



# **Configure a Cisco Nexus 9336C-FX2 cluster switch**

## **ONTAP Systems Switches**

NetApp

November 18, 2021

# Table of Contents

- Configure a Cisco Nexus 9336C-FX2 cluster switch ..... 1
- Configure a Cisco Nexus 9336C-FX2 cluster switch ..... 1
- Initial installation of the Nexus 9336C-FX2 cluster switch ..... 1
- Install the NX-OS software ..... 6
- Install the Reference Configuration File (RCF) ..... 13

# Configure a Cisco Nexus 9336C-FX2 cluster switch

## Configure a Cisco Nexus 9336C-FX2 cluster switch

You can configure a new Nexus 9336C-FX2 switch by completing the steps detailed in this chapter.

Installing the Nexus 9336C-FX2 switch on systems running ONTAP 9.8 and later, starts with setting up an IP address and configuration to allow the switch to communicate through the management interface. You can then install the NX-OS software and reference configuration file (RCF). This procedure is intended for preparing the Nexus 9336C-FX2 switch before controllers are added.

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

- The Nexus 9336C-FX2 switch names are cs1 and cs2.
- The example used in this procedure starts the upgrade on the second switch, \*cs2\*.
- The cluster LIF names are node1\_clus1 and node1\_clus2 for node1, and node2\_clus1 and node2\_clus2 for node2.
- The IPspace name is Cluster.
- The `cluster1::*>` prompt indicates the name of the cluster.
- The cluster ports on each node are named e0a and e0b.

See the *Hardware Universe* for the actual cluster ports supported on your platform.

[NetApp Hardware Universe](#)

- The node connections supported for the Nexus 9336C-FX2 switches are ports 1/1 through 1/34.
- The Inter-Switch Links (ISLs) supported for the Nexus 9336C-FX2 switches are ports 1/35 and 1/36.
- The examples in this procedure use two nodes, but you can have up to 24 nodes in a cluster.

## Initial installation of the Nexus 9336C-FX2 cluster switch

You can use this procedure to perform the initial installation of the Cisco Nexus 9336C-FX2 switch.

You can download the applicable NetApp Cisco NX-OS software for your switches from the NetApp Support Site at [mysupport.netapp.com](https://mysupport.netapp.com)

[mysupport.netapp.com](https://mysupport.netapp.com)

NX-OS is a network operating system for the Nexus series of Ethernet switches and MDS series of Fibre Channel (FC) storage area network switches provided by Cisco Systems.

This procedure provides a summary of the process to install your switches and get them running:

1. Connect the serial port to the host or serial port of your choice.

2. Connect the management port (on the non-port side of the switch) to the same network where your SFTP server is located.
3. At the console, set the host side serial settings:
  - 9600 baud
  - 8 data bits
  - 1 stop bit
  - parity: none
  - flow control: none
4. Booting for the first time or rebooting after erasing the running configuration, the Nexus 9336C-FX2 switch loops in a boot cycle. Interrupt this cycle by typing **yes** to abort Power on Auto Provisioning. You are then presented with the System Admin Account setup:

```
$ VDC-1 %$ %POAP-2-POAP_INFO: - Abort Power On Auto Provisioning [yes
- continue with normal setup, skip - bypass password and basic
configuration, no - continue with Power On Auto Provisioning]
(yes/skip/no) [no]:
**yes**
Disabling POAP.....Disabling POAP
2019 Apr 10 00:36:17 switch %$ VDC-1 %$ poap: Rolling back, please
wait... (This may take 5-15 minutes)
```

```
---- System Admin Account Setup ----
```

```
Do you want to enforce secure password standard (yes/no) [y]:
```

5. Type **y** to enforce secure password standard:

```
Do you want to enforce secure password standard (yes/no) [y]: **y**
```

6. Enter and confirm the password for user admin:

```
Enter the password for "admin":
Confirm the password for "admin":
```

7. Enter the Basic System Configuration dialog:

This setup utility will guide you through the basic configuration of the system. Setup configures only enough connectivity for management of the system.

Please register Cisco Nexus9000 Family devices promptly with your supplier. Failure to register may affect response times for initial service calls. Nexus9000 devices must be registered to receive entitled support services.

Press Enter at anytime to skip a dialog. Use ctrl-c at anytime to skip the remaining dialogs.

Would you like to enter the basic configuration dialog (yes/no):

#### 8. Create another login account:

Create another login account (yes/no) [n]:

#### 9. Configure read-only and read-write SNMP community strings:

Configure read-only SNMP community string (yes/no) [n]:

Configure read-write SNMP community string (yes/no) [n]:

#### 10. Configure the cluster switch name:

Enter the switch name : \*\*cs2\*\*

#### 11. Configure the out-of-band management interface:

Continue with Out-of-band (mgmt0) management configuration? (yes/no) [y]: \*\*y\*\*

Mgmt0 IPv4 address : 172.22.133.216

Mgmt0 IPv4 netmask : 255.255.224.0

Configure the default gateway? (yes/no) [y]: \*\*y\*\*

IPv4 address of the default gateway : 172.22.128.1

12. Configure advanced IP options:

```
Configure advanced IP options? (yes/no) [n]: **n**
```

13. Configure Telnet services:

```
Enable the telnet service? (yes/no) [n]: **n**
```

14. Configure SSH services and SSH keys:

```
Enable the ssh service? (yes/no) [y]: **y**
```

```
    Type of ssh key you would like to generate (dsa/rsa) [rsa]:  
**rsa**
```

```
    Number of rsa key bits <1024-2048> [1024]: **2048**
```

15. Configure other settings:

```
Configure the ntp server? (yes/no) [n]: **n**
```

```
    Configure default interface layer (L3/L2) [L2]: **L2**
```

```
    Configure default switchport interface state (shut/noshut) [noshut]:  
**noshut**
```

```
    Configure CoPP system profile (strict/moderate/lenient/dense)  
[strict]: **strict**
```

16. Confirm switch information and save the configuration:

```
Would you like to edit the configuration? (yes/no) [n]: **n**
```

```
Use this configuration and save it? (yes/no) [y]: **y**
```

```
[#####] 100%  
Copy complete, now saving to disk (please wait)...  
Copy complete.
```

17. For ONTAP 9.8 and later, enable the Ethernet switch health monitor log collection feature for collecting switch-related log files, using the commands: `system switch ethernet log setup-password`system switch ethernet log enable-collection`

```

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

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

Enter the switch name: **cs1**
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: **cs2**
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>

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.

18. For ONTAP releases 9.5P16, 9.6P12, and 9.7P10 and later patch releases, enable the Ethernet switch health monitor log collection feature for collecting switch-related log files, using the commands: `system cluster-switch log setup-password`system cluster-switch log enable-collection`

```

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

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

Enter the switch name: **cs1**
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 cluster-switch log setup-password**

Enter the switch name: **cs2**
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>

cluster1::*> **system cluster-switch 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.

## Install the NX-OS software

You can use this procedure to install the NX-OS software on the Nexus 9336C-FX2 cluster switch.

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.



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

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

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

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

```
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.
```

### 4. Verify the running version of the NX-OS software:

```
cs2# **show version**
```

```
Cisco Nexus Operating System (NX-OS) Software
```

```
TAC support: http://www.cisco.com/tac
```

```
Copyright (C) 2002-2020, Cisco and/or its affiliates.
```

```
All rights reserved.
```

```
The copyrights to certain works contained in this software are  
owned by other third parties and used and distributed under their own  
licenses, such as open source. This software is provided "as is," and  
unless
```

```
otherwise stated, there is no warranty, express or implied, including  
but not
```

```
limited to warranties of merchantability and fitness for a particular  
purpose.
```

```
Certain components of this software are licensed under  
the GNU General Public License (GPL) version 2.0 or  
GNU General Public License (GPL) version 3.0 or the GNU  
Lesser General Public License (LGPL) Version 2.1 or  
Lesser General Public License (LGPL) Version 2.0.
```

```
A copy of each such license is available at
```

```
http://www.opensource.org/licenses/gpl-2.0.php and
```

```
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#
```

## 5. Install the NX-OS image.

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

```
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
1	nxos	9.3(4)	9.3(5)
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.

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

```
cs2# **show version**

Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (C) 2002-2020, Cisco and/or its affiliates.
All rights reserved.
The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under their own
licenses, such as open source. This software is provided "as is," and
unless
otherwise stated, there is no warranty, express or implied, including
```

but not  
limited to warranties of merchantability and fitness for a particular  
purpose.

Certain components of this software are licensed under  
the GNU General Public License (GPL) version 2.0 or  
GNU General Public License (GPL) version 3.0 or the GNU  
Lesser General Public License (LGPL) Version 2.1 or  
Lesser General Public License (LGPL) Version 2.0.

A copy of each such license is available at  
<http://www.opensource.org/licenses/gpl-2.0.php> and  
<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):

## 7. Upgrade the EPLD image and reboot the switch.

```
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 1**
```

```
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.
```

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

```
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

## Install the Reference Configuration File (RCF)

You can install the RCF after setting up the Nexus 9336C-FX2 switch for the first time. You can also use this procedure to upgrade your RCF version.

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

1. Display the cluster ports on each node that are connected to the cluster switches: `network device-discovery show`

```

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 -role cluster`

```

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

Node: cluster1-01

Ignore

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

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

8 entries were displayed.

Node: cluster1-03

Ignore

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

Node: cluster1-04

Ignore

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

cluster1::\*>

b. Verify that all the cluster interfaces (LIFs) are on the home port: `network interface show -role`

cluster

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

```

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
**

```

### 4. On cluster switch cs2, shut down the ports connected to the cluster ports of the nodes.

```

cs2(config)# **interface eth1/1/1-2,eth1/7-8**
cs2(config-if-range)# **shutdown**

```

### 5. Verify that the cluster ports have migrated to the ports hosted on cluster switch cs1. This might take a few seconds.

```
network interface show -role cluster
```

```

cluster1::*> **network interface show -role cluster**
          Logical          Status      Network          Current
Current Is
Vserver   Interface             Admin/Oper  Address/Mask     Node
Port      Home
-----
-----
Cluster
e0a       cluster1-01_clus1 up/up      169.254.3.4/23   cluster1-01
          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::*>

```

6. Verify that the cluster is healthy: cluster show

```

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. Clean the configuration on switch cs2 and perform a basic setup.

- a. Clean the configuration. This step requires a console connection to the switch.

```
cs2# **write erase
**Warning: This command will erase the startup-configuration.
Do you wish to proceed anyway? (y/n) [n] **y**
cs2# **reload**
This command will reboot the system. (y/n)? [n] **y**
cs2#
```

b. Perform a basic setup of the switch.

8. Copy the RCF to the bootflash of switch cs2 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 cs2:

```
cs2# **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)...
```

9. 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 cs2:

```
cs2# **copy Nexus_9336C_RCF_v1.6-Cluster-HA-Breakout.txt running-config
echo-commands**
```

10. 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.

```

cs2# **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
*
*****
*****

```

11. 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



```

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 (this might not show switch cs2, since LIFs are not homed on e0d).

```

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

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

The following example uses the interface example output from step 1:

```
cs1(config)# **interface eth1/1/1-2,eth1/7-8**
cs1(config-if-range)# **shutdown**
```

17. Verify that the cluster LIFs have migrated to the ports hosted on switch cs2. This might take a few seconds.

```
network interface show -role cluster
```

```

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

```

18. Verify that the cluster is healthy: cluster show

```

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::*>

```

19. Repeat Steps 7 to 14 on switch cs1.

20. Enable auto-revert on the cluster LIFs.

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

21. Reboot switch cs1. You do this to trigger the cluster LIFs to revert to their home ports. You can ignore the “cluster ports down” events reported on the nodes while the switch reboots.

```
cs1# **reload**
This command will reboot the system. (y/n)? [n] **y**
```

22. Verify that the switch ports connected to the cluster ports are up.

```
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)
--
.
.
```

23. Verify that the ISL between cs1 and cs2 is functional: `show port-channel summary`

```

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#

```

24. Verify that the cluster LIFs have reverted to their home port: `network interface show -role cluster`

```

cluster1::*> **network interface show -role cluster**
          Logical          Status      Network          Current
Current Is
Vserver   Interface             Admin/Oper  Address/Mask     Node
Port      Home
-----
-----
Cluster
e0d      true      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::*>

```

25. Verify that the cluster is healthy: cluster show

```

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::*>

```

26. Ping the remote cluster interfaces to verify connectivity: cluster ping-cluster -node local

```

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)

```

## Copyright Information

Copyright © 2021 NetApp, Inc. All rights reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system- without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

## Trademark Information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.