Configure the software

Install and maintain

NetApp
February 13, 2026

This PDF was generated from https://docs.netapp.com/us-en/ontap-systems-switches/switch-cisco-9336c-fx2/configure-software-overview-9336c-cluster.html on February 13, 2026. Always check docs.netapp.com for the latest.

Table of Contents

Configure the software

Software install workflow for Cisco Nexus 9336C-FX2 and 9336C-FX2-T cluster switches

To install and configure the software for Cisco Nexus 9336C-FX2 and 9336C-FX2-T switches and to install or upgrade the Reference Configuration File (RCF), follow these steps:

1. **Configure the switch**

Configure the 9336C-FX2 and 9336C-FX2-T cluster switches.

2. **Prepare to install the NX-OS software and RCF**

The Cisco NX-OS software and reference configuration files (RCFs) must be installed on Cisco 9336C-FX2 and 9336C-FX2-T cluster switches.

3. **Install or upgrade the NX-OS software**

Download and install or upgrade the NX-OS software on the Cisco 9336C-FX2 and 9336C-FX2-T cluster switches.

4. **Install or upgrade the RCF**

Install or upgrade the RCF after setting up the Cisco 9336C-FX2 and 9336C-FX2-T switches for the first time. You can also use this procedure to upgrade your RCF version.

5. **Verify SSH configuration**

Verify that SSH is enabled on the switches to use the Ethernet Switch Health Monitor (CSHM) and log collection features.

6. **Reset the switch to factory defaults**

Erase the 9336C-FX2 and 9336C-FX2-T cluster switches settings.

Configure the 9336C-FX2 and 9336C-FX2-T cluster switches

Follow this procedure to configure the Cisco Nexus 9336C-FX2 and 9336C-FX2-T switches.

Before you begin

Make sure you have the following:

- Access to an HTTP, FTP, or TFTP server at the installation site to download the applicable NX-OS and Reference Configuration File (RCF) releases.
- Applicable NX-OS version, downloaded from the Cisco software download page.
- Applicable licenses, network and configuration information, and cables.
- Completed cabling worksheets.
- Applicable NetApp cluster network and management network RCFs downloaded from the NetApp Support Site at mysupport.netapp.com. All Cisco cluster network and management network switches arrive with the standard Cisco factory-default configuration. These switches also have the current version of the NX-OS software but do not have the RCFs loaded.
- Required switch and ONTAP documentation.

Steps

1. Perform an initial configuration of the cluster network switches.

   Provide applicable responses to the following initial setup questions when you first boot the switch. Your site's security policy defines the responses and services to enable.

Prompt	Response
Abort Auto Provisioning and continue with normal setup? (yes/no)	Respond with **yes**. The default is no.
Do you want to enforce secure password standard? (yes/no)	Respond with **yes**. The default is yes.
Enter the password for admin.	The default password is "admin"; you must create a new, strong password. A weak password can be rejected.
Would you like to enter the basic configuration dialog? (yes/no)	Respond with **yes** at the initial configuration of the switch.
Create another login account? (yes/no)	Your answer depends on your site's policies on alternate administrators. The default is **no**.
Configure read-only SNMP community string? (yes/no)	Respond with **no**. The default is no.
Configure read-write SNMP community string? (yes/no)	Respond with **no**. The default is no.
Enter the switch name.	Enter the switch name, which is limited to 63 alphanumeric characters.
Continue with Out-of-band (mgmt0) management configuration? (yes/no)	Respond with **yes** (the default) at that prompt. At the mgmt0 IPv4 address: prompt, enter your IP address: ip_address.

Prompt	Response
Configure the default-gateway? (yes/no)	Respond with **yes**. At the IPv4 address of the default-gateway: prompt, enter your default_gateway.
Configure advanced IP options? (yes/no)	Respond with **no**. The default is no.
Enable the telnet service? (yes/no)	Respond with **no**. The default is no.
Enabled SSH service? (yes/no)	Respond with **yes**. The default is yes. SSH is recommended when using Ethernet Switch Health Monitor (CSHM) for its log collection features. SSHv2 is also recommended for enhanced security.
Enter the type of SSH key you want to generate (dsa/rsa/rsa1).	The default is **rsa**.
Enter the number of key bits (1024-2048).	Enter the number of key bits from 1024 to 2048.
Configure the NTP server? (yes/no)	Respond with **no**. The default is no.
Configure default interface layer (L3/L2)	Respond with **L2**. The default is L2.
Configure default switch port interface state (shut/noshut)	Respond with **noshut**. The default is noshut.
Configure CoPP system profile (strict/moderate/lenient/dense)	Respond with **strict**. The default is strict.
Would you like to edit the configuration? (yes/no)	You should see the new configuration at this point. Review and make any necessary changes to the configuration you just entered. Respond with **no** at the prompt if you are satisfied with the configuration. Respond with **yes** if you want to edit your configuration settings.
Use this configuration and save it? (yes/no)	Respond with **yes** to save the configuration. This automatically updates the kickstart and system images. If you do not save the configuration at this stage, none of the changes will be in effect the next time you reboot the switch.

2. Verify the configuration choices you made in the display that appears at the end of the setup, and make sure that you save the configuration.
3. Check the version on the cluster network switches, and if necessary, download the NetApp-supported version of the software to the switches from the Cisco software download page.

What's next?

After you've configured your switches, you can prepare to install the NX-OS software and RCF.

Prepare to install NX-OS software and RCF

Before you install the NX-OS software and the Reference Configuration File (RCF), follow this procedure.

Suggested documentation

- Cisco Ethernet switch page

  Consult the switch compatibility table for the supported ONTAP and NX-OS versions.

- Software Upgrade and downgrade guides

  Refer to the appropriate software and upgrade guides available on the Cisco website for complete documentation on the Cisco switch upgrade and downgrade procedures.

- Cisco Nexus 9000 and 3000 Upgrade and ISSU Matrix

  Provides information on Disruptive Upgrade/Downgrade for Cisco NX-OS software on Nexus 9000 Series Switches based on your current and target releases.

  On the page, select **Disruptive Upgrade** and select your current release and target release from the dropdown list.

About the examples

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

- The names of the two Cisco switches are cs1 and cs2.
- The node names are cluster1-01 and cluster1-02.
- The cluster LIF names are cluster1-01_clus1 and cluster1-01_clus2 for cluster1-01 and cluster1-02_clus1 and cluster1-02_clus2 for cluster1-02.
- The `cluster1::*>` prompt indicates the name of the cluster.

About this task

The procedure requires the use of both ONTAP commands and Cisco Nexus 9000 Series Switches commands; ONTAP commands are used unless otherwise indicated.

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=x h`

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

The AutoSupport message notifies technical support of this maintenance task so that automatic case creation is suppressed during the maintenance window.

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

```
set -privilege advanced
```

The advanced prompt (`*>`) appears.

3. Display how many cluster interconnect interfaces are configured in each node for each cluster interconnect switch:

```
network device-discovery show -protocol cdp
```

Show example

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

Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface
Platform
----------- ------ ------------------------- -----------------
--------
cluster1-02/cdp
            e0a    cs1                       Eth1/2            N9K-
C9336C
            e0b    cs2                       Eth1/2            N9K-
C9336C
cluster1-01/cdp
            e0a    cs1                       Eth1/1            N9K-
C9336C
            e0b    cs2                       Eth1/1            N9K-
C9336C

4 entries were displayed.
```

4. Check the administrative or operational status of each cluster interface.
   a. Display the network port attributes:

```
network port show -ipspace Cluster
```

Show example

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

Node: cluster1-02
                                                  Speed(Mbps)
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status
--------- ------------ ---------------- ---- ---- -----------
------
e0a       Cluster      Cluster          up   9000  auto/10000
healthy
e0b       Cluster      Cluster          up   9000  auto/10000
healthy

Node: cluster1-01
                                                  Speed(Mbps)
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status
--------- ------------ ---------------- ---- ---- -----------
------
e0a       Cluster      Cluster          up   9000  auto/10000
healthy
e0b       Cluster      Cluster          up   9000  auto/10000
healthy

4 entries were displayed.
```

b. Display information about the LIFs:

```
network interface show -vserver Cluster
```

Show example

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

            Logical            Status     Network
Current       Current Is
Vserver     Interface          Admin/Oper Address/Mask       Node
Port    Home
----------- ------------------ ---------- ------------------
------------ ------- ----
Cluster
            cluster1-01_clus1  up/up      169.254.209.69/16
cluster1-01   e0a     true
            cluster1-01_clus2  up/up      169.254.49.125/16
cluster1-01   e0b     true
            cluster1-02_clus1  up/up      169.254.47.194/16
cluster1-02   e0a     true
            cluster1-02_clus2  up/up      169.254.19.183/16
cluster1-02   e0b     true

4 entries were displayed.
```

5. Verify the connectivity of the remote cluster interfaces:

ONTAP 9.9.1 and later

You can use the `network interface check cluster-connectivity` command to start an accessibility check for cluster connectivity and then display the details:

`network interface check cluster-connectivity start` and `network interface check cluster-connectivity show`

```
cluster1::*> network interface check cluster-connectivity start
```

NOTE: Wait for a number of seconds before running the `show` command to display the details.

```
cluster1::*> network interface check cluster-connectivity show
                                  Source               Destination
Packet
Node   Date                       LIF                  LIF
Loss
------ -------------------------- -------------------
------------------ -----------
node1
       3/5/2022 19:21:18 -06:00   cluster1-01_clus2    cluster1-02-
clus1   none
       3/5/2022 19:21:20 -06:00   cluster1-01_clus2    cluster1-
02_clus2   none
node2
       3/5/2022 19:21:18 -06:00   cluster1-02_clus2    cluster1-
01_clus1   none
       3/5/2022 19:21:20 -06:00   cluster1-02_clus2    cluster1-
01_clus2   none
```

All ONTAP releases

For all ONTAP releases, you can also use the `cluster ping-cluster -node <name>` command to check the connectivity:

```
cluster ping-cluster -node <name>
```

```
cluster1::*> cluster ping-cluster -node local
Host is cluster1-02
Getting addresses from network interface table...
Cluster cluster1-01_clus1 169.254.209.69 cluster1-01     e0a
Cluster cluster1-01_clus2 169.254.49.125 cluster1-01     e0b
Cluster cluster1-02_clus1 169.254.47.194 cluster1-02     e0a
Cluster cluster1-02_clus2 169.254.19.183 cluster1-02     e0b
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)
```

6. Verify that the auto-revert command is enabled on all cluster LIFs:

```
network interface show -vserver Cluster -fields auto-revert
```

Show example

```
cluster1::*> network interface show -vserver Cluster -fields auto-
revert

          Logical
Vserver   Interface           Auto-revert
--------- ------------------- ------------
Cluster
          cluster1-01_clus1   true
          cluster1-01_clus2   true
          cluster1-02_clus1   true
          cluster1-02_clus2   true
4 entries were displayed.
```

What's next?

After you've prepared to install the NX-OS software and RCF, you can install or upgrade the NX-OS software.

Install or upgrade the NX-OS software

Follow this procedure to install or upgrade the NX-OS software on the Nexus 9336C-FX2 and 9336C-FX2-T cluster switches.

Before you begin, complete the procedure in Prepare to install NX-OS and RCF.

Review requirements

Before you begin

Make sure you do the following:

- Run the `show install all impact nxos bootflash:<image_name>.bin` command on the switch to review the impact of installing or upgrading the new NX-OS software image. It verifies the image integrity, checks for necessary reboots, evaluates hardware compatibility, and confirms sufficient space.
- Review the release notes for the target NX-OS software version to check for any specific requirements.
- Verify that you have a current backup of the switch configuration.
- Verify that you have a fully functioning cluster (no errors in the logs or similar issues).

Suggested documentation

- Cisco Ethernet switch page

  Consult the switch compatibility table for the supported ONTAP and NX-OS versions.

- Software Upgrade and downgrade guides

  Refer to the appropriate software and upgrade guides available on the Cisco website for complete documentation on the Cisco switch upgrade and downgrade procedures.

- Cisco Nexus 9000 and 3000 Upgrade and ISSU Matrix

  Provides information on Disruptive Upgrade/Downgrade for Cisco NX-OS software on Nexus 9000 Series Switches based on your current and target releases.

  On the page, select **Disruptive Upgrade** and select your current release and target release from the dropdown list.

About the examples

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

- The names of the two Cisco switches are cs1 and cs2.
- The node names are cluster1-01, cluster1-02, cluster1-03, and cluster1-04.
- The cluster LIF names are cluster1-01_clus1, cluster1-01_clus2, cluster1-02_clus1, cluster1-02_clus2 , cluster1-03_clus1, cluster1-03_clus2, cluster1-04_clus1, and cluster1-04_clus2.
- The `cluster1::*>` prompt indicates the name of the cluster.

Install the software

The procedure requires the use of both ONTAP commands and Cisco Nexus 9000 Series Switches commands; ONTAP commands are used unless otherwise indicated.

Steps

1. Connect the cluster switch to the management network.
2. Use the ping command to verify connectivity to the server hosting the NX-OS software and the RCF.

   Show example

   This example verifies that the switch can reach the server at IP address 172.19.2.1:

   ```
   cs2# ping 172.19.2.1 VRF management
   Pinging 172.19.2.1 with 0 bytes of data:

   Reply From 172.19.2.1: icmp_seq = 0. time= 5910 usec.
   ```

3. Display the cluster ports on each node that are connected to the cluster switches:

   ```
   network device-discovery show
   ```

Show example

```
cluster1::*> network device-discovery show
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface
Platform
----------- ------ ------------------------- ----------------
--------------
cluster1-01/cdp
            e0a    cs1                       Ethernet1/7       N9K-
C9336C-FX2
            e0b    cs2                       Ethernet1/7       N9K-
C9336C-FX2
cluster1-02/cdp
            e0a    cs1                       Ethernet1/8       N9K-
C9336C-FX2
            e0b    cs2                       Ethernet1/8       N9K-
C9336C-FX2
cluster1-03/cdp
            e0a    cs1                       Ethernet1/1/1     N9K-
C9336C-FX2
            e0b    cs2                       Ethernet1/1/1     N9K-
C9336C-FX2
cluster1-04/cdp
            e0a    cs1                       Ethernet1/1/2     N9K-
C9336C-FX2
            e0b    cs2                       Ethernet1/1/2     N9K-
C9336C-FX2
cluster1::*>
```

4. Check the administrative and operational status of each cluster port.
   a. Verify that all the cluster ports are **up** with a healthy status:

      ```
      network port show -ipspace Cluster
      ```

Show example

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

Node: cluster1-01

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0b       Cluster      Cluster          up   9000  auto/100000
healthy false

Node: cluster1-02

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0b       Cluster      Cluster          up   9000  auto/100000
healthy false
8 entries were displayed.

Node: cluster1-03

   Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false
```

```
Node: cluster1-04

Ignore
                                                          Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false
cluster1::*>
```

b. Verify that all the cluster interfaces (LIFs) are on the home port:

```
network interface show -vserver Cluster
```

Show example

```
cluster1::*> network interface show -vserver Cluster
            Logical            Status     Network
Current      Current Is
Vserver     Interface          Admin/Oper Address/Mask      Node
Port    Home
----------- ------------------ ---------- -----------------
------------ ------- ----
Cluster
            cluster1-01_clus1  up/up     169.254.3.4/23
cluster1-01  e0a     true
            cluster1-01_clus2  up/up     169.254.3.5/23
cluster1-01  e0b     true
            cluster1-02_clus1  up/up     169.254.3.8/23
cluster1-02  e0a     true
            cluster1-02_clus2  up/up     169.254.3.9/23
cluster1-02  e0b     true
            cluster1-03_clus1  up/up     169.254.1.3/23
cluster1-03  e0a     true
            cluster1-03_clus2  up/up     169.254.1.1/23
cluster1-03  e0b     true
            cluster1-04_clus1  up/up     169.254.1.6/23
cluster1-04  e0a     true
            cluster1-04_clus2  up/up     169.254.1.7/23
cluster1-04  e0b     true
8 entries were displayed.
cluster1::*>
```

c. Verify that the cluster displays information for both cluster switches:

`system cluster-switch show -is-monitoring-enabled-operational true`

Show example

```
cluster1::*> system cluster-switch show -is-monitoring-enabled
-operational true
Switch                      Type               Address
Model
--------------------------- ------------------ ----------------
--------------
cs1                         cluster-network    10.233.205.90
N9K-C9336C-FX2
     Serial Number: FOCXXXXXXGD
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                    9.3(5)
    Version Source: CDP

cs2                         cluster-network    10.233.205.91
N9K-C9336C-FX2
     Serial Number: FOCXXXXXXGS
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                    9.3(5)
    Version Source: CDP
cluster1::*>
```

5. Disable auto-revert on the cluster LIFs. The cluster LIFs fail over to the partner cluster switch and remain there as you perform the upgrade procedure on the targeted switch:

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

6. Copy the NX-OS software and EPLD images to the Nexus 9336C-FX2 switch.

Show example

```
cs2# copy sftp: bootflash: vrf management
Enter source filename: /code/nxos.9.3.5.bin
Enter hostname for the sftp server: 172.19.2.1
Enter username: user1

Outbound-ReKey for 172.19.2.1:22
Inbound-ReKey for 172.19.2.1:22
user1@172.19.2.1's password:
sftp> progress
Progress meter enabled
sftp> get   /code/nxos.9.3.5.bin  /bootflash/nxos.9.3.5.bin
/code/nxos.9.3.5.bin  100% 1261MB   9.3MB/s   02:15
sftp> exit
Copy complete, now saving to disk (please wait)...
Copy complete.


cs2# copy sftp: bootflash: vrf management
Enter source filename: /code/n9000-epld.9.3.5.img
Enter hostname for the sftp server: 172.19.2.1
Enter username: user1

Outbound-ReKey for 172.19.2.1:22
Inbound-ReKey for 172.19.2.1:22
user1@172.19.2.1's password:
sftp> progress
Progress meter enabled
sftp> get   /code/n9000-epld.9.3.5.img  /bootflash/n9000-
epld.9.3.5.img
/code/n9000-epld.9.3.5.img  100%  161MB   9.5MB/s   00:16
sftp> exit
Copy complete, now saving to disk (please wait)...
Copy complete.
```

7. Verify the running version of the NX-OS software:

   ```
   show version
   ```

Show example

```
cs2# show version
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
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http://opensource.org/licenses/gpl-3.0.html and
http://www.opensource.org/licenses/lgpl-2.1.php and
http://www.gnu.org/licenses/old-licenses/library.txt.

Software
  BIOS: version 08.38
  NXOS: version 9.3(4)
  BIOS compile time:  05/29/2020
  NXOS image file is: bootflash:///nxos.9.3.4.bin
  NXOS compile time:  4/28/2020 21:00:00 [04/29/2020 02:28:31]


Hardware
  cisco Nexus9000 C9336C-FX2 Chassis
  Intel(R) Xeon(R) CPU E5-2403 v2 @ 1.80GHz with 8154432 kB of
memory.
  Processor Board ID FOC20291J6K

  Device name: cs2
  bootflash:   53298520 kB
Kernel uptime is 0 day(s), 0 hour(s), 3 minute(s), 42 second(s)
```

```
Last reset at 157524 usecs after Mon Nov  2 18:32:06 2020
  Reason: Reset Requested by CLI command reload
  System version: 9.3(4)
  Service:

plugin
  Core Plugin, Ethernet Plugin

Active Package(s):


cs2#
```

8. Install the NX-OS image.

   Installing the image file causes it to be loaded every time the switch is rebooted.

Show example

```
cs2# install all nxos bootflash:nxos.9.3.5.bin

Installer will perform compatibility check first. Please wait.
Installer is forced disruptive

Verifying image bootflash:/nxos.9.3.5.bin for boot variable "nxos".
[] 100% -- SUCCESS

Verifying image type.
[] 100% -- SUCCESS

Preparing "nxos" version info using image bootflash:/nxos.9.3.5.bin.
[] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/nxos.9.3.5.bin.
[] 100% -- SUCCESS

Performing module support checks.
[] 100% -- SUCCESS

Notifying services about system upgrade.
[] 100% -- SUCCESS



Compatibility check is done:
Module  Bootable  Impact          Install-type  Reason
------  --------  --------------- ------------  ---------
  1     yes       Disruptive      Reset         Default upgrade is
not hitless



Images will be upgraded according to following table:

Module   Image    Running-Version(pri:alt)                New-
Version         Upg-Required
-------  -------- ----------------------------------------
-------------------- ------------
  1      nxos     9.3(4)                                  9.3(5)
yes
  1      bios     v08.37(01/28/2020):v08.23(09/23/2015)
v08.38(05/29/2020)      yes
```

```
Switch will be reloaded for disruptive upgrade.

Do you want to continue with the installation (y/n)? [n] y

Install is in progress, please wait.

Performing runtime checks.
[] 100% -- SUCCESS

Setting boot variables.
[] 100% -- SUCCESS

Performing configuration copy.
[] 100% -- SUCCESS

Module 1: Refreshing compact flash and upgrading
bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[] 100% -- SUCCESS

Finishing the upgrade, switch will reboot in 10 seconds.
```

9. Verify the new version of NX-OS software after the switch has rebooted:

   ```
   show version
   ```

Show example

```
cs2# show version

Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
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http://opensource.org/licenses/gpl-3.0.html and
http://www.opensource.org/licenses/lgpl-2.1.php and
http://www.gnu.org/licenses/old-licenses/library.txt.

Software
  BIOS: version 05.33
  NXOS: version 9.3(5)
  BIOS compile time:  09/08/2018
  NXOS image file is: bootflash:///nxos.9.3.5.bin
  NXOS compile time:  11/4/2018 21:00:00 [11/05/2018 06:11:06]


Hardware
  cisco Nexus9000 C9336C-FX2 Chassis
  Intel(R) Xeon(R) CPU E5-2403 v2 @ 1.80GHz with 8154432 kB of
memory.
  Processor Board ID FOC20291J6K

  Device name: cs2
  bootflash:   53298520 kB
Kernel uptime is 0 day(s), 0 hour(s), 3 minute(s), 42 second(s)
```

```
Last reset at 277524 usecs after Mon Nov  2 22:45:12 2020
  Reason: Reset due to upgrade
  System version: 9.3(4)
  Service:

plugin
  Core Plugin, Ethernet Plugin

Active Package(s):
```

10. Upgrade the EPLD image and reboot the switch.

Show example

```
cs2# show version module 1 epld

EPLD Device                          Version
---------------------------------------
MI   FPGA                             0x7
IO   FPGA                             0x17
MI   FPGA2                            0x2
GEM  FPGA                             0x2
GEM  FPGA                             0x2
GEM  FPGA                             0x2
GEM  FPGA                             0x2

cs2# install epld bootflash:n9000-epld.9.3.5.img module all
Compatibility check:
Module        Type         Upgradable        Impact    Reason
------  ------------------ ----------------- --------- -----------
     1         SUP         Yes       disruptive  Module Upgradable

Retrieving EPLD versions.... Please wait.
Images will be upgraded according to following table:
Module  Type   EPLD              Running-Version   New-Version  Upg-
Required
------- ------ ----------------- ----------------- ------------
------------
     1  SUP    MI FPGA           0x07              0x07         No
     1  SUP    IO FPGA           0x17              0x19         Yes
     1  SUP    MI FPGA2          0x02              0x02         No
The above modules require upgrade.
The switch will be reloaded at the end of the upgrade
Do you want to continue (y/n) ?  [n] y

Proceeding to upgrade Modules.

Starting Module 1 EPLD Upgrade

Module 1 : IO FPGA [Programming] : 100.00% (     64 of      64
sectors)
Module 1 EPLD upgrade is successful.
Module   Type  Upgrade-Result
-------- ----- --------------
     1   SUP   Success

EPLDs upgraded.

Module 1 EPLD upgrade is successful.
```

11. After the switch reboot, log in again and verify that the new version of EPLD loaded successfully.

    Show example

    ```
    cs2# show version module 1 epld

    EPLD Device                          Version
    ---------------------------------------
    MI   FPGA                             0x7
    IO   FPGA                             0x19
    MI   FPGA2                            0x2
    GEM  FPGA                             0x2
    GEM  FPGA                             0x2
    GEM  FPGA                             0x2
    GEM  FPGA                             0x2
    ```

12. Verify the health of cluster ports on the cluster.
    a. Verify that cluster ports are up and healthy across all nodes in the cluster:

       ```
       network port show -ipspace Cluster
       ```

Show example

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

Node: cluster1-01

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false

Node: cluster1-02

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false

Node: cluster1-03

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0b       Cluster      Cluster          up   9000  auto/100000
healthy false
```

```
Node: cluster1-04

Ignore
                                                          Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0b       Cluster      Cluster          up   9000  auto/100000
healthy false
8 entries were displayed.
```

b. Verify the switch health from the cluster.

```
network device-discovery show -protocol cdp
```

Show example

```
cluster1::*> network device-discovery show -protocol cdp
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface
Platform
----------- ------ ------------------------- -----------------
--------------
cluster1-01/cdp
            e0a    cs1                       Ethernet1/7
N9K-C9336C-FX2
            e0b    cs2                       Ethernet1/7
N9K-C9336C-FX2
cluster01-2/cdp
            e0a    cs1                       Ethernet1/8
N9K-C9336C-FX2
            e0b    cs2                       Ethernet1/8
N9K-C9336C-FX2
cluster01-3/cdp
            e0a    cs1                       Ethernet1/1/1
N9K-C9336C-FX2
            e0b    cs2                       Ethernet1/1/1
N9K-C9336C-FX2
cluster1-04/cdp
            e0a    cs1                       Ethernet1/1/2
N9K-C9336C-FX2
            e0b    cs2                       Ethernet1/1/2
N9K-C9336C-FX2

cluster1::*> system cluster-switch show -is-monitoring-enabled
-operational true
Switch                      Type               Address
Model
--------------------------- ------------------ ----------------
--------------
cs1                         cluster-network    10.233.205.90
N9K-C9336C-FX2
     Serial Number: FOCXXXXXXGD
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                    9.3(5)
    Version Source: CDP

cs2                         cluster-network    10.233.205.91
```

```
N9K-C9336C-FX2
     Serial Number: FOCXXXXXXGS
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                    9.3(5)
    Version Source: CDP

2 entries were displayed.
```

You might observe the following output on the cs1 switch console depending on the RCF version previously loaded on the switch:

```
2020 Nov 17 16:07:18 cs1 %$ VDC-1 %$ %STP-2-UNBLOCK_CONSIST_PORT:
Unblocking port port-channel1 on VLAN0092. Port consistency
restored.
2020 Nov 17 16:07:23 cs1 %$ VDC-1 %$ %STP-2-BLOCK_PVID_PEER:
Blocking port-channel1 on VLAN0001. Inconsistent peer vlan.
2020 Nov 17 16:07:23 cs1 %$ VDC-1 %$ %STP-2-BLOCK_PVID_LOCAL:
Blocking port-channel1 on VLAN0092. Inconsistent local vlan.
```

13. Verify that the cluster is healthy:

    `cluster show`

    Show example

    ```
    cluster1::*> cluster show
    Node                 Health   Eligibility   Epsilon
    -------------------- -------- ------------- -------
    cluster1-01          true     true          false
    cluster1-02          true     true          false
    cluster1-03          true     true          true
    cluster1-04          true     true          false
    4 entries were displayed.
    cluster1::*>
    ```

14. Repeat steps 6 to 13 to install the NX-OS software on switch cs1.
15. Verify the connectivity of the remote cluster interfaces before enabling auto-revert on the cluster LIFs:

ONTAP 9.9.1 and later

You can use the `network interface check cluster-connectivity` command to start an accessibility check for cluster connectivity and then display the details:

`network interface check cluster-connectivity start` and `network interface check cluster-connectivity show`

```
cluster1::*> network interface check cluster-connectivity start
```

NOTE: Wait for a number of seconds before running the `show` command to display the details.

```
cluster1::*> network interface check cluster-connectivity show
                                  Source               Destination
Packet
Node   Date                       LIF                  LIF
Loss
------ -------------------------- -------------------
------------------ -----------
cluster1-01
       3/5/2022 19:21:18 -06:00   cluster1-01_clus2    cluster1-02-
clus1   none
       3/5/2022 19:21:20 -06:00   cluster1-01_clus2    cluster1-
02_clus2   none
cluster1-02
       3/5/2022 19:21:18 -06:00   cluster1-02_clus2    cluster1-
01_clus1   none
       3/5/2022 19:21:20 -06:00   cluster1-02_clus2    cluster1-
01_clus2   none
```

All ONTAP releases

For all ONTAP releases, you can also use the `cluster ping-cluster -node <name>` command to check the connectivity:

```
cluster ping-cluster -node <name>
```

```
cluster1::*> cluster ping-cluster -node local
Host is cluster1-02
Getting addresses from network interface table...
Cluster cluster1-01_clus1 169.254.209.69 cluster1-01     e0a
Cluster cluster1-01_clus2 169.254.49.125 cluster1-01     e0b
Cluster cluster1-02_clus1 169.254.47.194 cluster1-02     e0a
Cluster cluster1-02_clus2 169.254.19.183 cluster1-02     e0b
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)
```

16. Enable auto-revert on the cluster LIFs.

    network interface modify -vserver Cluster -lif * -auto-revert true

17. Verify that the cluster LIFs have reverted to their home port:

    network interface show -vserver Cluster

Show example

```
cluster1::*> network interface show -vserver Cluster
            Logical             Status     Network             Current
Current Is
Vserver     Interface           Admin/Oper Address/Mask        Node
Port    Home
----------- ------------------ ---------- ------------------
------------------- ------- ----
Cluster
            cluster1-01_clus1  up/up      169.254.3.4/23
cluster1-01         e0b     true
            cluster1-01_clus2  up/up      169.254.3.5/23
cluster1-01         e0b     true
            cluster1-02_clus1  up/up      169.254.3.8/23
cluster1-02         e0b     true
            cluster1-02_clus2  up/up      169.254.3.9/23
cluster1-02         e0b     true
            cluster1-03_clus1  up/up      169.254.1.3/23
cluster1-03         e0b     true
            cluster1-03_clus2  up/up      169.254.1.1/23
cluster1-03         e0b     true
            cluster1-04_clus1  up/up      169.254.1.6/23
cluster1-04         e0b     true
            cluster1-04_clus2  up/up      169.254.1.7/23
cluster1-04         e0b     true
8 entries were displayed.
cluster1::*>
```

If any cluster LIFs have not returned to their home ports, revert them manually from the local node:

```
network interface revert -vserver Cluster -lif <lif_name>
```

What's next?

After you've installed or upgraded the NX-OS software, you can install or upgrade the Reference Configuration File (RCF).

Install or upgrade the RCF

Install or upgrade the Reference Configuration File (RCF) overview

You install the Reference Configuration File (RCF) after setting up the Nexus 9336C-FX2 and 9336C-FX2-T switches for the first time. You upgrade your RCF version when you have an existing version of the RCF file installed on your switch.

See the Knowledge Base article How to clear configuration on a Cisco interconnect switch while retaining remote connectivity for further information when installing or upgrading your RCF.

Available RCF configurations

The following table describes the RCFs available for different configurations. Choose the RCF applicable to your configuration. See Cisco Ethernet Switches for more information.

For specific port and VLAN usage details, refer to the banner and important notes section in your RCF.

RCF configuration	Description
2-Cluster-HA-Breakout	Supports two ONTAP clusters with at least eight nodes, including nodes that use shared Cluster+HA ports.
4-Cluster-HA-Breakout	Supports four ONTAP clusters with at least four nodes, including nodes that use shared Cluster+HA ports.
1-Cluster-HA	All ports are configured for 40/100GbE. Supports shared cluster/HA traffic on ports. Required for AFF A320, AFF A250, and FAS500f systems. Additionally, all ports can be used as dedicated cluster ports.
1-Cluster-HA-Breakout	Ports are configured for 4x10GbE breakout, 4x25GbE breakout (RCF 1.6+ on 100GbE switches), and 40/100GbE. Supports shared cluster/HA traffic on ports for nodes that use shared cluster/HA ports: AFF A320, AFF A250, and FAS500f systems. Additionally, all ports can be used as dedicated cluster ports.
Cluster-HA-Storage	Ports are configured for 40/100GbE for Cluster+HA, 4x10GbE breakout for Cluster and 4x25GbE breakout for Cluster+HA, and 100GbE for each Storage HA Pair.
Cluster	Two flavors of RCF with different allocations of 4x10GbE ports (breakout) and 40/100GbE ports. All FAS/AFF nodes are supported, except for AFF A320, AFF A250, and FAS500f systems.
Storage	All ports are configured for 100GbE NVMe storage connections.

Available RCFs

The following table lists the available RCFs for 9336C-FX2 and 9336C-FX2-T switches. Choose the applicable RCF version for your configuration. See Cisco Ethernet Switches for more information.

RCF name
Cluster-HA-Breakout RCF 1.*xx*
Cluster-HA-Storage RCF 1.*xx*
Storage RCF 1.*xx*

RCF name
MultiCluster-HA RCF 1.*xx*

Suggested documentation

- Cisco Ethernet Switches (NSS)

  Consult the switch compatibility table for the supported ONTAP and RCF versions on the NetApp Support Site. Note that there can be command dependencies between the command syntax in the RCF and the syntax found in specific versions of NX-OS.

- Cisco Nexus 9000 Series Switches

  Refer to the appropriate software and upgrade guides available on the Cisco website for complete documentation on the Cisco switch upgrade and downgrade procedures.

About the examples

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

- The names of the two Cisco switches are **cs1** and **cs2**.
- The node names are **cluster1-01**, **cluster1-02**, **cluster1-03**, and **cluster1-04**.
- The cluster LIF names are **cluster1-01_clus1**, **cluster1-01_clus2**, **cluster1-02_clus1**, **cluster1-02_clus2**, **cluster1-03_clus1**, **cluster1-03_clus2**, **cluster1-04_clus1**, and **cluster1-04_clus2**.
- The `cluster1::*>` prompt indicates the name of the cluster.

The examples in this procedure use four nodes. These nodes use two 10GbE cluster interconnect ports **e0a** and **e0b**. See the Hardware Universe to verify the correct cluster ports on your platforms.

> The command outputs might vary depending on different releases of ONTAP.

For details of the available RCF configurations, see Software install workflow.

Commands used

The procedure requires the use of both ONTAP commands and Cisco Nexus 9000 Series Switches commands; ONTAP commands are used unless otherwise indicated.

What's next?

After you've reviewed the install RCF or upgrade RCF procedure, you can install the RCF or upgrade your RCF as required.

Install the Reference Configuration File (RCF)

You install the Reference Configuration File (RCF) after setting up the Nexus 9336C-FX2 and 9336C-FX2-T switches for the first time.

Before you begin

Verify the following installations and connections:

- A console connection to the switch. The console connection is optional if you have remote access to the switch.

- Switch cs1 and switch cs2 are powered up and the initial switch setup is complete (the Management IP address and SSH is setup).
- The desired NX-OS version has been installed.
- ISL connections between switches are connected.
- ONTAP node cluster ports are not connected.

Step 1: Install the RCF on the switches

1. Login to switch cs1 using SSH or by using a serial console.
2. Copy the RCF to the bootflash of switch cs1 using one of the following transfer protocols: FTP, TFTP, SFTP, or SCP.

   For more information on Cisco commands, see the appropriate guide in the Cisco Nexus 9000 Series NX-OS Command Reference guides.

   Show example

   This example shows TFTP being used to copy an RCF to the bootflash on switch cs1:

   ```
   cs1# copy tftp: bootflash: vrf management
   Enter source filename: Nexus_9336C_RCF_v1.6-Cluster-HA-Breakout.txt
   Enter hostname for the tftp server: 172.22.201.50
   Trying to connect to tftp server......Connection to Server
   Established.
   TFTP get operation was successful
   Copy complete, now saving to disk (please wait)...
   ```

3. Apply the RCF previously downloaded to the bootflash.

   For more information on Cisco commands, see the appropriate guide in the Cisco Nexus 9000 Series NX-OS Command Reference guides.

   This example shows the RCF file `Nexus_9336C_RCF_v1.6-Cluster-HA-Breakout.txt` being installed on switch cs1:

   ```
   cs1# copy Nexus_9336C_RCF_v1.6-Cluster-HA-Breakout.txt running-config
   echo-commands
   ```

4. Examine the banner output from the `show banner motd` command. You must read and follow these instructions to ensure the proper configuration and operation of the switch.

Show example

```
cs1# show banner motd

*****************************************************************
**********
* NetApp Reference Configuration File (RCF)
*
* Switch   : Nexus N9K-C9336C-FX2
* Filename : Nexus_9336C_RCF_v1.6-Cluster-HA-Breakout.txt
* Date     : 10-23-2020
* Version  : v1.6
*
* Port Usage:
* Ports  1- 3: Breakout mode (4x10G) Intra-Cluster Ports, int
e1/1/1-4, e1/2/1-4
, e1/3/1-4
* Ports  4- 6: Breakout mode (4x25G) Intra-Cluster/HA Ports, int
e1/4/1-4, e1/5/
1-4, e1/6/1-4
* Ports  7-34: 40/100GbE Intra-Cluster/HA Ports, int e1/7-34
* Ports 35-36: Intra-Cluster ISL Ports, int e1/35-36
*
* Dynamic breakout commands:
* 10G: interface breakout module 1 port <range> map 10g-4x
* 25G: interface breakout module 1 port <range> map 25g-4x
*
* Undo breakout commands and return interfaces to 40/100G
configuration in confi
g mode:
* no interface breakout module 1 port <range> map 10g-4x
* no interface breakout module 1 port <range> map 25g-4x
* interface Ethernet <interfaces taken out of breakout mode>
* inherit port-profile 40-100G
* priority-flow-control mode auto
* service-policy input HA
* exit
*
*****************************************************************
**********
```

5. Verify that the RCF file is the correct newer version:

   `show running-config`

When you check the output to verify you have the correct RCF, make sure that the following information is correct:

- The RCF banner
- The node and port settings
- Customizations

  The output varies according to your site configuration. Check the port settings and refer to the release notes for any changes specific to the RCF that you have installed.

6. Record any custom additions between the current `running-config` file and the RCF file in use.
7. After you verify that the RCF versions and switch settings are correct, copy the `running-config` file to the `startup-config` file.

```
cs1# copy running-config startup-config
[########################################] 100% Copy complete
```

8. Save basic configuration details to the `write_erase.cfg` file on the bootflash.

Make sure to configure the following:

- Username and password
- Management IP address
- Default gateway
- Switch name

```
cs1# show run | i "username admin password" > bootflash:write_erase.cfg

cs1# show run | section "vrf context management" >> bootflash:write_erase.cfg

cs1# show run | section "interface mgmt0" >> bootflash:write_erase.cfg

cs1# show run | section "switchname" >> bootflash:write_erase.cfg
```

9. When installing RCF version 1.12 and later, run the following commands:

```
cs1# echo "hardware access-list tcam region ing-racl 1024" >>
bootflash:write_erase.cfg

cs1# echo "hardware access-list tcam region egr-racl 1024" >>
bootflash:write_erase.cfg

cs1# echo "hardware access-list tcam region ing-l2-qos 1280" >>
bootflash:write_erase.cfg
```

See the Knowledge Base article How to clear configuration on a Cisco interconnect switch while retaining remote connectivity for further details.

10. Verify that the `write_erase.cfg` file is populated as expected:

    `show file bootflash:write_erase.cfg`

11. Repeat steps 1 through 10 on switch cs2.
12. Connect the cluster ports of all nodes in the ONTAP cluster to switches cs1 and cs2.

Step 2: Verify the switch connections

1. Verify that the switch ports connected to the cluster ports are **up**.

    `show interface brief`

    Show example

    ```
    cs1# show interface brief | grep up
    .
    .
    Eth1/1/1      1       eth  access up      none
    10G(D) --
    Eth1/1/2      1       eth  access up      none
    10G(D) --
    Eth1/7        1       eth  trunk  up      none
    100G(D) --
    Eth1/8        1       eth  trunk  up      none
    100G(D) --
    .
    .
    ```

2. Verify that the cluster nodes are in their correct cluster VLANs using the following commands:

    `show vlan brief`

    `show interface trunk`

Show example

```
cs1# show vlan brief

VLAN Name                              Status    Ports
---- --------------------------------- ---------
-------------------------------
1    default                           active    Po1, Eth1/1, Eth1/2,
Eth1/3
                                                 Eth1/4, Eth1/5,
Eth1/6, Eth1/7
                                                 Eth1/8, Eth1/35,
Eth1/36
                                                 Eth1/9/1, Eth1/9/2,
Eth1/9/3
                                                 Eth1/9/4, Eth1/10/1,
Eth1/10/2
                                                 Eth1/10/3, Eth1/10/4
17   VLAN0017                          active    Eth1/1, Eth1/2,
Eth1/3, Eth1/4
                                                 Eth1/5, Eth1/6,
Eth1/7, Eth1/8
                                                 Eth1/9/1, Eth1/9/2,
Eth1/9/3
                                                 Eth1/9/4, Eth1/10/1,
Eth1/10/2
                                                 Eth1/10/3, Eth1/10/4
18   VLAN0018                          active    Eth1/1, Eth1/2,
Eth1/3, Eth1/4
                                                 Eth1/5, Eth1/6,
Eth1/7, Eth1/8
                                                 Eth1/9/1, Eth1/9/2,
Eth1/9/3
                                                 Eth1/9/4, Eth1/10/1,
Eth1/10/2
                                                 Eth1/10/3, Eth1/10/4
31   VLAN0031                          active    Eth1/11, Eth1/12,
Eth1/13
                                                 Eth1/14, Eth1/15,
Eth1/16
                                                 Eth1/17, Eth1/18,
Eth1/19
                                                 Eth1/20, Eth1/21,
Eth1/22
32   VLAN0032                          active    Eth1/23, Eth1/24,
Eth1/25
```

```
                                                    Eth1/26, Eth1/27,
Eth1/28
                                                    Eth1/29, Eth1/30,
Eth1/31
                                                    Eth1/32, Eth1/33,
Eth1/34
33   VLAN0033                         active    Eth1/11, Eth1/12,
Eth1/13
                                                    Eth1/14, Eth1/15,
Eth1/16
                                                    Eth1/17, Eth1/18,
Eth1/19
                                                    Eth1/20, Eth1/21,
Eth1/22
34   VLAN0034                         active    Eth1/23, Eth1/24,
Eth1/25
                                                    Eth1/26, Eth1/27,
Eth1/28
                                                    Eth1/29, Eth1/30,
Eth1/31
                                                    Eth1/32, Eth1/33,
Eth1/34

cs1# show interface trunk

----------------------------------------------------
Port          Native  Status        Port
              Vlan                  Channel
----------------------------------------------------
Eth1/1        1       trunking      --
Eth1/2        1       trunking      --
Eth1/3        1       trunking      --
Eth1/4        1       trunking      --
Eth1/5        1       trunking      --
Eth1/6        1       trunking      --
Eth1/7        1       trunking      --
Eth1/8        1       trunking      --
Eth1/9/1      1       trunking      --
Eth1/9/2      1       trunking      --
Eth1/9/3      1       trunking      --
Eth1/9/4      1       trunking      --
Eth1/10/1     1       trunking      --
Eth1/10/2     1       trunking      --
Eth1/10/3     1       trunking      --
Eth1/10/4     1       trunking      --
Eth1/11       33      trunking      --
```

```
Eth1/12       33      trunking      --
Eth1/13       33      trunking      --
Eth1/14       33      trunking      --
Eth1/15       33      trunking      --
Eth1/16       33      trunking      --
Eth1/17       33      trunking      --
Eth1/18       33      trunking      --
Eth1/19       33      trunking      --
Eth1/20       33      trunking      --
Eth1/21       33      trunking      --
Eth1/22       33      trunking      --
Eth1/23       34      trunking      --
Eth1/24       34      trunking      --
Eth1/25       34      trunking      --
Eth1/26       34      trunking      --
Eth1/27       34      trunking      --
Eth1/28       34      trunking      --
Eth1/29       34      trunking      --
Eth1/30       34      trunking      --
Eth1/31       34      trunking      --
Eth1/32       34      trunking      --
Eth1/33       34      trunking      --
Eth1/34       34      trunking      --
Eth1/35       1       trnk-bndl     Po1
Eth1/36       1       trnk-bndl     Po1
Po1           1       trunking      --

----------------------------------------------------
Port          Vlans Allowed on Trunk
----------------------------------------------------
Eth1/1        1,17-18
Eth1/2        1,17-18
Eth1/3        1,17-18
Eth1/4        1,17-18
Eth1/5        1,17-18
Eth1/6        1,17-18
Eth1/7        1,17-18
Eth1/8        1,17-18
Eth1/9/1      1,17-18
Eth1/9/2      1,17-18
Eth1/9/3      1,17-18
Eth1/9/4      1,17-18
Eth1/10/1     1,17-18
Eth1/10/2     1,17-18
Eth1/10/3     1,17-18
Eth1/10/4     1,17-18
```

```
Eth1/11       31,33
Eth1/12       31,33
Eth1/13       31,33
Eth1/14       31,33
Eth1/15       31,33
Eth1/16       31,33
Eth1/17       31,33
Eth1/18       31,33
Eth1/19       31,33
Eth1/20       31,33
Eth1/21       31,33
Eth1/22       31,33
Eth1/23       32,34
Eth1/24       32,34
Eth1/25       32,34
Eth1/26       32,34
Eth1/27       32,34
Eth1/28       32,34
Eth1/29       32,34
Eth1/30       32,34
Eth1/31       32,34
Eth1/32       32,34
Eth1/33       32,34
Eth1/34       32,34
Eth1/35       1
Eth1/36       1
Po1           1
..
..
..
..
..
```

For specific port and VLAN usage details, refer to the banner and important notes section in your RCF.

3. Verify that the ISL between cs1 and cs2 is functional:

```
show port-channel summary
```

Show example

```
cs1# show port-channel summary
Flags:  D - Down        P - Up in port-channel (members)
        I - Individual  H - Hot-standby (LACP only)
        s - Suspended   r - Module-removed
        b - BFD Session Wait
        S - Switched    R - Routed
        U - Up (port-channel)
        p - Up in delay-lacp mode (member)
        M - Not in use. Min-links not met
--------------------------------------------------------------------------
------------
Group Port-       Type     Protocol  Member Ports      Channel
--------------------------------------------------------------------------
------------
1     Po1(SU)     Eth      LACP      Eth1/35(P)        Eth1/36(P)
cs1#
```

Step 3: Set up your ONTAP cluster

NetApp recommends that you use System Manager to set up new clusters.

System Manager provides a simple and easy workflow for cluster set up and configuration including assigning a node management IP address, initializing the cluster, creating a local tier, configuring protocols and provisioning initial storage.

Go to Configure ONTAP on a new cluster with System Manager for setup instructions.

What's next?

After you've installed the RCF, you can verify the SSH configuration.

Upgrade your Reference Configuration File (RCF)

You upgrade your RCF version when you have an existing version of the RCF file installed on your operational switches.

Before you begin

Make sure you have the following:

- A current backup of the switch configuration.
- A fully functioning cluster (no errors in the logs or similar issues).
- The current RCF.
- If you are updating your RCF version, you need a boot configuration in the RCF that reflects the desired boot images.

If you need to change the boot configuration to reflect the current boot images, you must do so before reapplying the RCF so that the correct version is instantiated on future reboots.

No operational inter-switch link (ISL) is needed during this procedure. This is by design because RCF version changes can affect ISL connectivity temporarily. To ensure non-disruptive cluster operations, the following procedure migrates all of the cluster LIFs to the operational partner switch while performing the steps on the target switch.

Before installing a new switch software version and RCFs, you must erase the switch settings and perform basic configuration. You must be connected to the switch using the serial console or have preserved basic configuration information prior to erasing the switch settings.

Step 1: Prepare for the upgrade

1. Display the cluster ports on each node that are connected to the cluster switches:

```
network device-discovery show
```

Show example

```
cluster1::*> network device-discovery show
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface
Platform
----------- ------ ------------------------- ----------------
--------
cluster1-01/cdp
            e0a    cs1                       Ethernet1/7       N9K-
C9336C
            e0d    cs2                       Ethernet1/7       N9K-
C9336C
cluster1-02/cdp
            e0a    cs1                       Ethernet1/8       N9K-
C9336C
            e0d    cs2                       Ethernet1/8       N9K-
C9336C
cluster1-03/cdp
            e0a    cs1                       Ethernet1/1/1     N9K-
C9336C
            e0b    cs2                       Ethernet1/1/1     N9K-
C9336C
cluster1-04/cdp
            e0a    cs1                       Ethernet1/1/2     N9K-
C9336C
            e0b    cs2                       Ethernet1/1/2     N9K-
C9336C
cluster1::*>
```

2. Check the administrative and operational status of each cluster port.
   a. Verify that all the cluster ports are **up** with a healthy status:

      `network port show -ipspace cluster`

Show example

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

Node: cluster1-01

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0d       Cluster      Cluster          up   9000  auto/100000
healthy false

Node: cluster1-02

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0d       Cluster      Cluster          up   9000  auto/100000
healthy false
8 entries were displayed.

Node: cluster1-03

   Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false
```

```
Node: cluster1-04

Ignore
                                                          Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false
cluster1::*>
```

b. Verify that all the cluster interfaces (LIFs) are on the home port:

```
network interface show -vserver cluster
```

Show example

```
cluster1::*> network interface show -vserver cluster
            Logical            Status     Network
Current      Current Is
Vserver     Interface          Admin/Oper Address/Mask      Node
Port    Home
----------- ------------------ ---------- -----------------
------------ ------- ----
Cluster
            cluster1-01_clus1  up/up     169.254.3.4/23
cluster1-01  e0a     true
            cluster1-01_clus2  up/up     169.254.3.5/23
cluster1-01  e0d     true
            cluster1-02_clus1  up/up     169.254.3.8/23
cluster1-02  e0a     true
            cluster1-02_clus2  up/up     169.254.3.9/23
cluster1-02  e0d     true
            cluster1-03_clus1  up/up     169.254.1.3/23
cluster1-03  e0a     true
            cluster1-03_clus2  up/up     169.254.1.1/23
cluster1-03  e0b     true
            cluster1-04_clus1  up/up     169.254.1.6/23
cluster1-04  e0a     true
            cluster1-04_clus2  up/up     169.254.1.7/23
cluster1-04  e0b     true
8 entries were displayed.
cluster1::*>
```

c. Verify that the cluster displays information for both cluster switches:

```
system cluster-switch show -is-monitoring-enabled-operational true
```

Show example

```
cluster1::*> system cluster-switch show -is-monitoring-enabled
-operational true
Switch                      Type               Address
Model
--------------------------- ------------------ ----------------
-----
cs1                         cluster-network    10.233.205.90
N9K-C9336C
     Serial Number: FOCXXXXXXGD
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                    9.3(5)
    Version Source: CDP

cs2                         cluster-network    10.233.205.91
N9K-C9336C
     Serial Number: FOCXXXXXXGS
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                    9.3(5)
    Version Source: CDP
cluster1::*>
```

3. Disable auto-revert on the cluster LIFs.

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

Step 2: Configure ports

1. On cluster switch cs1, shut down the ports connected to the cluster ports of the nodes.

```
cs1> enable

cs1# configure

cs1(config)# interface eth1/1/1-2,eth1/7-8

cs1(config-if-range)# shutdown
```

```
cs1(config-if-range)# exit

cs1# exit
```

> Make sure to shutdown **all** connected cluster ports to avoid any network connection issues. See the Knowledge Base article Node out of quorum when migrating cluster LIF during switch OS upgrade for further details.

2. Verify that the cluster LIFs have failed over to the ports hosted on cluster switch cs1. This might take a few seconds.

```
network interface show -vserver cluster
```

Show example

```
cluster1::*> network interface show -vserver cluster
            Logical           Status     Network            Current
Current Is
Vserver     Interface         Admin/Oper Address/Mask       Node
Port    Home
----------- ----------------- ---------- ------------------
------------ ------- ----
Cluster
            cluster1-01_clus1 up/up      169.254.3.4/23
cluster1-01   e0a     true
            cluster1-01_clus2 up/up      169.254.3.5/23
cluster1-01   e0a     false
            cluster1-02_clus1 up/up      169.254.3.8/23
cluster1-02   e0a     true
            cluster1-02_clus2 up/up      169.254.3.9/23
cluster1-02   e0a     false
            cluster1-03_clus1 up/up      169.254.1.3/23
cluster1-03   e0a     true
            cluster1-03_clus2 up/up      169.254.1.1/23
cluster1-03   e0a     false
            cluster1-04_clus1 up/up      169.254.1.6/23
cluster1-04   e0a     true
            cluster1-04_clus2 up/up      169.254.1.7/23
cluster1-04   e0a     false
8 entries were displayed.
cluster1::*>
```

3. Verify that the cluster is healthy:

```
cluster show
```

Show example

```
cluster1::*> cluster show
Node                  Health  Eligibility   Epsilon
--------------------- ------- ------------  -------
cluster1-01           true    true          false
cluster1-02           true    true          false
cluster1-03           true    true          true
cluster1-04           true    true          false
4 entries were displayed.
cluster1::*>
```

4. If you have not already done so, save a copy of the current switch configuration by copying the output of the following command to a text file:

   `show running-config`

   a. Record any custom additions between the current `running-config` and the RCF file in use (such as an SNMP configuration for your organization).

   b. Beginning with NX-OS 10.2, use the `show diff running-config` command to compare with the saved RCF file in the bootflash. Otherwise, use a third part diff/compare tool.

5. Save basic configuration details to the `write_erase.cfg` file on the bootflash.

   Make sure to configure the following:

   - Username and password
   - Management IP address
   - Default gateway
   - Switch name

```
cs1# show run | i "username admin password" > bootflash:write_erase.cfg

cs1# show run | section "vrf context management" >> bootflash:write_erase.cfg

cs1# show run | section "interface mgmt0" >> bootflash:write_erase.cfg

cs1# show run | section "switchname" >> bootflash:write_erase.cfg
```

6. When upgrading to RCF version 1.12 and later, run the following commands:

```
cs1# echo "hardware access-list tcam region ing-racl 1024" >>
bootflash:write_erase.cfg

cs1# echo "hardware access-list tcam region egr-racl 1024" >>
bootflash:write_erase.cfg
```

```
cs1# echo "hardware access-list tcam region ing-l2-qos 1280" >>
bootflash:write_erase.cfg
```

See the Knowledge Base article How to clear configuration on a Cisco interconnect switch while retaining remote connectivity for further details.

7. Verify that the `write_erase.cfg` file is populated as expected:

   `show file bootflash:write_erase.cfg`

8. Issue the write erase command to erase the current saved configuration:

   ```
   cs1# write erase

   Warning: This command will erase the startup-configuration.

   Do you wish to proceed anyway? (y/n) [n] y
   ```

9. Copy the previously saved basic configuration into the startup configuration.

   ```
   cs1# copy bootflash:write_erase.cfg startup-config
   ```

10. Perform a reboot of the switch:

    ```
    switch# reload

    This command will reboot the system. (y/n)? [n] y
    ```

11. After the management IP address is reachable again, log in to the switch through SSH.

    You may need to update host file entries related to the SSH keys.

12. Copy the RCF to the bootflash of switch cs1 using one of the following transfer protocols: FTP, TFTP, SFTP, or SCP.

    For more information on Cisco commands, see the appropriate guide in the Cisco Nexus 9000 Series NX-OS Command Reference guides.

    This example shows TFTP being used to copy an RCF to the bootflash on switch cs1:

    ```
    cs1# copy tftp: bootflash: vrf management
    Enter source filename: Nexus_9336C_RCF_v1.6-Cluster-HA-Breakout.txt
    Enter hostname for the tftp server: 172.22.201.50
    Trying to connect to tftp server......Connection to Server Established.
    TFTP get operation was successful
    Copy complete, now saving to disk (please wait)...
    ```

13. Apply the RCF previously downloaded to the bootflash.

    For more information on Cisco commands, see the appropriate guide in the Cisco Nexus 9000 Series NX-OS Command Reference.

This example shows the RCF file `Nexus_9336C_RCF_v1.6-Cluster-HA-Breakout.txt` being installed on switch cs1:

```
cs1# copy Nexus_9336C_RCF_v1.6-Cluster-HA-Breakout.txt running-config
echo-commands
```

Make sure to read thoroughly the **Installation notes**, **Important Notes**, and **banner** sections of your RCF. You must read and follow these instructions to ensure the proper configuration and operation of the switch.

14. Verify that the RCF file is the correct newer version:

    ```
    show running-config
    ```

    When you check the output to verify you have the correct RCF, make sure that the following information is correct:

    - The RCF banner
    - The node and port settings
    - Customizations

      The output varies according to your site configuration. Check the port settings and refer to the release notes for any changes specific to the RCF that you have installed.

15. Reapply any previous customizations to the switch configuration. Refer to Review cabling and configuration considerations for details of any further changes required.
16. After you verify the RCF versions, custom additions, and switch settings are correct, copy the running-config file to the startup-config file.

    For more information on Cisco commands, see the appropriate guide in the Cisco Nexus 9000 Series NX-OS Command Reference.

    ```
    cs1# copy running-config startup-config

    [] 100% Copy complete
    ```

17. Reboot switch cs1. You can ignore the “cluster switch health monitor” alerts and “cluster ports down” events reported on the nodes while the switch reboots.

    ```
    cs1# reload

    This command will reboot the system. (y/n)? [n] y
    ```

18. Verify the health of cluster ports on the cluster.
    a. Verify that cluster ports are up and healthy across all nodes in the cluster:

       ```
       network port show -ipspace cluster
       ```

Show example

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

Node: cluster1-01

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false

Node: cluster1-02

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false

Node: cluster1-03

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0d       Cluster      Cluster          up   9000  auto/100000
healthy false
```

```
Node: cluster1-04

Ignore
                                                          Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0d       Cluster      Cluster          up   9000  auto/100000
healthy false
8 entries were displayed.
```

b. Verify the switch health from the cluster.

```
network device-discovery show -protocol cdp
```

Show example

```
cluster1::*> network device-discovery show -protocol cdp
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface
Platform
----------- ------ ------------------------- -----------------
--------
cluster1-01/cdp
            e0a    cs1                       Ethernet1/7
N9K-C9336C
            e0d    cs2                       Ethernet1/7
N9K-C9336C
cluster01-2/cdp
            e0a    cs1                       Ethernet1/8
N9K-C9336C
            e0d    cs2                       Ethernet1/8
N9K-C9336C
cluster01-3/cdp
            e0a    cs1                       Ethernet1/1/1
N9K-C9336C
            e0b    cs2                       Ethernet1/1/1
N9K-C9336C
cluster1-04/cdp
            e0a    cs1                       Ethernet1/1/2
N9K-C9336C
            e0b    cs2                       Ethernet1/1/2
N9K-C9336C

cluster1::*> system cluster-switch show -is-monitoring-enabled
-operational true
Switch                      Type               Address
Model
--------------------------- ------------------ ----------------
-----
cs1                         cluster-network    10.233.205.90
NX9-C9336C
     Serial Number: FOCXXXXXXGD
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                    9.3(5)
    Version Source: CDP

cs2                         cluster-network    10.233.205.91
```

```
NX9-C9336C
     Serial Number: FOCXXXXXXGS
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                    9.3(5)
    Version Source: CDP

2 entries were displayed.
```

You might observe the following output on the cs1 switch console depending on the RCF version previously loaded on the switch:

```
2020 Nov 17 16:07:18 cs1 %$ VDC-1 %$ %STP-2-UNBLOCK_CONSIST_PORT:
Unblocking port port-channel1 on VLAN0092. Port consistency
restored.
2020 Nov 17 16:07:23 cs1 %$ VDC-1 %$ %STP-2-BLOCK_PVID_PEER:
Blocking port-channel1 on VLAN0001. Inconsistent peer vlan.
2020 Nov 17 16:07:23 cs1 %$ VDC-1 %$ %STP-2-BLOCK_PVID_LOCAL:
Blocking port-channel1 on VLAN0092. Inconsistent local vlan.
```

19. Verify that the cluster is healthy:

    `cluster show`

    Show example

    ```
    cluster1::*> cluster show
    Node                 Health   Eligibility   Epsilon
    -------------------- -------- ------------- -------
    cluster1-01          true     true          false
    cluster1-02          true     true          false
    cluster1-03          true     true          true
    cluster1-04          true     true          false
    4 entries were displayed.
    cluster1::*>
    ```

20. Repeat steps 1 to 19 on switch cs2.
21. Enable auto-revert on the cluster LIFs.

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

22. Perform a reboot of switch cs2.

```
cs2# reload

This command will reboot the system. (y/n)? [n] y
```

Step 3: Verify the cluster network configuration and cluster health

1. Verify that the switch ports connected to the cluster ports are **up**.

```
show interface brief
```

Show example

```
cs1# show interface brief | grep up
.
.
Eth1/1/1      1       eth  access up      none
10G(D) --
Eth1/1/2      1       eth  access up      none
10G(D) --
Eth1/7        1       eth  trunk  up      none
100G(D) --
Eth1/8        1       eth  trunk  up      none
100G(D) --
.
.
```

2. Verify that the expected nodes are still connected:

```
show cdp neighbors
```

Show example

```
cs1# 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         133    H           FAS2980
e0a
node2              Eth1/2         133    H           FAS2980
e0a
cs1                Eth1/35        175    R S I s     N9K-C9336C
Eth1/35
cs1                Eth1/36        175    R S I s     N9K-C9336C
Eth1/36

Total entries displayed: 4
```

3. Verify that the cluster nodes are in their correct cluster VLANs using the following commands:

   `show vlan brief`

   `show interface trunk`

Show example

```
cs1# show vlan brief

VLAN Name                              Status    Ports
---- --------------------------------- ---------
-------------------------------
1    default                           active    Po1, Eth1/1, Eth1/2,
Eth1/3
                                                 Eth1/4, Eth1/5,
Eth1/6, Eth1/7
                                                 Eth1/8, Eth1/35,
Eth1/36
                                                 Eth1/9/1, Eth1/9/2,
Eth1/9/3
                                                 Eth1/9/4, Eth1/10/1,
Eth1/10/2
                                                 Eth1/10/3, Eth1/10/4
17   VLAN0017                          active    Eth1/1, Eth1/2,
Eth1/3, Eth1/4
                                                 Eth1/5, Eth1/6,
Eth1/7, Eth1/8
                                                 Eth1/9/1, Eth1/9/2,
Eth1/9/3
                                                 Eth1/9/4, Eth1/10/1,
Eth1/10/2
                                                 Eth1/10/3, Eth1/10/4
18   VLAN0018                          active    Eth1/1, Eth1/2,
Eth1/3, Eth1/4
                                                 Eth1/5, Eth1/6,
Eth1/7, Eth1/8
                                                 Eth1/9/1, Eth1/9/2,
Eth1/9/3
                                                 Eth1/9/4, Eth1/10/1,
Eth1/10/2
                                                 Eth1/10/3, Eth1/10/4
31   VLAN0031                          active    Eth1/11, Eth1/12,
Eth1/13
                                                 Eth1/14, Eth1/15,
Eth1/16
                                                 Eth1/17, Eth1/18,
Eth1/19
                                                 Eth1/20, Eth1/21,
Eth1/22
32   VLAN0032                          active    Eth1/23, Eth1/24,
Eth1/25
```

```
                                                  Eth1/26, Eth1/27,
Eth1/28
                                                  Eth1/29, Eth1/30,
Eth1/31
                                                  Eth1/32, Eth1/33,
Eth1/34
33   VLAN0033                         active    Eth1/11, Eth1/12,
Eth1/13
                                                  Eth1/14, Eth1/15,
Eth1/16
                                                  Eth1/17, Eth1/18,
Eth1/19
                                                  Eth1/20, Eth1/21,
Eth1/22
34   VLAN0034                         active    Eth1/23, Eth1/24,
Eth1/25
                                                  Eth1/26, Eth1/27,
Eth1/28
                                                  Eth1/29, Eth1/30,
Eth1/31
                                                  Eth1/32, Eth1/33,
Eth1/34

cs1# show interface trunk

----------------------------------------------------
Port          Native  Status        Port
              Vlan                  Channel
----------------------------------------------------
Eth1/1        1       trunking      --
Eth1/2        1       trunking      --
Eth1/3        1       trunking      --
Eth1/4        1       trunking      --
Eth1/5        1       trunking      --
Eth1/6        1       trunking      --
Eth1/7        1       trunking      --
Eth1/8        1       trunking      --
Eth1/9/1      1       trunking      --
Eth1/9/2      1       trunking      --
Eth1/9/3      1       trunking      --
Eth1/9/4      1       trunking      --
Eth1/10/1     1       trunking      --
Eth1/10/2     1       trunking      --
Eth1/10/3     1       trunking      --
Eth1/10/4     1       trunking      --
Eth1/11       33      trunking      --
```

```
Eth1/12       33      trunking      --
Eth1/13       33      trunking      --
Eth1/14       33      trunking      --
Eth1/15       33      trunking      --
Eth1/16       33      trunking      --
Eth1/17       33      trunking      --
Eth1/18       33      trunking      --
Eth1/19       33      trunking      --
Eth1/20       33      trunking      --
Eth1/21       33      trunking      --
Eth1/22       33      trunking      --
Eth1/23       34      trunking      --
Eth1/24       34      trunking      --
Eth1/25       34      trunking      --
Eth1/26       34      trunking      --
Eth1/27       34      trunking      --
Eth1/28       34      trunking      --
Eth1/29       34      trunking      --
Eth1/30       34      trunking      --
Eth1/31       34      trunking      --
Eth1/32       34      trunking      --
Eth1/33       34      trunking      --
Eth1/34       34      trunking      --
Eth1/35       1       trnk-bndl     Po1
Eth1/36       1       trnk-bndl     Po1
Po1           1       trunking      --

----------------------------------------------------
Port          Vlans Allowed on Trunk
----------------------------------------------------
Eth1/1        1,17-18
Eth1/2        1,17-18
Eth1/3        1,17-18
Eth1/4        1,17-18
Eth1/5        1,17-18
Eth1/6        1,17-18
Eth1/7        1,17-18
Eth1/8        1,17-18
Eth1/9/1      1,17-18
Eth1/9/2      1,17-18
Eth1/9/3      1,17-18
Eth1/9/4      1,17-18
Eth1/10/1     1,17-18
Eth1/10/2     1,17-18
Eth1/10/3     1,17-18
Eth1/10/4     1,17-18
```

```
Eth1/11       31,33
Eth1/12       31,33
Eth1/13       31,33
Eth1/14       31,33
Eth1/15       31,33
Eth1/16       31,33
Eth1/17       31,33
Eth1/18       31,33
Eth1/19       31,33
Eth1/20       31,33
Eth1/21       31,33
Eth1/22       31,33
Eth1/23       32,34
Eth1/24       32,34
Eth1/25       32,34
Eth1/26       32,34
Eth1/27       32,34
Eth1/28       32,34
Eth1/29       32,34
Eth1/30       32,34
Eth1/31       32,34
Eth1/32       32,34
Eth1/33       32,34
Eth1/34       32,34
Eth1/35       1
Eth1/36       1
Po1           1
..
..
..
..
..
```

For specific port and VLAN usage details, refer to the banner and important notes section in your RCF.

4. Verify that the ISL between cs1 and cs2 is functional:

```
show port-channel summary
```

Show example

```
cs1# show port-channel summary
Flags:  D - Down        P - Up in port-channel (members)
        I - Individual  H - Hot-standby (LACP only)
        s - Suspended   r - Module-removed
        b - BFD Session Wait
        S - Switched    R - Routed
        U - Up (port-channel)
        p - Up in delay-lacp mode (member)
        M - Not in use. Min-links not met
--------------------------------------------------------------------------
------------
Group Port-       Type     Protocol  Member Ports      Channel
--------------------------------------------------------------------------
------------
1     Po1(SU)     Eth      LACP      Eth1/35(P)        Eth1/36(P)
cs1#
```

5. Verify that the cluster LIFs have reverted to their home port:

   `network interface show -vserver cluster`

Show example

```
cluster1::*> network interface show -vserver cluster
            Logical            Status     Network            Current
Current Is
Vserver     Interface          Admin/Oper Address/Mask       Node
Port    Home
----------- ------------------ ---------- ------------------
------------------- ------- ----
Cluster
            cluster1-01_clus1  up/up      169.254.3.4/23
cluster1-01         e0d     true
            cluster1-01_clus2  up/up      169.254.3.5/23
cluster1-01         e0d     true
            cluster1-02_clus1  up/up      169.254.3.8/23
cluster1-02         e0d     true
            cluster1-02_clus2  up/up      169.254.3.9/23
cluster1-02         e0d     true
            cluster1-03_clus1  up/up      169.254.1.3/23
cluster1-03         e0b     true
            cluster1-03_clus2  up/up      169.254.1.1/23
cluster1-03         e0b     true
            cluster1-04_clus1  up/up      169.254.1.6/23
cluster1-04         e0b     true
            cluster1-04_clus2  up/up      169.254.1.7/23
cluster1-04         e0b     true
8 entries were displayed.
cluster1::*>
```

If any cluster LIFs have not returned to their home ports, revert them manually from the local node:

`network interface revert -vserver vserver_name -lif lif_name`

6. Verify that the cluster is healthy:

   `cluster show`

Show example

```
cluster1::*> cluster show
Node                 Health  Eligibility   Epsilon
-------------------- ------- ------------- -------
cluster1-01          true    true          false
cluster1-02          true    true          false
cluster1-03          true    true          true
cluster1-04          true    true          false
4 entries were displayed.
cluster1::*>
```

7. Verify the connectivity of the remote cluster interfaces:

ONTAP 9.9.1 and later

You can use the `network interface check cluster-connectivity` command to start an accessibility check for cluster connectivity and then display the details:

`network interface check cluster-connectivity start` and `network interface check cluster-connectivity show`

```
cluster1::*> network interface check cluster-connectivity start
```

NOTE: Wait for a number of seconds before running the `show` command to display the details.

```
cluster1::*> network interface check cluster-connectivity show
                                  Source               Destination
Packet
Node   Date                       LIF                  LIF
Loss
------ -------------------------- -------------------
------------------ -----------
node1
       3/5/2022 19:21:18 -06:00   cluster1-01_clus2    cluster1-02-
clus1   none
       3/5/2022 19:21:20 -06:00   cluster1-01_clus2    cluster1-
02_clus2   none
node2
       3/5/2022 19:21:18 -06:00   cluster1-02_clus2    cluster1-
01_clus1   none
       3/5/2022 19:21:20 -06:00   cluster1-02_clus2    cluster1-
01_clus2   none
```

All ONTAP releases

For all ONTAP releases, you can also use the `cluster ping-cluster -node <name>` command to check the connectivity:

```
cluster ping-cluster -node <name>
```

```
cluster1::*> cluster ping-cluster -node local
Host is cluster1-03
Getting addresses from network interface table...
Cluster cluster1-03_clus1 169.254.1.3 cluster1-03 e0a
Cluster cluster1-03_clus2 169.254.1.1 cluster1-03 e0b
Cluster cluster1-04_clus1 169.254.1.6 cluster1-04 e0a
Cluster cluster1-04_clus2 169.254.1.7 cluster1-04 e0b
Cluster cluster1-01_clus1 169.254.3.4 cluster1-01 e0a
Cluster cluster1-01_clus2 169.254.3.5 cluster1-01 e0d
Cluster cluster1-02_clus1 169.254.3.8 cluster1-02 e0a
Cluster cluster1-02_clus2 169.254.3.9 cluster1-02 e0d
Local = 169.254.1.3 169.254.1.1
Remote = 169.254.1.6 169.254.1.7 169.254.3.4 169.254.3.5 169.254.3.8
169.254.3.9
Cluster Vserver Id = 4294967293
Ping status:
............
Basic connectivity succeeds on 12 path(s)
Basic connectivity fails on 0 path(s)
................................................
Detected 9000 byte MTU on 12 path(s):
    Local 169.254.1.3 to Remote 169.254.1.6
    Local 169.254.1.3 to Remote 169.254.1.7
    Local 169.254.1.3 to Remote 169.254.3.4
    Local 169.254.1.3 to Remote 169.254.3.5
    Local 169.254.1.3 to Remote 169.254.3.8
    Local 169.254.1.3 to Remote 169.254.3.9
    Local 169.254.1.1 to Remote 169.254.1.6
    Local 169.254.1.1 to Remote 169.254.1.7
    Local 169.254.1.1 to Remote 169.254.3.4
    Local 169.254.1.1 to Remote 169.254.3.5
    Local 169.254.1.1 to Remote 169.254.3.8
    Local 169.254.1.1 to Remote 169.254.3.9
Larger than PMTU communication succeeds on 12 path(s)
RPC status:
6 paths up, 0 paths down (tcp check)
6 paths up, 0 paths down (udp check)
```

What's next?

After you've upgraded your RCF, you can verify the SSH configuration.

Verify your SSH configuration

If you are using the Ethernet Switch Health Monitor (CSHM) and log collection features,

verify that SSH and SSH keys are enabled on the cluster switches.

Steps

1. Verify that SSH is enabled:

```
(switch) show ssh server
ssh version 2 is enabled
```

2. Verify that the SSH keys are enabled:

```
show ssh key
```

Show example

```
(switch)# show ssh key

rsa Keys generated:Fri Jun 28 02:16:00 2024

ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAAAgQDiNrD52Q586wTGJjFAbjBlFaA23EpDrZ2sDCew
l7nwlioC6HBejxluIObAH8hrW8kR+gj0ZAfPpNeLGTg3APj/yiPTBoIZZxbWRShywAM5
PqyxWwRb7kp9Zt1YHzVuHYpSO82KUDowKrL6lox/YtpKoZUDZjrZjAp8hTv3JZsPgQ==

bitcount:1024
fingerprint:
SHA256:aHwhpzo7+YCDSrp3isJv2uVGz+mjMMokqdMeXVVXfdo

could not retrieve dsa key information

ecdsa Keys generated:Fri Jun 28 02:30:56 2024

ecdsa-sha2-nistp521
AAAAE2VjZHNhLXNoYTItbmlzdHA1MjEAAAAIbmlzdHA1MjEAAACFBABJ+ZX5SFKhS57e
vkE273e0VoqZi4/32dt+f14fBuKv80MjMsmLfjKtCWy1wgVt1Zi+C5TIBbugpzez529z
kFSF0ADb8JaGCoaAYe2HvWR/f6QLbKbqVIewCdqWgxzrIY5BPP5GBdxQJMBiOwEdnHg1
u/9Pzh/Vz9cHDcCW9qGE780QHA==

bitcount:521
fingerprint:
SHA256:TFGe2hXn6QIpcs/vyHzftHJ7Dceg0vQaULYRAlZeHwQ

(switch)# show feature | include scpServer
scpServer             1          enabled
(switch)# show feature | include ssh
sshServer             1          enabled
(switch)#
```

When enabling FIPS, you must change the bitcount to 256 on the switch using the command `ssh key ecdsa 256 force`. See Configure network security using FIPS for more details.

What's next?

After you've verified your SSH configuration, you can configure switch health monitoring.

Reset 9336C-FX2 and 9336C-FX2-T cluster switches to factory defaults

To reset the 9336C-FX2 and 9336C-FX2-T cluster switches to factory defaults, you must erase the 9336C-FX2 and 9336C-FX2-T switch settings.

About this task

- You must be connected to the switch using the serial console.
- This task resets the configuration of the management network.

Steps

1. Erase the existing configuration:

   `write erase`

   ```
   (cs2)# write erase

   Warning: This command will erase the startup-configuration.
   Do you wish to proceed anyway? (y/n) [n] y
   ```

2. Reload the switch software:

   `reload`

   ```
   (cs2)# reload

   This command will reboot the system. (y/n)? [n] y
   ```

   The system reboots and enters the configuration wizard. During the boot, if you receive the prompt “Abort Auto Provisioning and continue with normal setup? (yes/no)[n]”, you should respond **yes** to proceed.

What’s next

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

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