NVIDIA SN2100 Switches

Cluster and storage switches

NetApp
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NVIDIA SN2100 switch

Starting with ONTAP 9.10.1P3, you can use NVIDIA SN2100 switches to combine storage and cluster functionality into a shared switch configuration.

If you want to build ONTAP clusters with more than two nodes, you need two supported cluster network switches. You can use additional management switches, which are optional.

You install the NVIDIA SN2100 switch (X190006/X190106) in the NVIDIA dual/single switch cabinet with the standard brackets that are included with the switch.

SN2100 switches and rail kit details

The following table lists the part number and description for the MSN2100 switches and rail kits:

Part number	Description
X190006-PE	Cluster Switch, NVIDIA SN2100, 16PT 100G, PTSX
X190006-PI	Cluster Switch, NVIDIA SN2100, 16PT 100G, PSIN
X190106-FE-PE	Switch, NVIDIA SN2100, 16PT 100G, PTSX, Front End
X190106-FE-PI	Switch, NVIDIA SN2100, 16PT 100G, PSIN, Front End
X-MTEF-KIT-D	Rail Kit, NVIDIA Dual switch side by side
X-MTEF-KIT-E	Rail Kit, NVIDIA Single switch short depth

See NVIDIA documentation for details on installing your SN2100 switch and rail kit.

Available documentation

The following table lists the documentation available for the NVIDIA SN2100 switches.

Title	Description
Setup and configure your NVIDIA SN2100 switches	Describes how to setup and configure your NVIDIA SN2100 switches, including installing Cumulus Linux and applicable RCFs.
Migrate from a Cisco cluster switch to a NVIDIA SN2100 cluster switch	Describes how to migrate from environments that use Cisco cluster switches to environments that use NVIDIA SN2100 cluster switches.
Migrate from a Cisco storage switch to a NVIDIA storage switch	Describes how to migrate from environments that use Cisco storage switches to environments that use NVIDIA SN2100 storage switches.

Title	Description
Migrate to a two-node switched cluster with NVIDIA SN2100 cluster switches	Describes how to migrate to a two-node switched environment using NVIDIA SN2100 cluster switches.
Replace a NVIDIA SN2100 cluster switch	Describes the procedure to replace a defective NVIDIA SN2100 switch in a cluster and download Cumulus Linux and reference configuration file.
Replace a NVIDIA SN2100 storage switch	Describes the procedure to replace a defective NVIDIA SN2100 storage switch and download Cumulus Linux and reference configuration file.

Set up and configure NVIDIA SN2100 switches

Set up and configure the NVIDIA SN2100 switches

The NVIDIA SN2100 switch is a 10/25/40/100 Gb Ethernet switch running Cumulus Linux. The SN2100 switch serves Cluster and Storage applications in ONTAP 9.10.1P3 over different switch-pairs.

Cumulus Linux (CL) OS can be installed either when the switch is running Cumulus Linux or ONIE. For this release, Cumulus Linux version 4.4.2 is supported.

> The procedures here 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.

> When using breakout cables for 10G and 25G, make sure that auto-negotiation is off and hard set the port speed on the switch. See Cabling and configuration considerations for further details.

Cabling and configuration considerations

Before configuring your NVIDIA SN2100 switch, review the following information:

1. Only optical connections are supported on SN2100 switches with X1151A NIC, X1146A NIC, or onboard 100GbE ports. For example:
   a. AFF A800 on ports e0a and e0b
   b. AFF A320 on ports e0g and e0h
2. When a QSA adapter is used to connect to the onboard Intel cluster ports on a platform, not all links come up.

   Example platforms are: FAS2750, AFF A300, and FAS8200 (all 10G) and AFF A250 (25G).

   To resolve this issue, do the following:

   a. For Intel 10G, manually set the swp1s0-3 link speed to 10000 and set auto-negotiation to off

b. For Chelsio 25G, manually set the swp2s0-3 link speed to 25000 and set auto-negotiation to off

> Using 10G/25G QSA, use the non-breakout 40/100G ports. Do not insert the QSA adapter on ports that are configured for breakout.

3. Depending on the transceiver in the switchport, you might need to set the speed on the switchport to fixed speed. If using 10G and 25G breakout ports, make sure that auto-negotiation is off and hard set the port speed on the switch. For example:

```
cumulus@cumulus:mgmt:~$ net add int swp1s3 link autoneg off && net com
--- /etc/network/interfaces     2019-11-17 00:17:13.470687027 +0000
+++ /run/nclu/ifupdown2/interfaces.tmp  2019-11-24 00:09:19.435226258
+0000
@@ -37,21 +37,21 @@
     alias 10G Intra-Cluster Node
     link-autoneg off
     link-speed 10000  <---- port speed set
     mstpctl-bpduguard yes
     mstpctl-portadminedge yes
     mtu 9216

auto swp1s3
iface swp1s3
     alias 10G Intra-Cluster Node
-    link-autoneg off
+    link-autoneg on
     link-speed 10000 <---- port speed set
     mstpctl-bpduguard yes
     mstpctl-portadminedge yes
     mtu 9216

auto swp2s0
iface swp2s0
     alias 25G Intra-Cluster Node
     link-autoneg off
     link-speed 25000 <---- port speed set
```

Install Cumulus Linux in Cumulus mode

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

Before you begin

The following assumptions are made:

- You have intermediate-level Linux knowledge.

- You are familiar with basic text editing, UNIX file permissions, and process monitoring. A variety of text editors are pre-installed, including `vi` and `nano`.
- You must have 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.

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.

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

Steps

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: netapp1!
Retype new password: netapp1!
```

2. Check the Cumulus Linux version:

```
cumulus@cumulus:mgmt:~$ net show system
Hostname......... cumulus
Build............ Cumulus Linux 4.4.2
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.

```
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. 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 4.4.2:

   ```
   cumulus@sw1:mgmt:~$ sudo onie-install -a -i http://<web-
   server>/<path>/cumulus-linux-4.4.2-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 4.4.2:

```
cumulus@sw1:mgmt:~$ net show version
NCLU_VERSION=1.0-cl4.4.2u0
DISTRIB_ID="Cumulus Linux"
DISTRIB_RELEASE=4.4.2
DISTRIB_DESCRIPTION="Cumulus Linux 4.4.2"
```

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:

```
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+cl4.4.2u1 (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:~$
```

Install Cumulus Linux in ONIE mode

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

Before you begin

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. Hit 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:

```
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-
4.4.2-mlx-amd64.bin

  Stopping: discover... done.
  Info: Attempting
http://10.60.132.97/x/eng/testbedN,svl/nic/files/cumulus-linux-4.4.2-
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:

```
cumulus login: cumulus
Password: cumulus
You are required to change your password immediately (administrator
enforced)
Changing password for cumulus.
Current password: cumulus
New password: netapp1!
Retype new password: netapp1!
```

14. Verify the Cumulus Linux version:

```
cumulus@cumulus:mgmt:~$ net show version
NCLU_VERSION=1.0-cl4.4.2u4
DISTRIB_ID="Cumulus Linux"
DISTRIB_RELEASE=4.4.2
DISTRIB_DESCRIPTION="Cumulus Linux 4.4.2"
```

Install the RCF script

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

- Cumulus Linux 4.4.2 is installed.
- IP address, subnet mask, and default gateway defined via DHCP or manually configured.

> See Cabling and configuration considerations for caveats and further details.

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:

```
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 following steps:

a. Updates the banner MOTD
b. Disables the apt-get for OS updates
c. Defines breakout and non-breakout interfaces
d. Configures interfaces and SNMP
e. Disables CDP
f. Changes the LLDP configuration
g. Adds a RoCE configuration
h. Modifies the RoCE configuration for HA and Cluster RDMA
i. Reboots the switch

> For any RCF python script issues that cannot be corrected, contact NetApp Support for assistance.

4. Verify the configuration after the reboot:

```
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`

```
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`

```
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`

```
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).

```
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 4.4.2 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 4.4.2 running on Mellanox
                    Technologies Ltd. MSN2100
    Version Source: LLDP
```

Configure SNMPv3 for switch log collection

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

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] PRIV-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 SHM: `cluster1::*> system switch ethernet modify -device DEVICE -snmp-version SNMPv3 -community-or-username SNMPv3_USER`

Steps

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

```
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 netapp1!
encrypt-aes netapp1!
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 netapp1! AES netapp1!
 ifmib_max_num_ifaces 500
 iquerysecname _snmptrapusernameX
 master agentx
 monitor -r 60 -o laNames -o laErrMessage "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 cshm1! default
 rouser _snmptrapusernameX
+rouser SNMPv3User priv
 sysobjectid 1.3.6.1.4.1.40310
 sysservices 72
-rocommunity cshm1! 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 netapp1! encrypt-aes netapp1!

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. Setup the SNMPv3 user on the ONTAP side:

```
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 SHM to monitor with the new SNMPv3 user:

```
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: cshm1!
                                 Model Number: MSN2100-CB2FC
                               Switch Network: cluster-network
                             Software Version: Cumulus Linux version
4.4.2 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 SHM polling period has completed.

```
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
4.4.2 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
```

Cable NS224 shelves as switch-attached storage

If you have a system in which the NS224 drive shelves need to be cabled as switch-attached storage (not direct-attached storage), use the information provided here.

- Cable NS224 drive shelves through storage switches:

  Information for cabling switch-attached NS224 drive shelves

- Install your storage switches:

  AFF and FAS Switch Documentation

- Confirm supported hardware, such as storage switches and cables, for your platform model:

  NetApp Hardware Universe

Migrate from a Cisco cluster switch to a NVIDIA SN2100 cluster switch

You can migrate nondisruptively Cisco cluster switches for an ONTAP cluster to NVIDIA SN2100 cluster switches. You must be aware of certain configuration information, port connections and cabling requirements when you are replacing some older Cisco cluster

switches with NVIDIA SN2100 cluster switches.

The following Cisco cluster switches are supported:

- Nexus 9336C-FX2
- Nexus 92300YC
- Nexus 5596UP
- Nexus 3232C
- Nexus 3132Q-V

Before you begin

You can migrate nondisruptively older Cisco cluster switches for an ONTAP cluster to NVIDIA SN2100 cluster switches.

- The existing cluster must be properly set up and functioning.
- All cluster ports must be in the up state to ensure nondisruptive operations.
- The NVIDIA SN2100 cluster switches must be configured and operating under the proper version of Cumulus Linux installed with the reference configuration file (RCF) applied.
- The existing cluster network configuration must have the following:
  - A redundant and fully functional NetApp cluster using both older Cisco switches.
  - Management connectivity and console access to both the older Cisco switches and the new switches.
  - All cluster LIFs in the up state with the cluster LIfs are on their home ports.
  - ISL ports enabled and cabled between the older Cisco switches and between the new switches.
- See the Hardware Universe for full details of supported ports and their configurations.
- You have configured some of the ports on NVIDIA SN2100 switches to run at 40 GbE or 100 GbE.
- You have planned, migrated, and documented 40 GbE and 100 GbE connectivity from nodes to NVIDIA SN2100 cluster switches.

> In this procedure, Cisco Nexus 3232C cluster switches are used for example commands and outputs.

About this task

The examples in this procedure use the following switch and node nomenclature:

- The existing Cisco Nexus 3232C cluster switches are *c1* and *c2*.
- The new NVIDIA SN2100 cluster switches are *sw1* and *sw2*.
- The nodes are *node1* and *node2*.
- The cluster LIFs are *node1_clus1* and *node1_clus2* on node 1, and *node2_clus1* and *node2_clus2* on node 2 respectively.
- The `cluster1::*>` prompt indicates the name of the cluster.
- The cluster ports used in this procedure are *e3a* and *e3b*.
- Breakout ports take the format: swp[port]s[breakout port 0-3]. For example, four breakout ports on swp1 are *swp1s0*, *swp1s1*, *swp1s2*, and *swp1s3*.

- Switch c2 is replaced by switch sw2 first and then switch c1 is replaced by switch sw1.
  - Cabling between the nodes and c2 are then disconnected from c2 and reconnected to sw2.
  - Cabling between the nodes and c1 are then disconnected from c1 and reconnected to sw1.

Steps

1. If AutoSupport is enabled on this cluster, suppress automatic case creation by invoking an AutoSupport message: `system node autosupport invoke -node * -type all -message MAINT=xh`

   where *x* is the duration of the maintenance window in hours.

2. Change the privilege level to advanced, entering **y** when prompted to continue: `set -privilege advanced`

   The advanced prompt (*>) appears.

3. Disable auto-revert on the cluster LIFs: `network interface modify -vserver Cluster -lif * -auto-revert false`

   ```
   cluster1::*> network interface modify -vserver Cluster -lif * -auto
   -revert false

   Warning: Disabling the auto-revert feature of the cluster logical
   interface may effect the availability of your cluster network. Are you
   sure you want to continue? {y|n}: y
   ```

4. Determine the administrative or operational status for each cluster interface:

   Each port should display up for `Link` and healthy for `Health Status`.

   a. Display the network port attributes: `network port show -ipspace Cluster`

```
cluster1::*> network port show -ipspace Cluster

Node: node1

Ignore
                                                  Speed(Mbps)  Health
Health
Port      IPspace    Broadcast Domain Link MTU   Admin/Oper   Status
Status
--------- ---------- ---------------- ---- ----- ------------
-------- ------
e3a       Cluster    Cluster          up   9000  auto/100000  healthy
false
e3b       Cluster    Cluster          up   9000  auto/100000  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/100000  healthy
false
e3b       Cluster    Cluster          up   9000  auto/100000  healthy
false
```

b. Display information about the logical interfaces and their designated home nodes: `network interface show -vserver Cluster`

   Each LIF should display up/up for `Status Admin/Oper` and true for `Is Home`.

```
cluster1::*> network interface show -vserver Cluster

            Logical      Status     Network            Current
Current Is
Vserver     Interface    Admin/Oper Address/Mask       Node
Port    Home
----------- -----------  ---------- ------------------ -----------
------- ----
Cluster
            node1_clus1  up/up      169.254.209.69/16  node1
e3a     true
            node1_clus2  up/up      169.254.49.125/16  node1
e3b     true
            node2_clus1  up/up      169.254.47.194/16  node2
e3a     true
            node2_clus2  up/up      169.254.19.183/16  node2
e3b     true
```

5. The cluster ports on each node are connected to existing cluster switches in the following way (from the nodes' perspective) using the command: `network device-discovery show -protocol lldp`

```
cluster1::*> network device-discovery show -protocol lldp
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface         Platform
----------- ------ ------------------------- ----------------
----------------
node1      /lldp
            e3a    c1 (6a:ad:4f:98:3b:3f)    Eth1/1            -
            e3b    c2 (6a:ad:4f:98:4c:a4)    Eth1/1            -
node2      /lldp
            e3a    c1 (6a:ad:4f:98:3b:3f)    Eth1/2            -
            e3b    c2 (6a:ad:4f:98:4c:a4)    Eth1/2            -
```

6. The cluster ports and switches are connected in the following way (from the switches' perspective) using the command: `show cdp neighbors`

```
c1# show cdp neighbors

Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater,
                  V - VoIP-Phone, D - Remotely-Managed-Device,
                  s - Supports-STP-Dispute

Device-ID             Local Intrfce Hldtme Capability  Platform
Port ID
node1                 Eth1/1         124   H           AFF-A400
e3a
node2                 Eth1/2         124   H           AFF-A400
e3a
c2                    Eth1/31        179   S I s       N3K-C3232C
Eth1/31
c2                    Eth1/32        175   S I s       N3K-C3232C
Eth1/32

c2# show cdp neighbors

Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater,
                  V - VoIP-Phone, D - Remotely-Managed-Device,
                  s - Supports-STP-Dispute


Device-ID             Local Intrfce Hldtme Capability  Platform
Port ID
node1                 Eth1/1        124    H           AFF-A400
e3b
node2                 Eth1/2        124    H           AFF-A400
e3b
c1                    Eth1/31       175    S I s       N3K-C3232C
Eth1/31
c1                    Eth1/32       175    S I s       N3K-C3232C
Eth1/32
```

7. Ensure that the cluster network has full connectivity using the command: `cluster ping-cluster -node node-name`

```
cluster1::*> cluster ping-cluster -node node2

Host is node2
Getting addresses from network interface table...
Cluster node1_clus1 169.254.209.69 node1     e3a
Cluster node1_clus2 169.254.49.125 node1     e3b
Cluster node2_clus1 169.254.47.194 node2     e3a
Cluster node2_clus2 169.254.19.183 node2     e3b
Local = 169.254.47.194 169.254.19.183
Remote = 169.254.209.69 169.254.49.125
Cluster Vserver Id = 4294967293
Ping status:
....
Basic connectivity succeeds on 4 path(s)
Basic connectivity fails on 0 path(s)
................
Detected 9000 byte MTU on 4 path(s):
    Local 169.254.19.183 to Remote 169.254.209.69
    Local 169.254.19.183 to Remote 169.254.49.125
    Local 169.254.47.194 to Remote 169.254.209.69
    Local 169.254.47.194 to Remote 169.254.49.125
Larger than PMTU communication succeeds on 4 path(s)
RPC status:
2 paths up, 0 paths down (tcp check)
2 paths up, 0 paths down (udp check)
```

8. On switch c2, shut down the ports connected to the cluster ports of the nodes.

```
(c2)# configure
Enter configuration commands, one per line. End with CNTL/Z.

(c2)(Config)# interface
(c2)(config-if-range)# shutdown <interface_list>
(c2)(config-if-range)# exit
(c2)(Config)# exit
(c2)#
```

9. Move the node cluster ports from the old switch c2 to the new switch sw2, using appropriate cabling supported by NVIDIA SN2100.
10. Display the network port attributes: `network port show -ipspace Cluster`

```
cluster1::*> network port show -ipspace Cluster

Node: node1

Ignore
                                                  Speed(Mbps)  Health
Health
Port      IPspace    Broadcast Domain Link MTU   Admin/Oper   Status
Status
--------- ---------- ---------------- ---- ----- ------------ --------
------
e3a       Cluster    Cluster          up   9000  auto/100000  healthy
false
e3b       Cluster    Cluster          up   9000  auto/100000  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/100000  healthy
false
e3b       Cluster    Cluster          up   9000  auto/100000  healthy
false
```

11. The cluster ports on each node are now connected to cluster switches in the following way, from the nodes' perspective:

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

Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface         Platform
----------- ------ ------------------------- ----------------
----------------
node1      /lldp
            e3a    c1  (6a:ad:4f:98:3b:3f)   Eth1/1            -
            e3b    sw2 (b8:ce:f6:19:1a:7e)   swp3              -
node2      /lldp
            e3a    c1  (6a:ad:4f:98:3b:3f)   Eth1/2            -
            e3b    sw2 (b8:ce:f6:19:1b:96)   swp4              -
```

12. On switch sw2, verify that all node cluster ports are up: `net show interface`

```
cumulus@sw2:~$ net show interface

State  Name          Spd   MTU    Mode        LLDP               Summary
-----  ------------  ----  -----  ----------  -----------------
----------------------
...
...
UP     swp3          100G  9216   Trunk/L2    e3b                Master:
bridge(UP)
UP     swp4          100G  9216   Trunk/L2    e3b                Master:
bridge(UP)
UP     swp15         100G  9216   BondMember  sw1 (swp15)        Master:
cluster_isl(UP)
UP     swp16         100G  9216   BondMember  sw1 (swp16)        Master:
cluster_isl(UP)
```

13. On switch c1, shut down the ports connected to the cluster ports of the nodes.

```
(c1)# configure
Enter configuration commands, one per line. End with CNTL/Z.

(c1)(Config)# interface
(c1)(config-if-range)# shutdown <interface_list>
(c1)(config-if-range)# exit
(c1)(Config)# exit
(c1)#
```

14. Move the node cluster ports from the old switch c1 to the new switch sw1, using appropriate cabling

supported by NVIDIA SN2100.

15. Verify the final configuration of the cluster: `network port show -ipspace Cluster`

    Each port should display up for `Link` and healthy for `Health Status`.

```
cluster1::*> network port show -ipspace Cluster

Node: node1

Ignore
                                                  Speed(Mbps)  Health
Health
Port      IPspace    Broadcast Domain Link MTU   Admin/Oper   Status
Status
--------- ---------- ---------------- ---- ----- ------------ --------
------
e3a       Cluster    Cluster          up   9000  auto/100000  healthy
false
e3b       Cluster    Cluster          up   9000  auto/100000  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/100000  healthy
false
e3b       Cluster    Cluster          up   9000  auto/100000  healthy
false
```

16. The cluster ports on each node are now connected to cluster switches in the following way, from the nodes' perspective:

```
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            -
```

17. On switches sw1 and sw2, verify that all node cluster ports are up: `net show interface`

```
cumulus@sw1:~$ net show interface

State  Name         Spd   MTU    Mode        LLDP               Summary
-----  -----------  ----  -----  ----------  -----------------
----------------------
...
...
UP     swp3         100G  9216   Trunk/L2    e3a                Master:
bridge(UP)
UP     swp4         100G  9216   Trunk/L2    e3a                Master:
bridge(UP)
UP     swp15        100G  9216   BondMember  sw2 (swp15)        Master:
cluster_isl(UP)
UP     swp16        100G  9216   BondMember  sw2 (swp16)        Master:
cluster_isl(UP)


cumulus@sw2:~$ net show interface

State  Name         Spd   MTU    Mode        LLDP               Summary
-----  -----------  ----  -----  ----------  -----------------
----------------------
...
...
UP     swp3         100G  9216   Trunk/L2    e3b                Master:
bridge(UP)
UP     swp4         100G  9216   Trunk/L2    e3b                Master:
bridge(UP)
UP     swp15        100G  9216   BondMember  sw1 (swp15)        Master:
cluster_isl(UP)
UP     swp16        100G  9216   BondMember  sw1 (swp16)        Master:
cluster_isl(UP)
```

18. Verify that both nodes each have one connection to each switch: `net show lldp`

    The following example shows the appropriate results for both switches:

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

LocalPort  Speed  Mode        RemoteHost          RemotePort
---------  -----  ----------  ------------------  -----------
swp3       100G   Trunk/L2    node1               e3a
swp4       100G   Trunk/L2    node2               e3a
swp15      100G   BondMember  sw2                 swp15
swp16      100G   BondMember  sw2                 swp16

cumulus@sw2:~$ net show lldp

LocalPort  Speed  Mode        RemoteHost          RemotePort
---------  -----  ----------  ------------------  -----------
swp3       100G   Trunk/L2    node1               e3b
swp4       100G   Trunk/L2    node2               e3b
swp15      100G   BondMember  sw1                 swp15
swp16      100G   BondMember  sw1                 swp16
```

19. Enable auto-revert on the cluster LIFs: `cluster1::*> network interface modify -vserver Cluster -lif * -auto-revert true`
20. Verify that all cluster network LIFs are back on their home ports: `network interface show`

```
cluster1::*> network interface show -vserver Cluster

            Logical    Status     Network            Current
Current Is
Vserver     Interface  Admin/Oper Address/Mask       Node          Port
Home
----------- ---------- ---------- ------------------ -------------
------- ----
Cluster
            node1_clus1  up/up    169.254.209.69/16  node1         e3a
true
            node1_clus2  up/up    169.254.49.125/16  node1         e3b
true
            node2_clus1  up/up    169.254.47.194/16  node2         e3a
true
            node2_clus2  up/up    169.254.19.183/16  node2         e3b
true
```

21. Enable the Ethernet switch health monitor log collection feature for collecting switch-related log files, using the two commands: `system switch ethernet log setup-password` and `system switch ethernet log enable-collection`

Enter: `system switch ethernet log setup-password`

```
cluster1::*> system switch ethernet log setup-password
Enter the switch name: <return>
The switch name entered is not recognized.
Choose from the following list:
sw1
sw2

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

Enter the switch name: sw1
RSA key fingerprint is e5:8b:c6:dc:e2:18:18:09:36:63:d9:63:dd:03:d9:cc
Do you want to continue? {y|n}::[n] y

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

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

Enter the switch name: sw2
RSA key fingerprint is 57:49:86:a1:b9:80:6a:61:9a:86:8e:3c:e3:b7:1f:b1
Do you want to continue? {y|n}:: [n] y

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

Followed by: `system switch ethernet log enable-collection`

```
cluster1::*> system  switch ethernet log enable-collection

Do you want to enable cluster log collection for all nodes in the
cluster?
{y|n}: [n] y

Enabling cluster switch log collection.

cluster1::*>
```

If any of these commands return an error, contact NetApp support.

22. Initiate the switch log collection feature: `system switch ethernet log collect -device *`

    Wait for 10 minutes and then check that the log collection was successful using the command: `system switch ethernet log show`

```
cluster1::*> system switch ethernet log show
Log Collection Enabled: true

Index  Switch                          Log Timestamp         Status
------ ------------------------------- --------------------  ---------
1      sw1 (b8:ce:f6:19:1b:42)         4/29/2022 03:05:25    complete
2      sw2 (b8:ce:f6:19:1b:96)         4/29/2022 03:07:42    complete
```

23. Change the privilege level back to admin: `set -privilege admin`
24. If you suppressed automatic case creation, reenable it by invoking an AutoSupport message: `system node autosupport invoke -node * -type all -message MAINT=END`

Migrate from a Cisco storage switch to a NVIDIA SN2100 storage switch

You must be aware of certain configuration information, port connections and cabling requirements when you are replacing some older Cisco switches with NVIDIA SN2100 storage switches.

- The following storage switches are supported:
  - Cisco Nexus 9336C-FX2
  - Cisco Nexus 3232C
- See the Hardware Universe for full details of supported ports and their configurations.

Before you begin

You can migrate nondisruptively older Cisco storage switches for an ONTAP cluster to NVIDIA SN2100 storage switches.

- The existing cluster must be properly set up and functioning.
- All storage ports must be in the up state to ensure nondisruptive operations.
- The NVIDIA SN2100 storage switches must be configured and operating under the proper version of Cumulus Linux installed with the reference configuration file (RCF) applied.
- The existing storage network configuration must have the following:
  - A redundant and fully functional NetApp cluster using both older Cisco switches.
  - Management connectivity and console access to both the older Cisco switches and the new switches.
  - All cluster LIFs in the up state with the cluster LIfs are on their home ports.
  - ISL ports enabled and cabled between the older Cisco switches and between the new switches.
- See the Hardware Universe for full details of supported ports and their configurations.
- You have configured some of the ports on NVIDIA SN2100 switches to run at 100 GbE.
- You have planned, migrated, and documented 100 GbE connectivity from nodes to NVIDIA SN2100 storage switches.

In this procedure, Cisco Nexus 9336C-FX2 storage switches are used for example commands and outputs.

About this task

The examples in this procedure use the following switch and node nomenclature:

- The existing Cisco Nexus 9336C-FX2 storage switches are *S1* and *S2*.
- The new NVIDIA SN2100 storage switches are *sw1* and *sw2*.
- The nodes are *node1* and *node2*.
- The cluster LIFs are *node1_clus1* and *node1_clus2* on node 1, and *node2_clus1* and *node2_clus2* on node 2 respectively.
- The `cluster1::*>` prompt indicates the name of the cluster.
- The network ports used in this procedure are *e5a* and *e5b*.
- Breakout ports take the format: swp1s0-3. For example four breakout ports on swp1 are *swp1s0*, *swp1s1*, *swp1s2*, and *swp1s3*.
- Switch S2 is replaced by switch sw2 first and then switch S1 is replaced by switch sw1.
  - Cabling between the nodes and S2 are then disconnected from S2 and reconnected to sw2.
  - Cabling between the nodes and S1 are then disconnected from S1 and reconnected to sw1.

Steps

1. If AutoSupport is enabled, suppress automatic case creation by invoking an AutoSupport message: `system node autosupport invoke -node * -type all -message MAINT=xh`

   where *x* is the duration of the maintenance window in hours.

2. Change the privilege level to advanced, entering **y** when prompted to continue: `set -privilege advanced`

   The advanced prompt (*>) appears.

3. Determine the administrative or operational status for each storage interface:

   Each port should display enabled for `Status`.

   Display the network port attributes: `storage port show`

```
cluster1::*> storage port show
                                  Speed                      VLAN
Node           Port Type  Mode    (Gb/s) State    Status       ID
-------------- ---- ----- ------- ------ -------- --------- ----
node1
               e0c  ENET  storage  100   enabled  online      30
               e0d  ENET  storage    0   enabled  offline     30
               e5a  ENET  storage    0   enabled  offline     30
               e5b  ENET  storage  100   enabled  online      30
node2
               e0c  ENET  storage  100   enabled  online      30
               e0d  ENET  storage    0   enabled  offline     30
               e5a  ENET  storage    0   enabled  offline     30
               e5b  ENET  storage  100   enabled  online      30
cluster1::*>
```

4. The storage ports on each node are connected to existing storage switches in the following way (from the nodes' perspective) using the command: `network device-discovery show -protocol lldp`

```
cluster1::*> network device-discovery show -protocol lldp
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface       Platform
----------- ------ ------------------------- --------------
----------------
node1      /lldp
            e0c    S1 (7c:ad:4f:98:6d:f0)    Eth1/1           -
            e5b    S2 (7c:ad:4f:98:8e:3c)    Eth1/1           -
node2      /lldp
            e0c    S1 (7c:ad:4f:98:6d:f0)    Eth1/2           -
            e5b    S2 (7c:ad:4f:98:8e:3c)    Eth1/2           -
```

5. On switch S1 and S2, the storage ports and switches are connected in the following way (from the switches' perspective) using the command: `show lldp neighbors`

```
S1# show lldp neighbors

Capability Codes: (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS
Cable Device,
                  (W) WLAN Access Point, (P) Repeater, (S) Station (O)
Other

Device-ID             Local Intf     Holdtime    Capability
Port ID
node1                 Eth1/1         121         S
e0c
node2                 Eth1/2         121         S
e0c
SHFGD1947000186       Eth1/10        120         S
e0a
SHFGD1947000186       Eth1/11        120         S
e0a
SHFGB2017000269       Eth1/12        120         S
e0a
SHFGB2017000269       Eth1/13        120         S
e0a

S2# show lldp neighbors

Capability Codes: (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS
Cable Device,
                  (W) WLAN Access Point, (P) Repeater, (S) Station (O)
Other

Device-ID             Local Intf     Holdtime    Capability
Port ID
node1                 Eth1/1         121         S                  e5b
node2                 Eth1/2         121         S                  e5b
SHFGD1947000186       Eth1/10        120         S
 e0b
SHFGD1947000186       Eth1/11        120         S
 e0b
SHFGB2017000269       Eth1/12        120         S
 e0b
SHFGB2017000269       Eth1/13        120         S                  e0b
```

6. On switch sw2, shut down the ports connected to the storage ports and nodes of the disk shelves.

```
cumulus@sw2:~$ net add interface swp1-16 link down
cumulus@sw2:~$ net pending
cumulus@sw2:~$ net commit
```

7. Move the node storage ports of the controller and disk shelves from the old switch S2 to the new switch sw2, using appropriate cabling supported by NVIDIA SN2100.
8. On switch sw2, bring up the ports connected to the storage ports of the nodes and the disk shelves.

```
cumulus@sw2:~$ net del interface swp1-16 link down
cumulus@sw2:~$ net pending
cumulus@sw2:~$ net commit
```

9. The storage ports on each node are now connected to the switches in the following way, from the nodes' perspective:

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

Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface      Platform
----------- ------ ------------------------- -------------
----------------
node1      /lldp
            e0c    S1 (7c:ad:4f:98:6d:f0)    Eth1/1         -
            e5b    sw2 (b8:ce:f6:19:1a:7e)   swp1           -

node2      /lldp
            e0c    S1 (7c:ad:4f:98:6d:f0)    Eth1/2         -
            e5b    sw2 (b8:ce:f6:19:1a:7e)   swp2           -
```

10. Verify the network port attributes: `storage port show`

```
cluster1::*> storage port show
                                  Speed                      VLAN
Node           Port Type  Mode    (Gb/s) State    Status       ID
-------------- ---- ----- ------- ------ -------- --------- ----
node1
               e0c  ENET  storage  100   enabled  online      30
               e0d  ENET  storage    0   enabled  offline     30
               e5a  ENET  storage    0   enabled  offline     30
               e5b  ENET  storage  100   enabled  online      30
node2
               e0c  ENET  storage  100   enabled  online      30
               e0d  ENET  storage    0   enabled  offline     30
               e5a  ENET  storage    0   enabled  offline     30
               e5b  ENET  storage  100   enabled  online      30
cluster1::*>
```

11. On switch sw2, verify that all node storage ports are up:

```
cumulus@sw2:~$ net show interface

State  Name    Spd   MTU    Mode         LLDP                   Summary
-----  ------  ----  -----  ----------  --------------------
--------------------
...
...
UP     swp1    100G  9216   Trunk/L2   node1 (e5b)             Master:
bridge(UP)
UP     swp2    100G  9216   Trunk/L2   node2 (e5b)             Master:
bridge(UP)
UP     swp3    100G  9216   Trunk/L2   SHFFG1826000112 (e0b)   Master:
bridge(UP)
UP     swp4    100G  9216   Trunk/L2   SHFFG1826000112 (e0b)   Master:
bridge(UP)
UP     swp5    100G  9216   Trunk/L2   SHFFG1826000102 (e0b)   Master:
bridge(UP)
UP     swp6    100G  9216   Trunk/L2   SHFFG1826000102 (e0b)   Master:
bridge(UP))
...
...
```

12. On switch sw1, shut down the ports connected to the storage ports of the nodes and the disk shelves.

```
cumulus@sw1:~$ net add interface swp1-16 link down
cumulus@sw1:~$ net pending
cumulus@sw1:~$ net commit
```

13. Move the node storage ports of the controller and the disk shelves from the old switch S1 to the new switch sw1, using appropriate cabling supported by NVIDIA SN2100.
14. On switch sw1, bring up the ports connected to the storage ports of the nodes and the disk shelves.

```
cumulus@sw1:~$ net del interface swp1-16 link down
cumulus@sw1:~$ net pending
cumulus@sw1:~$ net commit
```

15. The storage ports on each node are now connected to the switches in the following way, from the nodes' perspective:

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

Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface       Platform
----------- ------ ------------------------- --------------
----------------
node1      /lldp
            e0c    sw1 (b8:ce:f6:19:1b:96)   swp1            -
            e5b    sw2 (b8:ce:f6:19:1a:7e)   swp1            -

node2      /lldp
            e0c    sw1  (b8:ce:f6:19:1b:96)  swp2            -
            e5b    sw2  (b8:ce:f6:19:1a:7e)  swp2            -
```

16. Verify the final configuration: `storage port show`

    Each port should display enabled for `State` and enabled for `Status`.

```
cluster1::*> storage port show
                                  Speed                      VLAN
Node           Port Type  Mode    (Gb/s) State    Status       ID
-------------- ---- ----- ------- ------ -------- --------- ----
node1
               e0c  ENET  storage  100   enabled  online       30
               e0d  ENET  storage    0   enabled  offline      30
               e5a  ENET  storage    0   enabled  offline      30
               e5b  ENET  storage  100   enabled  online       30
node2
               e0c  ENET  storage  100   enabled  online       30
               e0d  ENET  storage    0   enabled  offline      30
               e5a  ENET  storage    0   enabled  offline      30
               e5b  ENET  storage  100   enabled  online       30
cluster1::*>
```

17. On switch sw2, verify that all node storage ports are up:

```
cumulus@sw2:~$ net show interface

State  Name    Spd   MTU    Mode         LLDP                   Summary
-----  ------  ----  -----  ----------  --------------------
--------------------
...
...
UP     swp1    100G  9216   Trunk/L2   node1 (e5b)             Master:
bridge(UP)
UP     swp2    100G  9216   Trunk/L2   node2 (e5b)             Master:
bridge(UP)
UP     swp3    100G  9216   Trunk/L2   SHFFG1826000112 (e0b)   Master:
bridge(UP)
UP     swp4    100G  9216   Trunk/L2   SHFFG1826000112 (e0b)   Master:
bridge(UP)
UP     swp5    100G  9216   Trunk/L2   SHFFG1826000102 (e0b)   Master:
bridge(UP)
UP     swp6    100G  9216   Trunk/L2   SHFFG1826000102 (e0b)   Master:
bridge(UP))
...
...
```

18. Verify that both nodes each have one connection to each switch: `net show lldp`

    The following example shows the appropriate results for both switches:

```
cumulus@sw1:~$ net show lldp
LocalPort  Speed  Mode      RemoteHost              RemotePort
---------  -----  --------  ----------------------  -----------
...
swp1       100G   Trunk/L2  node1                   e0c
swp2       100G   Trunk/L2  node2                   e0c
swp3       100G   Trunk/L2  SHFFG1826000112        e0a
swp4       100G   Trunk/L2  SHFFG1826000112        e0a
swp5       100G   Trunk/L2  SHFFG1826000102        e0a
swp6       100G   Trunk/L2  SHFFG1826000102        e0a

cumulus@sw2:~$ net show lldp
LocalPort  Speed  Mode      RemoteHost              RemotePort
---------  -----  --------  ----------------------  -----------
...
swp1       100G   Trunk/L2  node1                   e5b
swp2       100G   Trunk/L2  node2                   e5b
swp3       100G   Trunk/L2  SHFFG1826000112        e0b
swp4       100G   Trunk/L2  SHFFG1826000112        e0b
swp5       100G   Trunk/L2  SHFFG1826000102        e0b
swp6       100G   Trunk/L2  SHFFG1826000102        e0b
```

19. Enable the Ethernet switch health monitor log collection feature for collecting switch-related log files, using the two commands: `system switch ethernet log setup-password` and `system switch ethernet log enable-collection`

    Enter: `system switch ethernet log setup-password`

```
cluster1::*> system switch ethernet log setup-password
Enter the switch name: <return>
The switch name entered is not recognized.
Choose from the following list:
sw1
sw2

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

Enter the switch name: sw1
RSA key fingerprint is e5:8b:c6:dc:e2:18:18:09:36:63:d9:63:dd:03:d9:cc
Do you want to continue? {y|n}::[n] y

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

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

Enter the switch name: sw2
RSA key fingerprint is 57:49:86:a1:b9:80:6a:61:9a:86:8e:3c:e3:b7:1f:b1
Do you want to continue? {y|n}:: [n] y

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

Followed by: `system switch ethernet log enable-collection`

```
cluster1::*> system  switch ethernet log enable-collection

Do you want to enable cluster log collection for all nodes in the
cluster?
{y|n}: [n] y

Enabling cluster switch log collection.

cluster1::*>
```

If any of these commands return an error, contact NetApp support.

20. Initiate the switch log collection feature: `system switch ethernet log collect -device *`

    Wait for 10 minutes and then check that the log collection was successful using the command: `system switch ethernet log show`

```
cluster1::*> system switch ethernet log show
Log Collection Enabled: true

Index  Switch                          Log Timestamp         Status
------ ------------------------------- --------------------  ---------
1      sw1 (b8:ce:f6:19:1b:42)         4/29/2022 03:05:25    complete
2      sw2 (b8:ce:f6:19:1b:96)         4/29/2022 03:07:42    complete
```

21. Change the privilege level back to admin: `set -privilege admin`
22. If you suppressed automatic case creation, reenable it by invoking an AutoSupport message: `system node autosupport invoke -node * -type all -message MAINT=END`

Migrate to a two-node switched cluster with NVIDIA SN2100 cluster switches

You must be aware of certain configuration information, port connections, and cabling requirements when you migrate a two-node switchless cluster, non-disruptively, to a cluster with NVIDIA SN2100 cluster switches. The procedure you use depends on whether you have two dedicated cluster-network ports on each controller or a single cluster port on each controller. The process documented works for all nodes using optical or Twinax ports but is not supported on this switch if nodes are using onboard 10GBASE-T RJ45 ports for the cluster-network ports.

Two-node switchless configuration

- The two-node switchless configuration must be properly set up and functioning.
- The nodes must be running ONTAP 9.10.1P3 and later.
- All cluster ports must be in the up state.
- All cluster logical interfaces (LIFs) must be in the up state and on their home ports.

NVIDIA SN2100 cluster switch configuration

- Both switches must have management network connectivity.
- There must be console access to the cluster switches.
- NVIDIA SN2100 node-to-node switch and switch-to-switch connections must use Twinax or fiber cables.

  ⓘ See Cabling and configuration considerations for caveats and further details.

  The Hardware Universe - Switches contains more information about cabling.

- Inter-Switch Link (ISL) cables must be connected to ports swp15 and swp16 on both NVIDIA SN2100 switches.
- Initial customization of both the SN2100 switches must be completed. So that the:
  - SN2100 switches are running the latest version of Cumulus Linux
  - Reference Configuration Files (RCFs) have been applied to the switches

◦ Any site customization, such as SMTP, SNMP, and SSH must be configured on the new switches.

About this task

The examples in this procedure use the following cluster switch and node nomenclature:

- The names of the SN2100 switches are *sw1* and *sw2*.
- The names of the cluster SVMs are *node1* and *node2*.
- The names of the LIFs are *node1_clus1* and *node1_clus2* on node 1, and *node2_clus1* and *node2_clus2* on node 2 respectively.
- The `cluster1::*>` prompt indicates the name of the cluster.
- The cluster ports used in this procedure are *e3a* and *e3b*.
- Breakout ports take the format: swp[port]s[breakout port 0-3]. For example, four breakout ports on swp1 are *swp1s0*, *swp1s1*, *swp1s2*, and *swp1s3*.

  The Hardware Universe contains the latest information about the actual cluster ports for your platforms.

Steps

1. If AutoSupport is enabled on this cluster, suppress automatic case creation by invoking an AutoSupport message: `system node autosupport invoke -node * -type all -message MAINT=xh`

   where *x* is the duration of the maintenance window in hours.

2. Change the privilege level to advanced, entering `y` when prompted to continue: `set -privilege advanced`

   The advanced prompt (`*>`) appears.

3. Disable all node-facing ports (not ISL ports) on both the new cluster switches sw1 and sw2.

   You must not disable the ISL ports.

   The following commands disable the node-facing ports on switches sw1 and sw2:

   ```
   cumulus@sw1:~$ net add interface swp1s0-3, swp2s0-3, swp3-14 link down
   cumulus@sw1:~$ net pending
   cumulus@sw1:~$ net commit

   cumulus@sw2:~$ net add interface swp1s0-3, swp2s0-3, swp3-14 link down
   cumulus@sw2:~$ net pending
   cumulus@sw2:~$ net commit
   ```

4. Verify that the ISL and the physical ports on the ISL between the two SN2100 switches sw1 and sw2 are up on ports swp15 and swp16: `net show interface`

   The following example shows that the ISL ports are up on switch sw1:

```
cumulus@sw1:~$ net show interface

State  Name       Spd   MTU    Mode        LLDP         Summary
-----  ---------  ----  -----  ----------  -----------
-----------------------
...
...
UP     swp15      100G  9216   BondMember  sw2 (swp15)  Master:
cluster_isl(UP)
UP     swp16      100G  9216   BondMember  sw2 (swp16)  Master:
cluster_isl(UP)
```

The following example shows that the ISL ports are up on switch sw2:

```
cumulus@sw2:~$ net show interface

State  Name       Spd   MTU    Mode        LLDP         Summary
-----  ---------  ----  -----  ----------  -----------
-----------------------
...
...
UP     swp15      100G  9216   BondMember  sw1 (swp15)  Master:
cluster_isl(UP)
UP     swp16      100G  9216   BondMember  sw1 (swp16)  Master:
cluster_isl(UP)
```

5. Verify that all cluster ports are up: `network port show`

   Each port should display up for `Link` and healthy for `Health Status`.

```
cluster1::*> network port show

Node: node1


Ignore
                                                  Speed(Mbps)  Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper   Status
Status
--------- ------------ ---------------- ---- ---- ------------ --------
------
e3a       Cluster      Cluster          up   9000  auto/100000 healthy
false
e3b       Cluster      Cluster          up   9000  auto/100000 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/100000 healthy
false
e3b       Cluster      Cluster          up   9000  auto/100000 healthy
false
```

6. Verify that all cluster LIFs are up and operational: `network interface show`

   Each cluster LIF should display true for `Is Home` and have a `Status Admin/Oper` of up/up

```
cluster1::*> network interface show -vserver Cluster

            Logical    Status     Network            Current
Current Is
Vserver     Interface  Admin/Oper Address/Mask       Node          Port
Home
----------- ---------- ---------- ------------------ -------------
------- -----
Cluster
            node1_clus1  up/up    169.254.209.69/16  node1         e3a
true
            node1_clus2  up/up    169.254.49.125/16  node1         e3b
true
            node2_clus1  up/up    169.254.47.194/16  node2         e3a
true
            node2_clus2  up/up    169.254.19.183/16  node2         e3b
true
```

7. Disable auto-revert on the cluster LIFs: `network interface modify -vserver Cluster -lif * -auto-revert false`

```
cluster1::*> network interface modify -vserver Cluster -lif * -auto
-revert false

          Logical
Vserver   Interface     Auto-revert
--------- ------------- ------------
Cluster
          node1_clus1   false
          node1_clus2   false
          node2_clus1   false
          node2_clus2   false
```

8. Disconnect the cable from cluster port e3a on node1, and then connect e3a to port 3 on cluster switch sw1, using the appropriate cabling supported by the SN2100 switches.

   The Hardware Universe - Switches contains more information about cabling.

9. Disconnect the cable from cluster port e3a on node2, and then connect e3a to port 4 on cluster switch sw1, using the appropriate cabling supported by the SN2100 switches.
10. On switch sw1, enable all node-facing ports.

    The following command enables all node-facing ports on switch sw1:

```
cumulus@sw1:~$ net del interface swp1s0-3, swp2s0-3, swp3-14 link down
cumulus@sw1:~$ net pending
cumulus@sw1:~$ net commit
```

11. On switch sw1, verify that all ports are up: `net show interface all`

```
cumulus@sw1:~$ net show interface all

State  Name      Spd   MTU    Mode        LLDP             Summary
-----  --------- ----  -----  ----------  ---------------  --------
...
DN     swp1s0    10G   9216   Trunk/L2                     Master:
br_default(UP)
DN     swp1s1    10G   9216   Trunk/L2                     Master:
br_default(UP)
DN     swp1s2    10G   9216   Trunk/L2                     Master:
br_default(UP)
DN     swp1s3    10G   9216   Trunk/L2                     Master:
br_default(UP)
DN     swp2s0    25G   9216   Trunk/L2                     Master:
br_default(UP)
DN     swp2s1    25G   9216   Trunk/L2                     Master:
br_default(UP)
DN     swp2s2    25G   9216   Trunk/L2                     Master:
br_default(UP)
DN     swp2s3    25G   9216   Trunk/L2                     Master:
br_default(UP)
UP     swp3      100G  9216   Trunk/L2    node1 (e3a)      Master:
br_default(UP)
UP     swp4      100G  9216   Trunk/L2    node2 (e3a)      Master:
br_default(UP)
...
...
UP     swp15     100G  9216   BondMember  swp15            Master:
cluster_isl(UP)
UP     swp16     100G  9216   BondMember  swp16            Master:
cluster_isl(UP)
...
```

12. Verify that all cluster ports are up: `network port show -ipspace Cluster`

    The following example shows that all of the cluster ports are up on node1 and node2:

```
cluster1::*> network port show -ipspace Cluster

Node: node1

Ignore
                                                  Speed(Mbps)  Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper   Status
Status
--------- ------------ ---------------- ---- ---- ------------ --------
------
e3a       Cluster      Cluster          up   9000  auto/100000 healthy
false
e3b       Cluster      Cluster          up   9000  auto/100000 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/100000 healthy
false
e3b       Cluster      Cluster          up   9000  auto/100000 healthy
false
```

13. Display information about the status of the nodes in the cluster: `cluster show`

    The following example displays information about the health and eligibility of the nodes in the cluster:

```
cluster1::*> cluster show

Node                 Health  Eligibility   Epsilon
-------------------- ------- ------------  ------------
node1                true    true          false
node2                true    true          false
```

14. Disconnect the cable from cluster port e3b on node1, and then connect e3b to port 3 on cluster switch sw2, using the appropriate cabling supported by the SN2100 switches.
15. Disconnect the cable from cluster port e3b on node2, and then connect e3b to port 4 on cluster switch sw2,

using the appropriate cabling supported by the SN2100 switches.

16. On switch sw2, enable all node-facing ports.

    The following commands enable the node-facing ports on switch sw2:

```
cumulus@sw2:~$ net del interface swp1s0-3, swp2s0-3, swp3-14 link down
cumulus@sw2:~$ net pending
cumulus@sw2:~$ net commit
```

17. On switch sw2, verify that all ports are up: `net show interface all`

```
cumulus@sw2:~$ net show interface all

State  Name      Spd   MTU    Mode        LLDP             Summary
-----  --------- ----  -----  ----------  ---------------  --------
...
DN     swp1s0    10G   9216   Trunk/L2                     Master:
br_default(UP)
DN     swp1s1    10G   9216   Trunk/L2                     Master:
br_default(UP)
DN     swp1s2    10G   9216   Trunk/L2                     Master:
br_default(UP)
DN     swp1s3    10G   9216   Trunk/L2                     Master:
br_default(UP)
DN     swp2s0    25G   9216   Trunk/L2                     Master:
br_default(UP)
DN     swp2s1    25G   9216   Trunk/L2                     Master:
br_default(UP)
DN     swp2s2    25G   9216   Trunk/L2                     Master:
br_default(UP)
DN     swp2s3    25G   9216   Trunk/L2                     Master:
br_default(UP)
UP     swp3      100G  9216   Trunk/L2    node1 (e3b)      Master:
br_default(UP)
UP     swp4      100G  9216   Trunk/L2    node2 (e3b)      Master:
br_default(UP)
...
...
UP     swp15     100G  9216   BondMember  swp15            Master:
cluster_isl(UP)
UP     swp16     100G  9216   BondMember  swp16            Master:
cluster_isl(UP)
...
```

18. On both switches sw1 and sw2, verify that both nodes each have one connection to each switch: `net show lldp`

    The following example shows the appropriate results for both switches sw1 and sw2:

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

LocalPort  Speed  Mode        RemoteHost         RemotePort
---------  -----  ----------  -----------------  -----------
swp3       100G   Trunk/L2    node1              e3a
swp4       100G   Trunk/L2    node2              e3a
swp15      100G   BondMember  sw2                swp15
swp16      100G   BondMember  sw2                swp16

cumulus@sw2:~$ net show lldp

LocalPort  Speed  Mode        RemoteHost         RemotePort
---------  -----  ----------  -----------------  -----------
swp3       100G   Trunk/L2    node1              e3b
swp4       100G   Trunk/L2    node2              e3b
swp15      100G   BondMember  sw1                swp15
swp16      100G   BondMember  sw1                swp16
```

19. Display information about the discovered network devices in your cluster: `net device-discovery show -protocol lldp`

```
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          -
```

20. Verify that all cluster ports are up: `network port show -ipspace Cluster`

    The following example shows that all of the cluster ports are up on node1 and node2:

```
cluster1::*> network port show -ipspace 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
```

21. Enable auto-revert on all cluster LIFs: `net interface modify -vserver Cluster -lif * -auto -revert true`

```
cluster1::*> net interface modify -vserver Cluster -lif * -auto-revert
true

          Logical
Vserver   Interface     Auto-revert
--------- ------------- ------------
Cluster
          node1_clus1   true
          node1_clus2   true
          node2_clus1   true
          node2_clus2   true
```

22. Verify that all interfaces display true for `Is Home`: `net interface show -vserver Cluster`

    This might take a minute to complete.

    The following example shows that all LIFs are up on node1 and node2 and that `Is Home` results are true:

```
cluster1::*> net interface show -vserver Cluster

          Logical      Status     Network            Current    Current
Is
Vserver   Interface    Admin/Oper Address/Mask       Node       Port
Home
--------- ------------ ---------- ------------------ ---------- -------
----
Cluster
          node1_clus1  up/up      169.254.209.69/16  node1      e3a
true
          node1_clus2  up/up      169.254.49.125/16  node1      e3b
true
          node2_clus1  up/up      169.254.47.194/16  node2      e3a
true
          node2_clus2  up/up      169.254.19.183/16  node2      e3b
true
```

23. Verify that the settings are disabled: `network options switchless-cluster show`

    The false output in the following example shows that the configuration settings are disabled:

```
cluster1::*> network options switchless-cluster show
Enable Switchless Cluster: false
```

24. Verify the status of the node members in the cluster: `cluster show`

    The following example shows information about the health and eligibility of the nodes in the cluster:

```
cluster1::*> cluster show

Node                 Health  Eligibility   Epsilon
-------------------- ------- ------------  --------
node1                true    true          false
node2                true    true          false
```

25. Ensure that the cluster network has full connectivity: `cluster ping-cluster -node node-name`

```
cluster1::*> cluster ping-cluster -node node1
Host is node1
Getting addresses from network interface table...
Cluster node1_clus1 169.254.209.69 node1 e3a
Cluster node1_clus2 169.254.49.125 node1 e3b
Cluster node2_clus1 169.254.47.194 node2 e3a
Cluster node2_clus2 169.254.19.183 node2 e3b
Local = 169.254.47.194 169.254.19.183
Remote = 169.254.209.69 169.254.49.125
Cluster Vserver Id = 4294967293
Ping status:

Basic connectivity succeeds on 4 path(s)
Basic connectivity fails on 0 path(s)

Detected 9000 byte MTU on 4 path(s):
Local 169.254.47.194 to Remote 169.254.209.69
Local 169.254.47.194 to Remote 169.254.49.125
Local 169.254.19.183 to Remote 169.254.209.69
Local 169.254.19.183 to Remote 169.254.49.125
Larger than PMTU communication succeeds on 4 path(s)
RPC status:
2 paths up, 0 paths down (tcp check)
2 paths up, 0 paths down (udp check)
```

26. Enable the Ethernet switch health monitor log collection feature for collecting switch-related log files, using the commands: `system switch ethernet log setup-password` and `system switch ethernet log enable-collection`

    Enter: `system switch ethernet log setup-password`

```
cluster1::*> system switch ethernet log setup-password
Enter the switch name: <return>
The switch name entered is not recognized.
Choose from the following list:
sw1
sw2

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

Enter the switch name: sw1
RSA key fingerprint is e5:8b:c6:dc:e2:18:18:09:36:63:d9:63:dd:03:d9:cc
Do you want to continue? {y|n}::[n] y

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

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

Enter the switch name: sw2
RSA key fingerprint is 57:49:86:a1:b9:80:6a:61:9a:86:8e:3c:e3:b7:1f:b1
Do you want to continue? {y|n}:: [n] y

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

Followed by: `system switch ethernet log enable-collection`

```
cluster1::*> system switch ethernet log enable-collection

Do you want to enable cluster log collection for all nodes in the
cluster?
{y|n}: [n] y

Enabling cluster switch log collection.

cluster1::*>
```

If any of these commands return an error, contact NetApp support.

27. Initiate the switch log collection feature: `system switch ethernet log collect -device *`

    Wait for 10 minutes and then check that the log collection was successful using the command: `system switch ethernet log show`

```
cluster1::*> system switch ethernet log show
Log Collection Enabled: true

Index  Switch                         Log Timestamp        Status
------ ------------------------------ -------------------  ---------
1      sw1 (b8:ce:f6:19:1b:42)        4/29/2022 03:05:25   complete
2      sw2 (b8:ce:f6:19:1b:96)        4/29/2022 03:07:42   complete
```

28. Change the privilege level back to admin: `set -privilege admin`
29. If you suppressed automatic case creation, reenable it by invoking an AutoSupport message: `system node autosupport invoke -node * -type all -message MAINT=END`

Replace NVIDIA SN2100 switches

Replace a NVIDIA SN2100 cluster switch

Replacing a defective NVIDIA SN2100 switch in a cluster network is a nondisruptive procedure (NDU).

Before you begin

The following conditions must exist before performing the switch replacement in the current environment and on the replacement switch.

- Existing cluster and network infrastructure:
  - The existing cluster must be verified as completely functional, with at least one fully connected cluster switch.
  - All cluster ports must be up.
  - All cluster logical interfaces (LIFs) must be up and on their home ports.
  - The ONTAP `cluster ping-cluster -node node1` command must indicate that basic connectivity and larger than PMTU communication are successful on all paths.
- NVIDIA SN2100 replacement switch:
  - Management network connectivity on the replacement switch must be functional.
  - Console access to the replacement switch must be in place.
  - The node connections are ports swp1 through swp14.
  - All Inter-Switch Link (ISL) ports must be disabled on ports swp15 and swp16.
  - The desired reference configuration file (RCF) and Cumulus operating system image switch must be loaded onto the switch.
  - Initial customization of the switch must be complete, as detailed in:

    Any previous site customizations, such as STP, SNMP, and SSH, should be copied to the new switch.

You must execute the command for migrating a cluster LIF from the node where the cluster LIF is hosted.

About this task

The examples in this procedure use the following switch and node nomenclature:

- The names of the existing NVIDIA SN2100 switches are *sw1* and *sw2*.
- The name of the new NVIDIA SN2100 switch is *nsw2*.
- The node names are *node1* and *node2*.
- The cluster ports on each node are named *e3a* and *e3b*.
- The cluster LIF names are *node1_clus1* and *node1_clus2* for node1, and *node2_clus1* and *node2_clus2* for node2.
- The prompt for changes to all cluster nodes is `cluster1::*>`
- Breakout ports take the format: swp[port]s[breakout port 0-3]. For example, four breakout ports on swp1 are *swp1s0*, *swp1s1*, *swp1s2*, and *swp1s3*.

The following procedure is based on the following cluster network topology:

```
cluster1::*> network port show -ipspace Cluster

Node: node1

Ignore
                                                  Speed(Mbps)  Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper   Status
Status
--------- ------------ ---------------- ---- ---- ------------ --------
------
e3a       Cluster      Cluster          up   9000  auto/100000 healthy
false
e3b       Cluster      Cluster          up   9000  auto/100000 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/100000 healthy
false
e3b       Cluster      Cluster          up   9000  auto/100000 healthy
false
```

```
cluster1::*> network interface show -vserver Cluster

            Logical    Status     Network            Current
Current Is
Vserver     Interface  Admin/Oper Address/Mask       Node          Port
Home
----------- ---------- ---------- ------------------ -------------
------- ----
Cluster
            node1_clus1  up/up    169.254.209.69/16  node1         e3a
true
            node1_clus2  up/up    169.254.49.125/16  node1         e3b
true
            node2_clus1  up/up    169.254.47.194/16  node2         e3a
true
            node2_clus2  up/up    169.254.19.183/16  node2         e3b
true


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          -
```

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

LocalPort  Speed  Mode        RemoteHost          RemotePort
---------  -----  ----------  ------------------  -----------
swp3       100G   Trunk/L2    sw2                 e3a
swp4       100G   Trunk/L2    sw2                 e3a
swp15      100G   BondMember  sw2                 swp15
swp16      100G   BondMember  sw2                 swp16


cumulus@sw2:~$ net show lldp

LocalPort  Speed  Mode        RemoteHost          RemotePort
---------  -----  ----------  ------------------  -----------
swp3       100G   Trunk/L2    sw1                 e3b
swp4       100G   Trunk/L2    sw1                 e3b
swp15      100G   BondMember  sw1                 swp15
swp16      100G   BondMember  sw1                 swp16
```

Steps

1. If AutoSupport is enabled on this cluster, suppress automatic case creation by invoking an AutoSupport message: `system node autosupport invoke -node * -type all -message MAINT=xh`

   where *x* is the duration of the maintenance window in hours.

2. Change the privilege level to advanced, entering **y** when prompted to continue: `set -privilege advanced`

   The advanced prompt (*>) appears.

3. Install the appropriate RCF and image on the switch, nsw2, and make any necessary site preparations.

   If necessary, verify, download, and install the appropriate versions of the RCF and Cumulus software for the new switch. If you have verified that the new switch is correctly set up and does not need updates to the RCF and Cumulus software, continue to step 3. See Setup and configure the NVIDIA SN2100 switches for further details.

   a. You can download the applicable Cumulus software for your cluster switches from the *NVIDIA Support* site. Follow the steps on the Download page to download the Cumulus Linux for the version of ONTAP software you are installing.

   b. The appropriate RCF is available from the *NVIDIA Cluster and Storage Switches* page. Follow the steps on the Download page to download the correct RCF for the version of ONTAP software you are installing.

4. On the new switch nsw2, log in as admin and shut down all of the ports that will be connected to the node cluster interfaces (ports swp1 to swp14).

   If the switch that you are replacing is not functional and is powered down, go to Step 4. The LIFs on the cluster nodes should have already failed over to the other cluster port for each node.

```
cumulus@nsw2:~$ net add interface swp1s0-3, swp2s0-3, swp3-14 link down
cumulus@nsw2:~$ net pending
cumulus@nsw2:~$ net commit
```

5. Disable auto-revert on the cluster LIFs: `network interface modify -vserver Cluster -lif * -auto-revert false`

```
cluster1::*> network interface modify -vserver Cluster -lif * -auto
-revert false

Warning: Disabling the auto-revert feature of the cluster logical
interface may effect the availability of your cluster network. Are you
sure you want to continue? {y|n}: y
```

6. Shut down the ISL ports swp15 and swp16 on the SN2100 switch sw1:

```
cumulus@sw1:~$ net add interface swp15-16 link down
cumulus@sw1:~$ net pending
cumulus@sw1:~$ net commit
```

7. Remove all the cables from the SN2100 sw1 switch, and then connect them to the same ports on the SN2100 nsw2 switch.
8. Bring up the ISL ports swp15 and swp16 between the sw1 and nsw2 switches.

   The following commands enable ISL ports swp15 and swp16 on switch sw1:

```
cumulus@sw1:~$ net del interface swp15-16 link down
cumulus@sw1:~$ net pending
cumulus@sw1:~$ net commit
```

   The following example shows that the ISL ports are up on switch sw1:

```
cumulus@sw1:~$ net show interface

State  Name         Spd   MTU    Mode        LLDP           Summary
-----  -----------  ----  -----  ----------  -------------
----------------------
...
...
UP     swp15        100G  9216   BondMember  nsw2 (swp15)   Master:
cluster_isl(UP)
UP     swp16        100G  9216   BondMember  nsw2 (swp16)   Master:
cluster_isl(UP)
```

The following example shows that the ISL ports are up on switch nsw2:

```
cumulus@nsw2:~$ net show interface

State  Name         Spd   MTU    Mode        LLDP           Summary
-----  -----------  ----  -----  ----------  -------------
----------------------
...
...
UP     swp15        100G  9216   BondMember  sw1 (swp15)    Master:
cluster_isl(UP)
UP     swp16        100G  9216   BondMember  sw1 (swp16)    Master:
cluster_isl(UP)
```

9. Verify that port `e3b` is up on all nodes: `network port show -ipspace Cluster`

   The output should be similar to the following:

```
cluster1::*> network port show -ipspace Cluster

Node: node1

Ignore
                                                  Speed(Mbps)  Health
Health
Port      IPspace      Broadcast Domain Link MTU   Admin/Oper   Status
Status
--------- ------------ ---------------- ---- ----- ------------ --------
-------
e3a       Cluster      Cluster          up   9000  auto/100000  healthy
false
e3b       Cluster      Cluster          up   9000  auto/100000  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/100000  healthy
false
e3b       Cluster      Cluster          up   9000  auto/100000  healthy
false
```

10. The cluster ports on each node are now connected to cluster switches in the following way, from the nodes' perspective:

```
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    nsw2 (b8:ce:f6:19:1b:b6)   swp3          -
node2      /lldp
            e3a    sw1  (b8:ce:f6:19:1a:7e)   swp4          -
            e3b    nsw2 (b8:ce:f6:19:1b:b6)   swp4          -
```

11. Verify that all node cluster ports are up: `net show interface`

```
cumulus@nsw2:~$ net show interface

State  Name         Spd   MTU    Mode        LLDP               Summary
-----  -----------  ----  -----  ----------  -----------------
----------------------
...
...
UP     swp3         100G  9216   Trunk/L2                       Master:
bridge(UP)
UP     swp4         100G  9216   Trunk/L2                       Master:
bridge(UP)
UP     swp15        100G  9216   BondMember  sw1 (swp15)        Master:
cluster_isl(UP)
UP     swp16        100G  9216   BondMember  sw1 (swp16)        Master:
cluster_isl(UP)
```

12. Verify that both nodes each have one connection to each switch: `net show lldp`

    The following example shows the appropriate results for both switches:

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

LocalPort  Speed  Mode        RemoteHost         RemotePort
---------  -----  ----------  -----------------  -----------
swp3       100G   Trunk/L2    node1              e3a
swp4       100G   Trunk/L2    node2              e3a
swp15      100G   BondMember  nsw2               swp15
swp16      100G   BondMember  nsw2               swp16


cumulus@nsw2:~$ net show lldp

LocalPort  Speed  Mode        RemoteHost         RemotePort
---------  -----  ----------  -----------------  -----------
swp3       100G   Trunk/L2    node1                e3b
swp4       100G   Trunk/L2    node2                e3b
swp15      100G   BondMember  sw1                swp15
swp16      100G   BondMember  sw1                swp16
```

13. Enable auto-revert on the cluster LIFs: `cluster1::*> network interface modify -vserver Cluster -lif * -auto-revert true`
14. On switch nsw2, bring up the ports connected to the network ports of the nodes.

```
cumulus@nsw2:~$ net del interface swp1-14 link down
cumulus@nsw2:~$ net pending
cumulus@nsw2:~$ net commit
```

15. Display information about the nodes in a cluster: `cluster show`

    This example shows that the node health for node1 and node2 in this cluster is true:

```
cluster1::*> cluster show

Node          Health  Eligibility
------------- ------- ------------
node1         true    true
node2         true    true
```

16. Verify that all physical cluster ports are up: `network port show ipspace Cluster`

```
cluster1::*> network port show -ipspace 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
```

17. Verify that the cluster network is healthy:

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

LocalPort  Speed  Mode        RemoteHost      RemotePort
---------  -----  ----------  --------------  -----------
swp3       100G   Trunk/L2    node1           e3a
swp4       100G   Trunk/L2    node2           e3a
swp15      100G   BondMember  nsw2            swp15
swp16      100G   BondMember  nsw2            swp16
```

18. Enable the Ethernet switch health monitor log collection feature for collecting switch-related log files, using the commands: `system switch ethernet log setup-password` and `system switch ethernet log enable-collection`

    Enter: `system switch ethernet log setup-password`

```
cluster1::*> system switch ethernet log setup-password
Enter the switch name: <return>
The switch name entered is not recognized.
Choose from the following list:
sw1
nsw2

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

Enter the switch name: sw1
RSA key fingerprint is e5:8b:c6:dc:e2:18:18:09:36:63:d9:63:dd:03:d9:cc
Do you want to continue? {y|n}::[n] y

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

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

Enter the switch name: nsw2
RSA key fingerprint is 57:49:86:a1:b9:80:6a:61:9a:86:8e:3c:e3:b7:1f:b1
Do you want to continue? {y|n}:: [n] y

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

Followed by: `system switch ethernet log enable-collection`

```
cluster1::*> system switch ethernet log enable-collection

Do you want to enable cluster log collection for all nodes in the
cluster?
{y|n}: [n] y

Enabling cluster switch log collection.

cluster1::*>
```

If any of these commands return an error, contact NetApp support.

19. Initiate the switch log collection feature: `system switch ethernet log collect -device *`

    Wait for 10 minutes and then check that the log collection was successful using the command: `system switch ethernet log show`

```
cluster1::*> system switch ethernet log show
Log Collection Enabled: true

Index  Switch                         Log Timestamp         Status
------ ------------------------------ --------------------  ---------
1      sw1 (b8:ce:f6:19:1b:42)        4/29/2022 03:05:25    complete
2      nsw2 (b8:ce:f6:19:1b:96)       4/29/2022 03:07:42    complete
```

20. Change the privilege level back to admin: `set -privilege admin`
21. If you suppressed automatic case creation, re-enable it by invoking an AutoSupport message: `system node autosupport invoke -node * -type all -message MAINT=END`

Replace a NVIDIA SN2100 storage switch

You must be aware of certain configuration information, port connections and cabling requirements when you replace NVIDIA SN2100 storage switches.

Before you begin

You must verify that the following conditions exist before installing the Cumulus software and RCFs on a NVIDIA SN2100 storage switch:

- Your system can support NVIDIA SN2100 storage switches.
- You must have downloaded the applicable RCFs.
- The Hardware Universe provides full details of supported ports and their configurations.

About this task

The existing network configuration must have the following characteristics:

- Ensure that all troubleshooting steps have been completed to confirm that your switch needs replacing.
- Management connectivity must exist on both switches.

> Make sure that all troubleshooting steps have been completed to confirm that your switch needs replacing.

The replacement NVIDIA SN2100 switch must have the following characteristics:

- Management network connectivity must be functional.
- Console access to the replacement switch must be in place.
- The appropriate RCF and Cumulus operating system image must be loaded onto the switch.
- Initial customization of the switch must be complete.

Procedure summary

This procedure replaces the second NVIDIA SN2100 storage switch sw2 with the new NVIDIA SN2100 switch nsw2. The two nodes are node1 and node2.

Steps to complete:

- Confirm the switch to be replaced is sw2.
- Disconnect the cables from switch sw2.
- Reconnect the cables to switch nsw2.
- Verify all device configurations on switch nsw2.

Steps

1. If AutoSupport is enabled on this cluster, suppress automatic case creation by invoking an AutoSupport message: `system node autosupport invoke -node * -type all - message MAINT=xh`

   x is the duration of the maintenance window in hours.

2. Change the privilege level to advanced, entering **y** when prompted to continue: `set -privilege advanced`
3. Check on the health status of the storage node ports to make sure that there is connection to storage switch S1:

   `storage port show -port-type ENET`

```
cluster1::*> storage port show -port-type ENET
                                  Speed                      VLAN
Node           Port Type  Mode    (Gb/s) State    Status       ID
-------------- ---- ----- ------- ------ -------- --------- ----
node1
               e3a  ENET  storage 100    enabled  online      30
               e3b  ENET  storage   0    enabled  offline     30
               e7a  ENET  storage   0    enabled  offline     30
               e7b  ENET  storage 100    enabled  online      30
node2
               e3a  ENET  storage 100    enabled  online      30
               e3b  ENET  storage   0    enabled  offline     30
               e7a  ENET  storage   0    enabled  offline     30
               e7b  ENET  storage 100    enabled  online      30
cluster1::*>
```

4. Verify that storage switch sw1 is available: `network device-discovery show`

```
cluster1::*> network device-discovery show protocol lldp
Node/      Local Discovered
Protocol   Port  Device (LLDP: ChassisID)  Interface   Platform
--------   ----  ----------------------   ---------   ---------
node1/lldp
           e3a   sw1 (b8:ce:f6:19:1b:42)   swp3        -
node2/lldp
           e3a   sw1 (b8:ce:f6:19:1b:42)   swp4        -
cluster1::*>
```

5. Run the `net show interface` command on the working switch to confirm that you can see both nodes and all shelves: `net show interface`

```
cumulus@sw1:~$ net show interface

State  Name    Spd   MTU    Mode         LLDP                   Summary
-----  ------  ----  -----  ----------  --------------------
--------------------
...
...
UP     swp1    100G  9216   Trunk/L2   node1 (e3a)             Master:
bridge(UP)
UP     swp2    100G  9216   Trunk/L2   node2 (e3a)             Master:
bridge(UP)
UP     swp3    100G  9216   Trunk/L2   SHFFG1826000112 (e0b)   Master:
bridge(UP)
UP     swp4    100G  9216   Trunk/L2   SHFFG1826000112 (e0b)   Master:
bridge(UP)
UP     swp5    100G  9216   Trunk/L2   SHFFG1826000102 (e0b)   Master:
bridge(UP)
UP     swp6    100G  9216   Trunk/L2   SHFFG1826000102 (e0b)   Master:
bridge(UP))
...
...
```

6. Verify the shelf ports in the storage system: `storage shelf port show -fields remote-device, remote-port`

```
cluster1::*> storage shelf port show -fields remote-device, remote-port
shelf   id  remote-port   remote-device
-----   --  -----------   -------------
3.20    0   swp3          sw1
3.20    1   -             -
3.20    2   swp4          sw1
3.20    3   -             -
3.30    0   swp5          sw1
3.20    1   -             -
3.30    2   swp6          sw1
3.20    3   -             -
cluster1::*>
```

7. Remove all cables attached to storage switch sw2.
8. Reconnect all cables to the replacement switch nsw2.
9. Recheck the health status of the storage node ports: `storage port show -port-type ENET`

```
cluster1::*> storage port show -port-type ENET
                                  Speed                      VLAN
Node              Port Type  Mode    (Gb/s) State    Status      ID
----------------- ---- ----- ------- ------ -------- --------- ----
node1
                  e3a  ENET  storage 100    enabled  online      30
                  e3b  ENET  storage   0    enabled  offline     30
                  e7a  ENET  storage   0    enabled  offline     30
                  e7b  ENET  storage 100    enabled  online      30
node2
                  e3a  ENET  storage 100    enabled  online      30
                  e3b  ENET  storage   0    enabled  offline     30
                  e7a  ENET  storage   0    enabled  offline     30
                  e7b  ENET  storage 100    enabled  online      30
cluster1::*>
```

10. Verify that both switches are available: `net device-discovery show`

```
cluster1::*> network device-discovery show protocol lldp
Node/     Local Discovered
Protocol  Port  Device (LLDP: ChassisID)  Interface   Platform
--------  ----  -----------------------   ---------   ---------
node1/lldp
          e3a  sw1 (b8:ce:f6:19:1b:96)    swp1        -
          e7b  nsw2 (b8:ce:f6:19:1a:7e)   swp1        -
node2/lldp
          e3a  sw1 (b8:ce:f6:19:1b:96)    swp2        -
          e7b  nsw2 (b8:ce:f6:19:1a:7e)   swp2        -
cluster1::*>
```

11. Verify the shelf ports in the storage system: `storage shelf port show -fields remote-device, remote-port`

```
cluster1::*> storage shelf port show -fields remote-device, remote-port
shelf   id    remote-port     remote-device
-----   --    -----------     -------------
3.20    0     swp3            sw1
3.20    1     swp3            nsw2
3.20    2     swp4            sw1
3.20    3     swp4            nsw2
3.30    0     swp5            sw1
3.20    1     swp5            nsw2
3.30    2     swp6            sw1
3.20    3     swp6            nsw2
cluster1::*>
```

12. Enable the Ethernet switch health monitor log collection feature for collecting switch-related log files, using the two commands: `system switch ethernet log setup-password` and `system switch ethernet log enable-collection`

    Enter: `system switch ethernet log setup-password`

```
cluster1::*> system switch ethernet log setup-password
Enter the switch name: <return>
The switch name entered is not recognized.
Choose from the following list:
sw1
nsw2

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

Enter the switch name: sw1
RSA key fingerprint is e5:8b:c6:dc:e2:18:18:09:36:63:d9:63:dd:03:d9:cc
Do you want to continue? {y|n}::[n] y

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

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

Enter the switch name: nsw2
RSA key fingerprint is 57:49:86:a1:b9:80:6a:61:9a:86:8e:3c:e3:b7:1f:b1
Do you want to continue? {y|n}:: [n] y

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

Followed by: `system switch ethernet log enable-collection`

```
cluster1::*> system  switch ethernet log enable-collection

Do you want to enable cluster log collection for all nodes in the
cluster?
{y|n}: [n] y

Enabling cluster switch log collection.

cluster1::*>
```

If any of these commands return an error, contact NetApp support.

13. Initiate the switch log collection feature: `system switch ethernet log collect -device *`

    Wait for 10 minutes and then check that the log collection was successful using the command: `system switch ethernet log show`

```
cluster1::*> system switch ethernet log show
Log Collection Enabled: true

Index  Switch                         Log Timestamp        Status
------ ------------------------------ -------------------  ---------
1      sw1 (b8:ce:f6:19:1b:42)        4/29/2022 03:05:25   complete
2      nsw2 (b8:ce:f6:19:1b:96)       4/29/2022 03:07:42   complete
```

14. Change the privilege level back to admin: `set -privilege admin`
15. If you suppressed automatic case creation, re-enable it by invoking an AutoSupport message: `system node autosupport invoke -node * -type all -message MAINT=END`

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