • Name<br>• FQDD<br>• Fabric<br>• PowerState<br>• AssignedSlot<br>• AssignedBlade<br>• PCIeSlot |
| **Dell Chassis Fan Status** | | Provides the worst case aggregate health status of the fans in Dell chassis. | • Status<br>• FQDD<br>• Name<br>• Slot<br>• Speed (RPM) |
| **Dell Chassis Power Supply Status** | | Provides the worst case aggregate health status of the power supply in Dell chassis. | • Status<br>• FQDD<br>• Name<br>• PartNumber<br>• Slot |

| Service | Status | Description | Attributes Displayed when using WS-MAN |
|---|---|---|---|
| | | | • InputVoltage (V)<br>• InputCurrent (A)<br>• OutputPower (W ) |
| **Dell Chassis Controller Status**<br>Applicable only to Dell PoweEdge VRTX chassis. | | Provides the worst case aggregate health status of the storage controllers in Dell chassis. | • Status<br>• FQDD<br>• Name<br>• CacheSize(MB)<br>• FirmwareVersion<br>• SlotType<br>• SecurityStatus<br>• PatrolReadState |
| **Dell Chassis Enclosure Status**<br>Applicable only to Dell PoweEdge VRTX chassis. | | Provides the worst case aggregate health status of the enclosure in Dell chassis. | • Status<br>• FQDD<br>• BayID<br>• Connector<br>• FirmwareVersion<br>• SlotCount |
| **Dell Chassis IO Module Status** | | Provides the worst case aggregate health status of the IO module in Dell chassis. | • Status<br>• FQDD<br>• Name<br>• PartNumber<br>• Slot<br>• IPv4Address<br>• FabricType<br>• LaunchURL |
| **Dell Chassis Slot Information** | | Provides the worst case aggregate health status of the slot in Dell chassis. | • Status<br>• SlotNumber<br>• HostName<br>• Model<br>• ServiceTag<br>• iDRACIP |
| **Dell Chassis KVM Status** | | Provides the worst case aggregate health status of the KVM (Keyboard, Video, Mouse) in Dell chassis. | • Status<br>• Name |

| Service | Status | Description | Attributes Displayed when using WS-MAN |
|---|---|---|---|
| **Dell Chassis Warranty Information** | | Provides warranty information status for the Dell chassis. | • ServiceTag<br>• Service Level Details<br>• Item number<br>• Type<br>• Ship Date (UTC)<br>• Start Date (UTC)<br>• End Date (UTC)<br>• Days Remaining |

**Table 20. Dell EqualLogic component health information**

| Service | Status | Description | Attributes Displayed when using WS-MAN |
|---|---|---|---|
| **Dell Storage EqualLogic Member Physical Disk Status** | The following states are possible:<br>• **OK**<br>• **Warning**<br>• **Unknown**<br>• **Critical** | Provides the worst case aggregate health status of the physical disks in the Dell EqualLogic member. | • Status<br>• Slot<br>• Model<br>• SerialNumber<br>• FirmwareVersion<br>• TotalSize (GB) |
| **Dell Storage EqualLogic Group Volume Status** | | Provides the worst case aggregate health status of the EqualLogic Group volume status. | • Status<br>• Name<br>• TotalSize (GB)<br>• AssociatedPool |
| **Dell Storage EqualLogic Group Storage Pool Information** | | Provides the worst case aggregate health status of all the Dell EqualLogic storage arrays in a storage pool. | • Name<br>• MemberCount<br>• VolumeCount |
| **Dell Storage EqualLogic Group Warranty Information** | | Provides warranty information status for the Dell EqualLogic storage arrays. | • ServiceTag<br>• Service Level Details<br>• Item number<br>• Type<br>• Ship Date (UTC)<br>• Start Date (UTC)<br>• End Date (UTC)<br>• Days Remaining |

**Table 21. Dell Compellent component health information**

| Service | Status | Description | Attributes Displayed when using WS-MAN |
|---|---|---|---|
| **Dell Storage Compellent Physical Disk Status** | The following states are possible:<br>• **OK**<br>• **Warning**<br>• **Unknown**<br>• **Critical** | Provides the worst case aggregate health status of the physical disks in Dell Compellent storage arrays. | • Status<br>• Name<br>• DiskEnclosureNumber<br>• BusType<br>• TotalSize (GB) |
| **Dell Storage Compellent Volume Status** | | Provides the worst case aggregate health status of the Dell Compellent volume. | • Status<br>• VolumeName |
| **Dell Storage Compellent Controller Warranty Information** | | Provides warranty information status for the Dell Compellent storage arrays. | • ServiceTag<br>• Service Level Details<br>• Item number<br>• Type<br>• Ship Date (UTC)<br>• Start Date (UTC)<br>• End Date (UTC)<br>• Days Remaining |

**Table 22. Dell PowerVault MD warranty information**

| Service | Status | Description | Attributes Displayed when using WS-MAN |
|---|---|---|---|
| **Dell Storage PowerVault MD Warranty Information** | The following states are possible:<br>• **OK**<br>• **Warning**<br>• **Unknown**<br>• **Critical** | Provides warranty information status for the Dell PowerVault MD storage arrays. | • ServiceTag<br>• Service Level Details<br>• Item number<br>• Type<br>• Ship Date (UTC)<br>• Start Date (UTC)<br>• End Date (UTC)<br>• Days Remaining |

NOTE:

For more information about monitoring the health of the Compellent controllers, see the specific *Dell Compellent Controllers User's Guide* at Dell.com/support.

The Dell Chassis enclosure status will display the **Primary** Status of the Enclosure only. For more information, see Dell PowerEdge VRTX Chassis console or the Dell PoweEdge VRTX chassis User's Guide at Dell.com/support.

NOTE:

**Table 23. Units and description**

| Unit | Description |
|---|---|
| GHz | Giga Hertz |
| W | Watt |
| GB | Giga Byte |
| RPM | Revolutions Per Minute |
| A | Ampere |
| V | Volts |
| MB | Mega Bytes |

By default, the preceding services are scheduled once every four hours.

### Monitoring component health status of Dell devices

To monitor the component health status of Dell devices:

1. In Nagios Core user interface, under **Current Status**, select **Services**.
2. Select the associated service to monitor the health of Dell device.
   Health monitoring of Dell devices is performed through iDRAC with LC and corresponding details are shown in their respective component health service with proper severity health color.

# Monitor SNMP alerts

## About SNMP alert monitoring

You can asynchronously receive the SNMP alerts forwarded from the devices.

Once an SNMP alert is received, the respective device's service will display the alert summary message and alert severity of the last recieved alert in the Nagios Core console.

**Table 24. Dell trap information**

| Service | Status | Description |
|---|---|---|
| **Dell Server Traps** | The following states are possible:<br>• **OK**<br>• **Warning**<br>• **Unknown**<br>• **Critical** | Provides trap Information of the Dell server raised through agent-free method. |
| **Dell Chassis Traps** | The following states are possible:<br>• **OK**<br>• **Warning**<br>• **Unknown**<br>• **Critical** | Provides trap Information of the Dell M1000e, VRTX, and FX2/FX2s Chassis. |

| Service | Status | Description |
|---|---|---|
| **Dell Storage EqualLogic Member Traps** | The following states are possible:<br>• **OK**<br>• **Warning**<br>• **Unknown**<br>• **Critical** | Provides trap Information of the Dell EqualLogic PS-Series storage Arrays. |
| **Dell Storage Compellent Controller Traps** | The following states are possible:<br>• **OK**<br>• **Warning**<br>• **Unknown**<br>• **Critical** | Provides trap Information of the Dell Compellent storage Arrays. |
| **Dell Storage PowerVault MD Traps** | The following states are possible:<br>• **OK**<br>• **Warning**<br>• **Unknown**<br>• **Critical** | Provides trap Information of the Dell PowerVault MD storage arrays. |

## Viewing SNMP alerts

**Prerequisites**:

- Nagios Core with SNMPTT is installed and configured and the Dell integration on SNMPTT is configured.
- SNMP Trap destination is configured with Nagios Core server in the supported Dell devices.

  NOTE: To receive SNMP traps from Dell PowerVault MD 34/38 series storage arrays, SNMP trap destination must be configured for that device in the Modular Disk Storage Manager (MDSM) console.

  For information on configuring SNMP Trap destination in the iDRAC interface, see Appendix.

To view SNMP alerts:

In Nagios Core user interface, under **Current Status**, select **Services** and then navigate to the respective Dell device specific trap service.

Displays the last received SNMP alert in the status information and the severity of the alert is updated in the status. To view all the SNMP alerts that were received, select **Reports** → **Alerts** → **History**.

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# Launching Dell device specific consoles

To launch console for a supported Dell device:

1. In Nagios Core console, under **Current Status**, select any of the following:
   - **Hosts**
   - **Services**
   - **Host Groups → <Dell Device>**
2. Click  (**Perform Extra Host Actions** icon) adjacent to the Dell device.
   The respective Dell console is launched in a new window.

## Dell devices and their consoles

You can launch various Dell consoles from the supported Dell devices to get more information about the Dell devices you are monitoring.

**Table 25. Dell devices and their consoles**

| Dell Device | Applicable Console |
|---|---|
| Dell Servers | **Dell Integrated Remote Access Controller Console** |
| Dell PowerEdge M1000e Chassis | **Dell PowerEdge M1000e Chassis Controller Management Console** |
| Dell PowerEdge VRTX Chassis | **Dell PowerEdge VRTX Chassis Controller Management Console** |
| Dell PowerEdge FX2/FX2s Chassis | **Dell PowerEdge FX2 Chassis Controller Management Console** |
| Dell Compellent Storage Arrays | **Dell Compellent Storage Manager Console** |
| Dell EqualLogic PS-SeriesStorage Arrays | **Dell EqualLogic Group Manager Console** |

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# Warranty information for Dell devices

With this feature, you can access the warranty information for the discovered Dell devices. This feature allows you to monitor the Dell device's warranty details in the Nagios Core console. An active Internet connection is required to retrieve the warranty information. If you do not have direct internet access and are using proxy settings to access the internet, ensure that you resolve the host name `api.dell.com` in the `etc/hosts` file.

## Warranty information attributes

The warranty information for the respective Dell devices will be displayed in the Nagios core console. The Dell devices are polled for their warranty information at regular intervals. The default schedule for warranty polls on the discovered devices is once every 24 hours.

Once a discovered device is polled for its warranty information, the following warranty attributes will be displayed in the Nagios Core console:

- **ServiceTag** – Service tag for the discovered device.
- **Service Level Details** – Description of the type of warranty.
- **Item number** – Dell item number for this type of warranty.
- **Type** – Type of warranty.
- **Ship Date (UTC)** – Date the asset was shipped.
- **Start Date (UTC)** – Date when the warranty begins.
- **End Date (UTC)** – Date when the warranty ends.
- **Days Remaining** – Number of days left for the warranty to expire.

The warranty information severity will be determined based on the warranty parameter definitions and has the following severities:

- **Normal** - If the warranty is due to expire in more than <Warning> days. The default value is always greater than 30 days.
- **Warning** - If the warranty is due to expire within <Critical> to <Warning>days. The default value is 30 days.
- **Critical** - If the warranty is due to expire within <Critical> days. The default value is 10 days.
- **Unknown** - If the warranty information cannot be retrieved.

**WarrantyURL** - The warranty URL address.

## Configuring the Dell warranty information parameters

You can configure the warranty related parameters manually. To customize these parameters based on your requirements, navigate to **Dell_OpenManage_Plugin** → **resources** → **dell_pluginconfig.cfg** file and edit the default numerical values.

For example:

If you wish to receive a **Critical** warranty status notification for a discovered Dell device earlier than 10 days, which is the default value for a critical status notification , navigate to **Dell_OpenManage_Plugin → resources → dell_pluginconfig.cfg** file and change the default setting of this parameter from `RemainingDaysCritical=10` to `RemainingDaysCritical=20`.

NOTE: While configuring the Warranty information parameters, ensure the following:

- Provide positive numeric values only. In case any value other than a numeric is provided, the warranty information severity will be in the **Unknown** state while the warranty details will be displayed.
- Do not change any of the other key values in the `dell_pluginconfig.cfg` file other than the numerical values.
- Provide a value for `RemainingDaysWarning` parameter that is greater than the value provided for the `RemainingDaysCritical` parameter and that these values are always between 0 to 365. In case of negative values for these parameters, the warranty information severity will be in the **Unknown** state while the warranty details will be displayed.
- In case there is any change in a discovered device's IP address, rediscover the device again to receive correct warranty information for that device.

NOTE:

If the value for `RemainingDaysCritical` is greater than that of the `RemainingDaysWarning`, the warranty severity will be in the **Critical** state while the warranty information will be displayed.

If the warranty for a Dell device has expired or the `Days Remaining` is equal to zero, then the severity for that device will be **Critical**.

# Viewing warranty information

Before you can view the warranty information for the discovered Dell devices, ensure the following:

- You have an active Internet connection.
- You have configured the warranty report parameters correctly in the `dell_pluginconfig.cfg` file available in the **Dell_OpenManage_Plugin → resources** folder.
- The values for the `RemainingDaysWarning` and `RemainingDaysCritical` are configured appropriately. If they are not, the warranty will be in the **Unknown** state.
- The discovered device has a valid service tag.

Once a device has been successfully discovered, its warranty information is displayed under the **Status Information** column. To view the details for a Dell device,

1. Discover a Dell device.
2. Click on the **<Dell device> Warranty Information** under services.
   The details for the selected device are displayed in the **Service State Information** page.

For example:

To view the warranty service information for Dell VRTX Chassis, click on **Dell Chassis Warranty Information**.

**NOTE:** In case of Dell EqualLogic storage arrays, the warranty service will be associated with the EqualLogic Member IP only.

In case of Dell Compellent storage arrays, the warranty service will be associated with the Compellent Controller IP only.

In case of Dell PowerVault MD Storage Arrays, the warranty information will only be available for the latest firmware version.

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# Removing Dell devices

You can remove a Dell device that you do not want to monitor.

1. Navigate to `<NAGIOS_HOME>/dell/config/objects`, and delete the corresponding `<IP OR FQDN>.cfg` file.
2. For completing the removal of the Dell device, restart the Nagios Core services by running the following command: `service nagios restart`.

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# Knowledge Base (KB) messages for the generated alerts

You can get more information about the SNMP alerts generated by the discovered Dell devices from the KB messages for that device in the Nagios Core console.

## Viewing KB messages

To view the KB messages for an SNMP alert generated by a discovered Dell device complete the following steps:

1. Log in to the Nagios Core console.
2. In the left pane, click on **Services** under **Current Status**.
3. Navigate to the respective device trap or alert under **Service**, right click on **More Information** hyperlink under **Status Information** and then select **Open in new tab**.

   The KB messages for the respective device is displayed in a new tab.
4. In the KB messages page, search for the respective event ID or the KB message as displayed in the Nagios Core console to view further details about this alert.

For Example:

To view the KB messages for Chassis traps:

1. Scroll down to Dell Chassis Traps under **Service**, right click on **More Information** hyperlink under **Status Information** and then select **Open in new tab**.
2. Search for the respective event ID or KB message as generated by the Dell Chassis Traps such as `LIC212` to view further details about this Dell chassis alert.

**NOTE:** If you are not able to find the KB messages for any of the generated alerts by the process described above, go to "*Dell.com/support/article/us/en/19*" and search for the KB messages using the event ID or KB message as generated by the Dell device.

# 11

# Troubleshooting

This section lists the problems that you may encounter while using the Dell OpenManage Plug-in for Nagios Core and their workarounds.

Ensure that you meet the requirements, or perform the steps listed in this section.

## The Dell OpenManage Plug-in for Nagios Core installation script is failing

1. You have adequate permissions to run the script.
   **Recommended: Nagios Administrator**.
2. The prerequisites as mentioned in the Installation Guide are met.
3. You have provided correct inputs to the installation script.

## The Dell OpenManage Plug-in for Nagios Core uninstallation script is failing

1. You have adequate permissions to run the script.
   **Recommended: Nagios Administrator**.
2. The uninstallation script is running from the location where the Dell OpenManage Plug-in is installed.

## The discovery script is failing to execute

1. The discovery script has appropriate permissions.
   **Recommended: Nagios Administrator**.
2. The appropriate arguments are provided while running the script.

## The discovery script is not creating the host and service definition file for IPv4 or IPv6 addresses or hosts when the protocol selected is 1 (SNMP)

1. Net-SNMP is installed.
2. The IP addresses or hosts are reachable.
3. SNMP is enabled on the given IP addresses or hosts.

4. The appropriate protocol credentials are correctly configured in the following files before running a discovery:

   `dell_resource.cfg`

   `.dell_device_comm_params.cfg`
5. For an IPv6 address, ensure that the Perl Module Socket6 is installed in the same Perl library path.
6. At least one of the applicable service is enabled in the following service template:

   `dell_server_services_template.cfg`

   .

## The discovery script is not creating the host and service definition file for IPv4 or IPv6 addresses or hosts when the protocol selected is 2 (WS-MAN)

1. OpenWSMAN and its Perl binding are installed.
2. The IP addresses or hosts are reachable.
3. The appropriate protocol credentials are correctly configured in the following files before running a discovery:

   `dell_resource.cfg`

   `.dell_device_comm_params.cfg`
4. For an IPv6 address, ensure that the Perl Module Socket6 is installed in the same Perl library path.
5. At least one of the applicable service is enabled in the following service template:

   `dell_server_services_template.cfg`

   .

## The Dell device's IP address or host name changes after discovery of the device

Remove the old configuration file and rediscover the Dell device using a new IP address or hostname.

## The Nagios Core Console is not displaying the Dell devices that are discovered using the Dell discovery script

1. The host and service definition files exist in the **<NAGIOS_HOME>/dell/config/objects** folder.
2. The Nagios service has been restarted after running a discovery.
3. The host and service definition files have appropriate permissions.

## The Nagios Core Console is not displaying the Trap Service for Dell devices that are discovered using the Dell discovery script

1. SNMPTT is installed.
2. If SNMPTT is not installed, then the trap service is not created for any of the discovered Dell device.

3. After you install SNMPTT, ensure that the Trap Integration is performed.

   To perform Trap Integration, from **<NAGIOS_HOME>/dell/install**, run the command:

   ```
   install.sh trap
   ```

4. Once the trap integration is complete, restart the SNMPTT service, run the command:
   ```
   service snmptt restart
   ```

## The Dell OpenManage Plug-in specific services are displaying the message, “Error while creating SNMP Session”

1. The recommended versions of Net-SNMP and Net-IP are installed. If you are using IPv6, then the Perl module Socket6 should also be installed.
2. The IP addresses or hosts provided are reachable.
3. SNMP is enabled on the IP addresses or hosts.
4. The appropriate SNMP parameters are correctly configured in the following files:
   ```
   dell_resource.cfg
   ```
   ```
   .dell_device_comm_params.cfg
   ```

## Dell OpenManage Plug-in specific services are displaying the message, “WSMAN Error while communicating with host”

1. OpenWSMAN and its Perl binding and Net-IP are installed.
2. The IP addresses or hosts provided are reachable.
3. The appropriate WS-MAN parameters are correctly configured in the following files:
   ```
   dell_resource.cfg
   ```
   ```
   .dell_device_comm_params.cfg
   ```

## Dell OpenManage Plug-in specific services are displaying the message, “Component Information = UNKNOWN”

**NOTE:** This is an expected message if the component is not available in the discovered Dell device.

If the component is available and you are still receiving the message, then this message is due to protocol time-out. Set the required protocol specific time-out values in the `.dell_device_comm_params.cfg` file.

## Unable to view the SNMP alerts generated by the Dell device in the Nagios Core Console

1. Perform Trap Integration, from **<NAGIOS_HOME>/dell/install**, run the command:
   ```
   install.sh trap
   ```

2. The binary **<NAGIOS_HOME>/libexec/eventhandlers/submit_check_result** is present.
3. The trap configuration file `Dell_Agent_free_Server_Traps.conf` and the binary `submit_check_result` have appropriate permissions.

# Unable to monitor the RACADM specific services such as Speed(RPM), InputCurrent(A), InputVoltage(V), and OutputPower(W) for Dell chassis devices in the Nagios Core Console

1. Install RACADM.
2. Navigate to **<NAGIOS_HOME>/dell/install**, run the command:
   `install.sh racadm`
3. Restart Nagios Core services.
4. Rediscover the Dell chassis device.

For more information on downloading and installing RACADM, go to *"en.community.dell.com/techcenter/systems-management/w/wiki/3205.racadm-command-line-interface-for-drac"*

# Unable to monitor the Warranty information for the discovered Dell devices in the Nagios Core Console

- Ensure that you have an active internet connection. If you do not have direct internet access and are using proxy settings to access the internet, ensure that you resolve the host name `api.dell.com` in the `etc/hosts` file.

If you are still not able to view the warranty information, then ensure that you have Java version 1.6 or later installed in your system. If Java was installed after the Dell Plug-in was installed, then perform the following steps:

1. Install JAVA.
2. Navigate to **<NAGIOS_HOME>/dell/install**, run the command:
   `install.sh java`
3. Restart Nagios Core services.
4. Rediscover the Dell device.

# The Overall Health status is not getting refreshed after receiving a Dell device alert

If the Overall Health service is not created for a discovered Dell device, then the Dell device trap will not trigger an Overall health status. If Overall health service exists for a device, then ensure the following:

1. The file `<NAGIOS_HOME>/libexec/eventhandlers/submit_check_result` is present.
2. The trap configuration file `Dell_Agent_free_Server_Traps.conf` and the binary `submit_check_result` have appropriate permissions.
3. The SNMPTT process has appropriate permissions to run scripts in `<NAGIOS_HOME>/dell/scripts`.

## Where do I find the OpenWSMAN distribution and its Perl binding?

If the system has default Perl version (installed as part of operating system), go to *"Build.opensuse.org/package/show/Openwsman/openwsman"* and download the OpenWSMAN library and its Perl binding.

If you have installed a Perl version other than the default version, or the Perl binding is not available then go to *"Github.com/Openwsman/openwsman"* and follow the instructions to compile and use.

# 12

# Frequently asked questions

1. **Question:** Can you provide information on Licensing of Dell OpenManage Plug-in for Nagios Core?

   **Answer:** You can install and use this plug-in for free.

2. **Question:** What are the Dell hardware models supported by the plug-in?

   **Answer:** For the list of supported Dell platforms, see Support Matrix.

3. **Question:** I have earlier generation of servers (9th Generation – 11th Generation) in my data center. Can I still monitor them using the plug-in?

   **Answer:** No, you cannot monitor earlier generations of servers (9th Generation through 11th Generation) using this plug-in. You can only monitor Dell servers through iDRAC with LC, supported for 12th and later generations of Dell PowerEdge servers using this Plug-in. There are other plug-ins available on Nagios Exchange using which you can monitor earlier generation of servers.

4. **Question:** What is the difference between in-band versus out-of-band (OOB) method of monitoring Dell servers?

   **Answer:** There are two ways to monitor Dell servers, one is by using in-band method through software called OpenManage Server Administrator (OMSA) installed on a server operating system and the other is out-of-band method through iDRAC with LC.

   iDRAC with LC, a hardware, is on the server motherboard and iDRAC with LC enables systems administrators to monitor and manage dell servers regardless of whether the machine is powered on, or if an operating system is installed or functional. The technology works from any location and without the use of software agents like OMSA. By contrast, in-band management, that is, OMSA must be installed on the server being managed and only works after the machine is booted and the operating system is running and functional. The OMSA software has its limitations such as it does not allow access to BIOS settings, or the reinstallation of the operating system and cannot be used to fix problems that prevent the system from booting.

5. **Question:** Can I monitor Dell servers using OpenManage Server Administrator (OMSA) agent instead of iDRAC with LC using this plug-in?

   **Answer:** No, using this plug-in you cannot monitor Dell servers using OMSA agent. However, there are other plug-ins available on Nagios Exchange using which you can achieve the same. For more information, regarding the list of available Dell Plug-ins, visit URL: exchange.nagios.org/directory/Plugins/Hardware/Server-Hardware/Dell

6. **Question:** How is this plug-in different from other plug-ins available on the Nagios Exchange site?

   **Answer:** The primary functionality of this Plug-in is to monitor Dell servers' hardware through an agent-free, out-of-band method using iDRAC with LC. With this plug-in, you can get a comprehensive hardware-level information on Dell PowerEdge servers including overall and component-level health monitoring through SNMP and WS-MAN protocols. The plug-in enables

you to monitor SNMP alerts generated from Dell servers and supports one-to-one iDRAC web console launch to perform further troubleshooting, configuration, and management activities. Some of the capabilities provided here are not available in other plug-ins present on Nagios Exchange.

7. **Question:** What are the languages supported by the plug-in?

   **Answer:** The plug-in currently supports only English language.

# A

# Appendix

## Configuring SNMP parameters for iDRAC using the iDRAC web console

1. Launch the iDRAC (12th and later generation of Dell PowerEdge servers) web console and navigate to **Network** → **Services** in the console.
2. Configure the SNMP Agent properties:
   a. Set Enabled to `True` and SNMP Protocol to `All` (SNMP v1/v2/v3).
   b. Set **SNMP Community Name** with a community string.
   c. Click **Apply** to submit the configuration.

**NOTE:** The Plug-in communicates with iDRAC using only SNMP v1 or SNMP v2 protocol.

## Configuring SNMP parameters for iDRAC using RACADM script

1. Launch the iDRAC RACADM CLI by running the following ssh command:
   `ssh root@<iDRAC IP>`
2. Change the command mode to **racadm** by running the following command:
   `racadm`
3. Set the SNMP community string by running the following command:
   `racadm set idrac.SNMP.AgentCommunity <community string>`
4. Enable the SNMP agent by running the following command:
   `racadm set idrac.SNMP.AgentEnable 1`
   (Values: 0 – Disabled, 1 – Enabled)
5. Set the SNMP protocol to **All** by running the following command:
   `racadm set idrac.SNMP.SNMPProtocol 0`
   (Values: 0 – All, 1 – SNMPv3)
6. Verify the configuration by running the following command:
   `racadm get idrac.SNMP.Alert`

## Configuring SNMP trap destination address for iDRAC using iDRAC web console

1. Log in to iDRAC.
2. Select **Overview** → **Alerts**.
3. In the right pane, perform the following actions:
   - In the **Alerts** section, enable **Alerts** .

- In the **Alerts Filter section**, select the required fields under **Category** and **Severity**.

  You will not receive any SNMP alerts if none of these fields are selected.
- In the **Alerts and Remote System Log Configuration** section, select the required fields thereby configuring the SNMP alerts.

4. In the right pane, click on the**SNMP and Email Settings** tab and then perform the following actions:
   - In the **IP Destination List** section, populate the **Destination Address** fields as per your requirement and ensure that its respective **State** checkboxes are selected and then click **Apply**.
   - Configure the **Community String** and the **SNMP Alert Port Number** at the bottom of the **IP Destination List** section as required and then click **Apply**.
   - In the **SNMP Trap Format** section, select the required SNMP trap format and then click **Apply**.

# Configuring SNMP trap destination address for iDRAC using RACADM

1. Launch the iDRAC RACADM CLI by running the following ssh command:

   ```
   ssh root@<iDRAC IP>
   ```
2. Change the command mode to **racadm** by running the following command:

   ```
   racadm
   ```
3. Set the iDRAC SNMP port for receiving alerts by running the following command:

   ```
   racadm set idrac.SNMP.AlertPort <Trap Port Number>
   ```
4. Enable the SNMP monitoring protocol by running the following command:

   ```
   racadm set idrac.SNMP.TrapFormat <Trap Format>
   ```

   (Values for <Trap Format>: 0– SNMPv1, 1–SNMPv2, 2–SNMPv3)
5. Set the SNMP trap destination by running the following command:

   ```
   racadm set iDRAC.SNMP.Alert.DestAddr.<index> <Trap Destination IP Address>
   ```

   (This will override the trap destination address, if any, existing in that index)
6. Enable the index by running the following command:

   ```
   racadm set iDRAC.SNMP.Alert.Enable.<index> 1
   ```

   (Only eight trap destinations can be configured in iDRAC. You can only pass a trap destination <index> value from 1 to 8.)
7. Then run the following command to enable global e-mail alerting:

   ```
   racadm set iDRAC.IPMILan.AlertEnable 1
   ```
8. Then run the following command to clear all available alert settings:

   ```
   racadm eventfilters set -c idrac.alert.all -a none -n SNMP
   ```

You can also use the Perl based command line script to configure the SNMP parameters for multiple iDRACs (Dell 12th and later generation of PowerEdge Servers). For more information go to *en.community.dell.com/techcenter/systems-management/w/wiki/11460.snmp-parameters-configuration-script-for-dell-idracs*

For more information on RACADM commands, see the *iDRAC RACADM Command Line Interface Reference Guide* available at *dell.com/iDRACManuals*.