

CN1601 and CN1610 Switch Setup and Configuration Guide

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Overview of the CN1601 and CN1610 switches

The CN1601 cluster and management switches and the CN1610 cluster switches are designed to work in clusters ranging in size from two to eight nodes in Cluster-Mode supported configurations.

- **CN1601 cluster and management network switch**
This 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*.
- **CN1610 cluster network switch**
This 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*. Other features include:

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

Part number	Description
X1980-R6	CN1610 10-Gb cluster switch
X1981-R6	CN1601 1-Gb management switch
X1960-R6	CN1610 10-Gb cluster switch
X1961-R6	CN1601 1-Gb management switch
X1986-R6	CN1601 1-Gb used as a cluster switch with the FAS2220 and a different reference configuration file (RCF)
X6566-05-R6	Twinax 0.5-meter copper cable for CN1610
X6566-2-R6	Twinax 2-meter copper cable for CN1610
X6566-3-R6	Twinax 3-meter copper cable for CN1610
X6566-5-R6	Twinax 5-meter copper cable for CN1610
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

Part number	Description
X6537-R6	10 GbE 30-meter OM3 cable
X6560-R6	1 GbE 0.5-meter CAT6 cable
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

The X1980 and X1981 switches are identical to the X1960 and X1961 switches, but they are sold differently. The X1980 and X1981 switches are configured to order (CTO), and the X1960 and X1961 switches are sold as stand-alone units.

Setting up the CN1601 and CN1610 switches

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 19 for more information.
- You must have the applicable controller and Cluster-Mode 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 Cluster-Mode firmware and reference configuration files (RCFs) loaded.

Attention: If necessary, you can download the applicable NetApp RCFs and operating system software for your switches from the NetApp Support Site at support.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 19 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 21 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 21 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.

See the information provided in the [Cluster switch procedures](#) on page 21 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 support.netapp.com.

8. Perform an initial configuration of the management network switches based on information provided in the [Cluster switch procedures](#) on page 21 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 21. 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 overview

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

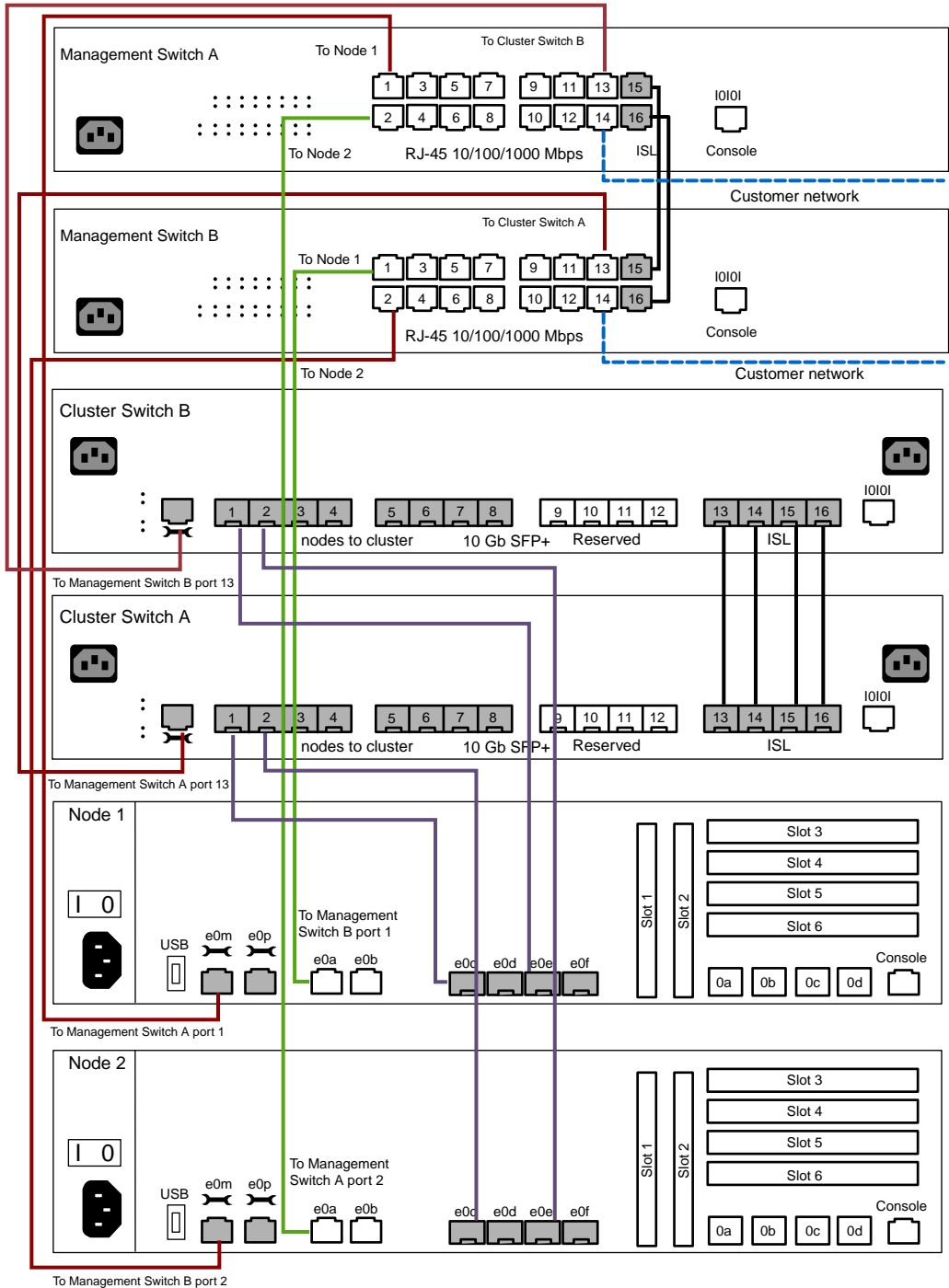
You need the following network information for all switch and controller configurations:

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- 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 and the remote LAN module (RLM) on 60xx systems
- Port e0d and the RLM on 3040A and 3070A systems
- Port e0M or the service port (wrench icon) on FAS2240, 31xx, 32xx, and 62xx 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 for failover, see the and the .

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 the settings are found in the reference configuration file (RCF).

CN1601 switch option settings				
Option	NetApp settings as shipped	FASTPATH default	Comments	Setting in RCF
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, 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

CN1601 switch option settings				
Option	NetApp settings as shipped	FASTPATH default	Comments	Setting in RCF
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
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

CN1601 switch option settings				
Option	NetApp settings as shipped	FASTPATH default	Comments	Setting in RCF
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.

CN1610 switch option settings				
Option	NetApp settings as shipped	FASTPATH default	Comments	Setting in RCF
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

CN1610 switch option settings				
Option	NetApp settings as shipped	FASTPATH default	Comments	Setting in RCF
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	off	off		no
VLANs	not configured; vlan1 only default	vlan1 is default		no
CoS/QoS	off	off		no
DiffServ	off	off		no

CN1610 switch option settings				
Option	NetApp settings as shipped	FASTPATH default	Comments	Setting in RCF
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 support.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

CN1601 management switch A		CN1601 management switch B	
Switch port	Node/port usage	Switch port	Node/port usage
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	Unused	9	Unused
10	Unused	10	Unused
11	Unused	11	Unused
12	Unused	12	Unused
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)

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

CN1601 cluster switch A		CN1601 cluster switch B	
Switch port	Node/port usage	Switch port	Node/port usage
6	Node management	6	Node management
7	Node management	7	Node management
8	Node management	8	Node management
9	Unused	9	Unused
10	Unused	10	Unused
11	Unused	11	Unused
12	Unused	12	Unused
13	Unused	13	Unused
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.

CN1610 port assignment table

Ports 1-12 are configured as cluster ports. This does not indicate the number of supported nodes for Cluster-Mode. 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 support.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 1 cluster port 1	1	Node 1 cluster port 2
2	Node 2 cluster port 1	2	Node 2 cluster port 2
3	Node 3 cluster port 1	3	Node 3 cluster port 2

CN1610 cluster switch A		CN1610 cluster switch B	
Switch port	Node/port usage	Switch port	Node/port usage
4	Node 4 cluster port 1	4	Node 4 cluster port 2
5	Node 5 cluster port 1	5	Node 5 cluster port 2
6	Node 6 cluster port 1	6	Node 6 cluster port 2
7	Node 7 cluster port 1	7	Node 7 cluster port 2
8	Node 8 cluster port 1	8	Node 8 cluster port 2
9	Node 9 cluster port 1	9	Node 9 cluster port 2
10	Node 10 cluster port 1	10	Node 10 cluster port 2
11	Node 11 cluster port 1	11	Node 11 cluster port 2
12	Node 12 cluster port 1	12	Node 12 cluster port 2
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 support.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 Cluster-Mode systems

To set up a Cluster-Mode system, you need the following documents from the NetApp Support Site at support.netapp.com:

Name	Description
<i>Site Requirements Guide</i>	Describes power and site requirements for all NetApp hardware, including system cabinets.
<i>Controller-specific Installation and Setup Instructions</i>	Describes how to install NetApp hardware.

Name	Description
Data ONTAP 8.x documentation for Cluster-Mode	Provides detailed information about all aspects of the Data ONTAP 8.x release for Cluster-Mode.

Using the CN1601 and CN1610 switch procedures

You can use these procedures to perform a variety of installation, replacement, and upgrade tasks on the CN1601 and CN1610 switches in your cluster.

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

- You must have access to an FTP or a TFTP server at the installation site, or the script must be on your laptop for the download of the applicable NetApp Cluster Network and Management Network software and configuration files.

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. Connect port 14 to the same network as the one where the TFTP server lives.
4. Log in to the switch. The switch user is `admin` and there is no password by default. At the (CN1601) prompt, enter **enable**.

This gives you access to Privileged EXEC mode, which enables you to 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 upload an image from the 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_1.0.0.4.stk`.

```
(CN1601) #copy tftp://tftpserver/NetApp_CN1601_1.0.0.4.stk active
```

10. Verify the download of the image file you downloaded in Step 9 by using the `show version` command.

Example

```
(CN1601) #show version  
Switch: 1  
  
System Description..... NetApp CN1601, 1.0.0.4,  
Linux
```

```

2.6.21.7
Machine Type..... NetApp
CN1601
Machine Model..... CN1601
Serial Number..... 10610100005
Burned In MAC Address..... 00:A0:98:4B:8A:80
Software Version..... 1.0.0.4
Operating System..... Linux 2.6.21.7
Network Processing Device..... BCM53716_A2
Part Number..... 111-00894
Additional Packages..... FASTPATH QOS
                                FASTPATH IPv6 Management

```

11. 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.

```

12. 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.

```

13. Upload the script to the TFTP server, or save a copy externally, by entering 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

```

14. 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_v1.0.scr`.

Example

```
(CN1601) #copy tftp://tftpserver/CN1601_MS_RCF_v1.0.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.
```

15. To validate the script before you apply it, use the `script validate` command. In this example, you are validating the `CN1601_MS_RCF_v1.0.scr` script.

Example

```
(CN1601) #script validate CN1601_MS_RCF_v1.0.scr
```

16. Apply the configuration script to the switch. If you are using the `CN1601_MS_RCF_v1.0.scr` example, enter `script apply CN1601_MS_RCF_v1.0.scr` at the (CN1601) prompt. The script output will go to the console.

Example

```
(CN1601) #script apply CN1601_MS_RCF_v1.0.scr
```

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

Example

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

18. 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.

Installing the CN1610 switch

Set up the inband network address through the console to prepare the CN1610 switch for downloading the reference configuration file (RCF), image, and other configuration files.

Before you begin

- You must have access to an FTP or a 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.

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 switch 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. 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 allows you to configure the network interface.

```
User:admin
Password:
(CN1610) >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. 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. If you are setting 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. Before continuing, back up the image on the switch that is currently running with the `copy active backup` command.

```
copy active backup
```

9. To download an image file to the CN1610 switch, use the `copy tftp` command. The image file in this example is `NetApp_CN1610_1.0.0.4.stk`.

Example

```
(CN1610) #copy tftp://tftpserver/NetApp_CN1610_1.0.0.4.stk
active
```

10. To verify the download, use the `show version` command.

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. To upload an image to the switch, enter **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

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

12. 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 using the **show running-config** command.

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

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

13. To verify that the script is saved, use the **script list** command.

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

14. 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
```

15. To apply the RCF file, download it to the switch using the **copy tftp** command and verify that the script is there by using **script list** command. In this example, the script name is **CN1610_CS_RCF_v1.0.scr**.

Example

```
(CN1610) #copy tftp://tftpserver/CN1610_CS_RCF_v1.0.txt nvram:script
CN1610_CS_RCF_v1.0.scr
```

```
(CN1610) #script list
Configuration Script Name      Size(Bytes)
-----
running-config.scr            6960
CN1610_CS_RCF_v1.0.scr        2147

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

The .scr extension must be on the file before downloading the script to the switch.

16. To validate the script before you apply it, use the `script validate` command. In this example, you are validating the `CN1610_CS_RCF_v1.0.scr` script.

Example

```
(CN1610) #script validate CN1610_CS_RCF_v1.0.scr
```

17. Apply the configuration script to the switch. If you are using the `CN1610_CS_RCF_v1.0.scr` example, enter `script apply CN1610_CS_RCF_v1.0.scr` at the CN1610 prompt. The script output will go to the console.

Example

```
(CN1610) #script apply CN1610_CS_RCF_v1.0.scr
```

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

Example

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

19. If you are satisfied with the configuration, write it to memory with the `write memory` command. 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 can continue to customize the switch for your environment's requirements. NetApp recommends that you configure the NDS, SNTP, hostname, prompt, and admin password settings as well as others.

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. Use the `cluster ping-cluster` command with advanced privilege from a node that has joined the cluster to verify that there is no failure on any path.

```
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 backupcommand`.

```
(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. Use the `write memory` command to make sure that the settings of the running switch are saved to be the startup configuration. Enter **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 verify that the script is saved, use 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 with `copy tftp` command. In this example, enter `copy tftp://tftpserver/NetApp_CN1610_1.0.0.4.stk active`. `tftpserver` is the name of the TFTP server; `NetApp_CN1610_1.0.0.4.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.

Example

```
(CN1610) #
copy tftp://tftpserver/NetApp_CN1610_1.0.0.4.stk active
```

10. Use the `show version` command to verify the version of the image downloaded to the flash.

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..... 1.0.0.2
System..... Linux 2.6.21.7
Network Processing Device..... BCM56820_B0
Part Number..... 111-00893
```

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

11. To verify that the download of the image was successful, enter 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

12. Repeat the **cluster ping-cluster** command used in Step 1 with advanced privilege from a node that has joined the cluster to verify that there is no failure on any path.

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

13. Use the **reload** command to complete the installation of the new image on the switch.

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 repeat the process for the other switch.

Replacing a CN1610 switch

Replacing a CN1610 switch in a cluster network running Data ONTAP 8.1.1 is a nondisruptive procedure (NDU).

Before you begin

The following conditions must be satisfied before performing the switch replacement in the current environment and on the replacement switch. Note that this procedure also refers to other procedures found in this document.

- Existing cluster and network infrastructure
 - Verify that the existing cluster is completely functional and that there are no defective cluster NICs, switch ports, or connectors.
 - All cluster ports must be up.
 - All cluster logical interfaces (LIFs) must be up and must not have been migrated.
 - Make sure the Data ONTAP `cluster ping-cluster -node node1` command reports that basic connectivity and larger than PMTU communication is successful on all paths.
- CN1601 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: ports 1 to 12.
 - All Interswitch Link (ISL) ports must be enabled: ports 13 to 16.
 - Initial customization of the switch must be complete.
 - RCF for the cluster switch must be loaded onto the switch.
- The examples in this procedure use the following switch and node nomenclature:
 - Names of the existing CN1610 switches: `CL1` and `CL2`
 - Name of the new CN1610 switch: `newCL1`
 - Node names: `node1` and `node2`
 - Names of Vservers on `node1` and `node2`: `node1` and `node 2`
 - Cluster ports on each node: `e1a` and `e2a`
 - Names of cluster LIFs connected to `CL1` and `CL2`: `clus1` and `clus2`
 - Prompt for changes to all cluster nodes: `cluster::*>`

About this task

This procedure replaces `CL1` with `newCL1`. Make sure that there is minimal traffic disruption on the cluster network as you perform each step. You can check this by using the `sysstat` command.

Steps

1. Install the appropriate RCF and image on the newCL1 switch and make any necessary site preparations. Shut down all of the ports that will be connected to the node cluster interfaces (ports 1 to 12) except the ISL ports (ports 13 to 16).

```
(newCL1) #config
(newCL1) (Config)#interface
(newCL1) (Interface 0/1-1/12)#shutdown
```

2. 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

```
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
```

3. On all of the cluster nodes, verify that the LIFs have been migrated. The LIFs are migrated if clus1's Current Port column shows e2a and the Is Home shows false.

Example

```
cluster::*> net 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

4. Use the cluster ping-cluster command on each node to check which paths in the network are up and which are down.

Example

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

5. On all cluster nodes, shut down the cluster ports connected to CL1 and verify the cluster health.

Example

```
cluster::*> net port modify -node node1 -port e1a -up-admin false

cluster::*> net port modify -node node2 -port e1a -up-admin false

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

6. Shut down the ISL ports on CL2.

Example

```
(CL2) #config
(CL2) (Config)#interface 0/13-0/16
(CL2) (Interface 0/13-0/16)#shut
```

7. Remove all of the cables from the CL1 switch and connect them to the same ports on the newCL1 switch.
8. Bring up the ISLs between the newCL1 and CL2 switches and 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 state.

Example

```
(CL2) #config
(CL2) (Config)#interface 0/13-0/16
(CL2) (Interface 0/13-0/16)#no shut

(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 Ports	Device/ Timeout	Port Speed	Port 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		

9. Bring up the ports on newCL1 associated with the cluster nodes.

Example

```
(newCL1) #config
(newCL1) (Config)#interface 0/1-0/12
(newCL1) (Interface 0/1-0/12)#no shut
```

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

Example

```
cluster::*> net 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

11. On that same node, revert the cluster LIF associated with the port in the previous step. The LIFs are reverted if the `clus1` output for Current Port is `e1a` and Is Home is `true`.

Example

```
cluster::*> net interface revert -vserver vs1 -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

12. If bringing up the first node is successful, then bring up the cluster port and revert the cluster interface on the remaining nodes by repeating Steps 10 and 11 for the other nodes.

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