

Dell EMC OpenManage Plug-in Version 3.0 for Nagios Core

User's Guide

Notes, cautions, and warnings

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

 **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.

Chapter 1: Introduction to Dell EMC OpenManage Plug-in Version 3.0 for Nagios Core.....	5
Chapter 2: What is new in Dell EMC OpenManage Plug-in version 3.0.....	6
Chapter 3: Key features.....	7
Chapter 4: Support matrix.....	8
Chapter 5: Device discovery and inventory.....	12
About device discovery.....	12
About Dell EMC device discovery utility.....	12
Discovering Dell EMC devices.....	17
Device information.....	18
About device information.....	18
Viewing device information.....	20
Chapter 6: Monitoring Dell EMC devices.....	21
Overall health status of the Dell EMC devices.....	21
Health Instances.....	21
About overall health status	21
Viewing overall health status.....	22
Monitoring component health of Dell EMC devices.....	22
About monitoring component health of Dell EMC devices.....	22
Monitoring component health status of Dell EMC devices.....	29
Viewing Dell EMC devices in the Nagios Core console.....	29
Monitoring SNMP alerts.....	30
About SNMP alert monitoring.....	30
Viewing SNMP alerts.....	31
Chapter 7: Launching Dell EMC device specific consoles.....	32
Dell EMC devices and their consoles.....	32
Chapter 8: Warranty information for Dell EMC devices.....	33
Viewing warranty information.....	33
Chapter 9: Removing Dell EMC devices.....	35
Chapter 10: Knowledge Base messages for the generated alerts.....	36
Chapter 11: Troubleshooting	37
Chapter 12: Frequently asked questions.....	41

Appendix A: Appendix.....42

Introduction to Dell EMC OpenManage Plug-in Version 3.0 for Nagios Core

This guide provides information about using the Dell EMC OpenManage Plug-in Version 3.0 for Nagios Core and its various features such as discovering, monitoring, launching consoles, and troubleshooting of the supported Dell EMC devices. The guide also provides details of the supported Dell EMC devices and frequently asked questions by the customer.

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

For more details on device support, see Support matrix in the *"Dell EMC OpenManage Plug-in Version 3.0 for Nagios Core User's Guide."*

What is new in Dell EMC OpenManage Plug-in version 3.0

The following table lists the new features and functionality of the Dell EMC OpenManage Plug-in version 3.0:

Table 1. New features and functionality

New Feature	Description
Support for new Dell EMC devices	<p>With this version, you can discover and monitor the following new Dell EMC devices:</p> <ul style="list-style-type: none"> • New launches of 14th generation of PowerEdge servers through Integrated Dell Remote Access Controller (iDRAC) with Lifecycle Controller (LC) • OEM Servers • Dell EMC Network Switches <p>For more details on device support, see Support matrix in the "<i>Dell EMC OpenManage Plug-in Version 3.0 for Nagios XI User's Guide</i>."</p>
Monitor basic system information including component level	<p>This version provides basic system information including component level details of the following Dell EMC devices:</p> <ul style="list-style-type: none"> • 14th generation of PowerEdge servers • OEM servers • Dell EMC Network Switches
Latest firmware version	<p>This version supports the latest firmware versions for the following Dell EMC devices</p> <ul style="list-style-type: none"> • 14th generation of PowerEdge servers (iDRAC9) • 12th and 13th generation of PowerEdge servers (iDRAC7 and iDRAC8) • Datacenter Scalable Solutions (DSS) • PowerEdge FX2/FX2s chassis • PowerEdge VRTX chassis • PowerEdge M1000e chassis • EqualLogic PS Series Storage Arrays • PowerVault MD 34/38 Series Storage Arrays • Compellent Storage Arrays
Upgrade to Dell EMC OpenManage Plug-in version 3.0 for Nagios Core	<p>You can upgrade from Dell OpenManage Plug-in Version 1.0 for Nagios Core, and Dell EMC OpenMandage Plug-in Version 2.1 for Nagios Core to Dell EMC OpenManage Plug-In Version 3.0 for Nagios Core.</p>
View and monitor SNMP alerts	<p>View and monitor SNMP alerts from all the supported devices.</p>
Trap based health monitoring	<p>Trap based health monitoring of all the supported devices.</p>
Launch Dell EMC device specific consoles	<p>Supports the launch of the following Dell EMC one-to-one consoles to perform further troubleshooting, configuration, or management activities for the supported Dell EMC devices:</p> <ul style="list-style-type: none"> • iDRAC Console for OEM servers • HCI Console Launch for HCI devices • Dell EMC Network Switches
View warranty information	<p>This feature allows you to view the warranty information for OEM servers and Dell EMC Network Switches.</p>
View Knowledge Base (KB) messages	<p>You can get more information about the SNMP alerts through the KB articles associated with those alerts. You can view the KB messages for OEM servers and HCI Platforms.</p>

Key features

The key features of the Dell EMC OpenManage Plug-in Version 3.0 for Nagios Core are as described in the following table.

Table 2. Key features

Feature	Functionality
Device discovery	<p>Discovers the supported Dell EMC devices in the Nagios Core console. Once the discovery is complete, host and service definitions are created for each device.</p> <ul style="list-style-type: none"> You can discover iDRAC devices either using SNMP or WSMAN protocol or Redfish REST APIs . Dell EMC storage and Dell EMC Network Switch discovery is supported using SNMP protocol. Dell EMC chassis discovery is supported using WSMAN protocol.
Device information	<p>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.</p> <p>For more information about the device information provided by the Plug-in, see Device Information.</p>
Monitor overall health of Dell EMC devices	Monitors the overall health of Dell EMC devices in a scheduled or periodic manner.
Component level health of Dell EMC devices	Monitors the health of device components (Physical Disks, Power Supply, Temperature Probe, Voltage Probe, and so on) and displays information about the Dell EMC device component status at scheduled time intervals.
Monitor SNMP alerts	<p>Monitors SNMP alerts for Dell EMC devices. This feature displays only the last received SNMP alert.</p> <p>To view all received SNMP alerts navigate to Reports > Alerts > History in the Nagios Core console.</p> <p>You can also view the Alert Knowledge Base (KB) information for the supported Dell EMC devices corresponding to an SNMP alert for faster troubleshooting of the respective alert.</p> <p>For more information, see Knowledge Base (KB) messages for the generated alerts in the <i>Dell EMC OpenManage Plug-in Version 3.0 for Nagios Core User's Guide</i>.</p> <p>NOTE: KB information is not available for Compellent Storage Arrays, PowerVault MD Storage Arrays and Dell EMC Networking.</p>
Launching device specific consoles	Launches the respective Dell EMC one-to-one consoles to further troubleshoot and manage the supported Dell EMC devices. For more information, see Launching Dell EMC Device Specific Consoles .
Warranty information	Monitors and displays the warranty information for the supported Dell EMC devices in a periodic manner and displays the status in the Nagios Core console. For more information, see Warranty information for Dell EMC devices .

Support matrix

Dell EMC OpenManage Plug-in version 3.0 for Nagios Core supports the Dell EMC devices as listed in the following tables.

Datacenter Scalable Solutions

Table 3. Supported Datacenter Scalable Solutions.

Datacenter Scalable Solutions (DSS)

DSS 1500
DSS 1510
DSS 2500

Hyper-converged Infrastructure (HCI) Platforms

Table 4. Supported HCI Platforms

VxRail Devices	Nutanix XC Devices
VxRail E460	XC6320-6
VxRail E460F	XC430-4 Xpress
VxRail P470	XC430-4
VxRail P470F	XC630-10
VxRail V470	XC730xd-24
VxRail V470F	XC640-10
VxRail S470	XC740-12
	XC740-12C
	XC740-12R
	XC740-24
	XC640-4
	XC6420-6
	XC-940-24
	XC640-4 Xpress
	XC730-16G
	XC730xd-12
	XC730xd-12C
	XC730xd-12R

PowerEdge Servers

Table 5. Supported PowerEdge Servers.

12th generation of PowerEdge servers	13th generation of PowerEdge servers	14th generation of PowerEdge servers
FM120x4	C4130	R640
M420	C6320	R740
M520	FC430	R740xd
M620	FC630	R940
M820	FC830	C6420
R220	M630	M640
R320	M830	FC640
R420	R230	R440
R520	R330	R540
R620	R430	T440
R720xd	R530	T640
R820	R530xd	R6415
R920	R630	R7415
T320	R730	R7425
T420	R730xd	
T620	R830	
R720	R930	
C6320p	T130	
	T330	
	T430	
	T630	

PowerEdge Chassis

Table 6. Supported PowerEdge chassis.

- PowerEdge FX2
- PowerEdge FX2s
- PowerEdge VRTX
- PowerEdge M1000e

Compellent SC-Series Storage Arrays

Table 7. Supported Compellent Storage Arrays.

- Compellent Series 40
- Compellent SC4020
- Compellent SC5020
- Compellent SC7020

Table 7. Supported Compellent Storage Arrays. (continued)

Compellent SC8000

Compellent SC9000

EqualLogic PS-Series Storage Arrays

Table 8. Supported EqualLogic PS-Series Storage Arrays.

EqualLogic PS4000	EqualLogic PS6000
EqualLogic PS4110	EqualLogic PS6010
EqualLogic PS-M4110	EqualLogic PS6110
EqualLogic PS4210	EqualLogic PS6610
EqualLogic PS4100	EqualLogic PS6100
EqualLogic PSM4110	EqualLogic PS6210
	EqualLogic PS6500
	EqualLogic PS6510

PowerVault MD-Series Storage Arrays

Table 9. Supported PowerVault MD-Series Storage Arrays.

PowerVault MD3400
PowerVault MD3420
PowerVault MD3460
PowerVault MD3800f
PowerVault MD3800i
PowerVault MD3820f
PowerVault MD3820i
PowerVault MD3860f
PowerVault MD3860i

Dell EMC Network Switches

Table 10. Supported Network Switches

S Series	Z Series	C Series	FN Series	M Series	N Series	
S3124	Z9100-ON	C9010	PowerEdge FN2210S	PowerEdge M I/O Aggregator	N1124T	N4064F
S3124P			PowerEdge FN410S	Power Edge MXL 10/40GbE	N1124P	N4064
S3124F			PowerEdge FN410T		N1148T	N3024
S3148			PowerEdge FN340Q		N1148P	N3024F
S3148F					N1108T	N3024P
S3048					N1108P	N3048
S4048					N1524	N3048P

Table 10. Supported Network Switches (continued)

S Series	Z Series	C Series	FN Series	M Series	N Series	
S4048-ON					N1524P	N4032
S5000					N1548	N4032F
S6000					N1548P	
S6000-ON					N2024	
S6010-ON					N2024P	
S6100-ON					N2048	
S5048F					N2048P	

i **NOTE:** All the information of the discovered Dell EMC Network Switch will not be displayed if the firmware version is less than 9.11.2.8. You need to ensure that the firmware version is 9.11.2.8 or above.

Device discovery and inventory

Topics:

- [About device discovery](#)
- [About Dell EMC device discovery utility](#)
- [Discovering Dell EMC devices](#)
- [Device information](#)

About device discovery

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

- Dell EMC Servers are discovered using SNMP or WSMAN protocol or Redfish REST APIs.
- Dell EMC Chassis are discovered using WSMAN protocol.
- Dell EMC Storage and Dell EMC Network Switches are discovered using SNMP protocol.

NOTE: For discovery using Redfish REST APIs, iDRAC firmware version should be 2.50.50.50 or above.

NOTE: For Dell EMC server discovered through Redfish, if the iDRAC firmware version is 2.50.50.50, the attribute values of OSName, OSVersion, ChassisServiceTag, GroupManager and GroupStatus will be shown as Not available

You must use **Dell EMC Discovery Utility** to discover Dell EMC 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 EMC device that you want to discover.

You can discover devices using any of the following:

- Device IP address or FQDN
- Subnet with Mask
- File Containing a list of device IP addresses or FQDNs or Subnet with Mask

NOTE: At a time you can discover a Dell EMC Server using SNMP or WSMAN protocol or Redfish REST APIs. To rediscover a server previously discovered through SNMP protocol with WSMAN protocol or Redfish REST APIs or vice versa, run the Dell EMC Discovery Utility option along with the value of the desired protocol.

NOTE: If a server was discovered using SNMP, but you want to discover the same device using WSMAN protocol, navigate to `<NAGIOS_HOME>/dell/scripts`, and run the following Python commands:

For example:

To discover a SNMP device through WSMAN Protocol using Host name details:

```
python dellemc_nagios_discovery_service_utility.py --host=<host name / IP address> --
prefProtocol=2 --http.user=root --http.password=calvin --output.file=/usr/local/nagios/
dell/config/objects/
```

`<NAGIOS_HOME>` is the installed location of Nagios Core and by default, the location of `<NAGIOS_HOME>` is `/usr/local/nagios`.

About Dell EMC device discovery utility

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

```
python dellemc_nagios_discovery_service_utility.py -h
```

All the available Dell EMC device discovery utility options are displayed.

Table 11. Dell EMC Device Helper Utility options

Options	Description
-h	Displays the help message.
--host	Host IP address or HostName to be discovered.
--File	Provides a filename with path containing the IP addresses / Hostname / Subnet with mask, separated by new line.
--subnet	To get the Subnet with mask.
--all	This option is used to display detailed services. If --all parameter is added, the result displays all the detailed services. By default, only basic services are displayed.
--prefProtocol	PrefProtocol used for monitoring. Allowed options are 1 (SNMP), 2 (WSMan) and 3 (Redfish). This value is optional. i NOTE: This parameter is applicable only for Dell EMC servers. By default, Server will be discovered using WSMAN Protocol if the WSMAN parameters are passed. Else the discovery will happen through SNMP if SNMP parameters are passed.
--output.file	This displays the location where the host file will be created in .cfg format.
--logLoc	This parameter takes the log location from the user. i NOTE: If this attribute is not passed, the logs will be created in the default location /<NAGIOS_HOME>/var/dell
--snmp.version	Version of SNMP protocol. Allowed options are 1(SNMP v1), 2(SNMP v2c)
--snmp.community	Community string for SNMP communication. Default value is Public .
--snmp.port	For SNMP port value. Allowed value is [1-65535]. Default value is 161 .
--snmp.retries	For SNMP retries count. Allowed value is [1-10]. Default value is 1 .
--snmp.timeout	SNMP timeout values (in seconds). Allowed values is [1-1440]. Default value is 3 .
--http.user	WSMan / REST authentication username.
--http.password	WSMan / REST authentication password.
--http.timeout	WSMan / REST timeout (in seconds). Allowed value is [1-1440]. Default value is 30 .
--http.retries	WSMan / REST retries count. Allowed value is [1-10]. Default value is 1 .
--http.port	WSMan / REST port details. Allowed value is [1-65535]. Default value is 443 .
--enableLog	To enable or disable the logs. If --enable parameter is passed, the logs are created else the logs are not created.
--force	--force rewrites the config file.
--warranty.criticalDays	Warranty critical days. Allowed value is [1-365]. Default value is 10 . i NOTE: The value of Warranty critical days should be less than Warranty warning days.
--warranty.warningDays	Warranty warning days. Allowed value is [1-365]. Default value is 30 .
--nagios.type	Decides the output format of the host file. Allowed options is 0 for .cfg format and 1 for .xml format. Default values is 0 .

Table 12. Dell EMC Device Helper Utility Mandatory Parameters

--host	These parameters define the value of the Dell EMC device to be discovered.
--filename	
--subnet	
--snmp.version	This parameter is mandatory for a Dell EMC device discovered through SNMP.
--http.user	This parameter is mandatory for a Dell EMC device discovered through WSMAN / Redfish.
--http.password	
--output.file	This displays the location where the host file will be created in .cfg format

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

- If you run the Python command `python dellemc_nagios_discovery_service_utility.py` without the `--all` 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 `python dellemc_nagios_discovery_service_utility.py` with the `--all` option, detailed services are created as listed in the table below, and are displayed in the Nagios Core console under **Services**:

Table 13. Default services created for Dell EMC Servers based on the selected protocol

Services	SNMP	WSMAN Protocol	Redfish Protocol
Basic Services			
Dell EMC Server Overall Health Status	√	√	√
Dell EMC Server Information	√	√	√
Dell EMC Server Traps	√	√	√
Detailed Services			
Dell EMC Memory Status	√	√	X
Dell EMC Server Physical Disk Status	√	√	X
Dell EMC Server Virtual Disk Status	√	√	X
Dell EMC Server Fan Status	√	√	√
Dell EMC Server Battery Status	√	√	X
Dell EMC Server Intrusion Status	√	√	X
Dell EMC Server Network Device Status	√	√	√
Dell EMC Server Voltage Probe Status	√	√	√
Dell EMC Server Controller Status	√	√	√
Dell EMC Server Amperage Probe Status	√	√	X
Dell EMC Server CPU Status	√	√	√

Table 13. Default services created for Dell EMC Servers based on the selected protocol (continued)

Services	SNMP	WSMan Protocol	Redfish Protocol
Dell EMC Server Power Supply Status	√	√	√
Dell EMC Server Temperature Probe Status	√	√	√
Dell EMC Server SD Card Status	X	√	X
Dell EMC Server FC NIC Status	X	√	X
Dell EMC Server Warranty Information	√	√	√

Table 14. Default services created for all Dell EMC Chassis based on WSMan protocol

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

Table 15. Default services created for all Dell EMC Networking based on SNMP protocol

Basic Services	
Dell EMC Network Switch Information	
Dell EMC Network Switch Overall Health Status	
Dell EMC Network Switch Traps	
Detailed Services	
Dell EMC Network Switch PowerSupply Status	
Dell EMC Network Switch PowerSupplyTray Status	
Dell EMC Network Switch Fan Status	
Dell EMC Network FanTray Status	

Table 15. Default services created for all Dell EMC Networking based on SNMP protocol (continued)

Dell EMC Network Switch Processor Status	
Dell EMC Network Switch vFlash Status	
Dell EMC Network Switch Physical Port Status	
Dell EMC Network Switch Warranty Information	

NOTE: For M-Series and F-Series Dell EMC Network Switch, Dell EMC Network Switch PowerSupply Status, Dell EMC Network Switch PowerSupplyTray Status, Dell EMC Switch Network FanTray Status, Dell EMC Network Switch Fan Status services are not applicable.

Table 16. Default services created for Compellent SC-Series Storage Arrays based on SNMP protocol

Services
Basic Services
Dell EMC Storage SC-Series Overall Health Status
Dell EMC Storage SC-Series Information
Dell EMC Storage SC-Series Management Traps
Dell EMC Storage SC-Series Controller Traps
Dell EMC Storage SC-Series Controller Overall Health Status
Dell EMC Storage SC-Series Controller Information
Detailed Services
Dell EMC Storage SC-Series Physical Disk Status
Dell EMC Storage SC-Series Volume Status
Dell EMC Storage SC-Series Controller Warranty Information

Table 17. Default services created for EqualLogic PS-Series Storage Arrays based on SNMP protocol

Services
Basic Services
Dell EMC Storage PS-Series Member Overall Health Status
Dell EMC Storage PS-Series Member Information
Dell EMC Storage PS-Series Group Information
Dell EMC Storage PS-Series Member Traps
Dell EMC Storage PS-Series Member Group Traps
Detailed Services
Dell EMC Storage PS-Series Member Physical Disk Status
Dell EMC Storage PS-Series Group Volume Status
Dell EMC Storage PS-Series Group Storage Pool Status
Dell EMC Storage PS-Series Group Storage Pool Information
Dell EMC Storage PS-Series Member Warranty Information

Table 18. Default services created for PowerVault MD-Series Storage Arrays based on SNMP protocol

Services
Basic Services
Dell EMC Storage MD-Series MD Overall Health Status

Table 18. Default services created for PowerVault MD-Series Storage Arrays based on SNMP protocol (continued)

Services
Dell EMC Storage MD-Series MD Information
Dell EMC Storage MD-Series MD Traps
Detailed Services
Dell EMC Storage MD-Series Warranty Information

Discovering Dell EMC devices

You can discover all the supported Dell EMC 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 Dell EMC Servers, Dell EMC Storage devices and Dell EMC Network Switch. 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.
- WSMAN is enabled and configured for discovering Dell EMC Chassis devices.
- WSMAN is enabled and configured for discovering Dell EMC Servers using WSMAN Protocol.
- Redfish is enabled and configured for discovering Dell EMC Servers using Redfish REST APIs.

To discover Dell EMC 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: `python dellemc_nagios_discovery_service_utility.py`

The script syntax and information on options are displayed. For more information see [About Dell Discovery Utility](#).

Based on your requirement do the following:

- To discover a SNMP device using Host IP address :

```
python dellemc_nagios_discovery_utility.py --host=<host name or IP address> --snmp.version=2 --output.file=/usr/local/nagios/dell/config/objects/
```

- To discover through WSMAN Protocol/ Redfish REST APIs using Filepath :

```
python dellemc_nagios_discovery_utility.py --file=<absolute file path> --http.user=root --http.password=calvin --output.file=/usr/local/nagios/dell/config/objects/
```

- To discover through SNMP or WSMAN Protocol/ Redfish REST API using Subnet mask :

```
python dellemc_nagios_discovery_utility.py --subnet=<subnet with mask> --snmp.version=2 --http.user=root --http.password=calvin --output.file=/usr/local/nagios/dell/config/objects/
```

NOTE: If the other Dell EMC discovery utility parameters are not passed, the command will run with default values.

NOTE: Ensure that the Dell EMC device is discovered either using IP address or FQDN and not both at a given instance.

4. By default, Dell EMC Server is discovered using WSMAN Protocol. If the WSMAN protocol parameters are not passed in the command, the discovery will happen through SNMP. Based on your requirements, the value of `--prefProtocol` can be changed.

Dell EMC Servers can be discovered through either WSMAN or Redfish or SNMP using the below commands:

- To discover using WSMAN Protocol using File Path :

```
python dellemc_nagios_discovery_utility.py --file=<absolute file path> --prefProtocol=2 --http.user=root --http.password=calvin --output.file=/usr/local/nagios/dell/config/objects/
```

- To discover using Redfish REST APIs using File Path:

```
python dellemc_nagios_discovery_utility.py --file=<absolute file path> --prefProtocol=3
--http.user=root --http.password=calvin --output.file=/usr/local/nagios/dell/config/
objects/
```

- To discover using SNMP using File Path:

```
python dellemc_nagios_discovery_utility.py --file=<absolute file path> --prefProtocol=1
--snmp.version=2 --output.file=/usr/local/nagios/dell/config/objects/
```

- Once the discovery utility script is run, verify the Nagios configuration by running the command `<NAGIOS_HOME>/bin/nagios -v /<NAGIOS_HOME>/etc/nagios.cfg`.

NOTE: If `--enable.log` parameter is not passed, the logs will not be created.

NOTE: If the `--enable.log` parameter is passed, but the `--logLoc` value is not defined, the logs will be created in the default location `<NAGIOS_HOME>/var/dell`

- Ensure that no errors are present and then restart Nagios Core by running the command `service nagios restart`.

After completion of discovery:

- Dell EMC device Host definition and its service definitions are created in the Nagios server and this is subsequently used for monitoring the Dell EMC devices.
The discovered Dell EMC 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 EMC devices are displayed in the **Map** view in the Nagios Core console.

Device information

About device information

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

Table 19. Device Information

Service	Status	Description	Attributes Displayed
Dell EMC Server Information	The following states are possible: <ul style="list-style-type: none"> OK Unknown Critical Warning 	This service provides the basic device inventory information. <p>NOTE: Chassis Tag is applicable only for modular servers and Node ID is applicable only for PowerEdge FM120x4</p> <p>NOTE: System Configuration Lockdown Mode, iDRAC Group Manager Status and iDRAC Group Name is applicable only for 14G Servers</p>	<ul style="list-style-type: none"> Node ID Chassis ServiceTag System Generation Service Tag Model OS Name OS Version iDRAC URL iDRAC Firmware Version Service Host FQDN VMM URL System Configuration Lockdown Mode iDRAC Group Name iDRAC Group Manager Status
Dell EMC Chassis Information	The following states are possible: <ul style="list-style-type: none"> OK Unknown 	This service provides the basic device inventory information for PowerEdge M1000e, PowerEdge VRTX, and PowerEdge FX2/FX2s chassis.	<ul style="list-style-type: none"> Service Tag Chassis Name Model Name CMC Firmware Version

Table 19. Device Information (continued)

Service	Status	Description	Attributes Displayed
	<ul style="list-style-type: none"> · Critical · Warning 		<ul style="list-style-type: none"> · CMC URL
Dell EMC Storage SC-Series Controller Information	The following states are possible: <ul style="list-style-type: none"> · OK · Unknown · Critical · Warning 	This service provides the basic device inventory information for Compellent Controller IP	<ul style="list-style-type: none"> · Overall Controller · Service Tag · Primary Controller · Controller Name · Model Name · Compellent URL
Dell EMC Storage SC-Series Information	The following states are possible: <ul style="list-style-type: none"> · OK · Unknown · Critical · Warning 	This service provides the basic device inventory information for Compellent Management IP	<ul style="list-style-type: none"> · Overall Storage Center · Firmware Version · Compellent URL · Storage Name · Primary Controller name · Primary Controller Model · Primary Controller IP Address · Primary Controller Service Tag · Secondary Controller Name · Secondary Controller Model · Secondary Controller IP Address · Secondary Controller Service tag
Dell EMC Storage PS-Series Member Information	The following states are possible: <ul style="list-style-type: none"> · OK · Unknown · Critical · Warning 	This service provides the basic device inventory information for the EqualLogic Member.	<ul style="list-style-type: none"> · Overall Member · Member Name · Product Family · Service Tag · Model Name · Chassis Type · Disk Count · RAID Status · Firmware Version · RAID Policy · Group Name · Group IP · Storage Pool · Capacity(GB)
Dell EMC Storage PS-Series Group Information	The following states are possible: <ul style="list-style-type: none"> · OK · Unknown · Critical · Warning 	This service provides the basic device inventory information for EqualLogic Groups	<ul style="list-style-type: none"> · Group Name · Member Count · Volume Count · Group URL
Dell EMC Storage MD-Series Information	The following states are possible: <ul style="list-style-type: none"> · OK · Unknown · Critical 	This service provides the basic device inventory information for PowerVault MD-Series Storage Arrays	<ul style="list-style-type: none"> · Overall Storage Array · Service Tag · Product ID · World-wide ID · Storage Name

Table 19. Device Information (continued)

Service	Status	Description	Attributes Displayed
	<ul style="list-style-type: none"> · Warning 		
Dell EMC Network Switch Information	The following states are possible: <ul style="list-style-type: none"> · OK · Unknown · Critical · Warning 	This service provides the basic information of the Network Switch.	<ul style="list-style-type: none"> · HostName · Model · ServiceTag · Serial Number · MACAddress · ManagementIP · Firmware Version

For attributes information on various components, see [About Monitoring Component Health of Dell EMC Devices](#).

Viewing device information

To view the information about Dell EMC devices once the **Dell EMC 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.

Monitoring Dell EMC devices

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

Topics:

- Overall health status of the Dell EMC devices
- Monitoring component health of Dell EMC devices
- Monitoring SNMP alerts

Overall health status of the Dell EMC devices

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

Health Instances

You can monitor the health instances of all the Dell EMC devices using the Nagios Core Console. The health instances indicates the health status of the discovered Dell EMC device. The instances are shown under the **status information** tab.

By default the unhealthy instances are shown for the discovered devices in the Nagios core console. Based on the monitoring requirement, you can change the value of **--excludeinstance** in the host configuration file. Restart the **Nagios Service** after changing the values.

i **NOTE:** To view all the instances of any service for the Dell EMC device in Nagios Core Console, navigate to `<NAGIOS_HOME>/dell/config/objects` and click on the `cfg` file of the discovered device. To see all the instances for the required service, remove the `--excludeinstance="status=Ok"` command from the `check_command` script.

i **NOTE:** Health instances is not applicable for Information Services, Overall Health Services and Warranty Services of the discovered Dell EMC 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 20. Overall health Status information

Service	Status	Description	Attributes displayed when using WSMAN	Attributes displayed when using SNMP	Attributes displayed when using Redfish
Dell EMC Server Overall Health Status	The following states are possible for the supported Dell EMC devices: <ul style="list-style-type: none"> • OK • Warning • Unknown • Critical 	Provides global health status of Dell EMC Servers.	<ul style="list-style-type: none"> • Overall System • Storage • Voltage • Power Supply • Amperage • Fan • Intrusion • Memory • Battery • CPU • Temperature 	<ul style="list-style-type: none"> • Overall System • Storage • Voltage • Power Supply • Amperage • Fan • Intrusion • Memory • Battery • CPU • Temperature 	<ul style="list-style-type: none"> • Overall System • Memory • CPU

Table 20. Overall health Status information (continued)

Service	Status	Description	Attributes displayed when using WSMAN	Attributes displayed when using SNMP	Attributes displayed when using Redfish
Dell EMC Chassis Overall Health Status		Provides global health status of Dell EMC Chassis.	Overall Chassis	Not Available	Not Available
Dell EMC Storage PS-Series Member Overall Health		Provides global health status of EqualLogic Storage Arrays.	Not Available	Overall Member	Not Available
Dell EMC Storage SC-Series Overall Health Status		Provides global health status of Compellent Storage Arrays.	Not Available	Overall Storage Center	Not Available
Dell EMC Storage SC-Series Controller Overall Health Status		Provides global health status of Compellent Storage Array's controller.	Not Available	Overall Controller	Not Available
Dell EMC Storage MD-Series Overall Health Status		Provides global health status of PowerVault MD Storage Arrays.	Not Available	Overall Storage Array	Not Available
Dell EMC Network Switch Overall Health Status		Provides global health status of Dell EMC Network Switch	Not Available	Overall Switch	Not Available

 **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 EMC devices in your data center environment, ensure that the discovered devices are reachable.

To view the overall health of Dell EMC 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.

Monitoring component health of Dell EMC devices

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

About monitoring component health of Dell EMC devices

This is a periodic poll based health monitoring of a Dell EMC 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 21. Dell EMC device's component health information

Service	Status	Description	Attributes displayed when using WSMAN	Attributes displayed when using SNMP	Attributes displayed when using Redfish
Dell EMC Server Memory Status	The following states are possible: <ul style="list-style-type: none"> • OK • Warning • Unknown • Critical 	Provides the worst case aggregate health status of the memory in Dell EMC Servers.	<ul style="list-style-type: none"> • Status • FQDD • Type • PartNumber • Size • State • Speed 	<ul style="list-style-type: none"> • Status • FQDD • Type • PartNumber • Size • State • Speed 	Not Available
Dell EMC Server Physical Disk Status		Provides the worst case aggregate health status of the physical disks in Dell EMC Servers.	<ul style="list-style-type: none"> • Status • ProductID • SerialNumber • Size • Media Type • Revision • State 	<ul style="list-style-type: none"> • Status • FQDD • ProductID • SerialNumber • Size • Media Type • Revision • State 	Not Available
Dell EMC Server Virtual Disk Status		Provides the worst case aggregate health status of the virtual disks in Dell EMC Servers.	<ul style="list-style-type: none"> • Status • FQDD • Layout • Size • MediaType • ReadCachePolicy • WriteCachePolicy • StripeSize • State 	<ul style="list-style-type: none"> • Status • FQDD • Layout • Size • MediaType • ReadCachePolicy • WriteCachePolicy • StripeSize • State 	Not Available
Dell EMC Server Fan Status		Provides overall health status of the fans in Dell EMC Server without considering the redundancy status.	<ul style="list-style-type: none"> • Status • FQDD • State 	<ul style="list-style-type: none"> • Status • FQDD • State 	<ul style="list-style-type: none"> • Status • FQDD • State
Dell EMC Server Intrusion Status		Provides overall health status of the chassis intrusion in Dell EMC Servers.	<ul style="list-style-type: none"> • Status • Location • State 	<ul style="list-style-type: none"> • Status • Location • State 	Not Available
Dell EMC Server Network Device Status		Provides the worst case aggregate health status of the NIC in Dell EMC Servers.	<ul style="list-style-type: none"> • ConnectionStatus • FQDD • LinkSpeed • FirmwareVersion • ProductName 	<ul style="list-style-type: none"> • ConnectionStatus • FQDD • LinkSpeed • FirmwareVersion • ProductName 	<ul style="list-style-type: none"> • ConnectionStatus • FQDD • LinkSpeed • FirmwareVersion • ProductName

Table 21. Dell EMC device’s component health information (continued)

Service	Status	Description	Attributes displayed when using WSMAN	Attributes displayed when using SNMP	Attributes displayed when using Redfish
					NOTE: FirmwareVersion and ProductName attributes will display Not Available.
Dell EMC Server CPU Status		Provides overall health status of the CPUs in Dell EMC Servers.	<ul style="list-style-type: none"> Status FQDD Model CoreCount 	<ul style="list-style-type: none"> Status FQDD Model CoreCount 	<ul style="list-style-type: none"> Status FQDD Model CoreCount
Dell EMC Server Power Supply Status		Provides overall health status of the power supplies in Dell EMC Server without considering the redundancy status.	<ul style="list-style-type: none"> Status FQDD FirmwareVersion InputWattage 	<ul style="list-style-type: none"> Status FQDD CapabilitiesState InputWattage 	<ul style="list-style-type: none"> Status FQDD Redundancy FirmwareVersion InputWattage NOTE: Redundancy and InputWattage(W) attributes will display Not Available.
Dell EMC Server Temperature Probe Status		Provides overall health status of the temperature probe in Dell EMC Servers.	<ul style="list-style-type: none"> Status Location State 	<ul style="list-style-type: none"> Status Location State 	<ul style="list-style-type: none"> Status Location State
Dell EMC Server Voltage Probe Status		Provides overall health status of the voltage probe in Dell EMC Servers.	<ul style="list-style-type: none"> Status Location State 	<ul style="list-style-type: none"> Status Location State 	<ul style="list-style-type: none"> Status Location State
Dell EMC Server Controller Status		Provides the worst case aggregate health status of the storage controllers in Dell EMC Servers.	<ul style="list-style-type: none"> Status FQDD CacheSize FirmwareVersion Name 	<ul style="list-style-type: none"> Status FQDD CacheSize FirmwareVersion Name 	<ul style="list-style-type: none"> Status FQDD CacheSize FirmwareVersion Name
Dell EMC Server Amperage Probe Status		Provides overall health status of the amperage probe in Dell EMC Servers.	<ul style="list-style-type: none"> Status Location State 	<ul style="list-style-type: none"> Status Location State 	Not Available
Dell EMC Server SD Card Status		Provides overall health status of the SD card in Dell EMC Servers.	<ul style="list-style-type: none"> Status FQDD Size WriteProtected InitializedState State 	Not Available	Not Available

Table 21. Dell EMC device's component health information (continued)

Service	Status	Description	Attributes displayed when using WSMAN	Attributes displayed when using SNMP	Attributes displayed when using Redfish
Dell EMC Server FC NIC Status		Provides overall health status of the FC NIC in Dell EMC Servers.	<ul style="list-style-type: none"> · ConnectionStatus · FQDD · Name · FirmwareVersion · LinkSpeed 	Not Available	Not Available

Table 22. Dell EMC Chassis component health information

Service	Status	Description	Attributes Displayed
Dell EMC Chassis Physical Disk Status Applicable only to PowerEdge VRTX chassis.	The following states are possible: <ul style="list-style-type: none"> · OK · Warning · Unknown · Critical 	Provides the worst case aggregate health status of the physical disks in Dell EMC Chassis.	<ul style="list-style-type: none"> · Status · FQDD · Model · PartNumber · Slot · FirmwareVersion · Capacity · FreeSpace · MediaType · SecurityState
Dell EMC Chassis Virtual Disk Status Applicable only to PowerEdge VRTX chassis.		Provides the worst case aggregate health status of the virtual disks in Dell EMC Chassis.	<ul style="list-style-type: none"> · Status · FQDD · BusProtocol · Capacity · MediaType · Name · RAIDTypes · ReadPolicy · StripeSize · WritePolicy
Dell EMC Chassis PCIe Devices Status		Provides the worst case aggregate health status of all the Dell EMC Chassis PCIe device instances	<ul style="list-style-type: none"> · Status · FQDD · Name · Fabric · PCIeSlot · PowerState · AssignedSlot · AssignedBlade
Dell EMC Chassis Fan Status		Provides the worst case aggregate health status of the fans in Dell EMC Chassis.	<ul style="list-style-type: none"> · Status · FQDD · Name · Slot · Speed
Dell EMC Chassis Power Supply Status		Provides the worst case aggregate health status of the power supply in Dell EMC Chassis.	<ul style="list-style-type: none"> · Status · FQDD · Name · PartNumber · Slot

Table 22. Dell EMC Chassis component health information (continued)

Service	Status	Description	Attributes Displayed
Dell EMC Chassis Controller Status Applicable only to PowerEdge VRTX chassis.		Provides the worst case aggregate health status of the storage controllers in Dell EMC Chassis.	<ul style="list-style-type: none"> • Status • FQDD • CacheSize • FirmwareVersion • Name • PatrolReadState • SecurityStatus • SlotType
Dell EMC Chassis Enclosure Status Applicable only to PowerEdge VRTX chassis.		Provides the worst case aggregate health status of the enclosure in Dell EMC Chassis.	<ul style="list-style-type: none"> • Status • FQDD • BayID • Connector • FirmwareVersion • SlotCount
Dell EMC Chassis IO Module Status		Provides the worst case aggregate health status of the IO module in Dell EMC Chassis.	<ul style="list-style-type: none"> • Status • FQDD • FabricType • IPv4Address • LaunchURL • Name • PartNumber • Slot
Dell EMC Chassis Server Slot Information		Provides the worst case aggregate health status of the Server slot in Dell EMC Chassis.	<ul style="list-style-type: none"> • Status • SlotNumber • HostName • Model • ServiceTag • iDRACIP
Dell EMC Chassis Storage Slot Information		Provides the worst case aggregate health status of the Storage slot in Dell EMC Chassis.	<ul style="list-style-type: none"> • Status • SlotNumber • Model • ServiceTag
Dell EMC Chassis KVM Status		Provides the worst case aggregate health status of the KVM (Keyboard, Video, Mouse) in Dell EMC Chassis.	<ul style="list-style-type: none"> • Status • Name
Dell EMC Chassis Warranty Information		Provides warranty information status for the Dell EMC Chassis.	<ul style="list-style-type: none"> • ServiceTag • Service Level Details • Item number • Device Type • Ship Date(UTC) • Start Date(UTC) • End Date(UTC) • Days Remaining

Table 23. EqualLogic component health information

Service	Status	Description	Attributes Displayed
Dell EMC Storage PS-Series Member Physical Disk Status	The following states are possible: <ul style="list-style-type: none"> · OK · Warning · Unknown · Critical 	Provides the worst case aggregate health status of the physical disks in the EqualLogic member.	<ul style="list-style-type: none"> · Status · Slot · Model · SerialNumber · FirmwareVersion · TotalSize
Dell EMC Storage PS-Series Group Volume Status		Provides the worst case aggregate health status of the EqualLogic Group volume status.	<ul style="list-style-type: none"> · Status · Name · TotalSize(GB) · AssociatedPool
Dell EMC Storage PS-Series Group Storage Pool Information		Provides the worst case aggregate health status of all the EqualLogic storage arrays in a storage pool.	<ul style="list-style-type: none"> · Name · MemberCount · VolumeCount
Dell EMC Storage PS-Series Group Warranty Information		Provides warranty information status for the EqualLogic storage arrays.	<ul style="list-style-type: none"> · ServiceTag · Service Level Details · Item number · Device Type · Ship Date(UTC) · Start Date(UTC) · End Date(UTC) · Days Remaining

Table 24. Compellent component health information

Service	Status	Description	Attributes Displayed
Dell EMC Storage SC-Series Physical Disk Status	The following states are possible: <ul style="list-style-type: none"> · OK · Warning · Unknown · Critical 	Provides the worst case aggregate health status of the physical disks in Compellent storage arrays.	<ul style="list-style-type: none"> · Status · Name · TotalSize · BusType · DiskEnclosureNumber
Dell EMC Storage SC-Series Volume Status		Provides the worst case aggregate health status of the Compellent volume.	<ul style="list-style-type: none"> · Status · VolumeName
Dell EMC Storage SC-Series Controller Warranty Information		Provides warranty information status for the Compellent storage arrays.	<ul style="list-style-type: none"> · ServiceTag · Service Level Details · Item number · Device Type · Ship Date(UTC) · Start Date(UTC) · End Date(UTC) · Days Remaining

Table 25. PowerVault MD warranty information

Service	Status	Description	Attributes Displayed when using SNMP
Dell EMC Storage MD-Series Warranty Information	The following states are possible: <ul style="list-style-type: none"> · OK 	Provides warranty information status for the PowerVault MD storage arrays.	<ul style="list-style-type: none"> · ServiceTag · Service Level Details · Item number

Table 25. PowerVault MD warranty information

Service	Status	Description	Attributes Displayed when using SNMP
	<ul style="list-style-type: none"> · Warning · Unknown · Critical 		<ul style="list-style-type: none"> · Device Type · Ship Date(UTC) · Start Date(UTC) · End Date(UTC) · Days Remaining

Table 26. Network Switch component health information

Service	Status	Description	Attributes Displayed when using SNMP
Dell EMC Network Switch Fan Status	<p>The following states are possible:</p> <ul style="list-style-type: none"> · OK · Warning · Unknown · Critical 	Provides the worst case aggregate Fan status of the Network Switch.	<ul style="list-style-type: none"> · Status · Index · Description
Dell EMC Network Switch FanTray Status		Provides the worst case aggregate FanTray status of the Network Switch.	<ul style="list-style-type: none"> · Status · Type · TrayIndex
Dell EMC Network Switch PowerSupply Status		Provides the worst case aggregate PowerSupply status of the Network Switch.	<ul style="list-style-type: none"> · Status · Index · Description · Source
Dell EMC Network Switch PowerSupplyTray Status		Provides the worst case aggregate PowerSupplyTray status of the Network Switch.	<ul style="list-style-type: none"> · Index · Type
Dell EMC Network Switch Processor		Provides overall health status of the processors in Dell EMC Network Switch.	<ul style="list-style-type: none"> · ProcessorMemSize · ProcessorModule · Index
Dell EMC Network Switch vFlash Status		Provides the worst case aggregate health status of the Network Switch.	<ul style="list-style-type: none"> · MountPoint · Size · Name
Dell EMC Network Switch Physical Port Status		Provides the worst case aggregate health status of the physical ports in Dell EMC Network Switch.	<ul style="list-style-type: none"> · Status <p>NOTE: The Status attribute displays the health status of the Admin Status.</p> <ul style="list-style-type: none"> · Type · Name
Dell EMC Network Switch Warranty Information		Provides warranty information status for the Dell EMC Network Switch	<ul style="list-style-type: none"> · ServiceTag · Service Level Details · Item Number · Device Type · Ship Date · Start Date · End Date · 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 EMC Chassis enclosure status will display the Primary Status of the Enclosure only. For more information, see *PowerEdge VRTX Chassis console* or the *PoweEdge VRTX chassis User's Guide* at Dell.com/support.

NOTE:

Table 27. 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 EMC devices

To monitor the component health status of Dell EMC devices:

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

Viewing Dell EMC devices in the Nagios Core console

To view the Dell EMC devices in the Nagios Core console, ensure that the devices are already discovered and inventoried.

You can view the discovered Dell EMC 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.

The screenshot shows the Nagios Core interface. On the left, there is a sidebar with navigation menus. The main content area is titled 'Host Status Details For All Host Groups'. It features a table with the following columns: Host, Status, Last Check, Duration, and Status Information. The table lists several hosts, all of which are in an 'UP' status. The status information for each host includes details like 'PING OK - Packet loss = 0%, RTA = 0.12 ms'.

Host	Status	Last Check	Duration	Status Information
Compellent_Storage	UP	03-19-2018 16:29:06	0d 0h 0m 17s+	PING OK - Packet loss = 0%, RTA = 0.12 ms
Equal_Storage	UP	03-19-2018 16:26:33	0d 0h 0m 17s+	PING OK - Packet loss = 0%, RTA = 0.15 ms
FX2_Chassis	UP	03-19-2018 16:30:01	0d 0h 0m 17s+	PING OK - Packet loss = 0%, RTA = 0.23 ms
MD_Storage	UP	03-19-2018 16:27:33	0d 0h 0m 17s+	PING OK - Packet loss = 0%, RTA = 0.14 ms
Network_Switch	UP	03-19-2018 16:28:33	0d 0h 0m 17s+	PING OK - Packet loss = 0%, RTA = 0.22 ms
iDRAC	UP	03-19-2018 16:29:33	0d 0h 0m 17s+	PING OK - Packet loss = 0%, RTA = 0.25 ms
localhost	UP	03-19-2018 16:25:47	8d 16h 18m 22s	PING OK - Packet loss = 0%, RTA = 0.02 ms

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.

Monitoring 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 received alert in the Nagios Core console.

Table 28. Dell EMC trap information

Service	Status	Description
Dell EMC Server Traps	The following states are possible: <ul style="list-style-type: none"> OK Warning Critical Unknown 	Provides trap Information of the Dell EMC Server raised through agent-free method.
Dell EMC Chassis Traps	The following states are possible: <ul style="list-style-type: none"> OK Warning Critical Unknown 	Provides trap Information of the M1000e, VRTX, and FX2/FX2s Chassis.
Dell EMC Storage PS-Series Member Traps	The following states are possible: <ul style="list-style-type: none"> OK Warning Critical Unknown 	Provides trap Information of the EqualLogic PS-Series storage Arrays.

Table 28. Dell EMC trap information (continued)

Service	Status	Description
Dell EMC Storage PS-Series Group Traps	The following states are possible: <ul style="list-style-type: none"> • OK • Warning • Critical • Unknown 	Provides trap Information of the EqualLogic PS-Series storage Arrays.
Dell EMC Storage SC-Series Management Traps	The following states are possible: <ul style="list-style-type: none"> • OK • Warning • Critical • Unknown 	Provides trap information of the Compellent SC-Series storage Arrays
Dell EMC Storage SC-Series Controller Traps	The following states are possible: <ul style="list-style-type: none"> • OK • Warning • Critical • Unknown 	Provides trap Information of the Compellent SC-Series storage Arrays.
Dell EMC Storage MD-Series Traps	The following states are possible: <ul style="list-style-type: none"> • OK • Warning • Critical • Unknown 	Provides trap Information of the PowerVault MD-Series storage arrays.
Dell EMC Network Switch Traps	The following states are possible: <ul style="list-style-type: none"> • OK • Warning • Critical • Unknown 	Provides trap Information of the Dell EMC Network Switch.

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**.

Launching Dell EMC device specific consoles

To launch console for a supported Dell EMC device:

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

Topics:

- [Dell EMC devices and their consoles](#)

Dell EMC devices and their consoles

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

Table 29. Dell EMC devices and their consoles

Dell Device	Applicable Console
Dell EMC Servers, DSS and HCI Platforms	Integrated Dell Remote Access Controller Console
PowerEdge M1000e Chassis	Chassis Management Controller Console
PowerEdge VRTX Chassis	Chassis Management Controller Console
PowerEdge FX2/FX2s Chassis	Chassis Management Controller Console
Compellent SC-Series Storage Arrays	Enterprise Manager Client for managing Compellent devices
EqualLogic PS-Series Storage Arrays	EqualLogic Group Manager Console
Dell EMC Network Switch	Dell EMC Network Switch Console

NOTE: Dell EMC Network Switch Console launch is not applicable for S, Z and C Series Switches.

NOTE: If the HCI devices are added to the cluster, by default VMM console launches. Else iDRAC console will be launched.

Warranty information for Dell EMC devices

With this feature, you can access the warranty information for the discovered Dell EMC devices. This feature allows you to monitor the Dell EMC 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 EMC devices will be displayed in the Nagios core console. The Dell EMC 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.
- **Device 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 EMC warranty information parameters

You can configure the warranty related parameters manually. By default, for all the discovered Dell EMC devices, the value of Warranty Critical Days will be 10 and Warranty Warning Days will be 30.

If you wish to change the values of Warranty Critical Days and Warranty Warning Days, navigate to **<NAGIOS_HOME>/dell/config/objects** and open the Host Configuration File of the discovered Dell EMC device. You can now change the values of `--warranty.critical` and `--warranty.warning` parameters under the **Warranty Services**.

NOTE: The warranty status will be determined based on the Configured warranty, critical thresholds and maximum value of the days remaining.

The value of the warranty status will be shown as Critical, when the device warranty has expired.

Topics:

- [Viewing warranty information](#)

Viewing warranty information

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

- You have an active Internet connection.
- 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 EMC device,

1. Discover a Dell EMC device.
2. Click on the **<Dell EMC 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 VRTX Chassis, click on **Dell EMC Chassis Warranty Information**.

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

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

Removing Dell EMC devices

You can remove a Dell EMC 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 EMC device, restart the Nagios Core services by running the following command: `service nagios restart`.

Knowledge Base messages for the generated alerts

You can get more information about the SNMP alerts generated by the discovered Dell EMC 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 EMC 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](https://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 EMC device.

NOTE: KB information is not available for Dell EMC SC-Series Storage Arrays, Dell EMC MD-Series Storage Arrays and Dell EMC Network Switches.

Troubleshooting

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

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

SNMP traps are not received from the Dell EMC devices in the Nagios Core Console for Ubuntu setup.

Resolution :Replace `#!/bin/sh` to `#!/bin/bash` in `<NAGIOS_HOME>/libexec/eventhandlers/submit_check_result` and then, restart SNMPTT and Nagios service.

Nagios console doesn't get eqlMemberGatewayIPAddrChanged trap

Resolution :After changing the EqualLogic Member Gateway IP address, you need to make sure that the connectivity from EqualLogic member or EqualLogic Group to trap listener is available.

The Dell EMC 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 EMC 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 EMC 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

1. OMSDK is installed.
2. The IP addresses or hosts are reachable.
3. SNMP or WSMAN or Redfish is enabled on the given IP addresses or hosts.
4. The appropriate protocol parameters are passed during discovery.

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

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

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

1. SNMPTT is installed.
2. If SNMPTT is not installed, then the service is not created for any of the discovered Dell EMC 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 EMC OpenManage Plug-in specific services are displaying the message, "Error while creating SNMP Session"

1. The IP addresses or hosts provided are reachable.
2. SNMP is enabled on the IP addresses or hosts.

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

1. Redfish is enabled on the IP addresses or Hosts.
2. The IP addresses or hosts provided are reachable.

Dell EMC 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 EMC 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 host config file available at <NAGIOS_HOME>/dell/config/objects.

Unable to view the SNMP alerts generated by the Dell EMC 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 Warranty information for the discovered Dell EMC 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 EMC 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 EMC device.

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

If the Overall Health service is not created for a discovered Dell EMC device, then the Dell EMC 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.

Unable to view the KB information from the device trap after the Nagios Management Server IP address is changed

The new IP address has to be updated in the following configuration files:

- Dell_Agent_free_Server_Traps.conf
- Dell_Chassis_Traps.conf
- Dell_EqualLogic_Traps.conf

 **NOTE:** By default, the configuration files are available at the location: <Nagios_Home>/dell/config/templates

To update the new IP address in the above mentioned configuration files, run the following command and then restart snmptt service:

```
sed -i s/<Old IP>/<New IP>/g <Nagios_Home>/dell/config/templates/Dell*_Traps.conf
```


Frequently asked questions

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

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

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

Answer: For the list of supported Dell EMC 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 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 EMC 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 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.

Appendix

Configuring SNMP parameters for iDRAC using the iDRAC web console

1. Launch the iDRAC (12th and 13th generation of PowerEdge servers) web console and navigate to **iDRAC Settings > Network > Services** in the console.
For 14th generation of PowerEdge servers Launch the iDRAC web console and navigate to **iDRAC Settings > Services**
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 trap destination address for iDRAC using iDRAC web console

For 12th and 13th Generation of PowerEdge servers.

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**.

For 14th Generation of PowerEdge servers.

1. Log in to iDRAC.
2. Select **Configuration > System Settings**.
3. You can perform the following actions:
 - In the **Alert Configuration** section, enable **Alerts** .
 - In the **Alerts and Remote System Log Configuration** section, select the required fields thereby configuring the SNMP alerts.
4. Click on the **SMTP(E-mai) Configuration** tab and then perform the following actions:
 - In the **Destination Email Address** 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** under the **SNMP Traps Configuration** section as required and then click **Apply**.
 - In the **SNMP Traps Configuration** section, select the required SNMP trap format and then click **Apply**.