**n NetApp**

# Cisco Nexus 9336C-FX2

## Cluster and storage switches

NetApp
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# Cisco Nexus 9336C-FX2

## Overview

### Overview of installation and configuration for Cisco Nexus 9336C-FX2 storage switches

The Cisco Nexus 9336C-FX2 storage switch is part of the Cisco Nexus 9000 platform and can be installed in a NetApp system cabinet. Storage switches allow you to route data between servers and storage arrays in a Storage Area Network (SAN).

**Initial configuration overview**

To initially configure a Cisco Nexus 9336C-FX2 switch on systems running ONTAP, follow these steps:

1. Complete cabling worksheet.
2. Install the switch.
3. Configure switch.
4. Install switch in NetApp cabinet.

   Depending on your configuration, you can install the Cisco Nexus 9336C-FX2 switch and pass-through panel in a NetApp cabinet with the standard brackets that are included with the switch.

5. Prepare to install NX-OS and RCF.
6. Install the NX-OS software.
7. Install the RCF config file.

   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.

**Additional information**

Before you begin installation or maintenance, be sure to review the following:

- Configuration requirements
- Components and part numbers
- Required documentation
- Smart Call Home requirements

### Configuration requirements for Cisco Nexus 9336C-FX2 storage switches

For Cisco Nexus 9336C-FX2 switch installation and maintenance, be sure to review configuration and network requirements.

**ONTAP support**

From ONTAP 9.9.1, you can use Cisco Nexus 9336C-FX2 switches to combine storage and cluster

functionality into a shared switch configuration.

If you want to build ONTAP clusters with more than two nodes, you need two supported network switches.

**Configuration requirements**

For configuration, you need the appropriate number and type of cables and cable connectors for your switches.

Depending on the type of switch you are initially configuring, you need to connect to the switch console port with the included console cable; you also need to provide specific network information.

**Network requirements**

You need the following network information for all switch configurations.

- IP subnet for management network traffic
- Host names and IP addresses for each of the storage system controllers and all applicable switches
- Most storage system controllers are managed through the e0M interface by connecting to the Ethernet service port (wrench icon). On AFF A800 and AFF A700s systems, the e0M interface uses a dedicated Ethernet port.
- Refer to the Hardware Universe for the latest information.

For more information about the initial configuration of your switch, see the following guide: Cisco Nexus 9336C-FX2 Installation and Upgrade Guide.

## Components and part numbers for Cisco Nexus 9336C-FX2 storage switches

For Cisco Nexus 9336C-FX2 switch installation and maintenance, be sure to review the list of components and part numbers.

The following table lists the part number and description for the 9336C-FX2 switch, fans, and power supplies:

| Part number | Description |
| --- | --- |
| X190200-CS-PE | N9K-9336C-FX2, CS, PTSX, 36PT10/25/40/100GQSFP28 |
| X190200-CS-PI | N9K-9336C-FX2, CS, PSIN, 36PT10/25/40/100GQSFP28 |
| X190210-FE-PE | N9K-9336C, FTE, PTSX, 36PT10/25/40/100GQSFP28 |
| X190210-FE-PI | N9K-9336C, FTE, PSIN, 36PT10/25/40/100GQSFP28 |
| X190002 | Accessory Kit X190001/X190003 |
| X-NXA-PAC-1100W-PE2 | N9K-9336C AC 1100W PSU - Port side exhaust airflow |
| X-NXA-PAC-1100W-PI2 | N9K-9336C AC 1100W PSU - Port side Intake airflow |
| X-NXA-FAN-65CFM-PE | N9K-9336C 65CFM, Port side exhaust airflow |

| Part number | Description |
| --- | --- |
| X-NXA-FAN-65CFM-PI | N9K-9336C 65CFM, Port side intake airflow |

## Documentation requirements for Cisco Nexus 9336C-FX2 storage switches

For Cisco Nexus 9336C-FX2 switch installation and maintenance, be sure to review specific switch and controller documentation to set up your Cisco 9336-FX2 switches and ONTAP cluster.

### Switch documentation

To set up the Cisco Nexus 9336C-FX2 switches, you need the following documentation from the Cisco Nexus 9000 Series Switches Support page:

| Document title | Description |
| --- | --- |
| *Nexus 9000 Series Hardware Installation Guide* | Provides detailed information about site requirements, switch hardware details, and installation options. |
| *Cisco Nexus 9000 Series Switch Software Configuration Guides* (choose the guide for the NX-OS release installed on your switches) | Provides initial switch configuration information that you need before you can configure the switch for ONTAP operation. |
| *Cisco Nexus 9000 Series NX-OS Software Upgrade and Downgrade Guide* (choose the guide for the NX-OS release installed on your switches) | Provides information on how to downgrade the switch to ONTAP supported switch software, if necessary. |
| *Cisco Nexus 9000 Series NX-OS Command Reference Master Index* | Provides links to the various command references provided by Cisco. |
| *Cisco Nexus 9000 MIBs Reference* | Describes the Management Information Base (MIB) files for the Nexus 9000 switches. |
| *Nexus 9000 Series NX-OS System Message Reference* | Describes the system messages for Cisco Nexus 9000 series switches, those that are informational, and others that might help diagnose problems with links, internal hardware, or the system software. |
| *Cisco Nexus 9000 Series NX-OS Release Notes (choose the notes for the NX-OS release installed on your switches)* | Describes the features, bugs, and limitations for the Cisco Nexus 9000 Series. |
| Regulatory Compliance and Safety Information for Cisco Nexus 9000 Series | Provides international agency compliance, safety, and statutory information for the Nexus 9000 series switches. |

**ONTAP systems documentation**

To set up an ONTAP system, you need the following documents for your version of the operating system from the ONTAP 9 Documentation Center.

| Name | Description |
|------|-------------|
| Controller-specific *Installation and Setup Instructions* | Describes how to install NetApp hardware. |
| ONTAP documentation | Provides detailed information about all aspects of the ONTAP releases. |
| Hardware Universe | Provides NetApp hardware configuration and compatibility information. |

**Rail kit and cabinet documentation**

To install a Cisco 9336-FX2 switch in a NetApp cabinet, see the following hardware documentation.

| Name | Description |
|------|-------------|
| 42U System Cabinet, Deep Guide | Describes the FRUs associated with the 42U system cabinet, and provides maintenance and FRU replacement instructions. |
| Install a Cisco 9336-FX2 switch in a NetApp Cabinet | Describes how to install a Cisco Nexus 9336C-FX2 switch in a four-post NetApp cabinet. |

## Smart Call Home requirements

To use Smart Call Home feature, review the following guidelines.

Smart Call Home monitors the hardware and software components on your network. When a critical system configuration occurs, it generates an email-based notification and raises an alert to all the recipients that are configured in your destination profile. To use Smart Call Home, you must configure a cluster network switch to communicate using email with the Smart Call Home system. In addition, you can optionally set up your cluster network switch to take advantage of Cisco's embedded Smart Call Home support feature.

Before you can use Smart Call Home, be aware of the following considerations:

- An email server must be in place.
- The switch must have IP connectivity to the email server.
- The contact name (SNMP server contact), phone number, and street address information must be configured. This is required to determine the origin of messages received.
- A CCO ID must be associated with an appropriate Cisco SMARTnet Service contract for your company.
- Cisco SMARTnet Service must be in place for the device to be registered.

The Cisco support site contains information about the commands to configure Smart Call Home.

# Install hardware

## Install the 9336C-FX2 storage switch

Follow this procedure to install the Cisco Nexus 9336C-FX2 storage switch.

**What you'll need**

- 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 documentation. See Required documentation for more information.

**Steps**

1. Rack the cluster network and management network switches and controllers.

| If you are installing your… | Then… |
|---|---|
| Cisco Nexus 9336C-FX2 in a NetApp system cabinet | See Install switch in NetApp cabinet for instructions to install the switch in a NetApp cabinet. |
| Equipment in a Telco rack | See the procedures provided in the switch hardware installation guides and the NetApp installation and setup instructions. |

2. Cable the cluster network and management network switches to the controllers using the completed cabling worksheets.
3. Power on the cluster network and management network switches and controllers.

**What's next?**

Go to Configure Cisco Nexus 9336C-FX2 storage switch.

## Configure the 9336C-FX2 storage switch

Follow this procedure to configure the Cisco Nexus 9336C-FX2 switch.

**What you'll need**

- 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 documentation. See Required documentation for more information.

**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. | The switch name 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. |
| 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. |

| Prompt | Response |
|---|---|
| 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.<br><br>ⓘ SSH is recommended when using Cluster 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.<br><br>ⓘ 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?**

Optionally, you can install a Cisco Nexus 9336C-FX2 switch in a NetApp cabinet. Otherwise, go to Prepare to install NX-OS and RCF.

## Install a Cisco Nexus 9336C-FX2 switch in a NetApp cabinet

Depending on your configuration, you might need to install the Cisco Nexus 9336C-FX2 switch and pass-through panel in a NetApp cabinet. Standard brackets are included with the switch.

### What you'll need

- For each switch, you must supply the eight 10-32 or 12-24 screws and clip nuts to mount the brackets and slider rails to the front and rear cabinet posts.

- You must use the Cisco standard rail kit to install the switch in a NetApp cabinet.

> (i) The jumper cords are not included with the pass-through kit and should be included with your switches. If they were not shipped with the switches, you can order them from NetApp (part number X1558A-R6).

### Required documentation

Review the initial preparation requirements, kit contents, and safety precautions in the Cisco Nexus 9000 Series Hardware Installation Guide.

### Steps

1. Install the pass-through blanking panel in the NetApp cabinet.

   The pass-through panel kit is available from NetApp (part number X8784-R6).

   The NetApp pass-through panel kit contains the following hardware:

   - One pass-through blanking panel
   - Four 10-32 x .75 screws
   - Four 10-32 clip nuts

     a. Determine the vertical location of the switches and blanking panel in the cabinet.

        In this procedure, the blanking panel will be installed in U40.

     b. Install two clip nuts on each side in the appropriate square holes for front cabinet rails.

     c. Center the panel vertically to prevent intrusion into adjacent rack space, and then tighten the screws.

     d. Insert the female connectors of both 48-inch jumper cords from the rear of the panel and through the brush assembly.
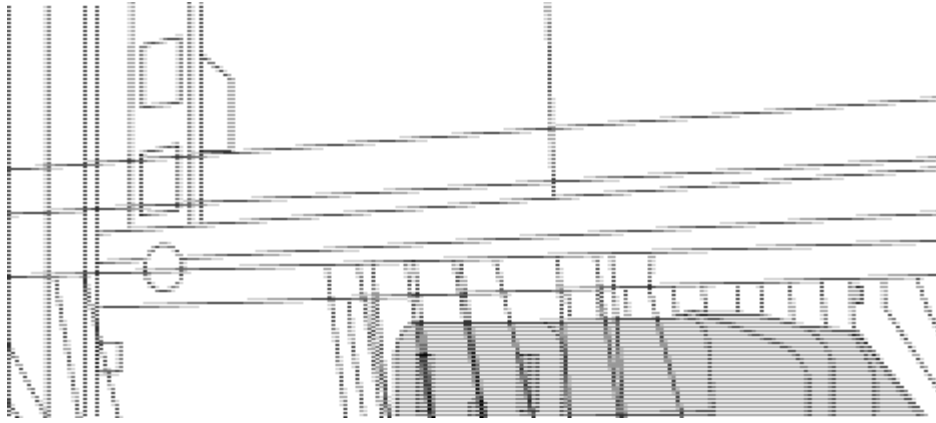
*(1) Female connector of the jumper cord.*

2. Install the rack-mount brackets on the Nexus 9336C-FX2 switch chassis.

   a. Position a front rack-mount bracket on one side of the switch chassis so that the mounting ear is aligned with the chassis faceplate (on the PSU or fan side), and then use four M4 screws to attach the bracket to the chassis.
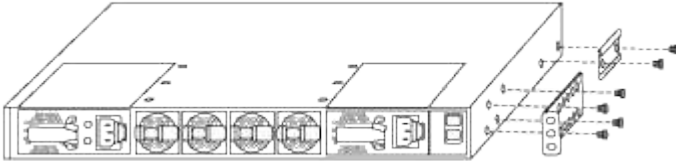
   

   b. Repeat step 2a with the other front rack-mount bracket on the other side of the switch.

   c. Install the rear rack-mount bracket on the switch chassis.

   d. Repeat step 2c with the other rear rack-mount bracket on the other side of the switch.

3. Install the clip nuts in the square hole locations for all four IEA posts.
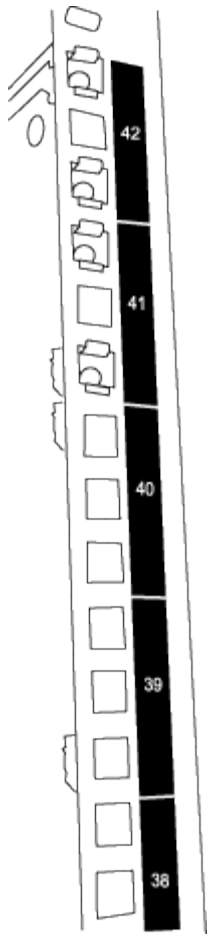
The two 9336C-FX2 switches will always be mounted in the top 2U of the cabinet RU41 and 42.

4. Install the slider rails in the cabinet.

   a. Position the first slider rail at the RU42 mark on the back side of the rear left post, insert screws with the matching thread type, and then tighten the screws with your fingers.
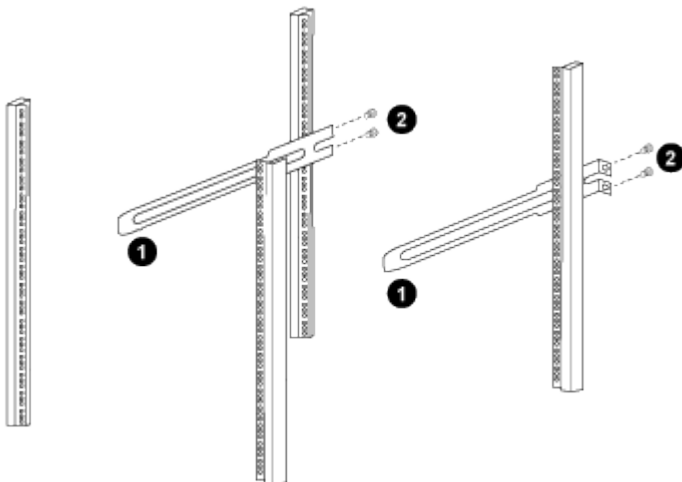


   *(1) As you gently slide the slider rail, align it to the screw holes in the rack.*

   *(2) Tighten the screws of the slider rails to the cabinet posts.*

   b. Repeat step 4a for the right side rear post.

c. Repeat steps 4a and 4b at the RU41 locations on the cabinet.

5. Install the switch in the cabinet.

   > ⓘ This step requires two people: one person to support the switch from the front and another to guide the switch into the rear slider rails.

   a. Position the back of the switch at RU41.



   Position switch and
   rails at U41 and 42
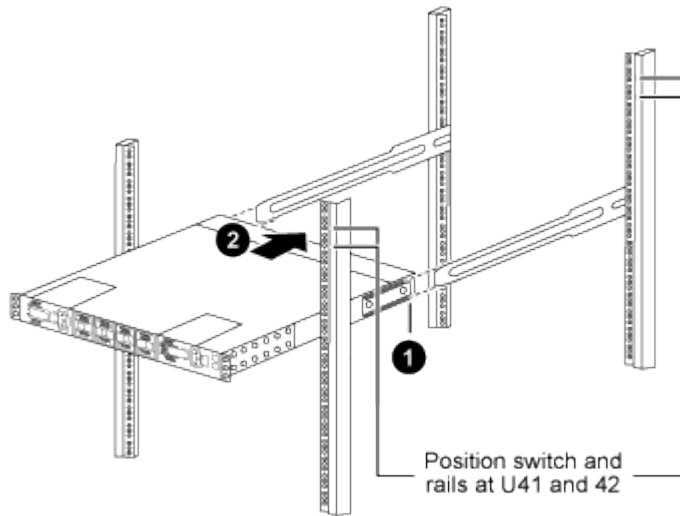
   *(1) As the chassis is pushed toward the rear posts, align the two rear rack-mount guides with the slider rails.*

   *(2) Gently slide the switch until the front rack-mount brackets are flush with the front posts.*

   b. Attach the switch to the cabinet.
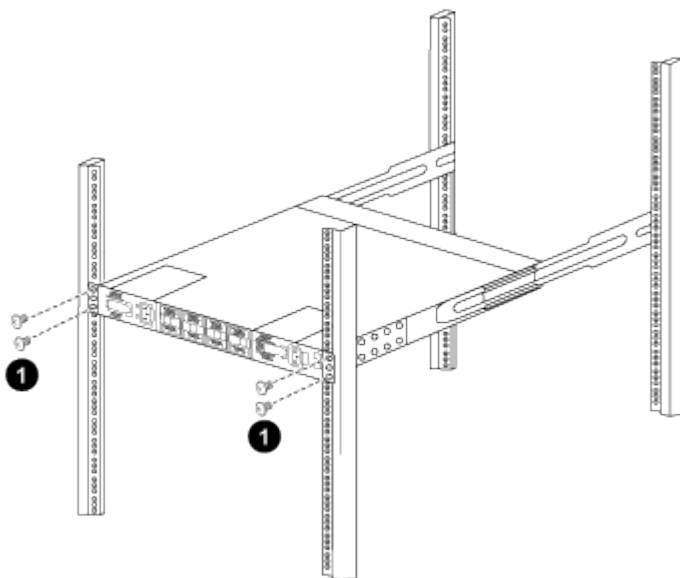


   *(1) With one person holding the front of the chassis level, the other person should fully tighten the four rear screws to the cabinet posts.*

   c. With the chassis now supported without assistance, fully tighten the front screws to the posts.

    d. Repeat steps 5a through 5c for the second switch at the RU42 location.

> ℹ️ By using the fully installed switch as a support, it is not necessary to hold the front of the second switch during the installation process.

6. When the switches are installed, connect the jumper cords to the switch power inlets.

7. Connect the male plugs of both jumper cords to the closest available PDU outlets.

> ℹ️ To maintain redundancy, the two cords must be connected to different PDUs.

8. Connect the management port on each 9336C-FX2 switch to either of the management switches (if ordered) or connect them directly to your management network.

The management port is the upper-right port located on the PSU side of the switch. The CAT6 cable for each switch needs to be routed through the pass-through panel after the switches are installed to connect to the management switches or management network.

# Configure software

## Software install workflow for Cisco Nexus 9336C-FX2 storage switches

To install and configure software for a Cisco Nexus 9336C-FX2 switch, follow these steps:

1. Prepare to install NX-OS and RCF.
2. Install the NX-OS software.
3. Install the RCF config file.

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.

## Prepare to install NX-OS software and RCF

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

**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.

   > (i) 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. Ping the remote cluster LIFs:

```
cluster ping-cluster -node node-name
```

**Show example**

```
cluster1::*> cluster ping-cluster -node cluster1-02
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.
```

7. 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` and `system switch ethernet log enable-collection`

**Show example**

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

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

Enter the switch name: cs1
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.

8. 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` and `system cluster-switch log enable-`

collection

**Show example**

```
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::*>
```

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

**What's next?**

## Install the NX-OS software

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

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

### Review requirements

**What you'll need**

- A current backup of the switch configuration.
- A fully functioning cluster (no errors in the logs or similar issues).
- Cisco Ethernet switch page. Consult the switch compatibility table for the supported ONTAP and NX-OS versions.
- Appropriate software and upgrade guides available on the Cisco web site for the Cisco switch upgrade and downgrade procedures. See Cisco Nexus 9000 Series Switches.

**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
   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.

**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.
```

4. 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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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.

**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.
```

6. 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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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.

**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 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.

**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
```

9. Repeat steps 1 to 8 to install the NX-OS software on switch cs1.

**What's next?**

Install RCF config file.

## 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.

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

**Review requirements**

**What you'll need**

- A current backup of the switch configuration.
- A fully functioning cluster (no errors in the logs or similar issues).
- The current RCF file.
- A console connection to the switch, required when installing the RCF.

**Suggested documentation**

- Cisco Ethernet switch page Consult the switch compatibility table for the supported ONTAP and RCF versions. Note that there can be command dependencies between the command syntax in the RCF and that found in versions of NX-OS.
- Cisco Nexus 3000 Series Switches. Refer to the appropriate software and upgrade guides available on the Cisco web site for complete documentation on the Cisco switch upgrade and downgrade procedures.

**Install the RCF**

**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 two 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.

**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.

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. This task resets the configuration of the management network.

**Step 1: Prepare for the installation**

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 –role cluster
    ```

**Show example**

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

**Show example**

```
cluster1::*> network interface show -role 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
```

```
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.

**Show example**

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

**Step 2: Configure ports**

1. 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
```

2. Verify that the cluster LIFs 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
          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
```

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

> ⚠️ When updating or applying a new RCF, you must erase the switch settings and perform basic configuration. You must be connected to the switch serial console port to set up the switch again.

   a. Clean the configuration:

   **Show example**

```
(cs2)# write erase

Warning: This command will erase the startup-configuration.

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

   b. Perform a reboot of the switch:

   **Show example**

```
(cs2)# reload

Are you sure you would like to reset the system? (y/n) y
```

6. 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.

**Show example**

> 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)...
> ```

7. 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.

   **Show example**

   > 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
   > ```

8. 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**

```
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
*
**********************************************************************
**********
```

9. 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.

10. After you verify the RCF versions 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 guides.

**Show example**

```
cs2# copy running-config startup-config
[########################################] 100% Copy complete
```

11. Reboot switch cs2. You can ignore the "cluster ports down" events reported on the nodes while the switch reboots.

**Show example**

```
cs2# reload
This command will reboot the system. (y/n)?  [n] y
```

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

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

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

**Show example**

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

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

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**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.
```

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

    **Show example**

    The following example uses the interface example output:

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

14. 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
    ```

**Show example**

```
cluster1::*> network interface show -role 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     false
          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     false
          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     false
          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     false
          cluster1-04_clus2  up/up      169.254.1.7/23
cluster1-04         e0b     true
8 entries were displayed.
cluster1::*>
```

15. 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::*>
```

16. Repeat steps 4 to 11 on switch cs1.

17. Enable auto-revert on the cluster LIFs.

**Show example**

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

18. 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.

**Show example**

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

**Step 3: Verify the configuration**

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
cs2                Eth1/35        175    R S I s     N9K-C9336C
Eth1/35
cs2                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
```

```
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 -role cluster
```

**Show example**

```
cluster1::*> network interface show -role 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::*>
```

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. 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)
```

# Replace a Cisco Nexus 9336C-FX2 storage switch

You can replace a defective Nexus 9336C-FX2 switch in a cluster network. This is a

# nondisruptive procedure.

**What you'll need**

Before installing the NX-OS software and RCFs on a Cisco Nexus 9336C-FX2 storage switch, ensure that:

- Your system can support Cisco Nexus 9336C-FX2 storage switches.
- You have consulted the switch compatibility table on the Cisco Ethernet Switch page for the supported ONTAP, NX-OS, and RCF versions.
- You have referred to the appropriate software and upgrade guides available on the Cisco web site.

Cisco Nexus 3000 Series Switches:

- You have downloaded the applicable RCFs.
- The existing network configuration has the following characteristics:
  - The Cisco Ethernet Switches page has the latest RCF and NX-OS versions on your switches.
  - Management connectivity must exist on both switches.
- The replacement Cisco Nexus 9336C-FX2 switch has the following characteristics:
  - Management network connectivity is functional.
  - Console access to the replacement switch is in place.
  - The appropriate RCF and NX-OS operating system image is loaded onto the switch.
  - Initial confiugration of the switch is complete.

**About this task**

This procedure replaces the second Nexus 9336C-FX2 storage switch S2 with the new 9336C-FX switch NS2. The two nodes are node1 and node2.

Steps to complete:

- Confirm the switch to be replaced is S2.
- Disconnect the cables from switch S2.
- Reconnect the cables to switch NS2.
- Verify all device configurations on switch NS2.

> ℹ️ There can be dependencies between command syntax in the RCF and NX-OS versions.

**Steps**

1. If AutoSupport is enabled on this cluster, suppress automatic case creation by invoking an AutoSupport message:

   ```
   system node autosupport invoke -node * -type all - message MAINT=xh
   ```

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

2. Check on the health status of the storage node ports to make sure that there is connection to storage switch S1:

   ```
   storage port show -port-type ENET
   ```

**Show example**

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

3. Verify that storage switch S1 is available:

```
network device-discovery show
```

**Show example**

```
storage::*> network device-discovery show
Node/      Local Discovered
Protocol   Port  Device (LLDP: ChassisID)   Interface   Platform
--------   ----  ----------------------   ---------   ---------
node1/cdp
           e3a   S1                         Ethernet1/1 NX9336C
           e4a   node2                      e4a         AFF-A700
           e4e   node2                      e4e         AFF-A700
node1/lldp
           e3a   S1                         Ethernet1/1 -
           e4a   node2                      e4a         -
           e4e   node2                      e4e         -
node2/cdp
           e3a   S1                         Ethernet1/2 NX9336C
           e4a   node1                      e4a         AFF-A700
           e4e   node1                      e4e         AFF-A700
node2/lldp
           e3a   S1                         Ethernet1/2 -
           e4a   node1                      e4a         -
           e4e   node1                      e4e         -
storage::*>
```

4. Run the show `lldp neighbors` command on the working switch to confirm that you can see both nodes and all shelves:

`show lldp neighbors`

**Show example**

```
S1# show lldp neighbors
Capability codes:
    (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device
    (W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other
Device ID        Local Intf   Hold-time   Capability   Port ID
node1            Eth1/1       121         S            e3a
node2            Eth1/2       121         S            e3a
SHFGD2008000011  Eth1/5       121         S            e0a
SHFGD2008000011  Eth1/6       120         S            e0a
SHFGD2008000022  Eth1/7       120         S            e0a
SHFGD2008000022  Eth1/8       120         S            e0a
```

5. Verify the shelf ports in the storage system:

```
storage shelf port show -fields remote-device,remote-port
```

**Show example**

```
storage::*> storage shelf port show -fields remote-device,remote-
port
shelf   id  remote-port    remote-device
-----   --  -----------    -------------
3.20    0   Ethernet1/5    S1
3.20    1   -              -
3.20    2   Ethernet1/6    S1
3.20    3   -              -
3.30    0   Ethernet1/7    S1
3.20    1   -              -
3.30    2   Ethernet1/8    S1
3.20    3   -              -
storage::*>
```

6. Remove all cables attached to storage switch S2.
7. Reconnect all cables to the replacement switch NS2.
8. Recheck the health status of the storage node ports:

```
storage port show -port-type ENET
```

**Show example**

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

9. Verify that both switches are available:

```
network device-discovery show
```

**Show example**

```
storage::*> network device-discovery show
Node/      Local Discovered
Protocol   Port  Device (LLDP: ChassisID)  Interface   Platform
--------   ----  ----------------------    ---------   ---------
node1/cdp
           e3a   S1                        Ethernet1/1 NX9336C
           e4a   node2                     e4a         AFF-A700
           e4e   node2                     e4e         AFF-A700
           e7b   NS2                       Ethernet1/1 NX9336C
node1/lldp
           e3a   S1                        Ethernet1/1 -
           e4a   node2                     e4a         -
           e4e   node2                     e4e         -
           e7b   NS2                       Ethernet1/1 -
node2/cdp
           e3a   S1                        Ethernet1/2 NX9336C
           e4a   node1                     e4a         AFF-A700
           e4e   node1                     e4e         AFF-A700
           e7b   NS2                       Ethernet1/2 NX9336C
node2/lldp
           e3a   S1                        Ethernet1/2 -
           e4a   node1                     e4a         -
           e4e   node1                     e4e         -
           e7b   NS2                       Ethernet1/2 -
storage::*>
```

10. Verify the shelf ports in the storage system:

```
storage shelf port show -fields remote-device,remote-port
```

**Show example**

```
storage::*> storage shelf port show -fields remote-device,remote-
port
shelf   id    remote-port       remote-device
-----   --    -----------       -------------
3.20    0     Ethernet1/5       S1
3.20    1     Ethernet1/5       NS2
3.20    2     Ethernet1/6       S1
3.20    3     Ethernet1/6       NS2
3.30    0     Ethernet1/7       S1
3.20    1     Ethernet1/7       NS2
3.30    2     Ethernet1/8       S1
3.20    3     Ethernet1/8       NS2
storage::*>
```

11. If you suppressed automatic case creation, re-enable it by invoking an AutoSupport message:

    ```
    system node autosupport invoke -node * -type all -message MAINT=END
    ```