



## Set up

### Cluster and storage switches

NetApp

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# 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](https://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 <i>Installing a Cisco Nexus 9336C-FX2 cluster switch and pass-through panel in a NetApp cabinet</i> guide for instructions to install the switch in a NetApp cabinet. |

| If you are installing your...                       | Then...   |
|---|---|
| Cisco Nexus 3232C in a NetApp system cabinet        | See the <i>Installing a Cisco Nexus 3232C cluster switch and pass-through panel in a NetApp cabinet</i> guide for instructions to install the switch in a NetApp cabinet.   |
| Cisco Nexus 3132Q-V in a NetApp system cabinet      | See the <i>Installing a Cisco Nexus 3132Q-V cluster switch and pass-through panel in a NetApp cabinet</i> guide for instructions to install the switch in a NetApp cabinet. |
| Equipment in a Telco rack                           | See the procedures provided in the switch hardware installation guides and the NetApp installation and setup instructions.  |
| Cisco Nexus 5596UP/5596T in a NetApp system cabinet | See the <i>Installing a Cisco Nexus 5596 cluster switch and pass-through panel in a NetApp cabinet</i> 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  |
|---|--|
| <i>Nexus 9000 Series Hardware Installation Guide</i>  | Provides detailed information about site requirements, switch hardware details, and installation options.                |
| <i>Cisco Nexus 9000 Series Switch Software Configuration Guides</i> (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. |
| <i>Cisco Nexus 9000 Series NX-OS Software Upgrade and Downgrade Guide</i> (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.                    |
| <i>Cisco Nexus 9000 Series NX-OS Command Reference Master Index</i>   | Provides links to the various command references provided by Cisco.  |



| Document title   | Description   |
|--|---|
| <i>Cisco Nexus 9000 MIBs Reference</i>   | Describes the Management Information Base (MIB) files for the Nexus 9000 switches.  |
| <i>Nexus 9000 Series NX-OS System Message Reference</i>  | 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. |
| <i>Cisco Nexus 9000 Series NX-OS Release Notes (choose the notes for the NX-OS release installed on your switches)</i> | Describes the features, bugs, and limitations for the Cisco Nexus 9000 Series.  |
| Regulatory Compliance and Safety Information for Cisco Nexus 9000 Series   | Provides international agency compliance, safety, and statutory information for the Nexus 9000 series switches.   |

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   |
|---|---|
| <i>Nexus 3000 Series Hardware Installation Guide</i>  | Provides detailed information about site requirements, switch hardware details, and installation options.   |
| <i>Cisco Nexus 3000 Series Switch Software Configuration Guides (choose the guide for the NX-OS release installed on your switches)</i>       | Provides initial switch configuration information that you need before you can configure the switch for ONTAP operation.  |
| <i>Cisco Nexus 3000 Series NX-OS Software Upgrade and Downgrade Guide (choose the guide for the NX-OS release installed on your switches)</i> | Provides information on how to downgrade the switch to ONTAP supported switch software, if necessary.   |
| <i>Cisco Nexus 3000 Series NX-OS Command Reference Master Index</i>   | Provides links to the various command references provided by Cisco.   |
| <i>Cisco Nexus 3000 MIBs Reference</i>  | Describes the Management Information Base (MIB) files for the Nexus 3000 switches.  |
| <i>Nexus 3000 Series NX-OS System Message Reference</i>   | 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. |

| Document title   | Description   |
|--|---|
| <i>Cisco Nexus 3000 Series NX-OS Release Notes (choose the notes for the NX-OS release installed on your switches)</i>                                 | 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  |
|--|--|
| <i>Nexus 5000 Series Hardware Installation Guide</i>   | Provides detailed information about site requirements, switch hardware details, and installation options.                |
| <i>Cisco Nexus 5000 Series Switch Software Configuration Guide (choose the guide for the software you are using)</i>   | Provides initial switch configuration information that you need before you can configure the switch for ONTAP operation. |
| <i>Cisco Nexus 5000 Series NX-OS Software Upgrade and Downgrade Guide</i>  | Provides information about how to downgrade the switch to the supported ONTAP switch software, if necessary.             |
| <i>Cisco Nexus 5000 Series NX-OS Command Reference Master Index</i>  | Provides an alphabetical list of all the commands supported for a specific NX-OS release.                                |
| <i>Cisco Nexus 5000 and Nexus 2000 MIBs Reference</i>  | Describes the Management Information Base (MIB) files for the Nexus 5000 switches.                                       |
| <i>Nexus 5000 Series NX-OS System Message Reference</i>  | Describes troubleshooting information.   |
| <i>Regulatory, Compliance, and Safety Information for the Cisco Nexus 6000 Series, Cisco Nexus 5000 Series, Cisco Nexus 3000 Series, and Cisco Nexus 2000 Series</i> | 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 <i>Installation and Setup Instructions</i> | Describes how to install NetApp hardware.                              |
| ONTAP documentation  | Provides detailed information about all aspects of the ONTAP releases. |
| <a href="#">Hardware Universe</a>                              | 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   |
|--|---|
| <a href="#">42U System Cabinet, Deep Guide</a>   | Describes the FRUs associated with the 42U system cabinet, and provides maintenance and FRU replacement instructions. |
| <a href="#">Installing a Cisco Nexus 3232C cluster switch and pass-through panel in a NetApp cabinet</a> | Describes how to install a Cisco Nexus 3232C switch in a four-post NetApp cabinet.                                    |
| <a href="#">Installing a Cisco Nexus 3132Q-V switch and pass-through panel in a NetApp Cabinet</a>       | Describes how to install a Cisco Nexus 3132Q-V switch in a four-post NetApp cabinet.                                  |
| <a href="#">Installing a Cisco Nexus 5596 switch and pass-through panel in a NetApp Cabinet</a>          | 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    |

| Cluster switch A |                              | Cluster switch B |                              |
|------------------|------------------------------|------------------|------------------------------|
| 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             |
| 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                |  |

| Cluster switch A |          | Cluster switch B |          |
|------------------|----------|------------------|----------|
| 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               |          |
| 22               |          | 22               |          |
| 23               |          | 23               |          |
| 24               |          | 24               |          |
| 25 through 34    | Reserved | 25 through 34    | Reserved |

| Cluster switch A |                              | Cluster switch B |                              |
|------------------|------------------------------|------------------|------------------------------|
| 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      |

| Cluster switch A |                | Cluster switch B |                |
|------------------|----------------|------------------|----------------|
| 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 |
| 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 |



| Cluster switch A |                 | Cluster switch B |                 |
|------------------|-----------------|------------------|-----------------|
| 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  |
| 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 |

| Cluster switch A |                                 | Cluster switch B |                                 |
|------------------|---------------------------------|------------------|---------------------------------|
| 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                 |
| 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                |                 |

| Cluster switch A |  | Cluster switch B |  |
|------------------|--|------------------|--|
| 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               |  |
| 22               |  | 22               |  |
| 23               |  | 23               |  |
| 24               |  | 24               |  |
| 25               |  | 25               |  |
| 26               |  | 26               |  |
| 27               |  | 27               |  |
| 28               |  | 28               |  |
| 29               |  | 29               |  |
| 30               |  | 30               |  |

| Cluster switch A |  | Cluster switch B |  |
|------------------|--|------------------|--|
| 31               |  | 31               |  |
| 32               |  | 32               |  |
| 33               |  | 33               |  |
| 34               |  | 34               |  |
| 35               |  | 35               |  |
| 36               |  | 36               |  |
| 37               |  | 37               |  |
| 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               |  |

| Cluster switch A |                         | Cluster switch B |                         |
|------------------|-------------------------|------------------|-------------------------|
| 53               |                         | 53               |                         |
| 54               |                         | 54               |                         |
| 55               |                         | 55               |                         |
| 56               |                         | 56               |                         |
| 57               |                         | 57               |                         |
| 58               |                         | 58               |                         |
| 59               |                         | 59               |                         |
| 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 |

| Cluster switch A |                     | Cluster switch B |                     |
|------------------|---------------------|------------------|---------------------|
| 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/100G node | 6                | 4x10G/40G/100G node |
| 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 |
| 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    |

| Cluster switch A |                              | Cluster switch B |                              |
|------------------|------------------------------|------------------|------------------------------|
| 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               |                 |

| 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 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      |



| Cluster switch A |                | Cluster switch B |                |
|------------------|----------------|------------------|----------------|
| 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 |
| 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    |

| Cluster switch A |                             | Cluster switch B |                             |
|------------------|-----------------------------|------------------|-----------------------------|
| 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               |                 |

| 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 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         |
| 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        |

| Cluster switch A |                         | Cluster switch B |                         |
|------------------|-------------------------|------------------|-------------------------|
| 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 |
| 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                |                 |

| Cluster switch A |                         | Cluster switch B |                         |
|------------------|-------------------------|------------------|-------------------------|
| 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               |                         |
| 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 |

| Cluster switch A |                         | Cluster switch B |                         |
|------------------|-------------------------|------------------|-------------------------|
| 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.

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