Cisco Nexus 92300YC switches

Cluster and storage switches

NetApp
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Cisco Nexus 92300YC switch overview

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

You can install the Cisco Nexus 92300YC switch (X190003/R) in a NetApp system cabinet or third-party cabinet with the standard brackets that are included with the switch.

The following table lists the part number and description for the 92300YC switch, fans, and power supplies:

Part number	Description
190003	Cisco 92300YC, CLSW, 48Pt10/25GB, 18Pt100G, PTSX (PTSX = Port Side Exhaust)
190003R	Cisco 92300YC, CLSW, 48Pt10/25GB, 18Pt100G, PSIN (PSIN = Port Side Intake)
X-NXA-FAN-35CFM-B	Fan, Cisco N9K port side intake airflow
X-NXA-FAN-35CFM-F	Fan, Cisco N9K port side exhaust airflow
X-NXA-PAC-650W-B	Power supply, Cisco 650W - port side intake
X-NXA-PAC-650W-F	Power supply, Cisco 650W - port side exhaust

Cisco Nexus 92300YC switch airflow details:

- Port-side exhaust airflow (standard air) --Cool air enters the chassis through the fan and power supply modules in the cold aisle and exhausts through the port end of the chassis in the hot aisle. Port-side exhaust airflow with blue coloring.
- Port-side intake airflow (reverse air) --Cool air enters the chassis through the port end in the cold aisle and exhausts through the fan and power supply modules in the hot aisle. Port-side intake airflow with burgundy coloring.

Other supported Switches

- Nexus 3232C

  You can install the Cisco Nexus 3232C switch (X190100) NetApp system cabinet with the custom brackets that come with the switch, or you can install it in a rack with the standard brackets that are also included with the switch.

- Nexus 3132Q-V

  You can install the Cisco Nexus 3132Q-V switch (X190001) in a NetApp system cabinet or third-party cabinet with the standard brackets that are included with the switch.

The following cluster switches are no longer available from NetApp, but will be supported by Cisco for a limited time:

- Nexus 5596UP/5596T

  You can install the Cisco Nexus 5596UP switch (X1967-R6) or 5596T (X1989-R6) in a NetApp system cabinet with the custom brackets that come with the switch, or you can install it in a rack with the standard brackets that are also included with the switch.

  The Nexus 5596UP switch also supports one or two 16-port expansion modules (X1988-R6).

  The Nexus 5596T switch is only supported as a cluster interconnect switch for the FAS2520 and is intended to be used for performing nondisruptive hardware upgrades.

  End of Availability details.

Available documentation

The following table lists the documentation available for the Cisco Nexus 92300YC switches.

Title	Description
Setup the Cisco® Nexus 92300YC cluster switches	Describes how to setup and configure your Cisco Nexus 92300YC cluster switches.
Install NX-OS and Reference Configuration Files (RCFs)	Describes how to install NX-OS and reference configuration files (RCFs) on Nexus 92300YC cluster switch.
Configure a new Cisco Nexus 92300YC Switch	Describes how to migrate from environments that use older Cisco switches to environments that use Cisco 92300YC switches.
Migrate from an older Cisco Switch to a Cisco Nexus 92300YC Switch	Describes the procedure to replace an older Cisco switch with a Cisco Nexus 92300YC cluster switch.
Migrate from a two-node Switchless Cluster	Describes how to migrate from a two-node switchless cluster environment to a two-node switched environment using Cisco Nexus 92300YC cluster switches.
Replace a Cisco Nexus 92300YC Cluster Switch	Describes the procedure to replace a defective Cisco Nexus 92300YC switch in a cluster and download the switch operating system and reference configuration file.

Set up

Set up the switches

If you do not already have the required configuration information and documentation, you

need to gather that information before setting up your cluster and management network switches.

- You must have access to an HTTP, FTP or TFTP server at the installation site to download the applicable NX-OS and reference configuration file (RCF) releases.
- You must have the required cluster network and management network switch documentation.

  See Required documentation for more information.

- You must have the required controller documentation and ONTAP documentation.

  NetApp documentation

- You must have the applicable licenses, network and configuration information, and cables.
- You must have the completed cabling worksheets.

  Due to the complexity that can result from illustrating layers of cabling, this guide does not provide cabling graphics. This guide does provide sample worksheets with recommended port assignments and blank worksheets that you can use to set up your cluster.

  For more information refer to the Hardware Universe.

- 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.

  You must download the applicable NetApp cluster network and management network RCFs from the NetApp Support Site at mysupport.netapp.com for the switches that you receive.

- In addition, you might need to install the required configuration file to support the Cluster Switch Health Monitor (CSHM) for the 92300YC cluster switches. See Installing the Cluster Switch Health Monitor (CSHM) configuration file for 92300YC switches for details.

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 the *Installing a Cisco Nexus 9336C-FX2 cluster switch and pass-through panel in a NetApp cabinet* guide for instructions to install the switch in a NetApp cabinet.
Cisco Nexus 3232C in a NetApp system cabinet	See the *Installing a Cisco Nexus 3232C cluster switch and pass-through panel in a NetApp cabinet* guide for instructions to install the switch in a NetApp cabinet.
Cisco Nexus 3132Q-V in a NetApp system cabinet	See the *Installing a Cisco Nexus 3132Q-V cluster switch and pass-through panel in a NetApp cabinet* guide for instructions to install the switch in a NetApp cabinet.

If you are installing your…	Then…
Equipment in a Telco rack	See the procedures provided in the switch hardware installation guides and the NetApp installation and setup instructions.
Cisco Nexus 5596UP/5596T in a NetApp system cabinet	See the *Installing a Cisco Nexus 5596 cluster switch and pass-through panel in a NetApp cabinet* guide for instructions to install the switch in a NetApp cabinet.

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.
4. Perform an initial configuration of the cluster network switches based on information provided in Required configuration information.
5. 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.
6. Check the version on the cluster network switches, and if necessary, download the NetApp-supported version of the software to the switches.

   If you download the NetApp-supported version of the software, then you must also download the *NetApp Cluster Network Switch Reference Configuration File* and merge it with the configuration you saved in Step 5. You can download the file and the instructions from the Cisco Ethernet Switches page.

7. Check the software version on the network switches and, if necessary, download the NetApp-supported version of the software to the switches. If you have your own switches, refer to the Cisco site.

   If you download the NetApp-supported version of the software, then you must also download the *NetApp Management Network Switch Reference Configuration File* and merge it with the configuration you saved in Step 5. You can download the file and instructions from the Cisco Ethernet Switches page.

Related information

Required cluster configuration information

Required documentation

Sample and blank cabling worksheets

Required cluster configuration information

To configure your cluster, 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.

Required network information for all switches

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 A700 systems, the e0M interface uses a dedicated Ethernet port.

Refer to the Hardware Universe for latest information.

Required network information for Cisco Nexus 9336C-FX2, 92300YC, 3232C, 3132Q-V, and 5596UP/5596T switches

For the Cisco Nexus 9336C-FX2, 92300YC, 3232C, 3132Q-V, and 5596UP/5596T switches, you need to 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.

- 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.

- Enable the telnet service? (yes/no)

  Respond with **no**. The default is no.

- Enabled SSH service? (yes/no)

  Respond with **yes**. The default is yes.

  SSH is recommended when using 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).
- Configure the NTP server? (yes/no)

  Respond with **no**. The default is no.

- Configure default interface layer (L3/L2):

  Respond with **L2**. The default is L2.

- Configure default switch port interface state (shut/noshut):

  Respond with **noshut**. The default is noshut.

- Configure CoPP system profile (strict/moderate/lenient/dense):

  Respond with **strict**. The default is strict.

- Would you like to edit the configuration? (yes/no)

  You should see the new configuration at this point. Review and make any necessary changes to the configuration you just entered. Respond with **no** at the prompt if you are satisfied with the configuration. Respond with **yes** if you want to edit your configuration settings.

- Use this configuration and save it? (yes/no)

  Respond with **yes** to save the configuration. This automatically updates the kickstart and system images.

  If you do not save the configuration at this stage, none of the changes will be in effect the next time you reboot the switch.

For more information about the initial configuration of your switch, see the following guides:

Cisco Nexus 9336C-FX2 Installation and Upgrade Guides

Cisco Nexus 92300YC Installation and Upgrade Guides

Cisco Nexus 5000 Series Hardware Installation Guide

Cisco Nexus 3000 Series Hardware Installation Guide

Install the Cluster Switch Health Monitor (CSHM) configuration file for 92300YC switches

You can use this procedure to install the applicable configuration file for cluster switch health monitoring of Nexus 92300YC cluster switches. In ONTAP releases 9.5P7 and earlier and 9.6P2 and earlier, you must download the cluster switch health monitor configuration file separately. In ONTAP releases 9.5P8 and later, 9.6P3 and later, and 9.7 and later, the cluster switch health monitor configuration file is bundled with ONTAP.

Before you setup the switch health monitor for 92300YC cluster switches, you must ensure that the ONTAP cluster is up and running.

It is advisable to enable SSH in order to use all features available in CSHM.

1. Download the cluster switch health monitor configuration zip file based on the corresponding ONTAP release version. This file is available from the NetApp Software download page.
   a. On the Software download page, select **Switch Health Monitor Configuration Files**
   b. Select Platform = **ONTAP** and click **Go!**
   c. On the Switch Health Monitor Configuration Files for ONTAP page, click **View & Download**
   d. On the Switch Health Monitor Configuration Files for ONTAP - Description page, click **Download** for the applicable cluster switch model, for example: **Cisco Nexus 92300YC**
   e. On the End User License Agreement page, click **Accept**
   f. On the Switch Health Monitor Configuration Files for ONTAP - Download page, select the applicable configuration file, for example, **Cisco_Nexus_92300YC.zip**
2. Upload the applicable zip file to your internal web server where the IP address is X.X.X.X.

   For an internal web server IP address of 192.168.2.20 and assuming a /usr/download directory exists, you can upload your zip file to your web server using scp:

   ```
   % scp Cisco_Nexus_92300YC.zip
   admin@192.168.2.20:/usr/download/Cisco_Nexus_92300YC.zip
   ```

3. Access the advanced mode setting from one of the ONTAP systems in the cluster, using the command set-privilege advanced:

   ```
   cluster1::> set -privilege advanced
   ```

4. Run the switch health monitor configure command system cluster-switch configure-health-monitor -node * -package-url X.X.X.X/location_to_download_zip_file:

   ```
   cluster1::> system cluster-switch configure-health-monitor -node *
   -package-url 192.168.2.20/usr/download/Cisco_Nexus_92300YC.zip
   ```

5. Verify that the command output contains the text string "downloaded package processed successfully". If

an error occurs, contact NetApp support.

6. Run the command system cluster-switch show on the ONTAP system and ensure that the cluster switches are discovered with the monitored field set to "True".

```
cluster1::> system cluster-switch show
```

If at any time you revert to an earlier version of ONTAP, you will need to install the CSHM configuration file again to enable switch health monitoring of 92300YC cluster switches.

Required documentation

You need specific switch and controller documentation to set up your ONTAP cluster.

Required documentation for cluster network switches

To set up the Cisco Nexus 9336C-FX2 and 92300YC 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.

Document title	Description
Regulatory Compliance and Safety Information for Cisco Nexus 9000 Series	Provides international agency compliance, safety, and statutory information for the Nexus 9000 series switches.

To set up the Cisco Nexus 3232C and 3132Q-V switches, you need the following documentation from the Cisco Nexus 3000 Series Switches Support page:

Document title	Description
Nexus 3000 Series Hardware Installation Guide	Provides detailed information about site requirements, switch hardware details, and installation options.
Cisco Nexus 3000 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 3000 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 3000 Series NX-OS Command Reference Master Index	Provides links to the various command references provided by Cisco.
Cisco Nexus 3000 MIBs Reference	Describes the Management Information Base (MIB) files for the Nexus 3000 switches.
Nexus 3000 Series NX-OS System Message Reference	Describes the system messages for Cisco Nexus 3000 series switches, those that are informational, and others that might help diagnose problems with links, internal hardware, or the system software.
Cisco Nexus 3000 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 3000 Series.
Regulatory, Compliance, and Safety Information for the Cisco Nexus 6000, Cisco Nexus 5000 Series, Cisco Nexus 3000 Series, and Cisco Nexus 2000 Series	Provides international agency compliance, safety, and statutory information for the Nexus 3000 series switches.

To set up the Cisco Nexus 5596 switch, you need the following documents from Cisco Nexus 5000 Series Switches Support page:

Document title	Description
Nexus 5000 Series Hardware Installation Guide	Provides detailed information about site requirements, switch hardware details, and installation options.
Cisco Nexus 5000 Series Switch Software Configuration Guide (choose the guide for the software you are using)	Provides initial switch configuration information that you need before you can configure the switch for ONTAP operation.
Cisco Nexus 5000 Series NX-OS Software Upgrade and Downgrade Guide	Provides information about how to downgrade the switch to the supported ONTAP switch software, if necessary.
Cisco Nexus 5000 Series NX-OS Command Reference Master Index	Provides an alphabetical list of all the commands supported for a specific NX-OS release.
Cisco Nexus 5000 and Nexus 2000 MIBs Reference	Describes the Management Information Base (MIB) files for the Nexus 5000 switches.
Nexus 5000 Series NX-OS System Message Reference	Describes troubleshooting information.
Regulatory, Compliance, and Safety Information for the Cisco Nexus 6000 Series, Cisco Nexus 5000 Series, Cisco Nexus 3000 Series, and Cisco Nexus 2000 Series	Provides international agency compliance, safety, and statutory information for the Nexus 5000 series switches.

Required documentation for supported ONTAP systems

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 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.
Installing a Cisco Nexus 3232C cluster switch and pass-through panel in a NetApp cabinet	Describes how to install a Cisco Nexus 3232C switch in a four-post NetApp cabinet.
Installing a Cisco Nexus 3132Q-V switch and pass-through panel in a NetApp Cabinet	Describes how to install a Cisco Nexus 3132Q-V switch in a four-post NetApp cabinet.
Installing a Cisco Nexus 5596 switch and pass-through panel in a NetApp Cabinet	Describes how to install a Cisco Nexus 5596 switch in a NetApp cabinet.

Considerations for using Smart Call Home

Smart Call Home monitors the hardware and software components on your network, to generate an email-based notification of critical system conditions. When an event occurs on your device, Smart Call Home raises an alert to all the recipients that are configured in your destination profile.

You must configure a cluster network switch to communicate using email with the Smart Call Home system. 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 feature, you need to 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.

Cisco support site

Sample and blank cabling worksheets

Cisco Nexus 9336C-FX2 cabling worksheet

If you want to document the supported platforms, you must complete the blank cabling worksheet by using the completed sample cabling worksheet as a guide.

Sample cabling worksheet

The sample port definition on each pair of switches is as follows:

Cluster switch A		Cluster switch B	
Switch port	Node and port usage	Switch port	Node and port usage
1	4x10GbE node 1	1	4x10GbE node 1
2	4x10GbE node 2	2	4x10GbE node 2
3	4x10GbE node 3	3	4x10GbE node 3
4	4x25GbE node 4	4	4x25GbE node 4
5	4x25GbE node 5	5	4x25GbE node 5
6	4x25GbE node 6	6	4x25GbE node 6
7	4x100GbE node 7	7	4x100GbE node 7
8	4x100GbE node 8	8	4x100GbE node 8
9	4x100GbE node 9	9	4x100GbE node 9
10	4x100GbE node 10	10	4x100GbE node 10
11	4x100GbE node 11	11	4x100GbE node 11
12	4x100GbE node 12	12	4x100GbE node 12
13	4x100GbE node 13	13	4x100GbE node 13
14	4x100GbE node 14	14	4x100GbE node 14
15	4x100GbE node 15	15	4x100GbE node 15
16	4x100GbE node 16	16	4x100GbE node 16
17	4x100GbE node 17	17	4x100GbE node 17
18	4x100GbE node 18	18	4x100GbE node 18
19	4x100GbE node 19	19	4x100GbE node 19
20	4x100GbE node 20	20	4x100GbE node 20

Cluster switch A		Cluster switch B	
21	4x100GbE node 21	21	4x100GbE node 21
22	4x100GbE node 22	22	4x100GbE node 22
23	4x100GbE node 23	23	4x100GbE node 23
24	4x100GbE node 24	24	4x100GbE node 24
25 through 34	Reserved	25 through 34	Reserved
35	100G ISL to switch B port 35	35	100G ISL to switch A port 35
36	100G ISL to switch B port 36	36	100G ISL to switch A port 36

Blank cabling worksheet

You can use the blank cabling worksheet to document the platforms that are supported as nodes in a cluster. The *Supported Cluster Connections* section of the *Hardware Universe* defines the cluster ports used by the platform.

Cluster switch A		Cluster switch B	
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	

Cluster switch A		Cluster switch B	
11		11	
12		12	
13		13	
14		14	
15		15	
16		16	
17		17	
18		18	
19		19	
20		20	
21		21	
22		22	
23		23	
24		24	
25 through 34	Reserved	25 through 34	Reserved
35	100G ISL to switch B port 35	35	100G ISL to switch A port 35
36	100G ISL to switch B port 36	36	100G ISL to switch A port 36

Cisco Nexus 92300YC cabling worksheet

If you want to document the supported platforms, you must complete the blank cabling worksheet by using the completed sample cabling worksheet as a guide.

Sample cabling worksheet

The sample port definition on each pair of switches is as follows:

Cluster switch A		Cluster switch B	
Switch port	Node and port usage	Switch port	Node and port usage
1	10/25 GbE node	1	10/25 GbE node
2	10/25 GbE node	2	10/25 GbE node
3	10/25 GbE node	3	10/25 GbE node
4	10/25 GbE node	4	10/25 GbE node
5	10/25 GbE node	5	10/25 GbE node
6	10/25 GbE node	6	10/25 GbE node
7	10/25 GbE node	7	10/25 GbE node
8	10/25 GbE node	8	10/25 GbE node
9	10/25 GbE node	9	10/25 GbE node
10	10/25 GbE node	10	10/25 GbE node
11	10/25 GbE node	11	10/25 GbE node
12	10/25 GbE node	12	10/25 GbE node
13	10/25 GbE node	13	10/25 GbE node
14	10/25 GbE node	14	10/25 GbE node
15	10/25 GbE node	15	10/25 GbE node
16	10/25 GbE node	16	10/25 GbE node
17	10/25 GbE node	17	10/25 GbE node
18	10/25 GbE node	18	10/25 GbE node
19	10/25 GbE node	19	10/25 GbE node
20	10/25 GbE node	20	10/25 GbE node
21	10/25 GbE node	21	10/25 GbE node

Cluster switch A		Cluster switch B	
22	10/25 GbE node	22	10/25 GbE node
23	10/25 GbE node	23	10/25 GbE node
24	10/25 GbE node	24	10/25 GbE node
25	10/25 GbE node	25	10/25 GbE node
26	10/25 GbE node	26	10/25 GbE node
27	10/25 GbE node	27	10/25 GbE node
28	10/25 GbE node	28	10/25 GbE node
29	10/25 GbE node	29	10/25 GbE node
30	10/25 GbE node	30	10/25 GbE node
31	10/25 GbE node	31	10/25 GbE node
32	10/25 GbE node	32	10/25 GbE node
33	10/25 GbE node	33	10/25 GbE node
34	10/25 GbE node	34	10/25 GbE node
35	10/25 GbE node	35	10/25 GbE node
36	10/25 GbE node	36	10/25 GbE node
37	10/25 GbE node	37	10/25 GbE node
38	10/25 GbE node	38	10/25 GbE node
39	10/25 GbE node	39	10/25 GbE node
40	10/25 GbE node	40	10/25 GbE node
41	10/25 GbE node	41	10/25 GbE node
42	10/25 GbE node	42	10/25 GbE node
43	10/25 GbE node	43	10/25 GbE node

Cluster switch A		Cluster switch B	
44	10/25 GbE node	44	10/25 GbE node
45	10/25 GbE node	45	10/25 GbE node
46	10/25 GbE node	46	10/25 GbE node
47	10/25 GbE node	47	10/25 GbE node
48	10/25 GbE node	48	10/25 GbE node
49	40/100 GbE node	49	40/100 GbE node
50	40/100 GbE node	50	40/100 GbE node
51	40/100 GbE node	51	40/100 GbE node
52	40/100 GbE node	52	40/100 GbE node
53	40/100 GbE node	53	40/100 GbE node
54	40/100 GbE node	54	40/100 GbE node
55	40/100 GbE node	55	40/100 GbE node
56	40/100 GbE node	56	40/100 GbE node
57	40/100 GbE node	57	40/100 GbE node
58	40/100 GbE node	58	40/100 GbE node
59	40/100 GbE node	59	40/100 GbE node
60	40/100 GbE node	60	40/100 GbE node
61	40/100 GbE node	61	40/100 GbE node
62	40/100 GbE node	62	40/100 GbE node
63	40/100 GbE node	63	40/100 GbE node
64	40/100 GbE node	64	40/100 GbE node

Cluster switch A		Cluster switch B	
65	100 GbE ISL to switch B port 65	65	100 GbE ISL to switch A port 65
66	100 GbE ISL to switch B port 66	66	100 GbE ISL to switch A port 65

Blank cabling worksheet

You can use the blank cabling worksheet to document the platforms that are supported as nodes in a cluster. The *Supported Cluster Connections* section of the *Hardware Universe* defines the cluster ports used by the platform.

Cluster switch A		Cluster switch B	
Switch port	Node/port usage	Switch port	Node/port usage
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	
11		11	
12		12	
13		13	
14		14	
15		15	

Cluster switch A		Cluster switch B	
16		16	
17		17	
18		18	
19		19	
20		20	
21		21	
22		22	
23		23	
24		24	
25		25	
26		26	
27		27	
28		28	
29		29	
30		30	
31		31	
32		32	
33		33	
34		34	
35		35	
36		36	
37		37	

Cluster switch A		Cluster switch B	
38		38	
39		39	
40		40	
41		41	
42		42	
43		43	
44		44	
45		45	
46		46	
47		47	
48		48	
49		49	
50		50	
51		51	
52		52	
53		53	
54		54	
55		55	
56		56	
57		57	
58		58	
59		59	

Cluster switch A		Cluster switch B	
60		60	
61		61	
62		62	
63		63	
64		64	
65	ISL to switch B port 65	65	ISL to switch A port 65
66	ISL to switch B port 66	66	ISL to switch A port 66

Cisco Nexus 3232C cabling worksheet

If you want to document the supported platforms, you must complete the blank cabling worksheet by using the completed sample cabling worksheet as a guide. Each switch can be configured as a single 100GbE, 40GbE port or 4 x 10GbE ports.

Sample cabling worksheet

The sample port definition on each pair of switches is as follows:

Cluster switch A		Cluster switch B	
Switch port	Node and port usage	Switch port	Node and port usage
1	4x10G/40G/100G node	1	4x10G/40G/100G node
2	4x10G/40G/100G node	2	4x10G/40G/100G node
3	4x10G/40G/100G node	3	4x10G/40G/100G node
4	4x10G/40G/100G node	4	4x10G/40G/100G node
5	4x10G/40G/100G node	5	4x10G/40G/100G node
6	4x10G/40G/100Gnode	6	4x10G/40G/100Gnode
7	4x10G/40G/100G node	7	4x10G/40G/100G node
8	4x10G/40G/100G node	8	4x10G/40G/100G node
9	4x10G/40G/100G node	9	4x10G/40G/100G node

Cluster switch A		Cluster switch B	
10	4x10G/40G/100G node	10	4x10G/40G/100G node
11	4x10G/40G/100G node	11	4x10G/40G/100G node
12	4x10G/40G/100G node	12	4x10G/40G/100G node
13	4x10G/40G/100G node	13	4x10G/40G/100G node
14	4x10G/40G/100G node	14	4x10G/40G/100G node
15	4x10G/40G/100G node	15	4x10G/40G/100G node
16	4x10G/40G/100G node	16	4x10G/40G/100G node
17	4x10G/40G/100G node	17	4x10G/40G/100G node
18	4x10G/40G/100G node	18	4x10G/40G/100G node
19	40G/100G node 19	19	40G/100G node 19
20	40G/100G node 20	20	40G/100G node 20
21	40G/100G node 21	21	40G/100G node 21
22	40G/100G node 22	22	40G/100G node 22
23	40G/100G node 23	23	40G/100G node 23
24	40G/100G node 24	24	40G/100G node 24
25 through 30	Reserved	25 through 30	Reserved
31	100G ISL to switch B port 31	31	100G ISL to switch A port 31
32	100G ISL to switch B port 32	32	100G ISL to switch A port 32

Blank cabling worksheet

You can use the blank cabling worksheet to document the platforms that are supported as nodes in a cluster. The *Supported Cluster Connections* section of the *Hardware Universe* defines the cluster ports used by the platform.

Cluster switch A		Cluster switch B	
Switch port	Node/port usage	Switch port	Node/port usage
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	
11		11	
12		12	
13		13	
14		14	
15		15	
16		16	
17		17	
18		18	
19		19	
20		20	
21		21	

Cluster switch A		Cluster switch B	
22		22	
23		23	
24		24	
25 through 30	Reserved	25 through 30	Reserved
31	100G ISL to switch B port 31	31	100G ISL to switch A port 31
32	100G ISL to switch B port 32	32	100G ISL to switch A port 32

Cisco Nexus 3132Q-V cabling worksheet

If you want to document the supported platforms, you must complete the blank cabling worksheet by using the completed sample cabling worksheet as a guide. Each switch can be configured as a single 40GbE port or 4 x 10GbE ports.

Sample cabling worksheet

The sample port definition on each pair of switches is as follows:

Cluster switch A		Cluster switch B	
Switch port	Node and port usage	Switch port	Node and port usage
1	4x10G/40G node	1	4x10G/40G node
2	4x10G/40G node	2	4x10G/40G node
3	4x10G/40G node	3	4x10G/40G node
4	4x10G/40G node	4	4x10G/40G node
5	4x10G/40G node	5	4x10G/40G node
6	4x10G/40G node	6	4x10G/40G node
7	4x10G/40G node	7	4x10G/40G node
8	4x10G/40G node	8	4x10G/40G node
9	4x10G/40G node	9	4x10G/40G node

Cluster switch A		Cluster switch B	
10	4x10G/40G node	10	4x10G/40G node
11	4x10G/40G node	11	4x10G/40G node
12	4x10G/40G node	12	4x10G/40G node
13	4x10G/40G node	13	4x10G/40G node
14	4x10G/40G node	14	4x10G/40G node
15	4x10G/40G node	15	4x10G/40G node
16	4x10G/40G node	16	4x10G/40G node
17	4x10G/40G node	17	4x10G/40G node
18	4x10G/40G node	18	4x10G/40G node
19	40G node 19	19	40G node 19
20	40G node 20	20	40G node 20
21	40G node 21	21	40G node 21
22	40G node 22	22	40G node 22
23	40G node 23	23	40G node 23
24	40G node 24	24	40G node 24
25 through 30	Reserved	25 through 30	Reserved
31	40G ISL to switch B port 31	31	40G ISL to switch A port 31
32	40G ISL to switch B port 32	32	40G ISL to switch A port 32

Blank cabling worksheet

You can use the blank cabling worksheet to document the platforms that are supported as nodes in a cluster. The *Supported Cluster Connections* section of the *Hardware Universe* defines the cluster ports used by the platform.

Cluster switch A		Cluster switch B	
Switch port	Node/port usage	Switch port	Node/port usage
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	
11		11	
12		12	
13		13	
14		14	
15		15	
16		16	
17		17	
18		18	
19		19	
20		20	
21		21	

Cluster switch A		Cluster switch B	
22		22	
23		23	
24		24	
25 through 30	Reserved	25 through 30	Reserved
31	40G ISL to switch B port 31	31	40G ISL to switch A port 31
32	40G ISL to switch B port 32	32	40G ISL to switch A port 32

Cisco Nexus 5596UP and 5596T cabling worksheet

If you want to document the supported platforms, you must complete the blank cabling worksheet by using the completed sample cabling worksheet as a guide.

Sample cabling worksheet

Some platforms support more than one 10GbE cluster port connection per cluster interconnect switch. To support additional cluster connections, you can use ports 25 through 40, as well as ports 49 through 80 when expansion modules are installed.

The sample port definition on each pair of switches is as follows:

Cluster switch A		Cluster switch B	
Switch port	Node and port usage	Switch port	Node and port usage
1	Node port 1	1	Node port 1
2	Node port 2	2	Node port 2
3	Node port 3	3	Node port 3
4	Node port 4	4	Node port 4
5	Node port 5	5	Node port 5
6	Node port 6	6	Node port 6
7	Node port 7	7	Node port 7
8	Node port 8	8	Node port 8

Cluster switch A		Cluster switch B	
9	Node port 9	9	Node port 9
10	Node port 10	10	Node port 10
11	Node port 11	11	Node port 11
12	Node port 12	12	Node port 12
13	Node port 13	13	Node port 13
14	Node port 14	14	Node port 14
15	Node port 15	15	Node port 15
16	Node port 16	16	Node port 16
17	Node port 17	17	Node port 17
18	Node port 18	18	Node port 18
19	Node port 19	19	Node port 19
20	Node port 20	20	Node port 20
21	Node port 21	21	Node port 21
22	Node port 22	22	Node port 22
23	Node port 23	23	Node port 23
24	Node port 24	24	Node port 24
25 through 40	Reserved	25 through 40	Reserved
41	ISL to switch B port 41	41	ISL to switch A port 41
42	ISL to switch B port 42	42	ISL to switch A port 42
43	ISL to switch B port 43	43	ISL to switch A port 43
44	ISL to switch B port 44	44	ISL to switch A port 44
45	ISL to switch B port 45	45	ISL to switch A port 45

Cluster switch A		Cluster switch B	
46	ISL to switch B port 46	46	ISL to switch A port 46
47	ISL to switch B port 47	47	ISL to switch A port 47
48	ISL to switch B port 48	48	ISL to switch A port 48

Blank cabling worksheet

You can use the blank cabling worksheet to document the platforms that are supported as nodes in a cluster. The *Supported Cluster Connections* section of the *Hardware Universe* defines the cluster ports used by the platform.

Switch ports 1 through 24 function as 10 GbE ports. Switch ports 41 through 48 are reserved for Inter-Switch Links (ISLs).

Cluster switch A		Cluster switch B	
Switch port	Node/port usage	Switch port	Node/port usage
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	
11		11	
12		12	
13		13	

Cluster switch A		Cluster switch B	
14		14	
15		15	
16		16	
17		17	
18		18	
19		19	
20		20	
21		21	
22		22	
23		23	
24		24	
25 through 40	Reserved	25 through 40	Reserved
41	ISL to switch B port 41	41	ISL to switch A port 41
42	ISL to switch B port 42	42	ISL to switch A port 42
43	ISL to switch B port 43	43	ISL to switch A port 43
44	ISL to switch B port 44	44	ISL to switch A port 44
45	ISL to switch B port 45	45	ISL to switch A port 45
46	ISL to switch B port 46	46	ISL to switch A port 46
47	ISL to switch B port 47	47	ISL to switch A port 47
48	ISL to switch B port 48	48	ISL to switch A port 48

Sample and blank cabling worksheets

The sample cabling worksheets provide examples of recommended port assignments

from the switches to the controllers. The blank worksheets provide a template that you can use in setting up your cluster.

Configure a new Cisco Nexus 92300YC switch

Configure a new Cisco Nexus 92300YC switch

You can configure a new Nexus 92300YC switch by completing the steps detailed in this chapter.

Installing the Nexus 92300YC switch on systems running ONTAP 9.6 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 92300YC switch before controllers are added.

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

- The Nexus 92300YC 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.
- The Inter-Switch Links (ISLs) supported for the Nexus 92300YC switches are ports 1/65 and 1/66.
- The node connections supported for the Nexus 92300YC switches are ports 1/1 through 1/66.
- The examples in this procedure use two nodes, but you can have up to 24 nodes in a cluster.

Initial installation of the Cisco Nexus 92300YC switch

You can use this procedure to perform the initial installation of the Cisco Nexus 92300YC switch.

About this task

You can download the applicable NetApp Cisco NX-OS software for your switches from the NetApp Support site.

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:

Steps

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 92300YC 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]: *y*
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]:
```

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

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

2. Enter and confirm the password for user admin:

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

3. 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):
```

4. Create another login account:

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

5. 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]:
```

6. Configure the cluster switch name:

```
Enter the switch name : cs2
```

7. 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
```

8. Configure advanced IP options:

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

9. Configure Telnet services:

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

10. 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
```

11. 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
```

12. 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.
```

Install the NX-OS software

You can use this procedure to install the NX-OS software on the Nexus 92300YC switch.

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.

   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 92300YC switch.

```
cs2# copy sftp: bootflash: vrf management
Enter source filename: /code/nxos.9.2.2.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.9.2.2.bin  /bootflash/nxos.9.2.2.bin
/code/nxos.9.2.2.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.9.2.2.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.9.2.2.img  /bootflash/n9000-epld.9.2.2.img
/code/n9000-epld.9.2.2.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) 2002-2018, 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.
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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 05.31
  NXOS: version 9.2(1)
  BIOS compile time:  05/17/2018
  NXOS image file is: bootflash:///nxos.9.2.1.bin
  NXOS compile time:  7/17/2018 16:00:00 [07/18/2018 00:21:19]


Hardware
  cisco Nexus9000 C92300YC Chassis
  Intel(R) Xeon(R) CPU D-1526 @ 1.80GHz with 16337884 kB of memory.
  Processor Board ID FDO220329V5

  Device name: cs2
  bootflash:  115805356 kB
Kernel uptime is 0 day(s), 4 hour(s), 23 minute(s), 11 second(s)

Last reset at 271444 usecs after Wed Apr 10 00:25:32 2019
  Reason: Reset Requested by CLI command reload
  System version: 9.2(1)
  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.9.2.2.bin

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

Verifying image bootflash:/nxos.9.2.2.bin for boot variable "nxos".
[] 100% -- SUCCESS

Verifying image type.
[] 100% -- SUCCESS

Preparing "nxos" version info using image bootflash:/nxos.9.2.2.bin.
[] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/nxos.9.2.2.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                                   9.2(1)
9.2(2)         yes
  1       bios    v05.31(05/17/2018):v05.28(01/18/2018)
v05.33(09/08/2018)       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
2019 Apr 10 04:59:35 cs2 %$ VDC-1 %$ %VMAN-2-ACTIVATION_STATE:
Successfully deactivated virtual service 'guestshell+'

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
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unless
otherwise stated, there is no warranty, express or implied, including
but not
limited to warranties of merchantability and fitness for a particular
purpose.
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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 9.2(2)
  BIOS compile time:  09/08/2018
  NXOS image file is: bootflash:///nxos.9.2.2.bin
  NXOS compile time:  11/4/2018 21:00:00 [11/05/2018 06:11:06]


Hardware
  cisco Nexus9000 C92300YC Chassis
  Intel(R) Xeon(R) CPU D-1526 @ 1.80GHz with 16337884 kB of memory.
  Processor Board ID FDO220329V5

  Device name: cs2
  bootflash:  115805356 kB
  Kernel uptime is 0 day(s), 0 hour(s), 3 minute(s), 52 second(s)

Last reset at 182004 usecs after Wed Apr 10 04:59:48 2019
  Reason: Reset due to upgrade
  System version: 9.2(1)
  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.9.2.2.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 92300YC switch for the first time. You can also use this procedure to upgrade your RCF version.

About this task

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 `node1` and `node2`.
- The cluster LIF names are `node1_clus1`, `node1_clus2`, `node2_clus1`, and `node2_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; ONTAP commands are used unless otherwise indicated.
- Before you perform this procedure, make sure that you have a current backup of the switch configuration.

Steps

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
----------- ------ ------------------------- ----------------
------------
node1/cdp
            e0a    cs1                       Ethernet1/1/1     N9K-
C92300YC
            e0b    cs2                       Ethernet1/1/1     N9K-
C92300YC
node2/cdp
            e0a    cs1                       Ethernet1/1/2     N9K-
C92300YC
            e0b    cs2                       Ethernet1/1/2     N9K-
C92300YC
cluster1::*>
```

2. Check the administrative and operational status of each cluster port.
   a. Verify that all the cluster ports are up with a healthy status: `network port show -ipspace Cluster`

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

Node: node1

Ignore
                                                  Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0c       Cluster      Cluster          up   9000  auto/100000
healthy false
e0d       Cluster      Cluster          up   9000  auto/100000
healthy false

Node: node2

Ignore
                                                  Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0c       Cluster      Cluster          up   9000  auto/100000
healthy false
e0d       Cluster      Cluster          up   9000  auto/100000
healthy false
cluster1::*>
```

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

```
cluster1::*> network interface show -vserver Cluster
            Logical              Status     Network            Current
Current Is
Vserver     Interface            Admin/Oper Address/Mask       Node
Port    Home
----------- ------------------ ---------- -----------------
------------ ------- ----
Cluster
            node1_clus1          up/up      169.254.3.4/23     node1
e0c     true
            node1_clus2          up/up      169.254.3.5/23     node1
e0d     true
            node2_clus1          up/up      169.254.3.8/23     node2
e0c     true
            node2_clus2          up/up      169.254.3.9/23     node2
e0d     true
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    10.233.205.92    N9K-
C92300YC
     Serial Number: FOXXXXXXXGS
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS) Software,
Version
                    9.3(4)
    Version Source: CDP

cs2                           cluster-network    10.233.205.93    N9K-
C92300YC
     Serial Number: FOXXXXXXXGD
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS) Software,
Version
                    9.3(4)
    Version Source: CDP

2 entries were displayed.
```

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 e1/1-64
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 -vserver Cluster`

```
cluster1::*> network interface show -vserver Cluster
            Logical           Status     Network            Current
Current Is
Vserver     Interface         Admin/Oper Address/Mask       Node
Port    Home
----------- ----------------- ---------- ------------------
------------ ------- ----
Cluster
            node1_clus1       up/up      169.254.3.4/23     node1
e0c     true
            node1_clus2       up/up      169.254.3.5/23     node1
e0c     false
            node2_clus1       up/up      169.254.3.8/23     node2
e0c     true
            node2_clus2       up/up      169.254.3.9/23     node2
e0c     false
cluster1::*>
```

6. Verify that the cluster is healthy: `cluster show`

```
cluster1::*> cluster show
Node           Health  Eligibility   Epsilon
-------------- ------- ------------  -------
node1          true    true          false
node2          true    true          false
cluster1::*>
```

7. If you do not already have a current backup of the switch, you can save the current switch configuration by copying the output of the following command to a log file:

   `show running-config`

8. 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.

9. 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 Switches 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: /code/Nexus_92300YC_RCF_v1.0.2.txt
Enter hostname for the tftp 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:
tftp> progress
Progress meter enabled
tftp> get /code/Nexus_92300YC_RCF_v1.0.2.txt /bootflash/nxos.9.2.2.bin
/code/Nexus_92300YC_R  100% 9687   530.2KB/s   00:00
tftp> exit
Copy complete, now saving to disk (please wait)...
Copy complete.
```

10. Apply the RCF previously downloaded to the bootflash.

    For more information on Cisco commands, see the appropriate guide in the Cisco Nexus 9000 Series Switches guides.

    This example shows the RCF file `Nexus_92300YC_RCF_v1.0.2.txt` being installed on switch cs2:

```
cs2# copy Nexus_92300YC_RCF_v1.0.2.txt running-config echo-commands

Disabling ssh: as its enabled right now:
 generating ecdsa key(521 bits)......
generated ecdsa key

Enabling ssh: as it has been disabled
 this command enables edge port type (portfast) by default on all
interfaces. You
 should now disable edge port type (portfast) explicitly on switched
ports leading to hubs,
 switches and bridges as they may create temporary bridging loops.

Edge port type (portfast) should only be enabled on ports connected to a
single
 host. Connecting hubs, concentrators, switches, bridges, etc...  to
this
 interface when edge port type (portfast) is enabled, can cause
temporary bridging loops.
 Use with CAUTION

Edge Port Type (Portfast) has been configured on Ethernet1/1 but will
only
 have effect when the interface is in a non-trunking mode.

...

Copy complete, now saving to disk (please wait)...
Copy complete.
```

11. Verify on the switch that the RCF has been merged successfully:

```
show running-config
```

```
cs2# show running-config
!Command: show running-config
!Running configuration last done at: Wed Apr 10 06:32:27 2019
!Time: Wed Apr 10 06:36:00 2019

version 9.2(2) Bios:version 05.33
switchname cs2
vdc cs2 id 1
  limit-resource vlan minimum 16 maximum 4094
  limit-resource vrf minimum 2 maximum 4096
  limit-resource port-channel minimum 0 maximum 511
  limit-resource u4route-mem minimum 248 maximum 248
  limit-resource u6route-mem minimum 96 maximum 96
  limit-resource m4route-mem minimum 58 maximum 58
  limit-resource m6route-mem minimum 8 maximum 8

feature lacp

no password strength-check
username admin password 5
$5$HY9Kk3F9$YdCZ8iQJ1RtoiEFa0sKP5IO/LNG1k9C4lSJfi5kesl
6  role network-admin
ssh key ecdsa 521

banner motd #

*
*
*  Nexus 92300YC Reference Configuration File (RCF) v1.0.2 (10-19-2018)
*
*
*
*  Ports 1/1  - 1/48: 10GbE Intra-Cluster Node Ports
*
*  Ports 1/49 - 1/64: 40/100GbE Intra-Cluster Node Ports
*
*  Ports 1/65 - 1/66: 40/100GbE Intra-Cluster ISL Ports
*
*
*
```

When applying the RCF for the first time, the **ERROR: Failed to write VSH commands** message is expected and can be ignored.

12. 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.

13. 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 Switches guides.

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

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

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

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

    a. Verify that e0d ports are up and healthy across all nodes in the cluster: `network port show -ipspace Cluster`

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

Node: node1

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

Node: node2

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

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
----------- ------ ------------------------ -----------------
------------
node1/cdp
            e0a    cs1                      Ethernet1/1       N9K-
C92300YC
            e0b    cs2                      Ethernet1/1       N9K-
C92300YC
node2/cdp
            e0a    cs1                      Ethernet1/2       N9K-
C92300YC
            e0b    cs2                      Ethernet1/2       N9K-
C92300YC

cluster1::*> system cluster-switch show -is-monitoring-enabled
-operational true
Switch                      Type               Address          Model
--------------------------- ------------------ ----------------
------------
cs1                         cluster-network    10.233.205.90    N9K-
C92300YC
     Serial Number: FOXXXXXXXGD
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS) Software,
Version
                    9.3(4)
    Version Source: CDP

cs2                         cluster-network    10.233.205.91    N9K-
C92300YC
     Serial Number: FOXXXXXXXGS
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS) Software,
Version
                    9.3(4)
    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.
```

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 e1/1-64
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 -vserver Cluster`

```
cluster1::*> network interface show -vserver Cluster
            Logical          Status     Network            Current
Current Is
Vserver     Interface        Admin/Oper Address/Mask       Node
Port    Home
----------- ---------------- ---------- ------------------
----------------- ------- ----
Cluster
            node1_clus1      up/up      169.254.3.4/23     node1
e0d     false
            node1_clus2      up/up      169.254.3.5/23     node1
e0d     true
            node2_clus1      up/up      169.254.3.8/23     node2
e0d     false
            node2_clus2      up/up      169.254.3.9/23     node2
e0d     true
cluster1::*>
```

18. Verify that the cluster is healthy: `cluster show`

```
cluster1::*> cluster show
Node           Health   Eligibility   Epsilon
-------------- -------- ------------- -------
node1          true     true          false
node2          true     true          false
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
.
.
Ethernet1/1      1       eth  access up      none
10G(D) --
Ethernet1/2      1       eth  access up      none
10G(D) --
Ethernet1/3      1       eth  trunk  up      none
100G(D) --
Ethernet1/4      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      Eth1/65(P)   Eth1/66(P)
cs1#
```

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

```
cluster1::*> network interface show -vserver Cluster
            Logical       Status     Network            Current
Current Is
Vserver     Interface     Admin/Oper Address/Mask       Node
Port    Home
----------- ------------- ---------- ------------------ -------------
------- ----
Cluster
            node1_clus1   up/up      169.254.3.4/23     node1
e0d     true
            node1_clus2   up/up      169.254.3.5/23     node1
e0d     true
            node2_clus1   up/up      169.254.3.8/23     node2
e0d     true
            node2_clus2   up/up      169.254.3.9/23     node2
e0d     true
cluster1::*>
```

25. Verify that the cluster is healthy: `cluster show`

```
cluster1::*> cluster show
Node           Health  Eligibility   Epsilon
-------------- ------- ------------- -------
node1          true    true          false
node2          true    true          false
```

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

```
cluster1::*> cluster ping-cluster -node local
Host is node1
Getting addresses from network interface table...
Cluster node1_clus1 169.254.3.4 node1 e0a
Cluster node1_clus2 169.254.3.5 node1 e0b
Cluster node2_clus1 169.254.3.8 node2 e0a
Cluster node2_clus2 169.254.3.9 node2 e0b
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)
```

For ONTAP 9.8 and later

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

Enter: `system switch ethernet log setup-password`

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

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

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

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

Enabling cluster switch log collection.

cluster1::*>
```

For ONTAP 9.4 and later

For ONTAP 9.4 and later, enable the cluster 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`

Enter: `system cluster-switch log setup-password`

```
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>
```

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

```
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 NX-OS software and RCF on Cisco Nexus 92300YC cluster switches

Install NX-OS software and RCF on Cisco Nexus 92300YC cluster switches

The Cisco NX-OS software and reference configuration files (RCFs) must be installed on Cisco Nexus 92300YC cluster switches.

Before you begin

The following conditions must exist before you install the NX-OS software and Reference Configurations Files (RCFs) on the cluster switch:

- The cluster must be fully functioning (there should be no errors in the logs or similar issues).
- You must have checked or set your desired boot configuration in the RCF to reflect the desired boot images if you are installing only NX-OS and keeping your current RCF version.
- If you need to change the boot configuration to reflect the current boot images, you must do so before reapplying the RCF so that the correct version is instantiated on future reboots.
- You must have consulted the switch compatibility table on the Cisco Ethernet switch page for the supported ONTAP, NX-OS, and RCF versions.
- There can be command dependencies between the command syntax in the RCF and that found in versions of NX-OS.
- You must have referred to the appropriate software and upgrade guides available on the Cisco web site for complete documentation on the Cisco switch upgrade and downgrade procedures on the Cisco Nexus 9000 Series Switches page.
- You must have the current RCF.

About this task

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.

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 `node1` and `node2`.
- The cluster LIF names are `node1_clus1` and `node1_clus2` for node1 and `node2_clus1` and `node2_clus2` for node2.
- 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.

Steps

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

   ```
   set -privilege advanced
   ```

   The advanced prompt (`*>`) appears.

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

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

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

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

   The following command suppresses automatic case creation for two hours:

   ```
   cluster1:> **system node autosupport invoke -node * -type all -message
   MAINT=2h**
   ```

3. Display how many cluster interconnect interfaces are configured in each node for each cluster interconnect switch: `network device-discovery show -protocol cdp`

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

    Node/      Local  Discovered
   Protocol    Port   Device (LLDP: ChassisID)  Interface         Platform
   ----------- ------ ------------------------- ----------------
   ----------------
   node2      /cdp
               e0a    cs1                       Eth1/2            N9K-
   C92300YC
               e0b    cs2                       Eth1/2            N9K-
   C92300YC
   node1      /cdp
               e0a    cs1                       Eth1/1            N9K-
   C92300YC
               e0b    cs2                       Eth1/1            N9K-
   C92300YC

   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`

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

Node: node2
                                                                  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: node1
                                                                  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`

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

            Logical    Status     Network            Current
Current Is
Vserver     Interface  Admin/Oper Address/Mask       Node
Port    Home
----------- ---------- ---------- ------------------ -------------
------- ----
Cluster
            node1_clus1  up/up    169.254.209.69/16  node1
e0a     true
            node1_clus2  up/up    169.254.49.125/16  node1
e0b     true
            node2_clus1  up/up    169.254.47.194/16  node2
e0a     true
            node2_clus2  up/up    169.254.19.183/16  node2
e0b     true

4 entries were displayed.
```

5. Ping the remote cluster LIFs:

`cluster ping-cluster -node node-name`

```
cluster1::*> cluster ping-cluster -node node2
Host is node2
Getting addresses from network interface table...
Cluster node1_clus1 169.254.209.69 node1     e0a
Cluster node1_clus2 169.254.49.125 node1     e0b
Cluster node2_clus1 169.254.47.194 node2     e0a
Cluster node2_clus2 169.254.19.183 node2     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`

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

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

4 entries were displayed.
```

Install the NX-OS software

You can use this procedure to install the NX-OS software on the Nexus 92300YC switch.

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.

   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 92300YC switch.

```
cs2# copy sftp: bootflash: vrf management
Enter source filename: /code/nxos.9.2.2.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.9.2.2.bin  /bootflash/nxos.9.2.2.bin
/code/nxos.9.2.2.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.9.2.2.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.9.2.2.img  /bootflash/n9000-epld.9.2.2.img
/code/n9000-epld.9.2.2.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) 2002-2018, 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
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http://opensource.org/licenses/gpl-3.0.html and
http://www.opensource.org/licenses/lgpl-2.1.php and
http://www.gnu.org/licenses/old-licenses/library.txt.

Software
  BIOS: version 05.31
  NXOS: version 9.2(1)
  BIOS compile time:  05/17/2018
  NXOS image file is: bootflash:///nxos.9.2.1.bin
  NXOS compile time:  7/17/2018 16:00:00 [07/18/2018 00:21:19]


Hardware
  cisco Nexus9000 C92300YC Chassis
  Intel(R) Xeon(R) CPU D-1526 @ 1.80GHz with 16337884 kB of memory.
  Processor Board ID FDO220329V5

  Device name: cs2
  bootflash:  115805356 kB
Kernel uptime is 0 day(s), 4 hour(s), 23 minute(s), 11 second(s)

Last reset at 271444 usecs after Wed Apr 10 00:25:32 2019
  Reason: Reset Requested by CLI command reload
  System version: 9.2(1)
  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.9.2.2.bin

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

Verifying image bootflash:/nxos.9.2.2.bin for boot variable "nxos".
[] 100% -- SUCCESS

Verifying image type.
[] 100% -- SUCCESS

Preparing "nxos" version info using image bootflash:/nxos.9.2.2.bin.
[] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/nxos.9.2.2.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                                   9.2(1)
9.2(2)         yes
  1       bios    v05.31(05/17/2018):v05.28(01/18/2018)
v05.33(09/08/2018)       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
2019 Apr 10 04:59:35 cs2 %$ VDC-1 %$ %VMAN-2-ACTIVATION_STATE:
Successfully deactivated virtual service 'guestshell+'

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
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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 05.33
  NXOS: version 9.2(2)
  BIOS compile time:  09/08/2018
  NXOS image file is: bootflash:///nxos.9.2.2.bin
  NXOS compile time:  11/4/2018 21:00:00 [11/05/2018 06:11:06]


Hardware
  cisco Nexus9000 C92300YC Chassis
  Intel(R) Xeon(R) CPU D-1526 @ 1.80GHz with 16337884 kB of memory.
  Processor Board ID FDO220329V5

  Device name: cs2
  bootflash:  115805356 kB
  Kernel uptime is 0 day(s), 0 hour(s), 3 minute(s), 52 second(s)

Last reset at 182004 usecs after Wed Apr 10 04:59:48 2019
  Reason: Reset due to upgrade
  System version: 9.2(1)
  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.9.2.2.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 92300YC switch for the first time. You can also use this procedure to upgrade your RCF version.

About this task

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 `node1` and `node2`.
- The cluster LIF names are `node1_clus1`, `node1_clus2`, `node2_clus1`, and `node2_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; ONTAP commands are used unless otherwise indicated.
- Before you perform this procedure, make sure that you have a current backup of the switch configuration.

Steps

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
----------- ------ ------------------------- ----------------
------------
node1/cdp
            e0a    cs1                       Ethernet1/1/1     N9K-
C92300YC
            e0b    cs2                       Ethernet1/1/1     N9K-
C92300YC
node2/cdp
            e0a    cs1                       Ethernet1/1/2     N9K-
C92300YC
            e0b    cs2                       Ethernet1/1/2     N9K-
C92300YC
cluster1::*>
```

2. Check the administrative and operational status of each cluster port.
   a. Verify that all the cluster ports are up with a healthy status: `network port show -ipspace Cluster`

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

Node: node1

Ignore
                                                  Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0c       Cluster      Cluster          up   9000  auto/100000
healthy false
e0d       Cluster      Cluster          up   9000  auto/100000
healthy false

Node: node2

Ignore
                                                  Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0c       Cluster      Cluster          up   9000  auto/100000
healthy false
e0d       Cluster      Cluster          up   9000  auto/100000
healthy false
cluster1::*>
```

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

```
cluster1::*> network interface show -vserver Cluster
            Logical              Status     Network            Current
Current Is
Vserver     Interface            Admin/Oper Address/Mask       Node
Port    Home
----------- ------------------ ---------- -----------------
------------ ------- ----
Cluster
            node1_clus1          up/up      169.254.3.4/23     node1
e0c     true
            node1_clus2          up/up      169.254.3.5/23     node1
e0d     true
            node2_clus1          up/up      169.254.3.8/23     node2
e0c     true
            node2_clus2          up/up      169.254.3.9/23     node2
e0d     true
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    10.233.205.92    N9K-
C92300YC
     Serial Number: FOXXXXXXXGS
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS) Software,
Version
                    9.3(4)
    Version Source: CDP

cs2                           cluster-network    10.233.205.93    N9K-
C92300YC
     Serial Number: FOXXXXXXXGD
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS) Software,
Version
                    9.3(4)
    Version Source: CDP

2 entries were displayed.
```

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 e1/1-64
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 -vserver Cluster`

```
cluster1::*> network interface show -vserver Cluster
            Logical           Status     Network            Current
Current Is
Vserver     Interface         Admin/Oper Address/Mask       Node
Port    Home
----------- ----------------- ---------- ------------------
------------ ------- ----
Cluster
            node1_clus1       up/up      169.254.3.4/23     node1
e0c     true
            node1_clus2       up/up      169.254.3.5/23     node1
e0c     false
            node2_clus1       up/up      169.254.3.8/23     node2
e0c     true
            node2_clus2       up/up      169.254.3.9/23     node2
e0c     false
cluster1::*>
```

6. Verify that the cluster is healthy: `cluster show`

```
cluster1::*> cluster show
Node           Health  Eligibility   Epsilon
-------------- ------- ------------  -------
node1          true    true          false
node2          true    true          false
cluster1::*>
```

7. If you do not already have a current backup of the switch, you can save the current switch configuration by copying the output of the following command to a log file:

   `show running-config`

8. 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.

9. 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 Switches 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: /code/Nexus_92300YC_RCF_v1.0.2.txt
Enter hostname for the tftp 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:
tftp> progress
Progress meter enabled
tftp> get /code/Nexus_92300YC_RCF_v1.0.2.txt /bootflash/nxos.9.2.2.bin
/code/Nexus_92300YC_R  100% 9687   530.2KB/s   00:00
tftp> exit
Copy complete, now saving to disk (please wait)...
Copy complete.
```

10. Apply the RCF previously downloaded to the bootflash.

    For more information on Cisco commands, see the appropriate guide in the Cisco Nexus 9000 Series Switches guides.

    This example shows the RCF file `Nexus_92300YC_RCF_v1.0.2.txt` being installed on switch cs2:

```
cs2# copy Nexus_92300YC_RCF_v1.0.2.txt running-config echo-commands

Disabling ssh: as its enabled right now:
 generating ecdsa key(521 bits)......
generated ecdsa key

Enabling ssh: as it has been disabled
 this command enables edge port type (portfast) by default on all
interfaces. You
 should now disable edge port type (portfast) explicitly on switched
ports leading to hubs,
 switches and bridges as they may create temporary bridging loops.

Edge port type (portfast) should only be enabled on ports connected to a
single
 host. Connecting hubs, concentrators, switches, bridges, etc...  to
this
 interface when edge port type (portfast) is enabled, can cause
temporary bridging loops.
 Use with CAUTION

Edge Port Type (Portfast) has been configured on Ethernet1/1 but will
only
 have effect when the interface is in a non-trunking mode.

...

Copy complete, now saving to disk (please wait)...
Copy complete.
```

11. Verify on the switch that the RCF has been merged successfully:

```
show running-config
```

```
cs2# show running-config
!Command: show running-config
!Running configuration last done at: Wed Apr 10 06:32:27 2019
!Time: Wed Apr 10 06:36:00 2019

version 9.2(2) Bios:version 05.33
switchname cs2
vdc cs2 id 1
  limit-resource vlan minimum 16 maximum 4094
  limit-resource vrf minimum 2 maximum 4096
  limit-resource port-channel minimum 0 maximum 511
  limit-resource u4route-mem minimum 248 maximum 248
  limit-resource u6route-mem minimum 96 maximum 96
  limit-resource m4route-mem minimum 58 maximum 58
  limit-resource m6route-mem minimum 8 maximum 8

feature lacp

no password strength-check
username admin password 5
$5$HY9Kk3F9$YdCZ8iQJ1RtoiEFa0sKP5IO/LNG1k9C4lSJfi5kesl
6  role network-admin
ssh key ecdsa 521

banner motd #

*
*
*  Nexus 92300YC Reference Configuration File (RCF) v1.0.2 (10-19-2018)
*
*
*
*  Ports 1/1  - 1/48: 10GbE Intra-Cluster Node Ports
*
*  Ports 1/49 - 1/64: 40/100GbE Intra-Cluster Node Ports
*
*  Ports 1/65 - 1/66: 40/100GbE Intra-Cluster ISL Ports
*
*
*
```

When applying the RCF for the first time, the **ERROR: Failed to write VSH commands** message is expected and can be ignored.

12. 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.

13. 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 Switches guides.

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

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

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

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

    a. Verify that e0d ports are up and healthy across all nodes in the cluster: `network port show -ipspace Cluster`

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

Node: node1

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

Node: node2

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

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
----------- ------ ------------------------ -----------------
------------
node1/cdp
            e0a    cs1                      Ethernet1/1       N9K-
C92300YC
            e0b    cs2                      Ethernet1/1       N9K-
C92300YC
node2/cdp
            e0a    cs1                      Ethernet1/2       N9K-
C92300YC
            e0b    cs2                      Ethernet1/2       N9K-
C92300YC

cluster1::*> system cluster-switch show -is-monitoring-enabled
-operational true
Switch                      Type               Address          Model
--------------------------- ------------------ ----------------
------------
cs1                         cluster-network    10.233.205.90    N9K-
C92300YC
     Serial Number: FOXXXXXXXGD
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS) Software,
Version
                    9.3(4)
    Version Source: CDP

cs2                         cluster-network    10.233.205.91    N9K-
C92300YC
     Serial Number: FOXXXXXXXGS
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS) Software,
Version
                    9.3(4)
    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.
```

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 e1/1-64
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 -vserver Cluster`

```
cluster1::*> network interface show -vserver Cluster
            Logical          Status     Network            Current
Current Is
Vserver     Interface        Admin/Oper Address/Mask       Node
Port    Home
----------- ---------------- ---------- ------------------
----------------- ------- ----
Cluster
            node1_clus1      up/up      169.254.3.4/23     node1
e0d     false
            node1_clus2      up/up      169.254.3.5/23     node1
e0d     true
            node2_clus1      up/up      169.254.3.8/23     node2
e0d     false
            node2_clus2      up/up      169.254.3.9/23     node2
e0d     true
cluster1::*>
```

18. Verify that the cluster is healthy: `cluster show`

```
cluster1::*> cluster show
Node           Health   Eligibility   Epsilon
-------------- -------- ------------- -------
node1          true     true          false
node2          true     true          false
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
.
.
Ethernet1/1      1       eth  access up      none
10G(D) --
Ethernet1/2      1       eth  access up      none
10G(D) --
Ethernet1/3      1       eth  trunk  up      none
100G(D) --
Ethernet1/4      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      Eth1/65(P)   Eth1/66(P)
cs1#
```

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

```
cluster1::*> network interface show -vserver Cluster
            Logical       Status     Network            Current
Current Is
Vserver     Interface     Admin/Oper Address/Mask       Node
Port    Home
----------- ------------- ---------- ------------------ -------------
------- ----
Cluster
            node1_clus1   up/up      169.254.3.4/23     node1
e0d     true
            node1_clus2   up/up      169.254.3.5/23     node1
e0d     true
            node2_clus1   up/up      169.254.3.8/23     node2
e0d     true
            node2_clus2   up/up      169.254.3.9/23     node2
e0d     true
cluster1::*>
```

25. Verify that the cluster is healthy: `cluster show`

```
cluster1::*> cluster show
Node           Health  Eligibility   Epsilon
-------------- ------- ------------- -------
node1          true    true          false
node2          true    true          false
```

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

```
cluster1::*> cluster ping-cluster -node local
Host is node1
Getting addresses from network interface table...
Cluster node1_clus1 169.254.3.4 node1 e0a
Cluster node1_clus2 169.254.3.5 node1 e0b
Cluster node2_clus1 169.254.3.8 node2 e0a
Cluster node2_clus2 169.254.3.9 node2 e0b
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)
```

For ONTAP 9.8 and later

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

Enter: `system switch ethernet log setup-password`

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

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

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

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

Enabling cluster switch log collection.

cluster1::*>
```

For ONTAP 9.4 and later

For ONTAP 9.4 and later, enable the cluster 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`

Enter: `system cluster-switch log setup-password`

```
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>
```

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

```
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.

Migrate to a two-node switched cluster with Cisco Nexus 92300YC switches

Migrate to a two-node switched cluster with Cisco Nexus 92300YC switches

You must be aware of certain configuration information, port connections, and cabling requirements when you migrate a two-node switchless cluster, non-disruptively, to a cluster with Cisco Nexus 92300YC cluster switches. The procedure you use depends on whether you have two dedicated cluster-network ports on each controller or a single cluster port on each controller. The process documented works for all nodes using optical or twinax ports but is not supported on this switch if nodes are using onboard 10Gb BASE-T RJ45 ports for the cluster-network ports.

Most systems require two dedicated cluster-network ports on each controller.

After your migration completes, you might need to install the required configuration file to support the Cluster Switch Health Monitor (CSHM) for 92300YC cluster switches. See *Installing the Cluster Switch Health Monitor (CSHM) configuration file for 92300YC switches* in the Setting up guide.

How to migrate to a two-node switched cluster with a Cisco Nexus 92300YC switch

If you have an existing two-node switchless cluster environment, you can migrate to a two-node switched cluster environment using Cisco Nexus 92300YC switches to enable you to scale beyond two nodes in the cluster.

Before you begin

Two-node switchless configuration:

- The two-node switchless configuration must be properly set up and functioning.
- The nodes must be running ONTAP 9.6 and later.
- All cluster ports must be in the up state.
- All cluster logical interfaces (LIFs) must be in the up state and on their home ports.

Cisco Nexus 92300YC switch configuration:

- Both switches must have management network connectivity.
- There must be console access to the cluster switches.
- Nexus 92300YC node-to-node switch and switch-to-switch connections must use twinax or fiber cables.

  The *Hardware Universe - Switches* contains more information about cabling.
- Inter-Switch Link (ISL) cables must be connected to ports 1/65 and 1/66 on both 92300YC switches.
- Initial customization of both the 92300YC switches must be completed. So that the:

- 92300YC switches are running the latest version of software
- Reference Configuration Files (RCFs) have been applied to the switches Any site customization, such as SMTP, SNMP, and SSH must be configured on the new switches.

About this task

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

- The names of the 92300YC switches are cs1 and cs2.
- The names of the cluster SVMs are node1 and node2.
- The names of the LIFs are node1_clus1 and node1_clus2 on node 1, and node2_clus1 and node2_clus2 on node 2 respectively.
- The `cluster1::*>` prompt indicates the name of the cluster.
- The cluster ports used in this procedure are e0a and e0b.

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

Steps

1. Change the privilege level to advanced, entering `y` when prompted to continue:

   ```
   set -privilege advanced
   ```

   The advanced prompt (`*>`) appears.

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

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

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

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

   The following command suppresses automatic case creation for two hours:

   ```
   cluster1::*> system node autosupport invoke -node * -type all -message
   MAINT=2h
   ```

3. Disable all node-facing ports (not ISL ports) on both the new cluster switches cs1 and cs2.

   You must not disable the ISL ports.

   The following example shows that node-facing ports 1 through 64 are disabled on switch cs1:

```
cs1# config
Enter configuration commands, one per line. End with CNTL/Z.
cs1(config)# interface e/1-64
cs1(config-if-range)# shutdown
```

4. Verify that the ISL and the physical ports on the ISL between the two 92300YC switches cs1 and cs2 are up on ports 1/65 and 1/66:

   `show port-channel summary`

   The following example shows that the ISL ports are up on switch cs1:

```
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      Eth1/65(P)   Eth1/66(P)
```

   The following example shows that the ISL ports are up on switch cs2 :

```
(cs2)# 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      Eth1/65(P)   Eth1/66(P)
```

5. Display the list of neighboring devices:

   `show cdp neighbors`

   This command provides information about the devices that are connected to the system.

   The following example lists the neighboring devices on switch cs1:

```
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
cs2(FDO220329V5)    Eth1/65        175    R S I s   N9K-C92300YC
Eth1/65
cs2(FDO220329V5)    Eth1/66        175    R S I s   N9K-C92300YC
Eth1/66

Total entries displayed: 2
```

   The following example lists the neighboring devices on switch cs2:

```
cs2# 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
cs1(FDO220329KU)    Eth1/65        177    R S I s   N9K-C92300YC
Eth1/65
cs1(FDO220329KU)    Eth1/66        177    R S I s   N9K-C92300YC
Eth1/66

Total entries displayed: 2
```

6. Verify that all cluster ports are up:

   `network port show -ipspace Cluster`

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

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

Node: node1

                                                  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: node2

                                                  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.
```

7. Verify that all cluster LIFs are up and operational:

   `network interface show -vserver Cluster`

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

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

            Logical    Status     Network            Current
Current Is
Vserver     Interface  Admin/Oper Address/Mask       Node          Port
Home
----------- ---------- ---------- ------------------ -------------
------- -----
Cluster
            node1_clus1  up/up    169.254.209.69/16  node1         e0a
true
            node1_clus2  up/up    169.254.49.125/16  node1         e0b
true
            node2_clus1  up/up    169.254.47.194/16  node2         e0a
true
            node2_clus2  up/up    169.254.19.183/16  node2         e0b
true
4 entries were displayed.
```

8. Verify that auto-revert is enabled on all cluster LIFs:

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

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

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

4 entries were displayed.
```

9. Disconnect the cable from cluster port e0a on node1, and then connect e0a to port 1 on cluster switch cs1, using the appropriate cabling supported by the 92300YC switches.

   The *Hardware Universe - Switches* contains more information about cabling.

10. Disconnect the cable from cluster port e0a on node2, and then connect e0a to port 2 on cluster switch cs1, using the appropriate cabling supported by the 92300YC switches.

11. Enable all node-facing ports on cluster switch cs1.

    The following example shows that ports 1/1 through 1/64 are enabled on switch cs1:

```
cs1# config
Enter configuration commands, one per line. End with CNTL/Z.
cs1(config)# interface e1/1-64
cs1(config-if-range)# no shutdown
```

12. Verify that all cluster LIFs are up, operational, and display as true for `Is Home`:

    `network interface show -vserver Cluster`

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

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

         Logical      Status     Network            Current     Current
Is
Vserver  Interface    Admin/Oper Address/Mask       Node        Port
Home
-------- ------------ ---------- ------------------ ----------- -------
----
Cluster
         node1_clus1  up/up      169.254.209.69/16  node1       e0a
true
         node1_clus2  up/up      169.254.49.125/16  node1       e0b
true
         node2_clus1  up/up      169.254.47.194/16  node2       e0a
true
         node2_clus2  up/up      169.254.19.183/16  node2       e0b
true

4 entries were displayed.
```

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

    `cluster show`

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

```
cluster1::*> cluster show

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

2 entries were displayed.
```

14. Disconnect the cable from cluster port e0b on node1, and then connect e0b to port 1 on cluster switch cs2, using the appropriate cabling supported by the 92300YC switches.
15. Disconnect the cable from cluster port e0b on node2, and then connect e0b to port 2 on cluster switch cs2, using the appropriate cabling supported by the 92300YC switches.
16. Enable all node-facing ports on cluster switch cs2.

    The following example shows that ports 1/1 through 1/64 are enabled on switch cs2:

    ```
    cs2# config
    Enter configuration commands, one per line. End with CNTL/Z.
    cs2(config)# interface e1/1-64
    cs2(config-if-range)# no shutdown
    ```

17. Verify that all cluster ports are up:

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

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

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

Node: node1

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

Node: node2

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

4 entries were displayed.
```

18. Verify that all interfaces display true for `Is Home`:

    `network interface show -vserver Cluster`

    This might take several minutes to complete.

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

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

          Logical      Status     Network            Current    Current
Is
Vserver   Interface    Admin/Oper Address/Mask       Node       Port
Home
--------- ------------ ---------- ------------------ ---------- -------
----
Cluster
          node1_clus1  up/up      169.254.209.69/16  node1      e0a
true
          node1_clus2  up/up      169.254.49.125/16  node1      e0b
true
          node2_clus1  up/up      169.254.47.194/16  node2      e0a
true
          node2_clus2  up/up      169.254.19.183/16  node2      e0b
true

4 entries were displayed.
```

19. Verify that both nodes each have one connection to each switch:

    `show cdp neighbors`

    The following example shows the appropriate results for both switches:

```
(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(FDO220329V5)    Eth1/65        175    R S I s   N9K-C92300YC
Eth1/65
cs2(FDO220329V5)    Eth1/66        175    R S I s   N9K-C92300YC
Eth1/66

Total entries displayed: 4


(cs2)# 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       e0b
node2               Eth1/2         133    H         FAS2980       e0b
cs1(FDO220329KU)
                    Eth1/65        175    R S I s   N9K-C92300YC
Eth1/65
cs1(FDO220329KU)
                    Eth1/66        175    R S I s   N9K-C92300YC
Eth1/66

Total entries displayed: 4
```

20. Display information about the discovered network devices in your cluster:

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

```
cluster1::*> network device-discovery show -protocol cdp
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface         Platform
----------- ------ ------------------------- ----------------
----------------
node2      /cdp
            e0a    cs1                       0/2               N9K-
C92300YC
            e0b    cs2                       0/2               N9K-
C92300YC
node1      /cdp
            e0a    cs1                       0/1               N9K-
C92300YC
            e0b    cs2                       0/1               N9K-
C92300YC

4 entries were displayed.
```

21. Verify that the settings are disabled:

    `network options switchless-cluster show`

    > It might take several minutes for the command to complete. Wait for the '3 minute lifetime to expire' announcement.

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

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

22. Verify the status of the node members in the cluster:

    `cluster show`

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

```
cluster1::*> cluster show

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

23. Ensure that the cluster network has full connectivity:

`cluster ping-cluster -node node-name`

```
cluster1::> cluster ping-cluster -node node2
Host is node2
Getting addresses from network interface table...
Cluster node1_clus1 169.254.209.69 node1 e0a
Cluster node1_clus2 169.254.49.125 node1 e0b
Cluster node2_clus1 169.254.47.194 node2 e0a
Cluster node2_clus2 169.254.19.183 node2 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 169.254.47.194 to Remote 169.254.209.69
Local 169.254.47.194 to Remote 169.254.49.125
Local 169.254.19.183 to Remote 169.254.209.69
Local 169.254.19.183 to Remote 169.254.49.125
Larger than PMTU communication succeeds on 4 path(s)
RPC status:
2 paths up, 0 paths down (tcp check)
2 paths up, 0 paths down (udp check)
```

24. If you suppressed automatic case creation, reenable it by invoking an AutoSupport message:

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

```
cluster1::*> system node autosupport invoke -node * -type all -message
MAINT=END
```

25. Change the privilege level back to admin:

    `set -privilege admin`

26. For ONTAP 9.4 and later, enable the cluster 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`

```
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.

Migrate from a Cisco switch to a Cisco Nexus 92300YC switch

Migrate from a Cisco switch to a Cisco Nexus 92300YC switch

You must be aware of certain configuration information, port connections and cabling requirements when you are replacing some older Cisco Nexus cluster switches with

Cisco Nexus 92300YC cluster switches.

- The following cluster switches are supported:
  - Nexus 92300YC
  - Nexus 5596UP
  - Nexus 5020
  - Nexus 5010
- The cluster switches use the following ports for connections to nodes:
  - Ports e1/1-48 (10/25 GbE), e1/49-64 (40/100 GbE): Nexus 92300YC
  - Ports e1/1-40 (10 GbE): Nexus 5596UP
  - Ports e1/1-32 (10 GbE): Nexus 5020
  - Ports e1/1-12, e2/1-6 (10 GbE): Nexus 5010 with expansion module
- The cluster switches use the following Inter-Switch Link (ISL) ports:
  - Ports e1/65-66 (100 GbE): Nexus 92300YC
  - Ports e1/41-48 (10 GbE): Nexus 5596UP
  - Ports e1/33-40 (10 GbE): Nexus 5020
  - Ports e1/13-20 (10 GbE): Nexus 5010
- The *Hardware Universe* contains information about supported cabling for all cluster switches.
- You have configured some of the ports on Nexus 92300YC switches to run at 10 GbE or 40 GbE.
- You have planned, migrated, and documented 10 GbE and 40 GbE connectivity from nodes to Nexus 92300YC cluster switches.
- The ONTAP and NX-OS versions supported in this procedure are on the Cisco Ethernet Switches page.

> After your migration completes, you might need to install the required configuration file to support the Cluster Switch Health Monitor (CSHM) for 92300YC cluster switches. See *Installing the Cluster Switch Health Monitor (CSHM) configuration file for 92300YC switches* in the Setting up guide.

How to migrate from a Cisco switch to a Cisco Nexus 92300YC switch

You can migrate nondisruptively older Cisco cluster switches for an ONTAP cluster to Cisco Nexus 92300YC cluster network switches.

About this task

- The existing cluster must be properly set up and functioning.
- All cluster ports must be in the up state to ensure nondisruptive operations.
- The Nexus 92300YC cluster switches must be configured and operating under the proper version of NX-OS installed and reference configuration file (RCF) applied.
- The existing cluster network configuration must have the following:
  - A redundant and fully functional NetApp cluster using both older Cisco switches.
  - Management connectivity and console access to both the older Cisco switches and the new switches.

- All cluster LIFs in the up state with the cluster LIFs are on their home ports.
- ISL ports enabled and cabled between the older Cisco switches and between the new switches.

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

- The existing Cisco Nexus 5596UP cluster switches are c1 and c2.
- The new Nexus 92300YC cluster switches are cs1 and cs2.
- The nodes are node1 and node2.
- The cluster LIFs are node1_clus1 and node1_clus2 on node 1, and node2_clus1 and node2_clus2 on node 2 respectively.
- Switch c2 is replaced by switch cs2 first and then switch c1 is replaced by switch cs1.
  - A temporary ISL is built on cs1 connecting c1 to cs1.
  - Cabling between the nodes and c2 are then disconnected from c2 and reconnected to cs2.
  - Cabling between the nodes and c1 are then disconnected from c1 and reconnected to cs1.
  - The temporary ISL between c1 and cs1 is then removed.

Steps

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

   ```
   set -privilege advanced
   ```

   The advanced prompt (*>) appears.

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

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

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

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

   The following command suppresses automatic case creation for two hours:

   ```
   cluster1::*> system node autosupport invoke -node * -type all -message
   MAINT=2h
   ```

3. Verify that auto-revert is enabled on all cluster LIFs:

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

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

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

4 entries were displayed.
```

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

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

   a. Display the network port attributes:

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

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

Node: node1

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

Node: node2

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

4 entries were displayed.
```

b. Display information about the logical interfaces and their designated home nodes:

`network interface show -vserver Cluster`

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

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

            Logical      Status     Network            Current
Current Is
Vserver     Interface    Admin/Oper Address/Mask       Node
Port    Home
----------- -----------  ---------- ------------------ -------------
------- ----
Cluster
            node1_clus1  up/up      169.254.209.69/16  node1
e0a     true
            node1_clus2  up/up      169.254.49.125/16  node1
e0b     true
            node2_clus1  up/up      169.254.47.194/16  node2
e0a     true
            node2_clus2  up/up      169.254.19.183/16  node2
e0b     true

4 entries were displayed.
```

5. The cluster ports on each node are connected to existing cluster switches in the following way (from the nodes' perspective) using the command:

   `network device-discovery show -protocol cdp`

```
cluster1::*> network device-discovery show -protocol cdp
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface         Platform
----------- ------ ------------------------- ----------------
----------------
node2      /cdp
            e0a    c1                        0/2               N5K-
C5596UP
            e0b    c2                        0/2               N5K-
C5596UP
node1      /cdp
            e0a    c1                        0/1               N5K-
C5596UP
            e0b    c2                        0/1               N5K-
C5596UP

4 entries were displayed.
```

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

show cdp neighbors

```
c1# show cdp neighbors

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


Device-ID             Local Intrfce Hldtme Capability  Platform
Port ID
node1                 Eth1/1         124    H         FAS2750
e0a
node2                 Eth1/2         124    H         FAS2750
e0a
c2(FOX2025GEFC)     Eth1/41        179    S I s     N5K-C5596UP
Eth1/41

c2(FOX2025GEFC)     Eth1/42        175    S I s     N5K-C5596UP
Eth1/42

c2(FOX2025GEFC)     Eth1/43        179    S I s     N5K-C5596UP
Eth1/43

c2(FOX2025GEFC)     Eth1/44        175    S I s     N5K-C5596UP
Eth1/44

c2(FOX2025GEFC)     Eth1/45        179    S I s     N5K-C5596UP
Eth1/45

c2(FOX2025GEFC)     Eth1/46        179    S I s     N5K-C5596UP
Eth1/46

c2(FOX2025GEFC)     Eth1/47        175    S I s     N5K-C5596UP
Eth1/47

c2(FOX2025GEFC)     Eth1/48        179    S I s     N5K-C5596UP
Eth1/48

Total entries displayed: 10


c2# show cdp neighbors

Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
```

```
                S - Switch, H - Host, I - IGMP, r - Repeater,
                V - VoIP-Phone, D - Remotely-Managed-Device,
                s - Supports-STP-Dispute


Device-ID            Local Intrfce Hldtme Capability  Platform
Port ID
node1              Eth1/1         124    H         FAS2750
e0b
node2              Eth1/2         124    H         FAS2750
e0b
c1(FOX2025GEEX)    Eth1/41        175    S I s     N5K-C5596UP
Eth1/41

c1(FOX2025GEEX)    Eth1/42        175    S I s     N5K-C5596UP
Eth1/42

c1(FOX2025GEEX)    Eth1/43        175    S I s     N5K-C5596UP
Eth1/43

c1(FOX2025GEEX)    Eth1/44        175    S I s     N5K-C5596UP
Eth1/44

c1(FOX2025GEEX)    Eth1/45        175    S I s     N5K-C5596UP
Eth1/45

c1(FOX2025GEEX)    Eth1/46        175    S I s     N5K-C5596UP
Eth1/46

c1(FOX2025GEEX)    Eth1/47        176    S I s     N5K-C5596UP
Eth1/47

c1(FOX2025GEEX)    Eth1/48        176    S I s     N5K-C5596UP
Eth1/48
```

7. Ensure that the cluster network has full connectivity using the command:

   `cluster ping-cluster -node node-name`

```
cluster1::*> cluster ping-cluster -node node2
Host is node2
Getting addresses from network interface table...
Cluster node1_clus1 169.254.209.69 node1     e0a
Cluster node1_clus2 169.254.49.125 node1     e0b
Cluster node2_clus1 169.254.47.194 node2     e0a
Cluster node2_clus2 169.254.19.183 node2     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)
```

8. Configure a temporary ISL on cs1on ports e1/41-48, between c1 and cs1.

   The following example shows how the new ISL is configured on c1 and cs1:

```
cs1# configure
Enter configuration commands, one per line. End with CNTL/Z.
cs1(config)# interface e1/41-48
cs1(config-if-range)# description temporary ISL between Nexus 5596UP and
Nexus 92300YC
cs1(config-if-range)# no lldp transmit
cs1(config-if-range)# no lldp receive
cs1(config-if-range)# switchport mode trunk
cs1(config-if-range)# no spanning-tree bpduguard enable
cs1(config-if-range)# channel-group 101 mode active
cs1(config-if-range)# exit
cs1(config)# interface port-channel 101
cs1(config-if)# switchport mode trunk
cs1(config-if)# spanning-tree port type network
cs1(config-if)# exit
cs1(config)# exit
```

9. Remove ISL cables from ports e1/41-48 from c2 and connect the cables to ports e1/41-48 on cs1.
10. Verify that the ISL ports and port-channel are operational connecting c1 and cs1:

    ```
    show port-channel summary
    ```

    The following example shows the Cisco show port-channel summary command being used to verify the ISL ports are operational on c1 and cs1:

```
c1# 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      Eth1/41(P)   Eth1/42(P)
Eth1/43(P)
                                     Eth1/44(P)   Eth1/45(P)
Eth1/46(P)
                                     Eth1/47(P)   Eth1/48(P)


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      Eth1/65(P)   Eth1/66(P)
101   Po101(SU)   Eth      LACP      Eth1/41(P)   Eth1/42(P)
Eth1/43(P)
                                     Eth1/44(P)   Eth1/45(P)
Eth1/46(P)
                                     Eth1/47(P)   Eth1/48(P)
```

11. For node1, disconnect the cable from e1/1 on c2, and then connect the cable to e1/1 on cs2, using

appropriate cabling supported by Nexus 92300YC.

12. For node2, disconnect the cable from e1/2 on c2, and then connect the cable to e1/2 on cs2, using appropriate cabling supported by Nexus 92300YC.
13. The cluster ports on each node are now connected to cluster switches in the following way, from the nodes' perspective:

    `network device-discovery show -protocol cdp`

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

Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface         Platform
----------- ------ ------------------------- ----------------
----------------
node2      /cdp
            e0a    c1                        0/2               N5K-
C5596UP
            e0b    cs2                       0/2               N9K-
C92300YC
node1      /cdp
            e0a    c1                        0/1               N5K-
C5596UP
            e0b    cs2                       0/1               N9K-
C92300YC

4 entries were displayed.
```

14. For node1, disconnect the cable from e1/1 on c1, and then connect the cable to e1/1 on cs1, using appropriate cabling supported by Nexus 92300YC.
15. For node2, disconnect the cable from e1/2 on c1, and then connect the cable to e1/2 on cs1, using appropriate cabling supported by Nexus 92300YC.
16. The cluster ports on each node are now connected to cluster switches in the following way, from the nodes' perspective:

    `network device-discovery show -protocol cdp`

```
cluster1::*> network device-discovery show -protocol cdp
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface         Platform
----------- ------ ------------------------- ----------------
----------------
node2      /cdp
            e0a    cs1                       0/2               N9K-
C92300YC
            e0b    cs2                       0/2               N9K-
C92300YC
node1      /cdp
            e0a    cs1                       0/1               N9K-
C92300YC
            e0b    cs2                       0/1               N9K-
C92300YC
4 entries were displayed.
```

17. Delete the temporary ISL between cs1 and c1.

```
cs1(config)# no interface port-channel 10
cs1(config)# interface e1/41-48
cs1(config-if-range)# lldp transmit
cs1(config-if-range)# lldp receive
cs1(config-if-range)# no switchport mode trunk
cs1(config-if-range)# no channel-group
cs1(config-if-range)# description 10GbE Node Port
cs1(config-if-range)# spanning-tree bpduguard enable
cs1(config-if-range)# exit
cs1(config)# exit
```

18. Verify the final configuration of the cluster:

    `network port show -ipspace Cluster`

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

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

Node: node1

Ignore
                                                  Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
```

```
Status
--------- ------------ ---------------- ---- ---- ----------- --------
------
e0a       Cluster      Cluster          up   9000  auto/10000 healthy
false
e0b       Cluster      Cluster          up   9000  auto/10000 healthy
false

Node: node2

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

4 entries were displayed.


cluster1::*> network interface show -vserver Cluster

            Logical    Status     Network            Current
Current Is
Vserver     Interface  Admin/Oper Address/Mask       Node          Port
Home
----------- ---------- ---------- ------------------ -------------
------- ----
Cluster
            node1_clus1  up/up    169.254.209.69/16  node1         e0a
true
            node1_clus2  up/up    169.254.49.125/16  node1         e0b
true
            node2_clus1  up/up    169.254.47.194/16  node2         e0a
true
            node2_clus2  up/up    169.254.19.183/16  node2         e0b
true

4 entries were displayed.
```

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

Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface         Platform
----------- ------ ------------------------- ----------------
----------------
node2      /cdp
            e0a    cs1                       0/2               N9K-
C92300YC
            e0b    cs2                       0/2               N9K-
C92300YC
node1      /cdp
            e0a    cs1                       0/1               N9K-
C92300YC
            e0b    cs2                       0/1               N9K-
C92300YC

4 entries were displayed.


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         124    H         FAS2750
e0a
node2               Eth1/2         124    H         FAS2750
e0a
cs2(FDO220329V5)    Eth1/65        179    R S I s   N9K-C92300YC
Eth1/65
cs2(FDO220329V5)    Eth1/66        179    R S I s   N9K-C92300YC
Eth1/66


cs2# show cdp neighbors

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

Device-ID          Local Intrfce  Hldtme Capability  Platform      Port
```

```
ID
node1               Eth1/1          124    H          FAS2750
e0b
node2               Eth1/2          124    H          FAS2750
e0b
cs1(FDO220329KU)
                    Eth1/65         179    R S I s    N9K-C92300YC
Eth1/65
cs1(FDO220329KU)
                    Eth1/66         179    R S I s    N9K-C92300YC
Eth1/66

Total entries displayed: 4
```

19. Ensure that the cluster network has full connectivity:

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

```
cluster1::*> set -priv advanced

Warning: These advanced commands are potentially dangerous; use them
only when
         directed to do so by NetApp personnel.
Do you want to continue? {y|n}: y

cluster1::*> cluster ping-cluster -node node2
Host is node2
Getting addresses from network interface table...
Cluster node1_clus1 169.254.209.69 node1     e0a
Cluster node1_clus2 169.254.49.125 node1     e0b
Cluster node2_clus1 169.254.47.194 node2     e0a
Cluster node2_clus2 169.254.19.183 node2     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)


cluster1::*> set -privilege admin
cluster1::*>
```

20. For ONTAP 9.4 and later, enable the cluster 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`

```
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.

Replace a Cisco Nexus 92300YC switch

Replacing a defective Nexus 92300YC switch in a cluster network is a nondisruptive procedure (NDU).

Before you begin

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

- Existing cluster and network infrastructure:
  - The existing cluster must be verified as completely functional, with at least one fully connected cluster switch.
  - All cluster ports must be up.
  - All cluster logical interfaces (LIFs) must be up and on their home ports.
  - The ONTAP cluster ping-cluster -node node1 command must indicate that basic connectivity and larger than PMTU communication are successful on all paths.
- Nexus 92300YC replacement switch:
  - Management network connectivity on the replacement switch must be functional.
  - Console access to the replacement switch must be in place.
  - The node connections are ports 1/1 through 1/64.
  - All Inter-Switch Link (ISL) ports must be disabled on ports 1/65 and 1/66.
  - The desired reference configuration file (RCF) and NX-OS operating system image switch must be loaded onto the switch.
  - Initial customization of the switch must be complete, as detailed in:

    Configure a new Cisco Nexus 92300YC switch

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

About this task

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

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

- The names of the existing Nexus 92300YC switches are cs1 and cs2.
- The name of the new Nexus 92300YC switch is newcs2.
- The node names are node1 and node2.
- The cluster ports on each node are named e0a and e0b.
- The cluster LIF names are node1_clus1 and node1_clus2 for node1, and node2_clus1 and node2_clus2 for node2.
- The prompt for changes to all cluster nodes is cluster1::*>

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

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

Node: node1

Ignore
                                                  Speed(Mbps)  Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper   Status
Status
```

```
--------- ------------ ---------------- ---- ---- ----------- --------
------
e0a       Cluster      Cluster          up   9000  auto/10000 healthy
false
e0b       Cluster      Cluster          up   9000  auto/10000 healthy
false

Node: node2

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



cluster1::*> network interface show -vserver Cluster
            Logical    Status     Network            Current       Current
Is
Vserver     Interface  Admin/Oper Address/Mask       Node          Port
Home
----------- ---------- ---------- ------------------ ------------- -------
----
Cluster
            node1_clus1  up/up    169.254.209.69/16  node1         e0a
true
            node1_clus2  up/up    169.254.49.125/16  node1         e0b
true
            node2_clus1  up/up    169.254.47.194/16  node2         e0a
true
            node2_clus2  up/up    169.254.19.183/16  node2         e0b
true
4 entries were displayed.



cluster1::*> network device-discovery show -protocol cdp
Node/       Local  Discovered
```

```
Protocol    Port   Device (LLDP: ChassisID)  Interface         Platform
----------- ------ ------------------------- ----------------
----------------
node2      /cdp
            e0a    cs1                       Eth1/2            N9K-
C92300YC
            e0b    cs2                       Eth1/2            N9K-
C92300YC
node1      /cdp
            e0a    cs1                       Eth1/1            N9K-
C92300YC
            e0b    cs2                       Eth1/1            N9K-
C92300YC
4 entries were displayed.



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         144    H           FAS2980       e0a
node2              Eth1/2         145    H           FAS2980       e0a
cs2(FDO220329V5)   Eth1/65        176    R S I s     N9K-C92300YC  Eth1/65
cs2(FDO220329V5)   Eth1/66        176    R S I s     N9K-C92300YC  Eth1/66

Total entries displayed: 4



cs2# 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         139    H           FAS2980       e0b
node2              Eth1/2         124    H           FAS2980       e0b
cs1(FDO220329KU)   Eth1/65        178    R S I s     N9K-C92300YC  Eth1/65
cs1(FDO220329KU)   Eth1/66        178    R S I s     N9K-C92300YC  Eth1/66
```

```
Total entries displayed: 4
```

Steps

1. Install the appropriate RCF and image on the switch, newcs2, and make any necessary site preparations.

   If necessary, verify, download, and install the appropriate versions of the RCF and NX-OS software for the new switch. If you have verified that the new switch is correctly set up and does not need updates to the RCF and NX-OS software, continue to step 2.

   a. Go to the *NetApp Cluster and Management Network Switches Reference Configuration File Description Page* on the NetApp Support Site.

   b. Click the link for the *Cluster Network and Management Network Compatibility Matrix*, and then note the required switch software version.

   c. Click your browser's back arrow to return to the **Description** page, click **CONTINUE**, accept the license agreement, and then go to the **Download** page.

   d. Follow the steps on the Download page to download the correct RCF and NX-OS files for the version of ONTAP software you are installing.

2. On the new switch, log in as admin and shut down all of the ports that will be connected to the node cluster interfaces (ports 1/1 to 1/64).

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

   ```
   newcs2# config
   Enter configuration commands, one per line. End with CNTL/Z.
   newcs2(config)# interface e1/1-64
   newcs2(config-if-range)# shutdown
   ```

3. Verify that all cluster LIFs have auto-revert enabled:

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

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

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

   4 entries were displayed.
   ```

4. Verify that all the cluster LIFs can communicate:

```
cluster ping-cluster
```

```
cluster1::*> cluster ping-cluster node1

Host is node2
Getting addresses from network interface table...
Cluster node1_clus1 169.254.209.69 node1 e0a
Cluster node1_clus2 169.254.49.125 node1 e0b
Cluster node2_clus1 169.254.47.194 node2 e0a
Cluster node2_clus2 169.254.19.183 node2 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 169.254.47.194 to Remote 169.254.209.69
Local 169.254.47.194 to Remote 169.254.49.125
Local 169.254.19.183 to Remote 169.254.209.69
Local 169.254.19.183 to Remote 169.254.49.125
Larger than PMTU communication succeeds on 4 path(s)
RPC status:
2 paths up, 0 paths down (tcp check)
2 paths up, 0 paths down (udp check)
```

5. Shut down the ISL ports 1/65 and 1/66 on the Nexus 92300YC switch cs1:

```
cs1# configure
Enter configuration commands, one per line. End with CNTL/Z.
cs1(config)# interface e1/65-66
cs1(config-if-range)# shutdown
cs1(config-if-range)#
```

6. Remove all of the cables from the Nexus 92300YC cs2 switch, and then connect them to the same ports on the Nexus 92300YC newcs2 switch.
7. Bring up the ISLs ports 1/65 and 1/66 between the cs1 and newcs2 switches, and then verify the port channel operation status.

   Port-Channel should indicate Po1(SU) and Member Ports should indicate Eth1/65(P) and Eth1/66(P).

   This example enables ISL ports 1/65 and 1/66 and displays the port channel summary on switch cs1:

```
cs1# configure
Enter configuration commands, one per line. End with CNTL/Z.
cs1(config)# int e1/65-66
cs1(config-if-range)# no shutdown

cs1(config-if-range)# 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      Eth1/65(P)   Eth1/66(P)

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

8. Verify that port e0b is up on all nodes:

   `network port show ipspace Cluster`

   The output should be similar to the following:

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

Node: node1

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

Node: node2

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

4 entries were displayed.
```

9. On the same node you used in the previous step, revert the cluster LIF associated with the port in the previous step by using the network interface revert command.

   In this example, LIF node1_clus2 on node1 is successfully reverted if the Home value is true and the port is e0b.

   The following commands return LIF `node1_clus2` on `node1` to home port `e0a` and displays information about the LIFs on both nodes. Bringing up the first node is successful if the Is Home column is true for both cluster interfaces and they show the correct port assignments, in this example `e0a` and `e0b` on node1.

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

            Logical      Status     Network            Current
Current Is
Vserver     Interface    Admin/Oper Address/Mask       Node       Port
Home
----------- ------------ ---------- ------------------ ----------
------- -----
Cluster
            node1_clus1  up/up      169.254.209.69/16  node1      e0a
true
            node1_clus2  up/up      169.254.49.125/16  node1      e0b
true
            node2_clus1  up/up      169.254.47.194/16  node2      e0a
true
            node2_clus2  up/up      169.254.19.183/16  node2      e0a
false

4 entries were displayed.
```

10. Display information about the nodes in a cluster:

    `cluster show`

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

```
cluster1::*> cluster show

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

11. Verify that all physical cluster ports are up:

    `network port show ipspace Cluster`

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

Node: node1

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

Node: node2

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

4 entries were displayed.
```

12. Verify that all the cluster LIFs can communicate:

```
cluster ping-cluster
```

```
cluster1::*> cluster ping-cluster -node node2
Host is node2
Getting addresses from network interface table...
Cluster node1_clus1 169.254.209.69 node1 e0a
Cluster node1_clus2 169.254.49.125 node1 e0b
Cluster node2_clus1 169.254.47.194 node2 e0a
Cluster node2_clus2 169.254.19.183 node2 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 169.254.47.194 to Remote 169.254.209.69
Local 169.254.47.194 to Remote 169.254.49.125
Local 169.254.19.183 to Remote 169.254.209.69
Local 169.254.19.183 to Remote 169.254.49.125
Larger than PMTU communication succeeds on 4 path(s)
RPC status:
2 paths up, 0 paths down (tcp check)
2 paths up, 0 paths down (udp check)
```

13. Confirm the following cluster network configuration:

```
network port show
```

```
cluster1::*> network port show -ipspace Cluster
Node: node1

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: node2
```

```
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

4 entries were displayed.


cluster1::*> network interface show -vserver Cluster

            Logical    Status     Network            Current
Current Is
Vserver     Interface  Admin/Oper Address/Mask       Node          Port
Home
----------- ---------- ---------- ------------------ -------------
------- ----
Cluster
            node1_clus1  up/up    169.254.209.69/16  node1         e0a
true
            node1_clus2  up/up    169.254.49.125/16  node1         e0b
true
            node2_clus1  up/up    169.254.47.194/16  node2         e0a
true
            node2_clus2  up/up    169.254.19.183/16  node2         e0b
true

4 entries were displayed.

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

Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface         Platform
----------- ------ ------------------------- ----------------
----------------
node2      /cdp
            e0a    cs1                       0/2               N9K-
C92300YC
            e0b    newcs2                    0/2               N9K-
```

```
C92300YC
node1      /cdp
            e0a    cs1                       0/1               N9K-
C92300YC
            e0b    newcs2                    0/1               N9K-
C92300YC

4 entries were displayed.


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         144    H           FAS2980       e0a
node2                Eth1/2         145    H           FAS2980       e0a
newcs2(FDO296348FU)  Eth1/65        176    R S I s     N9K-C92300YC
Eth1/65
newcs2(FDO296348FU)  Eth1/66        176    R S I s     N9K-C92300YC
Eth1/66


Total entries displayed: 4


cs2# 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         139    H           FAS2980       e0b
node2              Eth1/2         124    H           FAS2980       e0b
cs1(FDO220329KU)   Eth1/65        178    R S I s     N9K-C92300YC
Eth1/65
cs1(FDO220329KU)   Eth1/66        178    R S I s     N9K-C92300YC
Eth1/66

Total entries displayed: 4
```

14. For ONTAP 9.4 and later, enable the cluster switch health monitor log collection feature for collecting switch-related log files, using gthe commamds:

    `system cluster-switch log setup-password` and `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.

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