

# **CN1601 and CN1610 Switch Setup and Configuration Guide**

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## Overview of the CN1601 and CN1610 switches

The CN1601 management switches and the CN1610 cluster switches are designed to work in clusters ranging in size from two to 12 nodes in clustered Data ONTAP supported configurations running Data ONTAP 8.2.1 and later and from two to eight nodes on configurations prior to Data ONTAP 8.2.1

The CN1601 cluster and management network switch is a managed Layer 2 switch that provides 16 10/100/1000Base-T ports and features two ISL ports with an inboard management port. You can install the switch in a NetApp system cabinet with the rack-mount installation kit that comes with the switch, or you can install it in a rack. For more information about the CN1601 switch, see the *1G Cluster-Mode Switch Installation Guide*.

The CN1610 cluster network switch is a managed Layer 2 switch that provides 16 10-Gb Small Form-Factor Pluggable Plus (SFP+) ports and it features four ISL ports with an inband/outband management port. You can install the CN1610 switch in a NetApp system cabinet with the rack-mount installation kit that comes with the switch, or you can install it in a rack. For more information about the CN1610 switch, see the *10G Cluster-Mode Switch Installation Guide*.

The following table lists the part numbers and descriptions for the CN1601 and CN1610 switches and related components:

Part number	Description
X1960-R6	CN1610 10-GbE cluster switch
X1961-R6	CN1601 1-GbE management switch
X6566-05-R6	10 GbE Twinax 0.5-meter copper cable for CN1610 (will not work on FAS25xx systems)
X6566-2-R6	10 GbE Twinax 2-meter copper cable for CN1610 (will not work on FAS25xx systems)
X6566-3-R6	10 GbE Twinax 3-meter copper cable for CN1610 (will not work on FAS25xx systems)
X6566-5-R6	10 GbE Twinax 5-meter copper cable for CN1610 (will not work on FAS25xx systems)
X6566B-05-R6	10 GbE direct attach 0.5-meter copper cable for CN1610 (works with all systems, including FAS25xx systems)
X6566B-2-R6	10 GbE direct attach 2-meter copper cable for CN1610 (works with all systems, including FAS25xx systems)
X6566B-3-R6	10 GbE direct attach 3-meter copper cable for CN1610 (works with all systems, including FAS25xx systems)
X6566B-5-R6	10 GbE direct attach 5-meter copper cable for CN1610 (works with all systems, including FAS25xx systems)
X6589-R6	SFP+ 10-GbE module for CN1610
X6553-R6	10 GbE 2-meter OM3 cable
X6536-R6	10 GbE 5-meter OM3 cable
X6554-R6	10 GbE 15-meter OM3 cable
X6537-R6	10 GbE 30-meter OM3 cable
X6560-R6	1 GbE 0.5-meter CAT6 cable

<b>Part number</b>	<b>Description</b>
X6561-R6	1 GbE 2-meter CAT6 cable
X6562-R6	1 GbE 5-meter CAT6 cable
X6577-R6	1 GbE 30-meter CAT6 cable
X5530A-R6	Spare rack-mount kit

For more information, see the *Cluster Network and Management Network Compatibility Matrix* available from the NetApp CN1601 and CN1610 Switches download site: [http://mysupport.netapp.com/NOW/download/software/cm\\_switches\\_ntap/](http://mysupport.netapp.com/NOW/download/software/cm_switches_ntap/)

## Setting up the CN1601 and CN1610 switches

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You can use the setup information to get your switches ready to configure and customize them for your requirements.

### Overview of the initial setup for the CN1601 and CN1610 switches

Follow the general summary of this process to install your switches and get them ready to customize for your environment's needs.

#### Before you begin

- You must have access to an FTP or a TFTP server at the installation site or it must be installed on your laptop for the download of the applicable NetApp cluster network and management network software and configuration files.
- You must have the required cluster network and management network switch documentation. See [Required CN1601 and CN1610 documentation](#) on page 17 for more information.
- You must have the applicable controller and clustered Data ONTAP documentation.
- You must have the applicable network and configuration information and cables.
- You must have the recommended port assignments to set up the cluster.

#### About this task

All of your NetApp cluster network and management network switches should arrive with the standard NetApp factory default configuration installed on them. These switches should also have the current version of the FASTPATH firmware and reference configuration files (RCFs) loaded.

**Attention:** If necessary, you can download the applicable NetApp RCFs and FASTPATH software for your switches from the NetApp Support Site at [mysupport.netapp.com](http://mysupport.netapp.com).

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

#### Steps

1. Rack the cluster network and management network switches and controllers as shown in the switch installation guides for your switches.  
See the [Required CN1601 and CN1610 documentation](#) on page 17 for the appropriate guide.
2. Using the port installation table as a model, cable the cluster network and management network switches to the controllers.
3. Power on the cluster network and management network switches and controllers.  
See the [Cluster switch procedures](#) on page 18 for more information about this process.
4. Do the initial setup for the management switch.  
See the information provided in the [Cluster switch procedures](#) on page 18 for more information about this process. You need to do this before setting up the cluster switches to ensure that the cluster switches can connect to the management network.

5. Perform an initial configuration of the cluster switches.

**Note:** Your switch is shipped with the current versions of the RCF and FASTPATH image. The RCF is loaded onto the switch but will still need to be applied to create a working configuration. You do not need to change the RCF if you are satisfied with the version on your switch.

See the information provided in the [Cluster switch procedures](#) on page 18 for more information about this task.

6. Verify the configuration choices you made in the display that appears at the end of the setup, and ensure that you save the configuration.
7. Check the software 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 appropriate *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 [mysupport.netapp.com](http://mysupport.netapp.com).

8. Perform an initial configuration of the management network switches based on information provided in the [Cluster switch procedures](#) on page 18 section of this guide.

#### After you finish

Continue to customize the switch to meet your environment's requirements. It is strongly recommended that you configure the date and time, DNS, SNTP, host name, prompt, and administrator password.

For more information about the procedures to install the CN1601 or CN1610 switches, go to the [Cluster switch procedures](#) on page 18. For information about the command-line interface (CLI) commands to help you customize the switch, see the CLI reference manual for your switch.

## CN1601 and CN1610 configuration requirements

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 and you need specific network information.

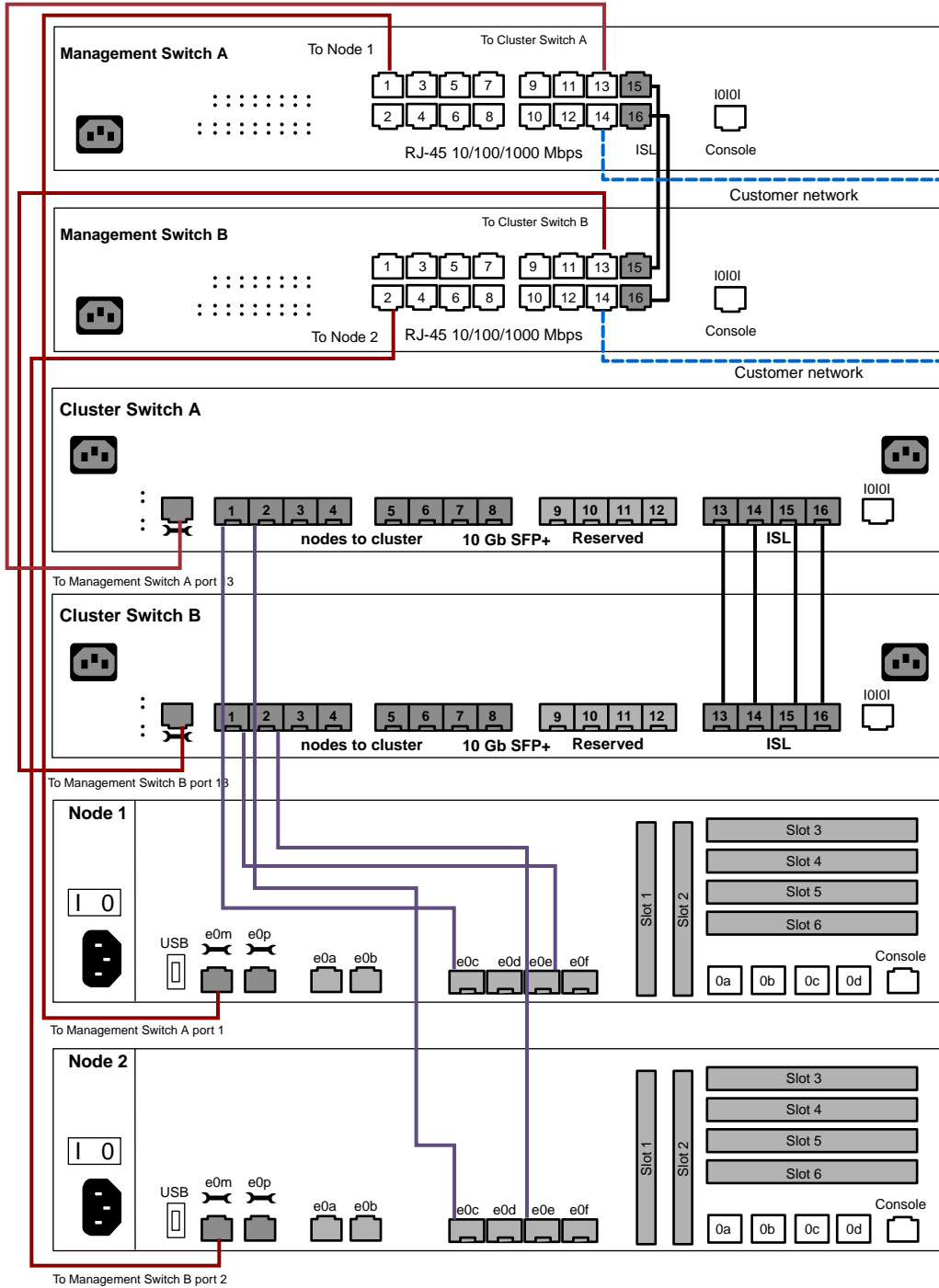
#### Supported platforms

You need the following network information for all switch and controller configurations:

- Two or more IP subnet addresses for cluster network and management network traffic
- Host names and IP addresses for each of the switches and controllers

The following example graphic shows the cabling connections for a two-node cluster using CN1610 switches with 62xx controllers. There is a single management connection from each node to the management switch. The labeled port connectors indicate the following connections:

- e0c, e0e: cluster switch connections
- e0M: management switch connections
- e0a: redundant management connections



**Required network information for CN1601 management switches**

Port e0M is allocated as the management port on supported platforms. The management port assignments for the various controllers are:

- Port e0f on 60xx systems
- Port e0d on 3040A and 3070A systems
- Port e0M or the service port (wrench icon) on FAS2240, FAS25xx, 31xx, 32xx, 62xx and 80xx systems



**Note:** The node management logical interface (LIF) resides on a single port on a node and uses a single port on a switch by default. The node management LIF does not fail over to other ports on the node in the same manner that the data and cluster LIFS do. For more information about how to configure the node management LIF, see the *Network Management Guide* and *Release Notes* for your version of clustered Data ONTAP.

## CN1601 switch option settings

The CN1601 switch ships with settings that were set by NetApp, including the FASTPATH software default values.

This table shows the CN1601 switch settings as set by NetApp, the FASTPATH default settings, and option settings that can be modified on site. Some of these settings are found in the reference configuration file (RCF).

<b>CN1601 switch option settings</b>				
<b>Option</b>	<b>NetApp settings as shipped</b>	<b>FASTPATH default</b>	<b>Comments</b>	<b>Setting in RCF</b>
Default account/password	admin/none	admin/none	Site configuration task	no
DHCP/bootp	enabled	enabled	Site configuration task	no
IPv6	none	none		no
Command-line logging	disabled	disabled	Site configuration task	no
SNMP communities	public, private	public, private	cshml! string configured as per RCF for health monitor	yes
syslog	disabled	disabled	Site configuration task	no
SNTP server	unconfigured	unconfigured	Site configuration task	no
DNS server	unconfigured	unconfigured	Site configuration task	no
Link aggregation	on for ISL links	unconfigured	NetApp uses src/dest IP and TCP ports for load balancing	yes
LLDP	off	off		no
ISDP (CDPv1)	enabled	disabled	Timer set to 5 seconds	yes
IGMP snooping	off	off		no

<b>CN1601 switch option settings</b>				
<b>Option</b>	<b>NetApp settings as shipped</b>	<b>FASTPATH default</b>	<b>Comments</b>	<b>Setting in RCF</b>
MTU	MTU for CN1601 cluster switch on all node ports is 9216; MTU for CN1601 management switch on all ports is 1518	default FASTPATH MTU is 1518	CN1601 MTU as a cluster switch is set to 9216; the MTU as a management switch is 1518	yes
Port mirroring	off	off		no
Storm control	off	off		no
Flow control	off	off		no
MSTP	off	off		no
VLANs	vlan1 is the default	vlan1 is the default	For CN1601 as cluster switch, vlan600 is set for network uplink port and no port span tree	no
CoS/QoS	off	off		no
DiffServ	off	off		no
ACLs	off	off		no
802.1X (authentication)	off	off		no
RADIUS	off	off		no
SSH	disabled	disabled	Site configuration task	no
TACACS	off	off		no
Hostname	CN1601	none	Set by default in NetApp FASTPATH version to CN1601; should be reset for site configuration needs	no

## CN1610 switch option settings

The CN1610 switch ships with settings that were made by NetApp, including the FASTPATH software default values.

This table shows the CN1610 switch settings as set by NetApp, the FASTPATH default settings, and option settings that can be modified on site. Some of the settings are found in the reference

configuration file (RCF). Before you start you will need the network addresses or subnet addresses for the cluster and the IDs assigned to the switches.

<b>CN1610 switch option settings</b>				
<b>Option</b>	<b>NetApp settings as shipped</b>	<b>FASTPATH default</b>	<b>Comments</b>	<b>Setting in RCF</b>
Default account/password	admin/none	admin/none	Site configuration task	no
DHCP/bootp	enabled	enabled	Site configuration task	no
Service port IP address	none	none	Site configuration task	no
IPv6	none	none		no
Command-line logging	disabled	disabled	Site configuration task	no
SNMP communities	public, private, netapp	public, private	NetApp string configured as per RCF for health monitor	yes
syslog	disabled	disabled	Site configuration task	no
Sntp server	unconfigured	unconfigured	Site configuration task	no
DNS server	unconfigured	unconfigured	Site configuration task	no
Link aggregation	on for ISL links	unconfigured	NetApp uses enhanced hashing algorithms for load-balancing	yes
LLDP	off	off		no
ISDP (CDPv1)	enabled	disabled	Timer set to 5 seconds	yes
IGMP snooping	off	off		no
MTU set to 9216	9216 for all node ports and ISLs	Default FASTPATH MTU is 1518		yes
Port mirroring	off	off		no
Storm control	off	off		no
Flow control	off	off		no
MSTP	on	on		no
VLANs	not configured; vlan1 only default	vlan1 is default		no
CoS/QoS	off	off		no

<b>CN1610 switch option settings</b>				
<b>Option</b>	<b>NetApp settings as shipped</b>	<b>FASTPATH default</b>	<b>Comments</b>	<b>Setting in RCF</b>
DiffServ	off	off		no
ACLs	off	off		no
802.1X (authentication)	off	off		no
RADIUS	off	off		no
SSH	disabled	disabled	Site configuration task	no
TACACS	off	off		no
Hostname	CN1610	none	Set by default in NetApp FASTPATH version to CN1610; should be reset for site configuration needs	no

## Port assignments for the CN1601 and CN1610 switches

The port assignment tables provide the recommended port assignments from the CN1601 and CN1610 switches to the controllers.

### CN1601 port assignments

Use the CN1601 port assignment table as a guide to configure your cluster.

#### CN1601 port assignment table

Ports 1 through 12 are treated equally by the reference configuration file (RCF) as the settings are the same. These ports are used for node connections. There are several options for connecting the nodes to the CN1601: single management, redundant management (two connections from each node), and RLM/BMC connections. The specific ports used as management ports are platform- and configuration-dependent. For specific port settings, see the latest RCF available from [mysupport.netapp.com](http://mysupport.netapp.com).

For redundant management configurations, each node will have a logical interface (LIF) composed of two ports, one connected to each switch. In this configuration, depending on the number of nodes in the cluster, there may not be enough ports on the CN1601 for the addition of a RLM/BMC connection from each node as there are only 12 ports allocated for node connectivity on each switch. Therefore, the RLM/BMC for the nodes may need to utilize ports on other site switches.

This table shows the port definition for a pair of CN1601 switches functioning as management switches with a single management connection:

CN1601 management switch A		CN1601 management switch B	
Switch port	Node/port usage	Switch port	Node/port usage
1	Node management connectivity	1	Node management connectivity
2	Node management connectivity	2	Node management connectivity
3	Node management connectivity	3	Node management connectivity
4	Node management connectivity	4	Node management connectivity
5	Node management connectivity	5	Node management connectivity
6	Node management connectivity	6	Node management connectivity
7	Node management connectivity	7	Node management connectivity
8	Node management connectivity	8	Node management connectivity
9	Node management connectivity*	9	Node management connectivity*

CN1601 management switch A		CN1601 management switch B	
Switch port	Node/port usage	Switch port	Node/port usage
10	Node management connectivity*	10	Node management connectivity*
11	Node management connectivity*	11	Node management connectivity*
12	Node management connectivity*	12	Node management connectivity*
13	Cluster switch A service port	13	Cluster switch B service port
14	Customer management network	14	Customer management network
15	Switch B port 15(ISL)	15	Switch A port 15 (ISL)
16	Switch B port 16 (ISL)	16	Switch A port 16 (ISL)

\*Data ONTAP 8.2 and later versions support 12 nodes.

This table shows the port definition for a pair of CN1601 switches functioning as cluster switches. Note that this configuration only supports the FAS2220 platform. The configuration also does not support connections to a management switch. Those connections go the customer management network.

CN1601 cluster switch A		CN1601 cluster switch B	
Switch port	Node/port usage	Switch port	Node/port usage
1	Node 1 cluster port e0a	1	Node 1 cluster port e0b
2	Node 2 cluster port e0a	2	Node 2 cluster port e0b
3	Node management	3	Node management
4	Node management	4	Node management
5	Node management	5	Node management
6	Node management	6	Node management
7	Node management	7	Node management
8	Node management	8	Node management
9	Node management connectivity*	9	Node management connectivity*
10	Node management connectivity*	10	Node management connectivity*
11	Node management connectivity*	11	Node management connectivity*
12	Node management connectivity*	12	Node management connectivity*

CN1601 cluster switch A		CN1601 cluster switch B	
Switch port	Node/port usage	Switch port	Node/port usage
13	Node management connectivity*	13	Node management connectivity*
14	Customer management network	14	Customer management network
15	Switch B port 15 (ISL)	15	Switch A port 15 (ISL)
16	Switch B port 16 (ISL)	16	Switch A port 16 (ISL)

## CN1610 port assignments

You can use the CN1610 port assignment table as a guide to configure your cluster.

**Note:** The 8040, 8060, and 8080 systems support more than one cluster port connection for each cluster interconnect switch.

### CN1610 port assignment table

Ports 1-12 are configured as ports. This does not indicate the number of supported nodes for clustered Data ONTAP.

**Note:** To use any unconnected ports for other administrative purposes, you must manually reconfigure them. For specific port settings, see the latest reference configuration file (RCF) available from [mysupport.netapp.com](http://mysupport.netapp.com).

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

CN1610 cluster switch A		CN1610 cluster switch B	
Switch port	Node/port usage	Switch port	Node/port usage
Serviceport/wrench port (out-of-band management port)	Admin net or management switch	Serviceport/wrench port (out-of-band management port)	Admin net or management switch
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

<b>CN1610 cluster switch A</b>		<b>CN1610 cluster switch B</b>	
<b>Switch port</b>	<b>Node/port usage</b>	<b>Switch port</b>	<b>Node/port usage</b>
13	ISL to switch B port 13	13	ISL to switch A port 13
14	ISL to switch B port 14	14	ISL to switch A port 14
15	ISL to switch B port 15	15	ISL to switch A port 15
16	ISL to switch B port 16	16	ISL to switch A port 16



## Required CN1601 and CN1610 documentation

You need specific switch and controller documentation to set up your Cluster-Mode configuration.

### Required documentation for CN1601 and CN1610 switches

To set up the CN1601 and CN1610 switches, you need the following documents from the NetApp Support Site at [mysupport.netapp.com](http://mysupport.netapp.com):

Document title	Description
<i>1G Cluster-Mode Switch Installation Guide</i>	Provides detailed information about site requirements, switch hardware details, and installation options for the CN1601 switch.
<i>CN1601 Network Switch Administrator's Guide</i>	Provides examples of how to use the CN1601 switch in a typical network.
<i>CN1601 Network Switch CLI Command Reference</i>	Describes the command-line interface (CLI) commands you use to view and configure the CN1601 software.
<i>10G Cluster-Mode Switch Installation Guide</i>	Provides detailed information about site requirements, switch hardware details, and installation options for the CN1610 switch.
<i>CN1610 Network Switch Administrator's Guide</i>	Provides examples of how to use the CN1610 switch in a typical network.
<i>CN1610 Network Switch CLI Command Reference</i>	Describes the command-line interface (CLI) commands you use to view and configure the CN1610 software.

### Required documentation for supported clustered Data ONTAP systems

To set up a clustered Data ONTAP system, you need the following documents from the NetApp Support Site at [mysupport.netapp.com](http://mysupport.netapp.com):

Name	Description
<i>Hardware Universe</i> (formerly the <i>Site Requirements Guide</i> )	Describes the power and site requirements for all NetApp hardware, including system cabinets.
Controller-specific <i>Installation and Setup Instructions</i>	Describes how to install NetApp hardware.
Data ONTAP 8.x documentation for clustered Data ONTAP	Provides detailed information about all aspects of the Data ONTAP 8.x release for clustered Data ONTAP.

## Using the CN1601 and CN1610 switch procedures

You can use the switch procedures to perform a variety of installation, replacement, and upgrade tasks on the CN1601 and CN1610 switches in your cluster on systems running clustered Data ONTAP.

### Configuring the CN1610 cluster switch for FASTPATH and RCF upgrade on systems running Data ONTAP 8.3.1 and later

Installing the CN1610 cluster switch on systems running Data ONTAP 8.3.1 and later starts with setting up an IP address and configuration information to allow the CN1610 switch to communicate through the management interface, and then installing the FASTPATH software and reference configuration file (RCF).

#### Before you begin

The following conditions must exist before installing the FASTPATH software and reference configuration file (RCF) on a NetApp CN16xx cluster switch:

- The cluster must be a fully functioning cluster (no error log messages or other issues).
- There must be no defective cluster NICs and all connected ports on both cluster switches must be functional.
- All cluster ports must be up.
- All cluster logical interfaces (LIFs) must be up and must not have been migrated.
- The Data ONTAP (privilege: advanced) `cluster ping-cluster -node node1` command must indicate that larger than PMTU communication is successful on all paths.
- You must consult the switch compatibility table on the [NetApp CN1601 and CN1610 Switches](#) page for the supported FASTPATH, RCF, and Data ONTAP versions. There can be command dependencies between command syntax in the RCF and FASTPATH versions.

#### About this task

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

- The two NetApp switch names are cs1 and cs2.
- The cluster logical interface (LIF) names are node1\_clus1 and node1\_clus2 for node1, and node2\_clus1 and node2\_clus2 for node2 .
- The Vserver name is Cluster.
- The `cluster1::*>` prompt indicates the name of the cluster.
- The cluster ports on each node are named e0a and e0b. Refer to the *Hardware Universe* for the actual cluster ports supported on your platform.
- The Inter-Switch Links (ISLs) supported for the NetApp cluster switches are Ports 0/13 through 0/16.
- The node connections supported for the NetApp cluster switches are Ports 0/1 through 0/12.

- The example in this procedure begins the upgrade on the second switch, *cs2*.
- The examples in this procedure use two nodes but you can have up to 24 nodes in a cluster.

### Steps

1. Connect the serial port (the RJ-45 socket on the right side of the switch) to the host or serial port of your choice.
2. Connect the management port (the RJ-45 wrench port on the left side of the switch) to the same network where your TFTP 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. Log into the switch as `admin`. There is no password by default. At the `(CN1610) >` prompt, enter the `enable` command.

This gives you access to Privileged EXEC mode, which allows you to configure the network interface.

```
User:admin
Password:
(CN1610)> enable
Password:
(CN1610) #
```

5. Prepare to connect to the network with the TFTP server. If you are using DHCP you do not need to do this.

The serviceport is set to use DHCP by default. The network management port will be set to None for the IPv4 and IPv6 protocol settings. If your wrench port is connected to the network that has a DHCP server that part is done. To set a static IP address, use the `serviceport protocol`, `network protocol`, and `serviceport ip` commands as shown here.

```
(CN1610) #serviceport protocol none
(CN1610) #network protocol none
(CN1610) #serviceport ip ipaddr netmask gateway
```

6. To verify the results, use the `show serviceport` command.

```
(CN1610) #show serviceport
Interface Status..... Up
IP Address..... 10.x.x.x
Subnet Mask..... 255.255.255.0
Default Gateway..... 10.x.x.x
IPv6 Administrative Mode..... Enabled
IPv6 Prefix is .....
fe80::2a0:98ff:fe4b:abfe/64
Configured IPv4 Protocol..... None
Configured IPv6 Protocol..... None
IPv6 AutoConfig Mode..... Disabled
Burned In MAC Address..... 00:A0:98:4B:AB:FE
```

- Use the `show network` command to display the configuration settings associated with the switch's interface.

```
(CN1610) #show network
Interface Status..... Down
IP Address..... 0.0.0.0
Subnet Mask..... 0.0.0.0
Default Gateway..... 0.0.0.0
IPv6 Administrative Mode..... Enabled
Burned In MAC Address..... 00:A0:98:4B:AB:FD
Locally Administered MAC address..... 00:00:00:00:00:00
MAC Address Type..... Burned In
Configured IPv4 Protocol..... None
Configured IPv6 Protocol..... None
IPv6 AutoConfig Mode..... Disabled
Management VLAN ID..... 1
```

- Connect the CN1610 to a laptop using a standard Ethernet cable and configure your network card in the same network with an alternate IP address. Use the `ping` command to verify the address.

If this is an issue, use a nonrouted network and configure the service port using IP 192.168.x or 172.16.x. You can reconfigure the service port to the production management IP address at a later date.

#### Example

This example verifies that the switch is connected to IP 172.16.130.1:

```
(CN1610) #ping 172.16.130.1
Pinging 172.16.130.1 with 0 bytes of data:

Reply From 172.16.130.1: icmp_seq = 0. time= 5910 usec.
```

- Display information about the network ports on the cluster by entering the following command:  
**network port show -role cluster**

#### Example

The following example shows the type of output from the command:

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

(Mbps)
Node  Port      IPspace      Broadcast Domain Link  MTU  Admin/
Oper
-----
node1
10000 e0a      Cluster      Cluster      up    9000 auto/
10000 e0b      Cluster      Cluster      up    9000 auto/
node2
10000 e0a      Cluster      Cluster      up    9000 auto/
10000 e0b      Cluster      Cluster      up    9000 auto/
4 entries were displayed.
```

- Display information about the LIFs on the cluster by entering the following command:  
**network interface show -role cluster**

**Example**

The following example shows the logical interfaces on the cluster. In this example the `-role` parameter displays information about the LIFs that are associate with cluster ports:

```
cluster1::> network interface show -role cluster
(network interface show)
Logical      Status      Network      Current
Current Is
Vserver      Interface  Admin/Oper  Address/Mask  Node
Port      Home
-----
Cluster
e0a      true      node1_clus1  up/up      10.254.66.82/16  node1
e0b      true      node1_clus2  up/up      10.254.206.128/16  node1
e0a      true      node2_clus1  up/up      10.254.48.152/16  node2
e0b      true      node2_clus2  up/up      10.254.42.74/16  node2
4 entries were displayed.
```

11. On each respective node, use the `network interface migrate` command to migrate `node1_clus2` to `e0a` on `node1` and `node2_clus2` to `e0a` on `node2` with the following commands:

**Example**

```
cluster1::> network interface migrate -vserver cluster -lif node1_clus2 -
source-node node1 -destination-node node1 -destination-port e0a
cluster1::> network interface migrate -vserver cluster -lif node2_clus2 -
source-node node2 -destination-node node2 -destination-port e0a
```

12. Use the `network interface show` command on a node to verify that the migration took place.

The following example shows verification that `clus2` has migrated to port `e0a` on nodes `node1` and `node2`:

```
cluster1::> network interface show -role cluster
Logical      Status      Network      Current
Current Is
Vserver      Interface  Admin/Oper  Address/Mask  Node
Port      Home
-----
Cluster
e0a      true      node1_clus1  up/up      10.254.66.82/16  node1
e0a      true      node1_clus2  up/up      10.254.206.128/16  node1
e0a      false     node2_clus1  up/up      10.254.48.152/16  node2
e0a      true      node2_clus2  up/up      10.254.42.74/16  node2
e0a      false
4 entries were displayed.
```

13. Use the `network port modify` command with the `-node`, `-port`, and `-up-admin` parameters on both nodes to shut down cluster port `e0b`.

**Example**

The following example shows the commands to shut down port `e0b` on all nodes:

```
cluster1::> network port modify -node node1 -port e0b -up-admin false
cluster1::> network port modify -node node2 -port e0b -up-admin false
```

14. Use the `network port show` command with the `-role` parameter to verify that port e0b is shut down on all nodes.

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

(Mbps)	Node	Port	IPspace	Broadcast Domain	Link	MTU	Speed	Admin/Oper
10000	node1	e0a	Cluster	Cluster	up	9000	auto/	
10000	node1	e0b	Cluster	Cluster	down	9000	auto/	
10000	node2	e0a	Cluster	Cluster	up	9000	auto/	
10000	node2	e0b	Cluster	Cluster	down	9000	auto/	

4 entries were displayed.

15. Shut down the Inter-Switch Link (ISL) ports on cs1:

```
(cs1) #configure
(cs1) (Config)#interface 0/13-0/16
(cs1) (Interface 0/13-0/16)#shutdown
(cs1) (Interface 0/13-0/16)#exit
(cs1) (Config)#exit
```

16. Back up the current active image on cs2:

```
(cs2) # show bootvar
```

Image Descriptions

```
active :
backup :
```

Images currently available on Flash

unit	active	backup	current-active	next-active
1	1.1.0.5	1.1.0.3	1.1.0.5	1.1.0.5

```
(cs2) # copy active backup
Copying active to backup
Copy operation successful
```

17. Verify the running version of the FASTPATH software:

```
(cs2) # show version
```

Switch: 1

```

System Description..... NetApp CN1610,
1.1.0.5, Linux

2.6.21.7
Machine Type..... NetApp
CN1610
Machine Model..... CN1610
Serial Number..... 20211200106
Burned In MAC Address..... 00:A0:98:21:83:69
Software Version..... 1.1.0.5
Operating System..... Linux 2.6.21.7
Network Processing Device..... BCM56820_B0
Part Number..... 111-00893

--More-- or (q)uit

Additional Packages..... FASTPATH QOS
Management..... FASTPATH IPv6

```

**18.** Download the image file to the switch.

Copying the image file to the active image means that when you reboot, that image establishes the running FASTPATH version. The previous image remains available as a backup.

```

(cs2) #copy sftp://root@10.22.201.50//tftpboot/
NetApp_CN1610_1.1.0.8.stk active
Remote Password:*****

Mode..... SFTP
Set Server IP..... 10.22.201.50
Path..... /tftpboot/
Filename.....
NetApp_CN1610_1.1.0.8.stk
Data Type..... Code
Destination Filename..... active

Management access will be blocked for the duration of the transfer
Are you sure you want to start? (y/n) y
SFTP Code transfer starting...

File transfer operation completed successfully.

```

**19.** Show the boot images for the active and backup configuration:

**Example**

Using the `bootvar` command illustrates that idea as seen in the following example:

```

(cs2) #show bootvar

Image Descriptions

active :
backup :

Images currently available on Flash

-----
unit      active      backup      current-active      next-active
-----
1         1.1.0.8      1.1.0.5      1.1.0.5              1.1.0.8

```

## 20. Reboot the switch.

```
(cs2) #reload

The system has unsaved changes.
Would you like to save them now? (y/n) y

Config file 'startup-config' created successfully .
Configuration Saved!
System will now restart!
```

## 21. Log in again and verify the new version of the FASTPATH software:

```
(cs2) #show version

Switch: 1

System Description..... NetApp CN1610,
1.1.0.8, Linux

2.6.21.7
Machine Type..... NetApp
CN1610
Machine Model..... CN1610
Serial Number..... 20211200106
Burned In MAC Address..... 00:A0:98:21:83:69
Software Version..... 1.1.0.8
Operating System..... Linux 2.6.21.7
Network Processing Device..... BCM56820_B0
Part Number..... 111-00893

--More-- or (q)uit

Additional Packages..... FASTPATH QOS
Management              FASTPATH IPv6
```

## 22. Steps 23 through 34 finish the FASTPATH upgrade.

If you...	Then...
Do not need to install the RCF file	Go to Step 29 to finish the installation.
Need to install the RCF file	Go to Step 23.

## 23. Install the RCF file to the switch.

```
(cs2) #copy tftp://10.22.201.50//CN1610_CS_RCF_v1.1.txt nvram:script
CN1610_CS_RCF_v1.1.scr

Mode..... TFTP
Set Server IP..... 10.22.201.50
Path..... /
Filename..... CN1610_CS_RCF_v1.1.txt
Data Type..... Config Script
Destination Filename..... CN1610_CS_RCF_v1.1.scr

File with same name already exists.
WARNING:Continuing with this command will overwrite the existing file.

Management access will be blocked for the duration of the transfer
Are you sure you want to start? (y/n) y

Validating configuration script...
```



```
[the script is now displayed line by line]
Configuration script validated.
File transfer operation completed successfully.
```

**Note:** The `.scr` extension must be set as part of the filename before invoking the script. This extension is the extension for the FASTPATH operating system.

The switch will validate the script automatically as it is downloaded to the switch and the output will go to the console.

24. Verify that the script was downloaded and saved to the file name you gave it.

```
(cs2) #script list

Configuration Script Name          Size(Bytes)
-----
CN1610_CS_RCF_v1.1.scr             2191

1 configuration script(s) found.
2541 Kbytes free.
```

25. Apply the script to the switch.

```
(cs2) #script apply CN1610_CS_RCF_v1.1.scr

Are you sure you want to apply the configuration script? (y/n) y
[the script is now displayed line by line]...

Configuration script 'CN1610_CS_RCF_v1.1.scr' applied.
```

26. Verify on the switch that your changes have been made by entering the following command and then save the changes:

```
(cs2) #show running-config
```

27. Save the running configuration so it will become the startup configuration when you reboot the switch.

```
(cs2) #write memory
This operation may take a few minutes.
Management interfaces will not be available during this time.

Are you sure you want to save? (y/n) y

Config file 'startup-config' created successfully.

Configuration Saved!
```

28. Reboot the switch and verify that the running-config is correct.

```
(cs2) #reload

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

System will now restart!
```

After the reboot completes, log in and show the running-config. Look for the description on interface 3/64, which is the version label for the RCF.

29. Bring up the ISL ports on cs1, the active switch:

```
(cs1) #configure
(cs1) (Config) #interface 0/13-0/16
(cs1) (Interface 0/13-0/16) #no shutdown
(cs1) (Interface 0/13-0/16) #exit
(cs1) (Config) #exit
```

30. Use the `show port-channel 3/1` command to verify that the ISLs are operational.

The Link State field should indicate *Up*.

```
(cs2) #show port-channel 3/1

Local Interface..... 3/1
Channel Name..... ISL-LAG
Link State..... Up
Admin Mode..... Enabled
Type..... Static
Load Balance Option..... 7
(Enhanced hashing mode)

Mbr   Device/      Port   Port
Ports Timeout      Speed  Active
-----
0/13  actor/long    10G Full  True
      partner/long
0/14  actor/long    10G Full  True
      partner/long
0/15  actor/long    10G Full  False
      partner/long
0/16  actor/long    10G Full  True
      partner/long
```

31. Use the `network port modify` command to bring up cluster port `e0b` on all nodes.

The following example shows port `e0b` being brought up on `node1` and `node2`:

```
cluster1::> network port modify -node node1 -port e0b -up-admin true
cluster1::> network port modify -node node2 -port e0b -up-admin true
```

32. Use the `network port show -role cluster` command to verify that port `e0b` is up on all nodes.

### Example

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

Node  Port      IPspace      Broadcast Domain Link  MTU      Speed (Mbps)
-----
node1  e0a       Cluster      Cluster      up    9000    auto/10000
      e0b       Cluster      Cluster      up    9000    auto/10000
node2  e0a       Cluster      Cluster      up    9000    auto/10000
      e0b       Cluster      Cluster      up    9000    auto/10000
4 entries were displayed.
```

33. Data ONTAP 8.3.1 and later automatically revert when the port becomes active. Use the `network interface show -role cluster` command to verify that the LIF is now home (true) on both nodes.

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

Current Vserver Port	Is Home	Logical Interface	Status Admin/Oper	Network Address/Mask	Current Node
-----					
Cluster		node1_clus1	up/up	169.254.66.82/16	node1
e0a	true	node1_clus2	up/up	169.254.206.128/16	node1
e0b	true	node2_clus1	up/up	169.254.48.152/16	node2
e0a	true	node2_clus2	up/up	169.254.42.74/16	node2
e0b	true				

4 entries were displayed.

34. Use the `cluster show` command to show the status of the node members.

```
cluster1::> cluster show
```

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

2 entries were displayed.

35. Repeat this procedure to upgrade the FASTPATH software and RCF file on the other switch, cs1.

## Upgrading images on a CN1610 switch running clustered Data ONTAP 8.3.1 and later

Upgrading images on CN1610 cluster switches running clustered Data ONTAP 8.3.1 and later is a nondisruptive upgrade (NDU) in that the image is downloaded to the switch and copied to the flash while the current image is active.

### Steps

1. Verify that there is no failure on any path by using the `cluster ping-cluster` command with advanced privilege from a node that has joined the cluster.

### Example

```
cluster::*>cluster ping-cluster node_name
```

2. Log in to the switch. The switch user is `admin` and there is no password by default. At the (CN1610) prompt, enter `enable`.

This gives you access to Privileged EXEC mode, which enables you to configure the user interface.

### Example

```
User: admin
Password:
(CN1610) > enable
Password:
```

3. Back up the image that is currently running by using the `copy active backup` command.

#### Example

```
(CN1610) #copy active backup
```

4. If you need to set a specific address to reach the TFTP server, enter the following commands at the (CN1610) prompt:

```
serviceport ip none
```

```
network parms none
```

```
serviceport ip ipaddr netmask gateway
```

The service port, not the network, should contain the IP address when the switch is ready for the upgrade.

#### Example

```
(CN1610) #serviceport ip none
```

```
(CN1610) #network parms none
```

```
(CN1610) #serviceport ip ipaddr netmask gateway
```

5. To verify the status of the switch, enter the following commands at the (CN1610) prompt:

```
show serviceport
```

```
show network
```

Your output should look similar to the example. If your switch is using DHCP, the Configured IPv4 protocol output is **DHCP** rather than **None**.

```
(CN1610) #show serviceport
```

```
Interface Status..... Up
IP Address..... x.x.x.x
Subnet Mask..... x.x.x.x
Default Gateway..... x.x.x.x
IPv6 Administrative Mode..... Enabled
IPv6 Prefix is .....
fe80::2a0:98ff:fe4b:abdc/64
IPv6 Default Router.....
fe80::222:55ff:fe79:5cc1
Configured IPv4 Protocol..... None
Configured IPv6 Protocol..... None
IPv6 AutoConfig Mode..... Disabled
Burned In MAC Address..... 00:A0:98:4B:AB:DC
```

```
(CN1610) #show network
```

```
Interface Status..... Up
IP Address..... 0.0.0.0
Subnet Mask..... 0.0.0.0
Default Gateway..... 0.0.0.0
IPv6 Administrative Mode..... Enabled
IPv6 Administrative Mode..... Enabled
IPv6 Prefix is .....
fe80::2a0:98ff:fe4b:abdb/64
Burned In MAC Address..... 00:A0:98:4B:AB:DB
Locally Administered MAC address..... 00:00:00:00:00:00
MAC Address Type..... Burned In
Configured IPv4 Protocol..... None
Configured IPv6 Protocol..... None
IPv6 AutoConfig Mode..... Disabled
Management VLAN ID..... 1
```

6. Make sure that the settings of the running switch are saved to be the startup configuration by using the `write memory` command and entering `y` when prompted to save the script.

#### Example

```
(CN1610) #write memory

This operation may take a few minutes.
Management interfaces will not be available during this time.

Are you sure you want to save? (y/n) y

Config file 'startup-config' created successfully.

Configuration Saved!
```

Make sure to save the `running-config` file to a script so that it can be used later if you want to reconfigure the switch to the current settings.

7. Save the script for future use if it is needed to reconfigure the switch to the current settings by using the `show running-config running-config.scr` command.

You can give the `running-config.scr` file any name you want, but it must have the `.scr` extension.

```
(CN1610) #show running-config running-config.scr
Config script created successfully.
```

8. To continue upgrading the image, continue from Step 8 to the end of the [Installing the CN1610 cluster switch on systems running Data ONTAP 8.3.1 and later](#) on page 18 section.

## Replacing a CN1610 switch on systems running Data ONTAP 8.3.1 and later

Replacing a defective CN1610 switch in a cluster network running Data ONTAP 8.3.1 and later 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 must not have been migrated.
  - The Data ONTAP `cluster ping-cluster -node node1` command must indicate that basic connectivity and larger than PMTU communication are successful on all paths.
- CN1610 replacement switch:
  - Management network connectivity on the replacement switch must be functional.
  - Console access to the replacement switch must be in place.

- All relevant switch ports for node connection must be disabled on ports 1 through 12.
- All Inter-Switch Link (ISL) ports must be disabled on ports 13 through 16.
- The desired reference configuration file (RCF) and FASTPATH operating system image switch must be loaded onto the switch.
- Initial customization of the switch must be complete.

### 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 CN1610 switches are cs1 and cs2.
- The name of the new CN1610 switch is new\_cs1.
- The node names are node1 and node2.
- The names of the Storage Virtual Machines (SVMs, formerly known as Vservers) are node1 and node2.
- The cluster ports on each node are named e1a and e2a.
- The names of the cluster LIFs connected to node1 are node1\_clus1 and node1\_clus2 for node1, and node2\_clus1 and node2\_clus2 for node2 .
- The `cluster1::*>` prompt for changes to all cluster nodes is

### Steps

1. Install the appropriate RCF and image on the switch, new\_cs1, and make any necessary site preparations.

This optional step is to verify, download, and install the appropriate versions of the RCF and FASTPATH 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 FASTPATH 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 FASTPATH files for the version of Data ONTAP software you are installing.
2. On the new switch, shut down all of the ports that will be connected to the node cluster interfaces (ports 1 to 12).

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.

**Note:** No password is required to enter *enable* mode.

**Example**

```
User:admin
Password:
(nic-cs-4) >enable

(nic-cs-4) #
(new_cs1) #config
(new_cs1)(config)#interface 0/1-0/12
(new_cs1)(interface 0/1-0/12)#shutdown
```

3. To continue the replacement on systems running Data ONTAP 8.3.1 and later, continue from Step 3 to the end of the [Installing the CN1610 cluster switch on systems running Data ONTAP 8.3.1 and later](#) on page 18 section.

## Installing the CN1601 switch

Set up the inband network address through the console to prepare the CN1601 switch for downloading the reference configuration file (RCF), image, and other configuration files.

**Before you begin**

Your CN1601 should arrive with the standard NetApp factory default configuration installed on them. These switches should also have the current version of the FASTPATH software and reference configuration files (RCFs) loaded.

**About this task**

There are three different modes available with the FASTPATH software to use in configuring the switch:

- Admin mode (also known as User EXEC mode) uses the > prompt:

```
(CN1601) >
```

This mode has a limited set of commands that let you view basic system information.

- Enable mode (also known as Privileged EXEC mode) uses the # prompt:

```
(CN1601) #
```

Use this mode to show a configuration. Enable mode also lets you enter any EXEC command, enter VLAN mode, or enter the Global Configuration mode.

- Configure mode (also known as Global Config mode) uses the (Config)# prompt:

```
(CN1601)(Config)#
```

Use this mode to set a configuration. Configure mode also groups the general setup commands and lets you make modifications to the running configuration.

Use the `exit` command to leave Config mode and return to Enable mode. Enter `exit` again in Enable mode to return to Admin mode. For example:

```
(CN1601)(Config)# exit
(CN1601)# exit
(CN1601)>
```

When you enter a command you can use the **Tab** key to finish the command's spelling after you have entered enough letters to identify the command. You can also use the **?** key after entering one or more characters of a command to list the commands beginning with those letters.

For more information on the modes and FASTPATH commands, see the *CN1601 Network Switch CLI Command Reference*.

### Steps

1. Connect the serial port (the RJ-45 socket on the right side of the switch) to the console port.
2. At the console, set the host side serial settings:
  - 9600 baud
  - 8 data bits
  - 1 stop bit
  - parity: none
  - flow control: none
3. If you are downloading software over the switch, connect port 14 to the same network as the one where the server lives.

This switch only supports the TFTP protocol.

4. Log into the switch as `admin` (there is no password by default) and at the (CN1601) prompt, enter `enable`.

### Example

This example logs you in as `admin` and entering `enable` gives you access to Privileged EXEC mode, which lets you configure the network interface:

```
User:admin
Password:
(CN1601) >enable
Password:
```

5. Prepare to connect to the network with the TFTP server. If you are using DHCP you do not need to do this because the inband network is set to DHCP by default. If you are using a static IP address, enter these commands at the (CN1601) prompt:

```
network protocol none
network parms ipaddr netmask gateway
```

```
(CN1601) #network protocol none
(CN1601) #network parms ipaddr netmask gateway
```

6. To verify the results, use the `show network` command.

```
(CN1601) #show network
Interface Status..... Up
IP Address..... 10.x.x.x
Subnet Mask..... 255.255.255.0
Default Gateway..... 10.x.x.x
IPv6 Administrative Mode..... Enabled
IPv6 Prefix is ..... fe80::2a0:98ff:fe4b:
8aa0/64
Burned In MAC Address..... 00:A0:98:4B:8A:A0
Locally Administered MAC address..... 00:00:00:00:00:00
```



```
MAC Address Type..... Burned In
Configured IPv4 Protocol..... None
Configured IPv6 Protocol..... None
IPv6 AutoConfig Mode..... Disabled
Management VLAN ID..... 1
```

7. Back up the image on the switch that is currently running by entering the `copy active backup` command:

#### Example

```
(CN1601) #copy active backup
```

8. To back up the existing software image on your switch, enter the `copy active tftp://tftpserver/image_name` command.

The `tftpserver` is the name of the TFTP server; `image_name` is the name of the image to upload to the switch.

#### Example

```
(CN1601) #copy active tftp://tftpserver/image_name
```

9. Download an image file to a CN1601 switch by using the `copy tftp` command.

#### Example

The image file in the following example is `NetApp_CN1601_1.1.0.8.stk`.

```
(CN1601) #copy tftp://tftpserver/NetApp_CN1601_1.1.0.8.stk active
```

10. To download the RCF files, NetApp recommends using a TFTP server. If the switch has previously been installed and configured, save the current configuration to a script by using the `show running-config` command.

The script being created can have any name, but it must end with a `.scr` extension.

#### Example

```
(CN1601) #show running-config running-config.scr
Config script created successfully.
```

11. To verify that the script is saved, use the `script list` command.

#### Example

```
(CN1601) #script list
Configuration Script Name          Size(Bytes)
-----
running-config.scr                6960
1 configuration script(s) found.
2041 Kbytes free.
```

12. To back up the existing software image on your switch, or save a copy externally, enter the following command:

```
copy nvram:script running-config.scr tftp://tftpserver/running-
config.scr running.config.scr
```

The last argument, the script being created, can be any name with any extension.

**Example**

```
copy nvram:script running-config.scr tftp://tftpserver/running-
config.scr
```

- Download the RCF file to the switch by using the `copy tftp:` command and verify that the script is there by entering the following command:

```
script list
```

In this example, the script name is `CN1601_MS_RCF_v1.1.scr`.

**Example**

```
(CN1601) #copy tftp://tftpserver/CN1601_MS_RCF_v1.1.txt nvram:script
CN1601_MS_RCF_v1.0.scr
```

```
(CN1601) #script list
Configuration Script Name      Size(Bytes)
-----
running-config.scr             6960
CN1601_MS_RCF_v1.0.scr         2409
```

```
1 configuration script(s) found.
2041 Kbytes free.
```

- To validate the script before you apply it, use the `script validate` command. In this example, you are validating the `CN1601_MS_RCF_v1.1.scr` script.

**Example**

```
(CN1601) #script validate CN1601_MS_RCF_v1.1.scr
```

- Apply the configuration script to the switch. If you are using the `CN1601_MS_RCF_v1.1.scr` example, enter `script apply CN1601_MS_RCF_v1.1.scr` at the (CN1601) prompt. The script output will go to the console.

**Example**

```
(CN1601) #script apply CN1601_MS_RCF_v1.1.scr
```

- Check the settings by using the `show running-config` command.

**Example**

```
(CN1601) #show running-config
```

- If you are satisfied with the configuration, you can write it to memory by using the `write memory` command. Enter `y` when prompted to save the configuration file.

**Example**

```
(CN1601) #write memory
This operation may take a few minutes.
Management interfaces will not be available during this time.

Are you sure you want to save? (y/n) y
```

```
Config file 'startup-config' created successfully.
Configuration Saved!
```

### After you finish

Continue to customize the switch for your environment's requirements. It is strongly recommended that you configure the SNTP, host name, prompt, and administrator password. For information on how to configure these items, refer to the *CN1601 Switch Administrator's Guide*.

### Related information

[CN1601 Documentation](#)

[CN1610 and CN1601 Cluster Network and Management Network Compatibility Matrix](#)

## Installing the CN1610 cluster switch

Installing the CN1610 cluster switch starts with setting up an IP address and configuration information to allow the CN1610 switch to communicate through the management interface.

### Before you begin

- You must have access to an FTP or TFTP server at the installation site, or the script must be installed on your laptop for the download of the applicable NetApp Cluster Network and Management Network software and configuration files.
- Check the version table on the [NetApp CN1601 and CN1610 Switches](#) page to verify that you have the appropriate FASTPATH firmware and reference configuration file (RCF) versions for your version of Data ONTAP.  
You can also download the latest versions of the firmware and RCF files from that page.

### About this task

There are three different modes available with the FASTPATH software to use in configuring the switch:

- Admin mode (also known as User EXEC mode) uses the > prompt:

```
(CN1610) >
```

This mode has a limited set of commands that enable you to view basic system information.

- Enable mode (also known as Privileged EXEC mode) uses the # prompt:

```
(CN1610) #
```

Use this mode to show a configuration. Enable mode also enables you to enter any EXEC command, enter VLAN mode, or enter the Global Configuration mode.

- Configure mode (also known as Global Config mode) uses the (Config)# prompt:

```
(CN1610)(Config)#
```

Use this mode to set a configuration. Configure mode also groups the general setup commands and enables you to make modifications to the running configuration.

Use the `exit` command to leave Config mode and return to Enable mode. Enter `exit` again in Enable mode to return to Admin mode. For example:

```
(CN1610)(Config)# exit
(CN1610)# exit
(CN1610)>
```

When you enter a command, you can use the Tab key to finish the command's spelling after you have entered enough letters to identify the command. You can also use the “?” key after entering one or more characters of a command to list the commands beginning with those letters.

For more information about the modes and FASTPATH commands, see the *CN1610 Network Switch CLI Command Reference*.

### Steps

1. Connect the serial port (the RJ-45 socket on the right side of the switch) to the host or serial port of your choice.
2. Connect the management port (the RJ-45 wrench port on the left side of the switch) to the same network where your TFTP 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. Log in to the switch as admin. There is no password by default. At the (CN1610) > prompt, enter the **enable** command.

This gives you access to Privileged EXEC mode, which enables you to configure the network interface.

```
User: admin
Password:
(CN1610)> enable
Password:
(CN1610) #
```

5. Prepare to connect to the network with the TFTP server. If you are using DHCP you do not need to do this.

The serviceport is set to use DHCP by default. The network management port will be set to **None** for the IPv4 and IPv6 protocol settings. If your wrench port is connected to the network that has a DHCP server, that part is done. To set a static IP address, use the `serviceport protocol`, `network protocol`, and `serviceport ip` commands as shown here.

```
(CN1610) #serviceport protocol none
(CN1610) #network protocol none
(CN1610) #serviceport ip ipaddr netmask gateway
```

6. To verify the results, use the `show serviceport` command.

```
(CN1610) #show serviceport
Interface Status..... Up
IP Address..... 10.x.x.x
Subnet Mask..... 255.255.255.0
Default Gateway..... 10.x.x.x
IPv6 Administrative Mode..... Enabled
IPv6 Prefix is .....
fe80::2a0:98ff:fe4b:abfe/64
Configured IPv4 Protocol..... None
Configured IPv6 Protocol..... None
IPv6 AutoConfig Mode..... Disabled
Burned In MAC Address..... 00:A0:98:4B:AB:FE
```

7. Use the `show network` command to display the configuration settings associated with the switch's interface.

```
(CN1610) #show network
Interface Status..... Down
IP Address..... 0.0.0.0
Subnet Mask..... 0.0.0.0
Default Gateway..... 0.0.0.0
IPv6 Administrative Mode..... Enabled
Burned In MAC Address..... 00:A0:98:4B:AB:FD
Locally Administered MAC address..... 00:00:00:00:00:00
MAC Address Type..... Burned In
Configured IPv4 Protocol..... None
Configured IPv6 Protocol..... None
IPv6 AutoConfig Mode..... Disabled
Management VLAN ID..... 1
```

8. Connect the CN1610 switch to a laptop using a standard Ethernet cable and configure your network card in the same network with an alternate IP address. Use the `ping` command to verify the address.

If this is an issue, use a nonrouted network and configure the service port using IP 192.168.x or 172.16.x. You can reconfigure the service port to the production management IP address at a later date.

### Example

This example verifies that the switch is connected to IP 172.16.130.1:

```
(CN1610) #ping 172.16.130.1
Pinging 172.16.130.1 with 0 bytes of data:

Reply From 172.16.130.1: icmp_seq = 0. time= 5910 usec.
```

9. Before continuing, use the `copy active backup` command to back up the image on the switch that is currently running.

```
copy active backup
```

10. Use the `show version` command to verify the download.

### Example

```
(CN1610) #show version
Switch: 1
System Description..... NetApp CN1610,
1.0.0.4, Linux

2.6.21.7
Machine Type..... NetApp
```

```

CN1610
Machine Model..... CN1610
Serial Number..... 10611100037
Burned In MAC Address..... 00:A0:98:4B:AB:DB
Software Version..... 1.0.0.4
System..... Linux 2.6.21.7
Network Processing Device..... BCM56820_B0
Part Number..... 111-00893
Additional Packages..... FASTPATH QOS
                        FASTPATH IPv6

Management

```

11. Use the `copy tftp` command to download an image file to the CN1610 switch.

### Example

This example downloads the `NetApp_CN1610_1.1.0.8.stk` file:

```

(CN1610) #copy tftp://tftpserver/NetApp_CN1610_1.1.0.8.stk
active
Management access will be blocked for the duration of the transfer
Are you sure you want to start? (y/n)

y

TFTP Code transfer starting...
.
.
File transfer operation completed successfully.

```

12. Use the `copy active tftp://tftpserver/image_name` command to upload an image to the switch.

`tftpserver` is the name of the TFTP server; `image_name` is the name of the image to upload to the switch.

### Example

```

(CN1610) #copy active tftp://tftpserver/image_name

```

13. To download the RCF files, NetApp recommends using a TFTP server.

If the switch was previously installed and configured, save the current configuration to a script using the `show running-config` command.

The script being created can have any name, but it must end with a `.scr` extension.

### Example

This example saves a script named `running-config.scr`:

```

(CN1610) #show running-config running-config.scr
Config script created successfully.

```

14. Use the `script list` command to verify that the script is saved.

```

(CN1610) #script list
Configuration Script Name      Size(Bytes)
-----
running-config.scr            6960
1 configuration script(s) found.
2041 Kbytes free.

```

15. To upload the script to the TFTP server, or to save a copy externally, enter `copy nvram:script running-config.scr tftp://tftpserver/running-config.scr`. The last argument, the script being created, can be any name with any extension.

```
(CN1610) #copy nvram:script running-config.scr tftp://tftpserver/running-config.scr
```

16. To apply the RCF file, use the `copy tftp` command to download it to the switch. The `.scr` extension must be on the file before downloading the script to the switch.

Use the `script list` command to verify that the script is there.

### Example

This example downloads the RCF file `CN1610_CS_RCF_v1.1.scr` and verifies that it is on the switch:

```
(CN1610) #copy tftp://tftpserver/CN1610_CS_RCF_v1.1.txt nvram:script CN1610_CS_RCF_v1.1.scr

(CN1610) #script list
Configuration Script Name      Size(Bytes)
-----
running-config.scr             6960
CN1610_CS_RCF_v1.1.scr         2147

2 configuration script(s) found.
2041 Kbytes free.
```

17. Use the `script validate` command to validate the script before you apply it.

### Example

This example validates the `CN1610_CS_RCF_v1.1.scr` script:

```
(CN1610) #script validate CN1610_CS_RCF_v1.1.scr
```

18. Apply the configuration script to the switch.

### Example

If you were using the `CN1610_CS_RCF_v1.1.scr` example, you would enter `script apply CN1610_CS_RCF_v1.1.scr` at the CN1610 prompt. The script output goes to the console.

```
(CN1610) #script apply CN1610_CS_RCF_v1.1.scr
```

19. Use the `show running-config` command to check the settings.

### Example

```
(CN1610) #show running-config
```

20. If you are satisfied with the configuration, use the `write memory` command to write it to memory. Enter `y` when prompted to save the configuration.

```
(CN1610) #write memory

This operation may take a few minutes.
Management interfaces will not be available during this time.

Are you sure you want to save? (y/n) y

Config file 'startup-config' created successfully.
```

**After you finish**

After you finish the installation, you should continue to customize the switch for your environment's requirements. NetApp recommends that you configure the NDS, SNTP, host name, prompt, and admin password settings as well as others.

**Related information**

[CN1610 Documentation](#)

[CN1610 and CN1601 Cluster Network and Management Network Compatibility Matrix](#)

## Upgrading images on a CN1610 switch

Upgrading images on a CN1610 is a nondisruptive upgrade (NDU) in that the image is downloaded to the switch and copied to the flash while the current image is active.

**Steps**

1. Verify that there is no failure on any path by using the `cluster ping-cluster` command with advanced privilege from a node that has joined the cluster.

```
cluster::*>cluster ping-cluster node_name
```

2. Log in to the switch. The switch user is `admin` and there is no password by default. At the (CN1610) prompt, enter `enable`.

This gives you access to Privileged EXEC mode, which enables you to configure the user interface.

**Example**

```
User: admin
Password:
(CN1610) > enable
Password:
```

3. Back up the image that is currently running by using the `copy active backup` command.

```
(CN1610) #copy active backup
```

4. If you need to set a specific address to reach the TFTP server, enter the following commands at the (CN1610) prompt:

```
serviceport ip none
network parms none
serviceport ip ipaddr netmask gateway
```

The service port, not the network, should contain the IP address when the switch is ready for the upgrade.



**Example**

```
(CN1610) #serviceport ip none
(CN1610) #network parms none
(CN1610) #serviceport ip ipaddr netmask gateway
```

5. Enter the following commands at the (CN1610) prompt:

```
show serviceport
```

```
show network
```

Your output should look similar to the example. If your switch is using DHCP, the Configured IPv4 protocol output is **DHCP** rather than **None**.

```
(CN1610) #show serviceport

Interface Status..... Up
IP Address..... x.x.x.x
Subnet Mask..... x.x.x.x
Default Gateway..... x.x.x.x
IPv6 Administrative Mode..... Enabled
IPv6 Prefix is .....
fe80::2a0:98ff:fe4b:abdc/64
IPv6 Default Router.....
fe80::222:55ff:fe79:5cc1
Configured IPv4 Protocol..... None
Configured IPv6 Protocol..... None
IPv6 AutoConfig Mode..... Disabled
Burned In MAC Address..... 00:A0:98:4B:AB:DC

(CN1610) #show network

Interface Status..... Up
IP Address..... 0.0.0.0
Subnet Mask..... 0.0.0.0
Default Gateway..... 0.0.0.0
IPv6 Administrative Mode..... Enabled
IPv6 Administrative Mode..... Enabled
IPv6 Prefix is .....
fe80::2a0:98ff:fe4b:abdb/64
Burned In MAC Address..... 00:A0:98:4B:AB:DB
Locally Administered MAC address..... 00:00:00:00:00:00
MAC Address Type..... Burned In
Configured IPv4 Protocol..... None
Configured IPv6 Protocol..... None
IPv6 AutoConfig Mode..... Disabled
Management VLAN ID..... 1
```

6. Make sure that the settings of the running switch are saved to be the startup configuration by using the `write memory` command and entering `y` when prompted to save the script.

**Example**

```
(CN1610) #write memory

This operation may take a few minutes.
Management interfaces will not be available during this time.

Are you sure you want to save? (y/n) y

Config file 'startup-config' created successfully.

Configuration Saved!
```

Make sure to save the `running-config` file to a script so that it can be used later if you want to reconfigure the switch to the current settings.

7. Save the script for future use if it is needed to reconfigure the switch to the current settings by using the `show running-config running-config.scr` command.

You can give the `running-config.scr` file any name you want, but it must have the `.scr` extension.

```
(CN1610) #show running-config running-config.scr
Config script created successfully.
```

8. Verify that the script is saved by using the `script list` command.

### Example

```
(CN1610) #script list
Configuration Script Name      Size(Bytes)
-----
running-config.scr            6960
1 configuration script(s) found.
2041 Kbytes free.
```

9. Download the image from the TFTP server to the CN1610 switch by using the `copy tftp` command.

### Example

In this example, enter `copy tftp://tftpserver/NetApp_CN1610_1.1.0.8.stk active`. `tftpserver` is the name of the TFTP server; `NetApp_CN1610_1.1.0.8.stk` is the name of the image. This command downloads the new image to the flash, which takes a few minutes to complete. During this time the current active image is still operational.

```
(CN1610) #copy tftp://tftpserver/NetApp_CN1610_1.1.0.8.stk active
```

10. Verify that the download of the image was successful by entering the `show bootvar` command.

The active and next-active images are the “desired now” and the “new desired image” versions, which are both 1.0.0.4 in the command output. This is before the switch reboot.

### Example

```
(CN1610) #show bootvar

Image Descriptions

active :
backup :

Images currently available on Flash
-----
unit      active      backup      current-active      next-active
-----
1         1.0.0.4     1.0.0.2     1.0.0.2             1.0.0.4
```

11. Verify the version of the image downloaded to the flash by using the `show version` command.

**Example**

```
(CN1610) #show version
Switch: 1
System Description..... NetApp CN1610,
1.1.0.8, Linux

2.6.21.7
Machine Type..... NetApp
CN1610
Machine Model..... CN1610
Serial Number..... 10611100037
Burned In MAC Address..... 00:A0:98:4B:AB:DB
Software Version..... 1.0.0.2
System..... Linux 2.6.21.7
Network Processing Device..... BCM56820_B0
Part Number..... 111-00893
Additional Packages..... FASTPATH QOS
FASTPATH IPv6

Management
```

12. Verify that there is no failure on any path by repeating the `cluster ping-cluster` command used in Step 1 with advanced privilege from a node that has joined the cluster.

```
cluster::*> cluster ping-cluster node_name
```

13. Complete the installation of the new image on the switch by using the `reload` command.

**Example**

```
(CN1610) #reload
```

The full boot cycle should take approximately 50 seconds. When the switch reboots, the cluster LIFs will be automatically migrated to run on the remaining switch and there will be some minor traffic interruption for less than 10 seconds. To have less interruption, you can migrate the cluster LIFs off of the switch that is to be upgraded, and then revert the cluster LIFs after the switch has finished rebooting.

14. After the upgrade is complete and you verify that all of the node interfaces are up and running, you can continue to customize the switch configuration, according to your requirements.
15. Repeat these steps for the other switch.

## Replacing a CN1610 switch

Replacing a defective CN1610 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 must not have been migrated.

- The Data ONTAP `cluster ping-cluster -node node1` command must indicate that basic connectivity and larger than PMTU communication are successful on all paths.
- CN1610 replacement switch:
  - Management network connectivity on the replacement switch must be functional.
  - Console access to the replacement switch must be in place.
  - All relevant switch ports for node connection must be disabled on ports 1 through 12.
  - All Inter-Switch Link (ISL) ports must be disabled on ports 13 through 16.
  - The desired reference configuration file (RCF) and FASTPATH operating system image switch must be loaded onto the switch.
  - Initial customization of the switch must be complete.

### About this task

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

This procedure replaces an existing CN1610 cluster switch (CL1 in this procedure) with a new CN1610 switch (“newCL1”).

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

- The names of the existing CN1610 switches are CL1 and CL2.
- The name of the new CN1610 switch is newCL1.
- The node names are node1 and node2.
- The names of the Vservers are node1 and node2.
- The cluster ports on each node are named e1a and e2a.
- The names of the cluster LIFs connected to CL1 and CL2 are clus1 and clus2.
- The prompt for changes to all cluster nodes is `cluster::*>`.

### Steps

1. Install the appropriate RCF and image on the switch, newCL1, and make any necessary site preparations.

This optional step is to verify, download, and install the appropriate versions of the RCF and FASTPATH 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 FASTPATH 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 FASTPATH files for the version of Data ONTAP software you are installing.

- On the new switch, shut down all of the ports that will be connected to the node cluster interfaces (ports 1 to 12).

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.

**Note:** No password is required to enter *enable* mode.

```
User:admin
Password:
(nic-cs-4) >enable

(nic-cs-4) #
(newCL1) #config
(newCL1)(config)#interface 0/1-0/12
(newCL1)(interface 0/1-0/12)#shutdown
```

- On all of the cluster nodes, migrate all of the cluster LIFs currently connected to CL1 to CL2 by using the `network interface migrate` command.

#### Example

This example migrates the LIF `clus1` on a Vserver named `node1` to port `e2a` on `node1`. The second command migrates the LIF `clus1` on a Vserver named `node2` to port `e2a` on `node1`.

```
cluster::> set -privilege advanced
cluster::*> network interface migrate -vserver node1 -lif clus1 -
source-node node1 -dest-node node1 -dest-port e2a

cluster::*> network interface migrate -vserver node2 -lif clus1 -
source-node node1 -dest-node node1 -dest-port e2a
```

- On all of the cluster nodes, verify that the LIFs have been migrated.

The LIFs are migrated if the `clus1` Current Port column shows `e2a` and the Is Home column shows `false`.

#### Example

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

Vserver	Logical Interface	Status Admin/Oper	Network Address/Mask	Current Node	Current Port	Is Home
node1	clus1	up/up	10.10.0.1/24	node1	e2a	false
	clus2	up/up	10.10.0.2/24	node1	e2a	true

- On cluster nodes `node1` and `node2`, shut down the cluster ports connected to CL1 and verify the cluster health.

#### Example

This example shuts down port `e1a` on `node1` and `node2` and checks to see that the port is down on `node1`.

```
cluster::*> network port modify -node node1 -port e1a -up-admin
falsecluster::*> network port modify -node node2 -port e1a -up-admin
false
```

**Example**

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

- Use the `cluster ping-cluster` command to verify that the ports are down.

**Example**

This example verifies that the port `e1a` is down on `node1`:

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

- Shut down the ISL ports 13 through 16 on the CN1610 switch CL2.

**Example**

This example shuts down the ISL ports 13 through 16 on CL2:

```
(CL2) #config
(CL2)(config)#interface 0/13-0/16
(CL2)(interface 0/13-0/16)#shutdown
```

- Remove all of the cables from the CN1610 CL1 switch, and then connect them to the same ports on the CN1610 newCL1 switch.
- Bring up the ISLs 13 through 16 between the newCL1 and CL2 switches, and then verify the port channel operation status.

The Link State for port-channel 3/1 should be **up** and all member ports should be **True** under the Port Active heading.

**Example**

This example enables ISL ports 13 through 16 and displays the Link State for port-channel 3/1:

```
(CL2) #config
(CL2)(config)#interface 0/13-0/16
(CL2)(interface 0/13-0/16)#no shutdown

(CL2) #show port-channel 3/1

Local Interface..... 3/1
Channel Name..... ISL-LAG
Link State..... Up
Admin Mode..... Enabled
Type..... Static
Load Balance Option..... 7
(Enhanced hashing mode)

Mbr   Device/      Port   Port
Ports Timeout    Speed  Active
-----
0/13  actor/long   10G Full  True
      partner/long
0/14  actor/long   10G Full  True
      partner/long
```

```

0/15 actor/long 10G Full True
      partner/long
0/16 actor/long 10G Full True
      partner/long

```

- Bring up the ports on the newCL1 switch that are associated with the cluster nodes.

#### Example

This example brings up ports 1 through 12 on the newCL1 switch:

```

(newCL1) #config
(newCL1) (config)#interface 0/1-0/12
(newCL1) (interface 0/1-0/12)#no shutdown

```

- On a single node, bring up the cluster node port e1a connected to newCL1 and confirm that the link to e1a is up.

#### Example

This example brings up port e1a on node1 and displays information about the ports, verifying that e1a is up:

```

cluster::*> network port modify -node node1 -port e1a -up-admin true
cluster::*> network port show -role cluster

```

Node	Port	Role	Link	MTU	Auto-Negot Admin/Oper	Duplex Admin/Oper	Speed (Mbps) Admin/Oper
node1	e1a	cluster	up	9000	true/true	full/full	auto/10000
	e2a	cluster	up	9000	true/true	full/full	auto/10000

- On that same node, revert the cluster LIF associated with the port in the previous step by using the `network interface revert` command.

In this example, the LIFs are successfully reverted if the Home value is `true` and the port is e1a.

#### Example

The following commands return the LIFs on clus1 (node1) to their home ports and display information about the LIFs on node1.

```

cluster::*> network interface revert -vserver node1 -lif clus1
cluster::*> network interface show -role
cluster

```

Vserver	Logical Interface	Status Admin/Oper	Network Address/Mask	Current Node	Current Port	Is Home
node1	clus1	up/up	10.10.0.1/24	node1	e1a	true
	clus2	up/up	10.10.0.2/24	node1	e2a	true

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 e1a and e2a.

- If bringing up the first node is successful, then repeat Steps 10 and 11 to bring up the cluster port and revert the cluster interface on the other nodes.
- Display information about the nodes in a cluster by using the `cluster show` command.

**Example**

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

```
cluster::*> cluster show
Node
-----
node1      true   true   false
node2      true   true   true
```

**Related information**

*NetApp Support Site: [support.netapp.com](http://support.netapp.com)*



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