



Configure software

Cluster and storage switches

NetApp
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Configure software

Software install workflow for NVIDIA SN2100 storage switches

To install and configure the software for a NVIDIA SN2100 switch, follow these steps:

1. [Install Cumulus Linux in Cumulus mode](#) or [install Cumulus Linux in ONIE mode](#).

You can install Cumulus Linux (CL) OS when the switch is running either Cumulus Linux or ONIE.

2. [Install the Reference Configuration File script](#).

There are two RCF scripts available for Clustering and Storage applications.

3. [Configure SNMPv3 for switch log collection](#).

This release includes support for SNMPv3 for switch log collection and for Switch Health Monitoring (SHM).

The procedures use Network Command Line Utility (NCLU), which is a command line interface that ensures Cumulus Linux is fully accessible to all. The net command is the wrapper utility you use to execute actions from a terminal.

Install Cumulus Linux in Cumulus mode

Follow this procedure to install Cumulus Linux (CL) OS when the switch is running in Cumulus mode.



Cumulus Linux (CL) OS can be installed either when the switch is running Cumulus Linux or ONIE (see [Install in ONIE mode](#)).

What you'll need

- Intermediate-level Linux knowledge.
- Familiarity with basic text editing, UNIX file permissions, and process monitoring. A variety of text editors are pre-installed, including `vi` and `nano`.
- Access to a Linux or UNIX shell. If you are running Windows, use a Linux environment as your command line tool for interacting with Cumulus Linux.
- The baud rate requirement must be set to 115200 on the serial console switch for NVIDIA SN2100 switch console access, as follows:
 - 115200 baud
 - 8 data bits
 - 1 stop bit
 - parity: none
 - flow control: none

About this task

Be aware of the following:



Each time Cumulus Linux is installed, the entire file system structure is erased and rebuilt.



The default password for the cumulus user account is **cumulus**. The first time you log into Cumulus Linux, you must change this default password. Be sure to update any automation scripts before installing a new image. Cumulus Linux provides command line options to change the default password automatically during the installation process.

Steps

1. Log in to the switch.

First time log in to the switch requires username/password of **cumulus/cumulus** with `sudo` privileges.

Show example

```
cumulus login: cumulus
Password: cumulus
You are required to change your password immediately (administrator
enforced)
Changing password for cumulus.
Current password: cumulus
New password: <new_password>
Retype new password: <new_password>
```

2. Check the Cumulus Linux version:

```
net show system
```

Show example

```
cumulus@cumulus:mgmt:~$ net show system
Hostname..... cumulus
Build..... Cumulus Linux 4.4.3
Uptime..... 0:08:20.860000
Model..... Mlnx X86
CPU..... x86_64 Intel Atom C2558 2.40GHz
Memory..... 8GB
Disk..... 14.7GB
ASIC..... Mellanox Spectrum MT52132
Ports..... 16 x 100G-QSFP28
Part Number..... MSN2100-CB2FC
Serial Number.... MT2105T05177
Platform Name.... x86_64-mlnx_x86-r0
Product Name..... MSN2100
ONIE Version..... 2019.11-5.2.0020-115200
Base MAC Address. 04:3F:72:43:92:80
Manufacturer..... Mellanox
```

3. Configure the hostname, IP address, subnet mask, and default gateway. The new hostname only becomes effective after restarting the console/SSH session.



A Cumulus Linux switch provides at least one dedicated Ethernet management port called `eth0`. This interface is specifically for out-of-band management use. By default, the management interface uses DHCPv4 for addressing.



Do not use an underscore (`_`), apostrophe (`'`), or non-ASCII characters in the hostname.

Show example

```
cumulus@cumulus:mgmt:~$ net add hostname sw1
cumulus@cumulus:mgmt:~$ net add interface eth0 ip address
10.233.204.71
cumulus@cumulus:mgmt:~$ net add interface eth0 ip gateway
10.233.204.1
cumulus@cumulus:mgmt:~$ net pending
cumulus@cumulus:mgmt:~$ net commit
```

This command modifies both the `/etc/hostname` and `/etc/hosts` files.

4. Confirm that the hostname, IP address, subnet mask, and default gateway have been updated.

Show example

```
cumulus@sw1:mgmt:~$ hostname sw1
cumulus@sw1:mgmt:~$ ifconfig eth0
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 10.233.204.71 netmask 255.255.254.0 broadcast 10.233.205.255
inet6 fe80::bace:f6ff:fe19:1df6 prefixlen 64 scopeid 0x20<link>
ether b8:ce:f6:19:1d:f6 txqueuelen 1000 (Ethernet)
RX packets 75364 bytes 23013528 (21.9 MiB)
RX errors 0 dropped 7 overruns 0 frame 0
TX packets 4053 bytes 827280 (807.8 KiB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0 device
memory 0xdfc00000-dfc1ffff

cumulus@sw1::mgmt:~$ ip route show vrf mgmt
default via 10.233.204.1 dev eth0
unreachable default metric 4278198272
10.233.204.0/23 dev eth0 proto kernel scope link src 10.233.204.71
127.0.0.0/8 dev mgmt proto kernel scope link src 127.0.0.1
```

5. Configure the time zone using NTP interactive mode.

- a. On a terminal, run the following command:

```
cumulus@sw1:~$ sudo dpkg-reconfigure tzdata
```

- b. Follow the on-screen menu options to select the geographic area and region.
- c. To set the time zone for all services and daemons, reboot the switch.
- d. Verify that the date and time on the switch are correct and update if necessary.

6. Install Cumulus Linux 4.4.3:

```
cumulus@sw1:mgmt:~$ sudo onie-install -a -i http://<web-  
server>/<path>/cumulus-linux-4.4.3-mlx-amd64.bin
```

The installer starts the download. Type **y** when prompted.

7. Reboot the NVIDIA SN2100 switch:

```
cumulus@sw1:mgmt:~$ sudo reboot
```

8. The installation starts automatically, and the following GRUB screens appear. Do **not** make any selections:

- Cumulus-Linux GNU/Linux

- ONIE: Install OS
- CUMULUS-INSTALL
- Cumulus-Linux GNU/Linux

9. Repeat steps 1 to 4 to log in.

10. Verify that the Cumulus Linux version is 4.4.3:

```
net show version
```

Show example

```
cumulus@sw1:mgmt:~$ net show version
NCLU_VERSION=1.0-cl4.4.3u0
DISTRIB_ID="Cumulus Linux"
DISTRIB_RELEASE=4.4.3
DISTRIB_DESCRIPTION="Cumulus Linux 4.4.3"
```

11. Create a new user and add this user to the `sudo` group. This user only becomes effective after the console/SSH session is restarted.

```
sudo adduser --ingroup netedit admin
```

Show example

```
cumulus@sw1:mgmt:~$ sudo adduser --ingroup netedit admin
[sudo] password for cumulus:
Adding user `admin' ...
Adding new user `admin' (1001) with group `netedit' ...
Creating home directory `/home/admin' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for admin
Enter the new value, or press ENTER for the default
Full Name []:
Room Number []:
Work Phone []:
Home Phone []:
Other []:
Is the information correct? [Y/n] y

cumulus@sw1:mgmt:~$ sudo adduser admin sudo
[sudo] password for cumulus:
Adding user `admin' to group `sudo' ...
Adding user admin to group sudo
Done.
cumulus@sw1:mgmt:~$ exit
logout
Connection to 10.233.204.71 closed.

[admin@cycrh6svl01 ~]$ ssh admin@10.233.204.71
admin@10.233.204.71's password:
Linux sw1 4.19.0-cl-1-amd64 #1 SMP Cumulus 4.19.206-1+cl4.4.3u1
(2021-09-09) x86_64
Welcome to NVIDIA Cumulus (R) Linux (R)

For support and online technical documentation, visit
http://www.cumulusnetworks.com/support

The registered trademark Linux (R) is used pursuant to a sublicense
from LMI, the exclusive licensee of Linus Torvalds, owner of the
mark on a world-wide basis.
admin@sw1:mgmt:~$
```

What's next?

Install Cumulus Linux in ONIE mode

Follow this procedure to install Cumulus Linux (CL) OS when the switch is running in ONIE mode.



Cumulus Linux (CL) OS can be installed either when the switch is running Cumulus Linux or ONIE (see [Install in Cumulus mode](#)).

About this task

You can install the Cumulus Linux using Open Network Install Environment (ONIE) that allows for automatic discovery of a network installer image. This facilitates the system model of securing switches with an operating system choice, such as Cumulus Linux. The easiest way to install Cumulus Linux with ONIE is with local HTTP discovery.



If your host is IPv6-enabled, make sure it is running a web server. If your host is IPv4-enabled, make sure it is running DHCP in addition to a web server.

This procedure demonstrates how to upgrade Cumulus Linux after the admin has booted in ONIE.

Steps

1. Download the Cumulus Linux installation file to the root directory of the web server. Rename this file `onie-installer`.
2. Connect your host to the management Ethernet port of the switch using an Ethernet cable.
3. Power on the switch. The switch downloads the ONIE image installer and boots. After the installation completes, the Cumulus Linux login prompt appears in the terminal window.



Each time Cumulus Linux is installed, the entire file system structure is erased and rebuilt.

4. Reboot the SN2100 switch:

```
cumulus@cumulus:mgmt:~$ sudo reboot
```

5. Press the **Esc** key at the GNU GRUB screen to interrupt the normal boot process, select **ONIE** and press **Enter**.
6. On the next screen displayed, select **ONIE: Install OS**.
7. The ONIE installer discovery process runs searching for the automatic installation. Press **Enter** to temporarily stop the process.
8. When the discovery process has stopped:

```
ONIE:/ # onie-stop  
discover: installer mode detected.  
Stopping: discover...start-stop-daemon: warning: killing process 427:  
No such process done.
```

9. If the DHCP service is running on your network, verify that the IP address, subnet mask, and the default gateway are correctly assigned:

```
ifconfig eth0
```

Show example

```
ONIE:/ # ifconfig eth0
eth0    Link encap:Ethernet  HWaddr B8:CE:F6:19:1D:F6
        inet addr:10.233.204.71  Bcast:10.233.205.255
Mask:255.255.254.0
        inet6 addr: fe80::bace:f6ff:fe19:1df6/64 Scope:Link
        UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
        RX packets:21344 errors:0 dropped:2135 overruns:0 frame:0
        TX packets:3500 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:6119398 (5.8 MiB)  TX bytes:472975 (461.8 KiB)
        Memory:dfc00000-dfc1ffff

ONIE:/ # route
Kernel IP routing table
Destination        Gateway            Genmask           Flags Metric Ref
Use Iface

default            10.233.204.1      0.0.0.0           UG    0      0
0 eth0
10.233.204.0       *                  255.255.254.0     U      0      0
0 eth0
```

10. If the IP addressing scheme is manually defined, do the following:

```
ONIE:/ # ifconfig eth0 10.233.204.71 netmask 255.255.254.0
ONIE:/ # route add default gw 10.233.204.1
```

11. Repeat step 9 to verify that the static information is correctly entered.
12. Install Cumulus Linux:

```
ONIE:/ # route
```

```
Kernel IP routing table
```

```
ONIE:/ # onie-nos-install http://<web-server>/<path>/cumulus-linux-4.4.3-mlx-amd64.bin
```

```
Stopping: discover... done.
```

```
Info: Attempting
```

```
http://10.60.132.97/x/eng/testbedN,svl/nic/files/cumulus-linux-4.4.3-mlx-amd64.bin ...
```

```
Connecting to 10.60.132.97 (10.60.132.97:80)
```

```
installer          100% |*|    552M  0:00:00 ETA
```

```
...
```

```
...
```

13. Once the installation has completed, log in to the switch:

Show example

```
cumulus login: cumulus
```

```
Password: cumulus
```

```
You are required to change your password immediately (administrator enforced)
```

```
Changing password for cumulus.
```

```
Current password: cumulus
```

```
New password: <new_password>
```

```
Retype new password: <new_password>
```

14. Verify the Cumulus Linux version:

```
net show version
```

Show example

```
cumulus@cumulus:mgmt:~$ net show version
```

```
NCLU_VERSION=1.0-cl4.4.3u4
```

```
DISTRIB_ID="Cumulus Linux"
```

```
DISTRIB_RELEASE=4.4.3
```

```
DISTRIB_DESCRIPTION="Cumulus Linux 4.4.3"
```

What's next?

Install the RCF script

Follow this procedure to install the RCF script.

What you'll need

Before installing the RCF script, make sure that the following are available on the switch:

- Cumulus Linux 4.4.3 is installed.
- IP address, subnet mask, and default gateway defined via DHCP or manually configured.

Current RCF script versions

There are two RCF scripts available for Clustering and Storage applications. The procedure for each is the same.

- Clustering: **MSN2100-RCF-v1.8-Cluster**
- Storage: **MSN2100-RCF-v1.8-Storage**



The following example procedure shows how to download and apply the RCF script for Cluster switches.



Example command output uses switch management IP address 10.233.204.71, netmask 255.255.254.0 and default gateway 10.233.204.1.

Steps

1. Display the available interfaces on the SN2100 switch:

```
net show interface all
```

Show example

```
cumulus@cumulus:mgmt:~$ net show interface all
```

| State | Name | Spd | MTU | Mode | LLDP | Summary |
|-------|-------|-----|-------|---------------|-------|---------|
| ----- | ----- | --- | ----- | ----- | ----- | ----- |
| ... | | | | | | |
| ... | | | | | | |
| ADMDN | swp1 | N/A | 9216 | NotConfigured | | |
| ADMDN | swp2 | N/A | 9216 | NotConfigured | | |
| ADMDN | swp3 | N/A | 9216 | NotConfigured | | |
| ADMDN | swp4 | N/A | 9216 | NotConfigured | | |
| ADMDN | swp5 | N/A | 9216 | NotConfigured | | |
| ADMDN | swp6 | N/A | 9216 | NotConfigured | | |
| ADMDN | swp7 | N/A | 9216 | NotConfigure | | |
| ADMDN | swp8 | N/A | 9216 | NotConfigured | | |
| ADMDN | swp9 | N/A | 9216 | NotConfigured | | |
| ADMDN | swp10 | N/A | 9216 | NotConfigured | | |
| ADMDN | swp11 | N/A | 9216 | NotConfigured | | |
| ADMDN | swp12 | N/A | 9216 | NotConfigured | | |
| ADMDN | swp13 | N/A | 9216 | NotConfigured | | |
| ADMDN | swp14 | N/A | 9216 | NotConfigured | | |
| ADMDN | swp15 | N/A | 9216 | NotConfigured | | |
| ADMDN | swp16 | N/A | 9216 | NotConfigured | | |

2. Copy the RCF python script to the switch:

```
cumulus@cumulus:mgmt:~$ pwd
/home/cumulus
cumulus@cumulus:mgmt: /tmp$ scp <user>@<host>:/<path>/MSN2100-RCF-v1.8-
Cluster
ssologin@10.233.204.71's password:
MSN2100-RCF-v1.8-Cluster          100% 8607    111.2KB/s
00:00
```

3. Apply the RCF python script **MSN2100-RCF-v1.8-Cluster**:

```
cumulus@cumulus:mgmt:/tmp$ sudo python3 MSN2100-RCF-v1.8-Cluster
[sudo] password for cumulus:
...
Step 1: Creating the banner file
Step 2: Registering banner message
Step 3: Updating the MOTD file
Step 4: Ensuring passwordless use of cl-support command by admin
Step 5: Disabling apt-get
Step 6: Creating the interfaces
Step 7: Adding the interface config
Step 8: Disabling cdp
Step 9: Adding the lldp config
Step 10: Adding the RoCE base config
Step 11: Modifying RoCE Config
Step 12: Configure SNMP
Step 13: Reboot the switch
```

The RCF script completes the steps listed above.



For any RCF python script issues that cannot be corrected, contact [NetApp Support](#) for assistance.

4. Verify the configuration after the reboot:

```
net show interface all
```

Show example

```
cumulus@cumulus:mgmt:~$ net show interface all
```

| State | Name | Spd | MTU | Mode | LLDP | Summary |
|-------------|--------|-------|-------|----------|-------|---------|
| ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| ... | | | | | | |
| ... | | | | | | |
| DN | swp1s0 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp1s1 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp1s2 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp1s3 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp2s0 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp2s1 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp2s2 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp2s3 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| UP | swp3 | 100G | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| UP | swp4 | 100G | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp5 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp6 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp7 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp8 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp9 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp10 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp11 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp12 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |
| DN | swp13 | N/A | 9216 | Trunk/L2 | | Master: |
| bridge (UP) | | | | | | |

```

DN      swp14      N/A    9216    Trunk/L2      Master:
bridge(UP)
UP      swp15      N/A    9216    BondMember    Master:
bond_15_16(UP)
UP      swp16      N/A    9216    BondMember    Master:
bond_15_16(UP)
...
...

```

```
cumulus@cumulus:mgmt:~$ net show roce config
```

```
RoCE mode..... lossless
```

```
Congestion Control:
```

```
Enabled SPs.... 0 2 5
```

```
Mode..... ECN
```

```
Min Threshold.. 150 KB
```

```
Max Threshold.. 1500 KB
```

```
PFC:
```

```
Status..... enabled
```

```
Enabled SPs.... 2 5
```

```
Interfaces..... swp10-16,swp1s0-3,swp2s0-3,swp3-9
```

| DSCP | 802.1p | switch-priority |
|-------------------------|--------|-----------------|
| ----- | ----- | ----- |
| 0 1 2 3 4 5 6 7 | 0 | 0 |
| 8 9 10 11 12 13 14 15 | 1 | 1 |
| 16 17 18 19 20 21 22 23 | 2 | 2 |
| 24 25 26 27 28 29 30 31 | 3 | 3 |
| 32 33 34 35 36 37 38 39 | 4 | 4 |
| 40 41 42 43 44 45 46 47 | 5 | 5 |
| 48 49 50 51 52 53 54 55 | 6 | 6 |
| 56 57 58 59 60 61 62 63 | 7 | 7 |

| switch-priority | TC | ETS |
|-----------------|----|----------|
| ----- | -- | ----- |
| 0 1 3 4 6 7 | 0 | DWRR 28% |
| 2 | 2 | DWRR 28% |
| 5 | 5 | DWRR 43% |

5. Verify information for the transceiver in the interface:

```
net show interface pluggables
```


Show example

```
cumulus@cumulus:mgmt:~$ net show interface pluggables
```

| Interface | Identifier | Vendor | Name | Vendor PN | Vendor SN |
|----------------|---------------|----------|------|-----------|-------------|
| Vendor | Rev | | | | |
| swp3 | 0x11 (QSFP28) | Amphenol | | 112-00574 | |
| APF20379253516 | B0 | | | | |
| swp4 | 0x11 (QSFP28) | AVAGO | | 332-00440 | AF1815GU05Z |
| A0 | | | | | |
| swp15 | 0x11 (QSFP28) | Amphenol | | 112-00573 | |
| APF21109348001 | B0 | | | | |
| swp16 | 0x11 (QSFP28) | Amphenol | | 112-00573 | |
| APF21109347895 | B0 | | | | |

6. Verify that the nodes each have a connection to each switch:

```
net show lldp
```

Show example

```
cumulus@cumulus:mgmt:~$ net show lldp
```

| LocalPort | Speed | Mode | RemoteHost | RemotePort |
|-----------|-------|------------|------------|------------|
| swp3 | 100G | Trunk/L2 | sw1 | e3a |
| swp4 | 100G | Trunk/L2 | sw2 | e3b |
| swp15 | 100G | BondMember | sw13 | swp15 |
| swp16 | 100G | BondMember | sw14 | swp16 |

7. Verify the health of cluster ports on the cluster.

a. Verify that e0d ports are up and healthy across all nodes in the cluster:

```
network port show -role cluster
```

Show example

```
cluster1::*> network port show -role cluster
```

Node: node1

Ignore

| Health | Health | | | | Speed (Mbps) |
|---------|---------|-----------|--------|------|--------------|
| Port | IPspace | Broadcast | Domain | Link | MTU |
| Status | Status | | | | Admin/Oper |
| ----- | ----- | ----- | ---- | ---- | ----- |
| e3a | Cluster | Cluster | | up | 9000 |
| healthy | false | | | | auto/10000 |
| e3b | Cluster | Cluster | | up | 9000 |
| healthy | false | | | | auto/10000 |

Node: node2

Ignore

| Health | Health | | | | Speed (Mbps) |
|---------|---------|-----------|--------|------|--------------|
| Port | IPspace | Broadcast | Domain | Link | MTU |
| Status | Status | | | | Admin/Oper |
| ----- | ----- | ----- | ---- | ---- | ----- |
| e3a | Cluster | Cluster | | up | 9000 |
| healthy | false | | | | auto/10000 |
| e3b | Cluster | Cluster | | up | 9000 |
| healthy | false | | | | auto/10000 |

- b. Verify the switch health from the cluster (this might not show switch sw2, since LIFs are not homed on e0d).

Show example

```
cluster1::*> network device-discovery show -protocol lldp
```

| Node/ | Local | Discovered | | |
|------------|-------|--------------------------|-----------|----------|
| Protocol | Port | Device (LLDP: ChassisID) | Interface | Platform |
| ----- | ----- | ----- | ----- | ----- |
| node1/lldp | | | | |
| | e3a | sw1 (b8:ce:f6:19:1a:7e) | swp3 | - |
| | e3b | sw2 (b8:ce:f6:19:1b:96) | swp3 | - |
| node2/lldp | | | | |
| | e3a | sw1 (b8:ce:f6:19:1a:7e) | swp4 | - |
| | e3b | sw2 (b8:ce:f6:19:1b:96) | swp4 | - |


```
cluster1::*> system switch ethernet show -is-monitoring-enabled  
-operational true
```

| Switch | Type | Address |
|---|-----------------|---------------|
| Model | | |
| ----- | ----- | ----- |
| sw1 | cluster-network | 10.233.205.90 |
| MSN2100-CB2RC | | |
| Serial Number: MNXXXXXXGD | | |
| Is Monitored: true | | |
| Reason: None | | |
| Software Version: Cumulus Linux version 4.4.3 running on Mellanox | | |
| Technologies Ltd. MSN2100 | | |
| Version Source: LLDP | | |
| sw2 | cluster-network | 10.233.205.91 |
| MSN2100-CB2RC | | |
| Serial Number: MNCXXXXXXGS | | |
| Is Monitored: true | | |
| Reason: None | | |
| Software Version: Cumulus Linux version 4.4.3 running on Mellanox | | |
| Technologies Ltd. MSN2100 | | |
| Version Source: LLDP | | |

What's next?

[Configure switch log collection.](#)

Ethernet Switch Health Monitoring log collection

The Ethernet switch health monitor (CSHM) is responsible for ensuring the operational health of Cluster and Storage network switches and collecting switch logs for debugging purposes. This procedure guides you through the process of setting up and starting the collection of detailed **Support** logs from the switch and starts an hourly collection of **Periodic** data that is collected by AutoSupport.

Before you begin

- The user for log collection must be specified when the Reference Configuration File (RCF) is applied. By default, this user is set to 'admin'. If you wish to use a different user, you must specify this in the `*# SHM User*`s section of the RCF.
- The user must have access to the **nv show** commands. This can be added by running `sudo adduser USER nv show` and replacing `USER` with the user for log collection.
- Switch health monitoring must be enabled for the switch. Verify this by ensuring the `Is Monitored:` field is set to **true** in the output of the `system switch ethernet show` command.

Steps

1. To set up log collection, run the following command for each switch. You are prompted to enter the switch name, username, and password for log collection.

```
system switch ethernet log setup-password
```

Show example

```
cluster1::*> system switch ethernet log setup-password
Enter the switch name: <return>
The switch name entered is not recognized.
Choose from the following list:
cs1
cs2

cluster1::*> system switch ethernet log setup-password

Enter the switch name: cs1
Would you like to specify a user other than admin for log
collection? {y|n}: n

Enter the password: <enter switch password>
Enter the password again: <enter switch password>

cluster1::*> system switch ethernet log setup-password

Enter the switch name: cs2
Would you like to specify a user other than admin for log
collection? {y|n}: n

Enter the password: <enter switch password>
Enter the password again: <enter switch password>
```

2. To start log collection, run the following command, replacing `DEVICE` with the switch used in the previous command. This starts both types of log collection: the detailed Support logs and an hourly collection of Periodic data.

```
system switch ethernet log modify -device <switch-name> -log-request true
```

Show example

```
cluster1::*> system switch ethernet log modify -device cs1 -log  
-request true
```

```
Do you want to modify the cluster switch log collection  
configuration? {y|n}: [n] y
```

```
Enabling cluster switch log collection.
```

```
cluster1::*> system switch ethernet log modify -device cs2 -log  
-request true
```

```
Do you want to modify the cluster switch log collection  
configuration? {y|n}: [n] y
```

```
Enabling cluster switch log collection.
```

Wait for 10 minutes and then check that the log collection completes:

```
system switch ethernet log show
```



If any of these commands return an error or if the log collection does not complete, contact NetApp support.

Troubleshooting

If you encounter any of the following error statuses reported by the log collection feature (visible in the output of `system switch ethernet log show`), try the corresponding debug steps:

| Log collection error status | Resolution |
|--|---|
| RSA keys not present | Regenerate ONTAP SSH keys. Contact NetApp support. |
| switch password error | Verify credentials, test SSH connectivity, and regenerate ONTAP SSH keys. Review switch documentation or contact NetApp support for instructions. |
| ECDSA keys not present for FIPS | If FIPS mode is enabled, ECDSA keys need to be generated on the switch before retrying. |
| pre-existing log found | Remove the previous log collection directory and '.tar' file located at <code>/tmp/shm_log</code> on the switch. |

| | |
|------------------------------|--|
| switch dump log error | Ensure the switch user has log collection permissions. Refer to the prerequisites above. |
|------------------------------|--|

Configure SNMPv3

Follow this procedure to configure SNMPv3, which supports Ethernet switch health monitoring (CSHM).

About this task

The following commands configure an SNMPv3 username on NVIDIA SN2100 switches:

- For **no authentication**: `net add snmp-server username SNMPv3_USER auth-none`
- For **MD5/SHA authentication**: `net add snmp-server username SNMPv3_USER [auth-md5|auth-sha] AUTH-PASSWORD`
- For **MD5/SHA authentication with AES/DES encryption**: `net add snmp-server username SNMPv3_USER [auth-md5|auth-sha] AUTH-PASSWORD [encrypt-aes|encrypt-des] PRIVATE-PASSWORD`

The following command configures an SNMPv3 username on the ONTAP side: `cluster1::*> security login create -user-or-group-name SNMPv3_USER -application snmp -authentication -method usm -remote-switch-ipaddress ADDRESS`

The following command establishes the SNMPv3 username with CSHM: `cluster1::*> system switch ethernet modify -device DEVICE -snmp-version SNMPv3 -community-or-username SNMPv3_USER`

Steps

1. Set up the SNMPv3 user on the switch to use authentication and encryption:

```
net show snmp status
```

Show example

```
cumulus@sw1:~$ net show snmp status
Simple Network Management Protocol (SNMP) Daemon.
-----
Current Status                active (running)
Reload Status                  enabled
Listening IP Addresses        all vrf mgmt
Main snmpd PID                 4318
Version 1 and 2c Community String Configured
Version 3 Usernames            Not Configured
-----

cumulus@sw1:~$
cumulus@sw1:~$ net add snmp-server username SNMPv3User auth-md5
<password> encrypt-aes <password>
cumulus@sw1:~$ net commit
--- /etc/snmp/snmpd.conf      2020-08-02 21:09:34.686949282 +0000
+++ /run/nclu/snmp/snmpd.conf 2020-08-11 00:13:51.826126655 +0000
@@ -1,26 +1,28 @@
# Auto-generated config file: do not edit. #
agentaddress udp:@mgmt:161
agentxperms 777 777 snmp snmp
agentxsocket /var/agentx/master
createuser _snmptrapusernameX
+createuser SNMPv3User MD5 <password> AES <password>
ifmib_max_num_ifaces 500
iquerysecname _snmptrapusernameX
master agentx
monitor -r 60 -o laNames -o laErrorMessage "laTable" laErrorFlag != 0
pass -p 10 1.3.6.1.2.1.1.1 /usr/share/snmp/sysDescr_pass.py
pass_persist 1.2.840.10006.300.43
/usr/share/snmp/ieee8023_lag_pp.py
pass_persist 1.3.6.1.2.1.17 /usr/share/snmp/bridge_pp.py
pass_persist 1.3.6.1.2.1.31.1.1.1.18
/usr/share/snmp/snmpifAlias_pp.py
pass_persist 1.3.6.1.2.1.47 /usr/share/snmp/entity_pp.py
pass_persist 1.3.6.1.2.1.99 /usr/share/snmp/entity_sensor_pp.py
pass_persist 1.3.6.1.4.1.40310.1 /usr/share/snmp/resq_pp.py
pass_persist 1.3.6.1.4.1.40310.2
/usr/share/snmp/cl_drop_cntrs_pp.py
pass_persist 1.3.6.1.4.1.40310.3 /usr/share/snmp/cl_poe_pp.py
pass_persist 1.3.6.1.4.1.40310.4 /usr/share/snmp/bgpun_pp.py
pass_persist 1.3.6.1.4.1.40310.5 /usr/share/snmp/cumulus-status.py
pass_persist 1.3.6.1.4.1.40310.6 /usr/share/snmp/cumulus-sensor.py
pass_persist 1.3.6.1.4.1.40310.7 /usr/share/snmp/vrf_bgpun_pp.py
+rocommunity cshml! default
```



```

router _snmptrapusernameX
+router SNMPv3User priv
  sysobjectid 1.3.6.1.4.1.40310
  sysservices 72
-rocommunity cshml! default

```

net add/del commands since the last "net commit"

=====

| User | Timestamp | Command |
|------------|----------------------------|---|
| ----- | ----- | ----- |
| ----- | ----- | ----- |
| SNMPv3User | 2020-08-11 00:13:51.826987 | net add snmp-server username SNMPv3User auth-md5 <password> encrypt-aes <password> |

```

cumulus@sw1:~$
cumulus@sw1:~$ net show snmp status
Simple Network Management Protocol (SNMP) Daemon.
-----
Current Status          active (running)
Reload Status           enabled
Listening IP Addresses  all vrf mgmt
Main snmpd PID          24253
Version 1 and 2c Community String Configured
Version 3 Usernames     Configured    <---- Configured
here
-----
cumulus@sw1:~$

```

2. Set up the SNMPv3 user on the ONTAP side:

```

security login create -user-or-group-name SNMPv3User -application snmp
-authentication-method usm -remote-switch-ipaddress 10.231.80.212

```

Show example

```
cluster1::*> security login create -user-or-group-name SNMPv3User  
-application snmp -authentication-method usm -remote-switch  
-ipaddress 10.231.80.212
```

Enter the authoritative entity's EngineID [remote EngineID]:

Which authentication protocol do you want to choose (none, md5, sha,
sha2-256)

[none]: **md5**

Enter the authentication protocol password (minimum 8 characters
long):

Enter the authentication protocol password again:

Which privacy protocol do you want to choose (none, des, aes128)

[none]: **aes128**

Enter privacy protocol password (minimum 8 characters long):

Enter privacy protocol password again:

3. Configure CSHM to monitor with the new SNMPv3 user:

```
system switch ethernet show-all -device "sw1 (b8:59:9f:09:7c:22)" -instance
```

Show example

```
cluster1::*> system switch ethernet show-all -device "sw1  
(b8:59:9f:09:7c:22)" -instance  
  
Device Name: sw1  
(b8:59:9f:09:7c:22)  
IP Address: 10.231.80.212  
SNMP Version: SNMPv2c  
Is Discovered: true  
DEPRECATED-Community String or SNMPv3 Username: -  
Community String or SNMPv3 Username: cshml!  
Model Number: MSN2100-CB2FC  
Switch Network: cluster-network  
Software Version: Cumulus Linux  
version 4.4.3 running on Mellanox Technologies Ltd. MSN2100  
Reason For Not Monitoring: None  
Source Of Switch Version: LLDP  
Is Monitored?: true  
Serial Number of the Device: MT2110X06399 <----  
serial number to check  
RCF Version: MSN2100-RCF-v1.9X6-  
Cluster-LLDP Aug-18-2022  
  
cluster1::*>  
cluster1::*> system switch ethernet modify -device "sw1  
(b8:59:9f:09:7c:22)" -snmp-version SNMPv3 -community-or-username  
SNMPv3User
```

4. Verify that the serial number to be queried with the newly created SNMPv3 user is the same as detailed in the previous step once the CSHM polling period has completed.

```
system switch ethernet polling-interval show
```

Show example

```
cluster1::*> system switch ethernet polling-interval show
Polling Interval (in minutes): 5

cluster1::*> system switch ethernet show-all -device "sw1
(b8:59:9f:09:7c:22)" -instance

Device Name: sw1
(b8:59:9f:09:7c:22)
IP Address: 10.231.80.212
SNMP Version: SNMPv3
Is Discovered: true
DEPRECATED-Community String or SNMPv3 Username: -
Community String or SNMPv3 Username: SNMPv3User
Model Number: MSN2100-CB2FC
Switch Network: cluster-network
Software Version: Cumulus Linux
version 4.4.3 running on Mellanox Technologies Ltd. MSN2100
Reason For Not Monitoring: None
Source Of Switch Version: LLDP
Is Monitored?: true
Serial Number of the Device: MT2110X06399 <----
serial number to check
RCF Version: MSN2100-RCF-v1.9X6-
Cluster-LLDP Aug-18-2022
```

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