Configure software

Install and maintain

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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 **Configure the switch**

Configure the NVIDIA SN2100 switch.

2 **Install Cumulus Linux in Cumulus mode**

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

3 **Install Cumulus Linux in ONIE mode**

Alternatively, you can install the Cumulus Linux (CL) OS when the switch is running Cumulus Linux in ONIE mode.

4 **Install the Reference Configuration File (RCF) script**

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

5 **Install the CSHM file**

You can install the applicable configuration file for Ethernet switch health monitoring of NVIDIA cluster switches.

6 **Reset the switch to factory defaults**

Erase the SN2100 storage switch settings.

Configure the NVIDIA SN2100 switch

To configure the SN2100 switch, refer to NVIDIA's documentation.

Steps

1. Review the configuration requirements.
2. Follow the instructions in NVIDIA System Bring-Up..

What's next?

After you've configured your switches, you can install Cumulus Linux in Cumulus mode or install Cumulus Linux in ONIE mode.

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).

Before you begin

Make sure that the following are available:

- 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.

Example 1. Steps

Cumulus Linux 4.4.3

1. Log in to the switch.

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

   ```
   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`

   ```
   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.

   > (i) 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.

```
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.

```
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. Set the date, time, time zone, and NTP server on the switch.
   a. Verify the current time zone:

   ```
   cumulus@sw1:~$ cat /etc/timezone
   ```

   b. Update to the new time zone:

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

c. Verify your current time zone:

```
cumulus@switch:~$ date +%Z
```

d. To set the time zone using the guided wizard, run the following command:

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

e. Set the software clock according to the configured time zone:

```
cumulus@switch:~$ sudo date -s "Tue Oct 28 00:37:13 2023"
```

f. Set the current value of the software clock to the hardware clock:

```
cumulus@switch:~$ sudo hwclock -w
```

g. Add an NTP server if required:

```
cumulus@sw1:~$ net add time ntp server <cumulus.network.ntp.org>
iburst
cumulus@sw1:~$ net pending
cumulus@sw1:~$ net commit
```

h. Verify that `ntpd` is running on the system:

```
cumulus@sw1:~$ ps -ef | grep ntp
ntp        4074      1   0 Jun20 ?        00:00:33 /usr/sbin/ntpd -p
/var/run/ntpd.pid -g -u 101:102
```

i. Specify the NTP source interface. By default, the source interface that NTP uses is `eth0`. You can configure a different NTP source interface as follows:

```
cumulus@sw1:~$ net add time ntp source <src_int>
cumulus@sw1:~$ net pending
cumulus@sw1:~$ net commit
```

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 screen choices 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`

```
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
```

```
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+cl4.4.1u1
(2021-09-09) x86_64
Welcome to NVIDIA Cumulus (R) Linux (R)

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

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from LMI, the exclusive licensee of Linus Torvalds, owner of the
mark on a world-wide basis.
admin@sw1:mgmt:~$
```

Cumulus Linux 5.4.0

1. Log in to the switch.

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

privileges.

```
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: `nv show system`

```
cumulus@cumulus:mgmt:~$ nv show system
operational          applied              description
-------------------- -------------------- ----------------------
hostname             cumulus              cumulus
build                Cumulus Linux 5.3.0  system build version
uptime               6 days, 8:37:36      system uptime
timezone             Etc/UTC              system time zone
```

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

> (i) 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.

```
cumulus@cumulus:mgmt:~$ nv set system hostname sw1
cumulus@cumulus:mgmt:~$ nv set interface eth0 ip address
10.233.204.71/24
cumulus@cumulus:mgmt:~$ nv set interface eth0 ip gateway
10.233.204.1
cumulus@cumulus:mgmt:~$ nv config apply
cumulus@cumulus:mgmt:~$ nv config save
```

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.

```
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. Set the time zone, date, time, and NTP server on the switch.

   a. Set the time zone:

   ```
   cumulus@sw1:~$ nv set system timezone US/Eastern
   cumulus@sw1:~$ nv config apply
   ```

   b. Verify your current time zone:

   ```
   cumulus@switch:~$ date +%Z
   ```

   c. To set the time zone using the guided wizard, run the following command:

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

   d. Set the software clock according to the configured time zone:

   ```
   cumulus@sw1:~$ sudo date -s "Tue Oct 28 00:37:13 2023"
   ```

   e. Set the current value of the software clock to the hardware clock:

   ```
   cumulus@sw1:~$ sudo hwclock -w
   ```

f. Add an NTP server if required:

```
cumulus@sw1:~$ nv set service ntp mgmt listen eth0
cumulus@sw1:~$ nv set service ntp mgmt server <server> iburst on
cumulus@sw1:~$ nv config apply
cumulus@sw1:~$ nv config save
```

See the Knowledge Base article NTP server configuration is not working with NVIDIA SN2100 switches for further details.

g. Verify that `ntpd` is running on the system:

```
cumulus@sw1:~$ ps -ef | grep ntp
ntp        4074     1  0 Jun20 ?        00:00:33 /usr/sbin/ntpd -p
/var/run/ntpd.pid -g -u 101:102
```

h. Specify the NTP source interface. By default, the source interface that NTP uses is `eth0`. You can configure a different NTP source interface as follows:

```
cumulus@sw1:~$ nv set service ntp default listen <src_int>
cumulus@sw1:~$ nv config apply
```

6. Install Cumulus Linux 5.4.0:

```
cumulus@sw1:mgmt:~$ sudo onie-install -a -i http://<web-
server>/<path>/cumulus-linux-5.4-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 screen choices 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 5.4.0: `nv show system`

```
cumulus@cumulus:mgmt:~$ nv show system
operational          applied              description
-------------------  -------------------  ---------------------
hostname             cumulus              cumulus
build                Cumulus Linux 5.4.0  system build version
uptime               6 days, 13:37:36     system uptime
timezone             Etc/UTC              system time zone
```

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

```
cumulus@sw1:mgmt:~$ net show lldp

LocalPort  Speed  Mode       RemoteHost
RemotePort
---------  -----  ---------- ---------------------------------
-----------
eth0       100M   Mgmt       mgmt-sw1
Eth110/1/29
swp2s1     25G    Trunk/L2   node1
e0a
swp15      100G   BondMember sw2
swp15
swp16      100G   BondMember sw2
swp16
```

12. 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
```

```
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+cl4.4.1u1
(2021-09-09) x86_64
Welcome to NVIDIA Cumulus (R) Linux (R)

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

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from LMI, the exclusive licensee of Linus Torvalds, owner of the
mark on a world-wide basis.
admin@sw1:mgmt:~$
```

13. Add additional user groups for the admin user to access `nv` commands:

```
cumulus@sw1:mgmt:~$ sudo adduser admin nvshow
      [sudo] password for cumulus:
      Adding user 'admin' to group 'nvshow' ...
      Adding user admin to group nvshow
      Done.
```

See NVIDIA User Accounts for more information.

Cumulus Linux 5.11.0

1. Log in to the switch.

   When you log in to the switch for the first time, it requires the username/password of **cumulus**/**cumulus** with `sudo` privileges.

   ```
   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: `nv show system`

   ```
   cumulus@cumulus:mgmt:~$ nv show system
   operational          applied              description
   -------------------- -------------------- ----------------------
   hostname             cumulus              cumulus
   build                Cumulus Linux 5.4.0  system build version
   uptime               6 days, 8:37:36      system uptime
   timezone             Etc/UTC              system time zone
   ```

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

   (i) 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.

```
cumulus@cumulus:mgmt:~$ nv unset interface eth0 ip address dhcp
cumulus@cumulus:mgmt:~$ nv set interface eth0 ip address
10.233.204.71/24
cumulus@cumulus:mgmt:~$ nv set interface eth0 ip gateway
10.233.204.1
cumulus@cumulus:mgmt:~$ nv config apply
cumulus@cumulus:mgmt:~$ nv config save
```

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.

```
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. Set the time zone, date, time, and NTP server on the switch.
   a. Set the time zone:

```
cumulus@sw1:~$ nv set system timezone US/Eastern
cumulus@sw1:~$ nv config apply
```

   b. Verify your current time zone:

```
cumulus@switch:~$ date +%Z
```

   c. To set the time zone using the guided wizard, run the following command:

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

d. Set the software clock according to the configured time zone:

```
cumulus@sw1:~$ sudo date -s "Tue Oct 28 00:37:13 2023"
```

e. Set the current value of the software clock to the hardware clock:

```
cumulus@sw1:~$ sudo hwclock -w
```

f. Add an NTP server if required:

```
cumulus@sw1:~$ nv set service ntp mgmt listen eth0
cumulus@sw1:~$ nv set service ntp mgmt server <server> iburst on
cumulus@sw1:~$ nv config apply
cumulus@sw1:~$ nv config save
```

See the Knowledge Base article NTP server configuration is not working with NVIDIA SN2100 switches for further details.

g. Verify that `ntpd` is running on the system:

```
cumulus@sw1:~$ ps -ef | grep ntp
ntp         4074      1   0 Jun20 ?        00:00:33 /usr/sbin/ntpd -p
/var/run/ntpd.pid -g -u 101:102
```

h. Specify the NTP source interface. By default, the source interface that NTP uses is `eth0`. You can configure a different NTP source interface as follows:

```
cumulus@sw1:~$ nv set service ntp default listen <src_int>
cumulus@sw1:~$ nv config apply
```

6. Install Cumulus Linux 5.11.0:

```
cumulus@sw1:mgmt:~$ sudo onie-install -a -i http://<web-
server>/<path>/cumulus-linux-5.11.0-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 screen choices 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 5.11.0:

```
nv show system
```

```
cumulus@cumulus:mgmt:~$ nv show system
operational          applied                description
-------------------  ---------------------  ---------------------
build                Cumulus Linux 5.11.0
uptime               153 days, 2:44:16
hostname             cumulus                cumulus
product-name         Cumulus Linux
product-release      5.11.0
platform             x86_64-mlnx_x86-r0
system-memory        2.76 GB used / 2.28 GB free / 7.47 GB total
swap-memory          0 Bytes used / 0 Bytes free / 0 Bytes total
health-status        not OK
date-time            2025-04-23 09:55:24
status               N/A
timezone             Etc/UTC
maintenance
  mode               disabled
  ports              enabled
version
  kernel             6.1.0-cl-1-amd64
  build-date         Thu Nov 14 13:06:38 UTC 2024
  image              5.11.0
  onie               2019.11-5.2.0020-115200
```

11. Verify that each node has a connection to each switch:

```
cumulus@sw1:mgmt:~$ nv show interface lldp

LocalPort   Speed   Mode        RemoteHost
RemotePort
---------   -----   ----------  ----------------------------------
-----------
eth0        100M    eth    mgmt-sw1
Eth110/1/14
swp2s1      25G     Trunk/L2    node1
e0a
swp1s1      10G     swp    sw2
e0a
swp9        100G    swp    sw3
e4a
swp10       100G    swp    sw4
e4a
swp15       100G    swp    sw5
swp15
swp16       100G    swp    sw6
swp16
```

See NVIDIA User Accounts for more information.

What's next?

After you've installed Cumulus Linux in Cumulus mode, you can install or upgrade the RCF script.

Install Cumulus Linux in ONIE mode

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

> (i) 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.

> (i) 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.

   > (i)   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?

After you've installed Cumulus Linux in ONIE mode, you can install or upgrade the RCF script.

Install or upgrade the RCF script

Follow this procedure to install or upgrade the RCF script.

Before you begin
Before installing or upgrading 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.*x*-Cluster**
- Storage: **MSN2100-RCF-v1.*x*-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:

```
admin@sw1:mgmt:~$ pwd
/home/cumulus
cumulus@cumulus:mgmt:~$ cd /tmp
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. Reapply any previous customizations to the switch configuration. Refer to Review cabling and configuration considerations for details of any further changes required.

5. 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%
```

6. 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
```

7. 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
```

8. 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
                                                     Speed(Mbps)
Health   Health
Port      IPspace       Broadcast Domain Link MTU  Admin/Oper
Status    Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e3a       Cluster       Cluster          up   9000  auto/10000
healthy  false
e3b       Cluster       Cluster          up   9000  auto/10000
healthy  false

Node: node2

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

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?

After you've installed or upgraded the RCF, you can install the CSHM file.

Install the Ethernet Switch Health Monitor configuration file

Follow this procedure to install the applicable configuration file for Ethernet switch health monitoring of NVIDIA cluster switches. Supported models are:

- MSN2100-CB2FC
- MSN2100-CB2RC
- X190006-PE
- X190006-PI

ⓘ This installation procedure applies to ONTAP 9.10.1 and later.

Before you begin

- Verify that you need to download the configuration file by running `system switch ethernet show` and checking if **OTHER** is shown for your model.

  If your model is still showing **OTHER** after applying the configuration file, contact NetApp support.

- Make sure that the ONTAP cluster is up and running.
- Enable SSH to use all of the features available in CSHM.
- Clear the `/mroot/etc/cshm_nod/nod_sign/` directory on all nodes:

  a. Enter the nodeshell:

  ```
  system node run -node <name>
  ```

  b. Change to advanced privilege:

  ```
  priv set advanced
  ```

  c. List the configuration files in the `/etc/cshm_nod/nod_sign` directory. If the directory exists and contains configuration files, it lists the file names.

  ```
  ls /etc/cshm_nod/nod_sign
  ```

  d. Delete all configuration files corresponding to your connected switch models.

  If you are unsure, remove all configuration files for the supported models listed above, then download and install the latest configuration files for those same models.

  ```
  rm /etc/cshm_nod/nod_sign/<filename>
  ```

  e. Confirm that the deleted configuration files are no longer in the directory:

  ```
  ls /etc/cshm_nod/nod_sign
  ```

Steps

1. Download the Ethernet switch health monitor configuration zip file based on the corresponding ONTAP release version. This file is available from the NVIDIA Ethernet switches page.

a. On the NVIDIA SN2100 Software download page, select **Nvidia CSHM File**.

b. On the Caution/Must read page, select the check box to agree.

c. On the End User License Agreement page, select the check box to agree and click **Accept & Continue**.

d. On the Nvidia CSHM File - Download page, select the applicable configuration file. The following files are available:

ONTAP 9.15.1 and later
- MSN2100-CB2FC-v1.4.zip
- MSN2100-CB2RC-v1.4.zip
- X190006-PE-v1.4.zip
- X190006-PI-v1.4.zip

ONTAP 9.11.1 through 9.14.1
- MSN2100-CB2FC_PRIOR_R9.15.1-v1.4.zip
- MSN2100-CB2RC_PRIOR_R9.15.1-v1.4.zip
- X190006-PE_PRIOR_9.15.1-v1.4.zip
- X190006-PI_PRIOR_9.15.1-v1.4.zip

---

2. Upload the applicable zip file to your internal web server.

3. Access the advanced mode setting from one of the ONTAP systems in the cluster.

```
set -privilege advanced
```

4. Run the switch health monitor configure command.

```
cluster1::> system switch ethernet configure-health-monitor
```

5. Verify that the command output ends with the following text for your ONTAP version:

ONTAP 9.15.1 and later
Ethernet switch health monitoring installed the configuration file.

ONTAP 9.11.1 through 9.14.1
SHM installed the configuration file.

ONTAP 9.10.1
CSHM downloaded package processed successfully.

If an error occurs, contact NetApp support.

6. Wait up to twice the Ethernet switch health monitor polling interval, found by running `system switch ethernet polling-interval show`, before completing the next step.

7. Run the command `system switch ethernet configure-health-monitor show` on the ONTAP system and make sure that the cluster switches are discovered with the monitored field set to **True** and the serial number field not showing **Unknown**.

```
cluster1::> system switch ethernet configure-health-monitor show
```

What's next?

After you've installed the CSHM file, you can configure switch health monitoring.

Reset the SN2100 storage switch to factory defaults

To reset the SN2100 storage switch to factory defaults:

- For Cumulus Linux 5.10 and earlier, you apply the Cumulus image.

- For Cumulus Linux 5.11 and later, you use the `nv action reset system factory-default` command.

About this task

- You must be connected to the switch using the serial console.

- You must have the root password for sudo access to the commands.

> For more information about installing Cumulus Linux, see Software install workflow for NVIDIA SN2100 switches.

Example 2. Steps

Cumulus Linux 5.10 and earlier

1. From the Cumulus console, download and queue the switch software installation with the command `onie-install -a -i` followed by the file path to the switch software, for example:

   ```
   cumulus@sw1:mgmt:~$ sudo onie-install -a -i http://<web-
   server>/<path>/cumulus-linux-5.10.0-mlx-amd64.bin
   ```

2. The installer starts the download. Type **y** when prompted to confirm the installation when the image is downloaded and verified.

3. Reboot the switch to install the new software.

   ```
   sudo reboot
   ```

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

   > (i) The switch reboots and enters the switch software installation which takes some time. When the installation is complete, the switch reboots and remains at the `log-in` prompt.

Cumulus Linux 5.11 and later

1. To reset the switch to the factory defaults and remove all configuration, system files, and log files, run:

   ```
   nv action reset system factory-default
   ```

   For example:

   ```
   cumulus@switch:~$ nv action reset system factory-default

   This operation will reset the system configuration, delete the log
   files and reboot the switch.
   Type [y] continue.
   Type [n] to abort.
   Do you want to continue? [y/n] y
   ```

See the NVIDIA Factory Reset documentation for further details.

What's next

After you've reset your switches, you can reconfigure them as needed.