Clustered Data ONTAP Switch Setup and Configuration Guide
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Overview of the cluster and management switches

IBM N series recommends using CN1610 as the cluster network switch. Refer to the management network switch requirements in this section for selecting a management network switch.

The CN1610 cluster switches are designed to work in clusters ranging in size from two to twelve nodes in Cluster-Mode supported configurations.

- 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 an IBM N series 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 CN1610 Installation Guide.

- Management network switch
  For the management switch, use a managed Layer 2 switch that provides 10/100/1000 Base-T ports. The management switch must support 802.1 link aggregation, spanning tree protocol, and at least 2 inter switch links. You can install the switch in an IBM N series system cabinet with the rack-mount installation kit that comes with the switch, or you can install it in a rack. For more information on installing the management switch, consult the documentation for your switch. Port numbers may vary depending on how many nodes you plan to have in your cluster. For more information, see “Management switch port assignment table” on page 9.

The following table lists the feature codes and descriptions for the CN1610 switch and related components:

<table>
<thead>
<tr>
<th>Feature code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1001</td>
<td>CN1610 10-GbE cluster switch</td>
</tr>
<tr>
<td>1090</td>
<td>Twinax 0.5-meter copper cable for CN1610</td>
</tr>
<tr>
<td>1091</td>
<td>Twinax 2-meter copper cable for CN1610</td>
</tr>
<tr>
<td>1092</td>
<td>Twinax 5-meter copper cable for CN1610</td>
</tr>
<tr>
<td>2013</td>
<td>SFP+ 10-GbE module for CN1610</td>
</tr>
</tbody>
</table>
Setting up the cluster and management 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 cluster and management 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 IBM N series cluster network and management network software and configuration files.
• You must have the required cluster network and management network switch documentation.
  See Required CN1610 documentation 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 IBM N series cluster network switches should arrive with the standard IBM N series 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.

Note: If necessary, you can download the applicable IBM N series RCFs and operating system software for your switches from the IBM N series support website.

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

Procedure

1. Rack the cluster network and management network switches and controllers as shown in the switch installation guides for your switches. See the Required CN1610 documentation 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 for more information about this process.
4. Do the initial setup for the management switch. See the information provided in the Cluster switch procedures 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](#) 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 IBM N series-supported version of the software to the switches. If you download the IBM N series-supported version of the software, then you must also download the appropriate [IBM N series Cluster Network Switch Reference Configuration File](#) and merge it with the configuration you saved in Step 5. You can download the file and the instructions from the [IBM N series support website](#).

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

**What to do next**

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

**Management and cluster switch 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:

- 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

[Figure 1 on page 5](#) shows the cabling connections for a two-node cluster using CN1610 switches with N7550T and N7950T 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
Figure 1. Cabling connections for a two-node cluster using CN1610 switches
Required network information for 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 N7600, N7700, N7800, and N7900 systems
- Port e0d and the RLM on N5300 and N5600 systems
- Port e0M or the service port (wrench icon) on N32xx, N60xx, N62xx, N7550T, and N7950T 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 Network Management Guide and the Data ONTAP 8.2 Clustered Data ONTAP Release Notes.

Management switch option settings

This table shows the management switch settings that can be modified and set on your management switch on site.

<table>
<thead>
<tr>
<th>Management switch option settings</th>
<th>Setting configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Link aggregation</td>
<td>on for inter-switch links</td>
</tr>
<tr>
<td>MTU</td>
<td>MTU for management switch on all ports to 1518</td>
</tr>
<tr>
<td>MSTP</td>
<td>on</td>
</tr>
</tbody>
</table>

CN1610 switch option settings

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

This table shows the CN1610 switch settings as set by IBM, 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

<table>
<thead>
<tr>
<th>Option</th>
<th>Setting configuration</th>
<th>FASTPATH default</th>
<th>Comments</th>
<th>Setting in RCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default account/password</td>
<td>admin/none</td>
<td>admin/none</td>
<td>Site configuration task</td>
<td>no</td>
</tr>
<tr>
<td>DHCP/bootp</td>
<td>enabled</td>
<td>enabled</td>
<td>Site configuration task</td>
<td>no</td>
</tr>
<tr>
<td>Service port IP address</td>
<td>none</td>
<td>none</td>
<td>Site configuration task</td>
<td>no</td>
</tr>
<tr>
<td>IPv6</td>
<td>none</td>
<td>none</td>
<td></td>
<td>no</td>
</tr>
<tr>
<td>Command-line logging</td>
<td>disabled</td>
<td>disabled</td>
<td>Site configuration task</td>
<td>no</td>
</tr>
<tr>
<td>SNMP communities</td>
<td>public, private, netapp</td>
<td>public, private</td>
<td>NetApp string configured as per RCF for health monitor</td>
<td>yes</td>
</tr>
<tr>
<td>syslog</td>
<td>disabled</td>
<td>disabled</td>
<td>Site configuration task</td>
<td>no</td>
</tr>
<tr>
<td>SNTP server</td>
<td>unconfigured</td>
<td>unconfigured</td>
<td>Site configuration task</td>
<td>no</td>
</tr>
<tr>
<td>DNS server</td>
<td>unconfigured</td>
<td>unconfigured</td>
<td>Site configuration task</td>
<td>no</td>
</tr>
<tr>
<td>Link aggregation</td>
<td>on for ISL links</td>
<td>unconfigured</td>
<td>NetApp uses enhanced hashing algorithms for load-balancing</td>
<td>yes</td>
</tr>
<tr>
<td>LLDP</td>
<td>off</td>
<td>off</td>
<td></td>
<td>no</td>
</tr>
<tr>
<td>ISDP (CDPv1)</td>
<td>enabled</td>
<td>disabled</td>
<td>Timer set to 5 seconds</td>
<td>yes</td>
</tr>
<tr>
<td>IGMP snooping</td>
<td>off</td>
<td>off</td>
<td></td>
<td>no</td>
</tr>
<tr>
<td>MTU set to 9216</td>
<td>9216 for all node ports and ISLs</td>
<td>Default FASTPATH MTU is 1518</td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>Port mirroring</td>
<td>off</td>
<td>off</td>
<td></td>
<td>no</td>
</tr>
<tr>
<td>Storm control</td>
<td>off</td>
<td>off</td>
<td></td>
<td>no</td>
</tr>
<tr>
<td>Flow control</td>
<td>off</td>
<td>off</td>
<td></td>
<td>no</td>
</tr>
<tr>
<td>MSTP</td>
<td>off</td>
<td>off</td>
<td></td>
<td>no</td>
</tr>
</tbody>
</table>
### CN1610 switch option settings

<table>
<thead>
<tr>
<th>Option</th>
<th>Setting configuration</th>
<th>FASTPATH default</th>
<th>Comments</th>
<th>Setting in RCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLANs</td>
<td>not configured; vlan1 only default</td>
<td>vlan1 is default</td>
<td></td>
<td>no</td>
</tr>
<tr>
<td>CoS/QoS</td>
<td>off</td>
<td>off</td>
<td></td>
<td>no</td>
</tr>
<tr>
<td>DiffServ</td>
<td>off</td>
<td>off</td>
<td></td>
<td>no</td>
</tr>
<tr>
<td>ACLs</td>
<td>off</td>
<td>off</td>
<td></td>
<td>no</td>
</tr>
<tr>
<td>802.1X (authentication)</td>
<td>off</td>
<td>off</td>
<td></td>
<td>no</td>
</tr>
<tr>
<td>RADIUS</td>
<td>off</td>
<td>off</td>
<td></td>
<td>no</td>
</tr>
<tr>
<td>SSH</td>
<td>disabled</td>
<td>disabled</td>
<td>Site configuration task</td>
<td>no</td>
</tr>
<tr>
<td>TACACS</td>
<td>off</td>
<td>off</td>
<td></td>
<td>no</td>
</tr>
<tr>
<td>Hostname</td>
<td>CN1610</td>
<td>none</td>
<td>Set by default in NetApp FASTPATH version to CN1610; should be reset for site configuration needs</td>
<td>no</td>
</tr>
</tbody>
</table>
Port assignments for the cluster and management switches

The port assignment tables provide the recommended port assignments from the cluster and management switches to the controllers.

Management switch port assignments

Use the management port assignment table as a guide for setting up a management switch while configuring your cluster. Port assignments can change based on the size of your switch. In this section, a 16 ports management switch is used as an example.

Management switch port assignment table

In a 16 port management switch configuration, ports 1 through 12 are treated equally as cluster node interfaces. They require spanning-tree to be enabled. There are several options for connecting the nodes to the management switch: 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 redundant management configurations, each node has 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, the RLM/BMC for the nodes may need to utilize ports on other site switches.

This table shows an example of the port definition for a pair of 16 port management switches with a single management connection.

<table>
<thead>
<tr>
<th>Management switch A</th>
<th>Management switch B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Switch port</strong></td>
<td><strong>Node/port usage</strong></td>
</tr>
<tr>
<td>1</td>
<td>Node management connectivity</td>
</tr>
<tr>
<td>2</td>
<td>Node management connectivity</td>
</tr>
<tr>
<td>3</td>
<td>Node management connectivity</td>
</tr>
<tr>
<td>4</td>
<td>Node management connectivity</td>
</tr>
<tr>
<td>5</td>
<td>Node management connectivity</td>
</tr>
<tr>
<td>6</td>
<td>Node management connectivity</td>
</tr>
<tr>
<td>7</td>
<td>Node management connectivity</td>
</tr>
<tr>
<td>8</td>
<td>Node management connectivity</td>
</tr>
<tr>
<td>9</td>
<td>Node management connectivity</td>
</tr>
</tbody>
</table>
In this 16 port switch example, you need to create a link aggregation for Port 15 and Port 16 of each switch. In any switch configuration, a minimum of two links aggregation with spanning tree must be created and set. Therefore, this may not necessarily be Port 15 and 16 on your switch.

### 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 [http://www.ibm.com/storage/support/nseries](http://www.ibm.com/storage/support/nseries). The sample port definition on each pair of switches is as follows:

<table>
<thead>
<tr>
<th>CN1610 cluster switch A</th>
<th>CN1610 cluster switch B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Switch port</strong></td>
<td><strong>Node/port usage</strong></td>
</tr>
<tr>
<td>Serviceport/wrench port (out-of-band management port)</td>
<td>Admin net or management switch</td>
</tr>
<tr>
<td>1</td>
<td>Node 1 cluster port 1</td>
</tr>
<tr>
<td>2</td>
<td>Node 2 cluster port 1</td>
</tr>
<tr>
<td>3</td>
<td>Node 3 cluster port 1</td>
</tr>
<tr>
<td>4</td>
<td>Node 4 cluster port 1</td>
</tr>
<tr>
<td>5</td>
<td>Node 5 cluster port 1</td>
</tr>
<tr>
<td>6</td>
<td>Node 6 cluster port 1</td>
</tr>
<tr>
<td>7</td>
<td>Node 7 cluster port 1</td>
</tr>
<tr>
<td>8</td>
<td>Node 8 cluster port 1</td>
</tr>
<tr>
<td>9</td>
<td>Node 9 cluster port 1</td>
</tr>
<tr>
<td>Switch port</td>
<td>Node/port usage</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>10</td>
<td>Node 10 cluster port 1</td>
</tr>
<tr>
<td>11</td>
<td>Node 11 cluster port 1</td>
</tr>
<tr>
<td>12</td>
<td>Node 12 cluster port 1</td>
</tr>
<tr>
<td>13</td>
<td>ISL to switch B port 13</td>
</tr>
<tr>
<td>14</td>
<td>ISL to switch B port 14</td>
</tr>
<tr>
<td>15</td>
<td>ISL to switch B port 15</td>
</tr>
<tr>
<td>16</td>
<td>ISL to switch B port 16</td>
</tr>
</tbody>
</table>

Port assignments for the cluster and management switches
Required CN1610 documentation

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

Required documentation for CN1610 switches

To set up the CN1610 switches, you need the following documents from the IBM N series support website at [http://www.ibm.com/storage/support/nseries](http://www.ibm.com/storage/support/nseries):

<table>
<thead>
<tr>
<th>Document title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CN1610 Switch Installation Guide</td>
<td>Provides detailed information about site requirements, switch hardware details, and installation options for the CN1610 switch.</td>
</tr>
<tr>
<td>CN1610 Network Switch Administrator’s Guide</td>
<td>Provides examples of how to use the CN1610 switch in a typical network.</td>
</tr>
<tr>
<td>CN1610 Network Switch CLI Command Reference</td>
<td>Describes the command-line interface (CLI) commands you use to view and configure the CN1610 software.</td>
</tr>
</tbody>
</table>

Required documentation for supported clustered Data ONTAP systems

To set up a clustered Data ONTAP system, you need the following documents from the IBM N series support website at [http://www.ibm.com/storage/support/nseries](http://www.ibm.com/storage/support/nseries):

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Requirements Guide</td>
<td>Describes power and site requirements for all IBM N series hardware, including system cabinets.</td>
</tr>
<tr>
<td>Controller-specific Installation and Setup Instructions</td>
<td>Describes how to install IBM N series hardware.</td>
</tr>
<tr>
<td>Data ONTAP 8.x documentation for clustered Data ONTAP</td>
<td>Provides detailed information about all aspects of the Data ONTAP 8.x release for clustered Data ONTAP.</td>
</tr>
</tbody>
</table>
Using the cluster and management switch procedures

You can use these procedures to perform a variety of installation, replacement, and upgrade tasks on the management and cluster switches in your cluster. IBM N series recommends using CN1610 as cluster network switches.

Installing the management switch

About this task

Configure your management switch as per the information in “Management switch port assignments” on page 9.

What to do next

Continue to customize the switch for your environment’s requirements. It is recommended that you configure the SNTP, host name, prompt, and administrator password.

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 IBM N series Cluster Network and Management Network software and configuration files.
- Verify that you have the appropriate FASTPATH firmware and reference configuration file (RCF) versions for your version of Data ONTAP.

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 let you 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 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:

(CN1610)(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:

(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 on the modes and FASTPATH commands, see the CN1610 Network Switch CLI Command Reference.

Procedure

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.
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 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.

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 `copy tftp` command to download an image file to the CN1610 switch. This example downloads the `NetApp_CN1610_1.0.0.4.stk` file.

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

11. Use the `show version` command to verify the download.
12. Use the `copy active tftp://tftpserver /image_name` command to upload an image to the switch. The `tftpserver` is the name of the TFTP server; `image_name` is the name of the image to upload to the switch.

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

13. To download the RCF files, IBM 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.

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 running.config.scr`. The last argument, the script being created, can by any name with any extension.

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

16. To apply the RCF, 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.

This example downloads the RCF file `CN1610_CS_RCF_v1.0.scr` and verifies that it is on the switch.

```
(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.
```
17. Use the `script validate` command to validate the script before you apply it.
   This example validates the CN1610_CS_RCF_v1.0.scr script.
   (CN1610) #script validate CN1610_CS_RCF_v1.0.scr

18. 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.
   (CN1610) #script apply CN1610_CS_RCF_v1.0.scr

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

What to do next

After you finish the installation, you can continue to customize the switch for your environment's requirements. IBM 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.

Procedure

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

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

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.

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.
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.

8. 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.
```

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.

```
(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.

```
(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.
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.

```
(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 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:**
  - Verify that the existing cluster is completely functional and there must be no defective cluster NICs, and at least one fully functional switch with all of its cables.
  - 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 enabled 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

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::*>

Procedure

1. Install the appropriate RCF and image on the newCL1 switch 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 IBM N series Cluster and Management Network Switches Reference Configuration File Description Page on the IBM N series support website.
   b. Click the link for the Cluster Network and Management Network Compatibility Matrix and 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 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 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.

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

3. 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.

   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.
4. 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 column shows false.

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

```
<table>
<thead>
<tr>
<th>Logical Vserver</th>
<th>Status</th>
<th>Network Address/Mask</th>
<th>Current Node</th>
<th>Current Port</th>
<th>Is Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>node1 clus1</td>
<td>up/up</td>
<td>10.10.0.1/24</td>
<td>node1</td>
<td>e2a</td>
<td>false</td>
</tr>
<tr>
<td>node1 clus2</td>
<td>up/up</td>
<td>10.10.0.2/24</td>
<td>node1</td>
<td>e2a</td>
<td>true</td>
</tr>
</tbody>
</table>
```

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

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

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

6. Use `cluster ping-cluster` to ensure that the ports are closed. This example checks to ensure that the port e1a is closed on node1:

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

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

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
```

8. Remove all of the cables from the CN1610 CL1 switch and connect them to the same ports on the CN1610 newCL1 switch.

9. Bring up the ISLs 13 through 16 between the newCL1 and CL2 switches and verify the port channel operation status. The Link State for port-channel 3/1 should be up up and all member ports should be True under the Port Active state.

This example opens the ISL ports 13 through 16 and displays the Link State for port-channel 3/1:
10. Bring up the ports on the newCL1 switch that are associated with the cluster nodes.

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 shut
```

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

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  Duplex  Speed  Speed (Mbps)
      ------ ─────── ──── ─────── ─────── ─────── ───────
node1 e1a cluster up 9000 true /true full /full auto /10000
        e2a cluster up 9000 true /true full /full auto /10000
```

12. On that same node, node1, use **network interface revert** to revert the cluster LIF associated with the port in the previous step. In this example, the LIFs are successfully reverted if the Home value is **true** and the port is e1a.

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

13. Use `cluster show` to display information about the nodes in a cluster.
   This example shows that the node health for node1 and node2 in this cluster is true:

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

14. 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.

Related information:

- IBM N series support website
Websites

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日本電子和資訊技術產業協會

日本電機和情報技術產業協會

Class A Statement

This explains the Japan Voluntary Control Council for Interference (VCCI)
statement.

日本電子和資訊技術產業

日本電子和情報技術工業

Class A Statement

This explains the Japan Voluntary Control Council for Interference (VCCI)
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日本電子和情報技術工業

日本電子和情報技術產業

Class A Statement

This explains the Japan Voluntary Control Council for Interference (VCCI)
statement.
This explains the JEITA statement for greater than 20 A per phase.

**Korean Communications Commission Class A Statement**

This explains the Korean Communications Commission (KCC) statement.

이 기기는 업무용(A급)으로 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

**Russia Electromagnetic Interference Class A Statement**

This statement explains the Russia Electromagnetic Interference (EMI) statement.

ВНИМАНИЕ! Настоящее изделие относится к классу А. В жилых помещениях оно может создавать радиопомехи, для снижения которых необходимы дополнительные меры.
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