Install and configure

Cluster and storage switches

NetApp
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Table of Contents

Install and configure

Install the hardware for the NetApp CN1610 switch

To install the NetApp CN1610 switch hardware, use the instructions in one of the following guides.

- 1G Installation Guide.

  An overview of the CN1601 switch hardware and software features and installation process.

- 10G Installation Guide

  An overview of the CN1610 switch hardware and software features and describes the features to install the switch and access the CLI.

Install FASTPATH software

When you install the FASTPATH software on your NetApp switches, you must begin the upgrade with the second switch, *cs2*.

Review requirements

What you'll need

- A current backup of the switch configuration.
- A fully functioning cluster (no errors in the logs and no defective cluster network interface cards (NICs) or similar issues).
- Fully functional port connections on the cluster switch.
- All cluster ports set up.
- All cluster logical interfaces (LIFs) set up (must not have been migrated).
- A successful communication path: The ONTAP (privilege: advanced) `cluster ping-cluster -node node1` command must indicate that `larger than PMTU communication` is successful on all paths.
- A supported version of FASTPATH and ONTAP.

  Make sure you consult the switch compatibility table on the NetApp CN1601 and CN1610 Switches page for the supported FASTPATH and ONTAP versions.

Install FASTPATH

The following procedure uses the clustered Data ONTAP 8.2 syntax. As a result, the cluster Vserver, LIF names, and CLI output are different than those in Data ONTAP 8.3.

There can be command dependencies between command syntax in the RCF and FASTPATH versions.

About the examples

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

- The two NetApp switches are cs1 and cs2.
- The two cluster LIFs are clus1 and clus2.
- The Vservers are vs1 and vs2.
- The `cluster::*>` prompt indicates the name of the cluster.
- The cluster ports on each node are named e1a and e2a.

  Hardware Universe has more information about the actual cluster ports that are supported on your platform.

- The supported Inter-Switch Links (ISLs) are ports 0/13 through 0/16.
- The supported node connections are ports 0/1 through 0/12.

Step 1: Migrate cluster

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

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

x is the duration of the maintenance window in hours.

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

2. Log into the switch as admin. There is no password by default. At the `(cs2) #` prompt, enter the `enable` command. Again, there is no password by default. This gives you access to Privileged EXEC mode, which allows you to configure the network interface.

   Show example

   ```
   (cs2) # enable
   Password (Enter)
   (cs2) #
   ```

3. On the console of each node, migrate clus2 to port e1a:

   ```
   network interface migrate
   ```

   Show example

   ```
   cluster::*> network interface migrate -vserver vs1 -lif clus2
   -destnode node1 -dest-port e1a
   cluster::*> network interface migrate -vserver vs2 -lif clus2
   -destnode node2 -dest-port e1a
   ```

4. On the console of each node, verify that the migration took place:

```
network interface show
```

The following example shows that clus2 has migrated to port e1a on both nodes:

Show example

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

        Logical     Status      Network          Current  Current  Is
Vserver  Interface  Admin/Open  Address/Mask     Node     Port     Home
-------- ---------- ----------  --------------   -------- -------  ----
vs1
        clus1       up/up       10.10.10.1/16    node1    e1a      true
        clus2       up/up       10.10.10.2/16    node1    e1a
false
vs2
        clus1       up/up       10.10.10.1/16    node2    e1a      true
        clus2       up/up       10.10.10.2/16    node2    e1a
false
```

Step 2: Install FASTPATH software

1. Shut down cluster port e2a on both nodes:

```
network port modify
```

Show example

The following example shows port e2a being shut down on both nodes:

```
cluster::*> network port modify -node node1 -port e2a -up-admin
false
cluster::*> network port modify -node node2 -port e2a -up-admin
false
```

2. Verify that port e2a is shut down on both nodes:

```
network port show
```

Show example

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

                                  Auto-Negot  Duplex       Speed
(Mbps)
Node    Port Role      Link MTU   Admin/Oper  Admin/Oper  Admin/Oper
------  ---- --------  ---- -----  ----------  ----------
------------
node1
        e1a  cluster   up    9000   true/true   full/full   auto/10000
        e2a  cluster   down 9000   true/true   full/full   auto/10000
node2
        e1a  cluster   up    9000   true/true   full/full   auto/10000
        e2a  cluster   down 9000   true/true   full/full   auto/10000
```

3. Shut down the Inter-Switch Link (ISL) ports on cs1, the active NetApp switch:

Show example

```
(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
```

4. Back up the current active image on cs2.

Show example

```
(cs2) # show bootvar

 Image Descriptions    .

  active:
  backup:

 Images currently available on Flash

 ------------------------------------------------------------------------
 --
  unit        active        backup      current-active       next-
 active
 ------------------------------------------------------------------------
 --

    1        1.1.0.3      1.1.0.1          1.1.0.3          1.1.0.3

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

(cs2) #
```

5. 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.

Show example

```
(cs2) # copy tftp://10.0.0.1/NetApp_CN1610_1.1.0.5.stk active


Mode..................................... TFTP
Set Server IP............................ 10.0.0.1
Path..................................... ./
Filename................................. NetApp_CN1610_1.1.0.5.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
TFTP Code transfer starting...


File transfer operation completed successfully.
```

6. Verify the running version of the FASTPATH software.

```
show version
```

Show example

```
(cs2) # show version

Switch: 1

System Description................... Broadcom Scorpion 56820
                                      Development System - 16 TENGIG,
                                      1.1.0.3, Linux 2.6.21.7
Machine Type........................ Broadcom Scorpion 56820
                                      Development System - 16TENGIG
Machine Model....................... BCM-56820
Serial Number....................... 10611100004
FRU Number..........................
Part Number......................... BCM56820
Maintenance Level................... A
Manufacturer........................ 0xbc00
Burned In MAC Address............... 00:A0:98:4B:A9:AA
Software Version.................... 1.1.0.3
Operating System.................... Linux 2.6.21.7
Network Processing Device........... BCM56820_B0
Additional Packages................. FASTPATH QOS
                                      FASTPATH IPv6 Management
```

7. View the boot images for the active and backup configuration.

```
show bootvar
```

Show example

```
(cs2) # show bootvar

Image Descriptions

 active :
 backup :

 Images currently available on Flash

------------------------------------------------------------------------
--
 unit        active        backup        current-active        next-
active
------------------------------------------------------------------------
--

    1        1.1.0.3        1.1.0.3           1.1.0.3              1.1.0.5
```

8. Reboot the switch.

```
reload
```

Show example

```
(cs2) # reload

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

System will now restart!
```

Step 3: Validate installation

1. Log in again, and verify the new version of the FASTPATH software.

```
show version
```

Show example

```
(cs2) # show version

Switch: 1

System Description................... Broadcom Scorpion 56820
                                      Development System - 16
TENGIG,
                                      1.1.0.5, Linux 2.6.21.7
Machine Type........................ Broadcom Scorpion 56820
                                      Development System - 16TENGIG
Machine Model....................... BCM-56820
Serial Number....................... 10611100004
FRU Number..........................
Part Number......................... BCM56820
Maintenance Level................... A
Manufacturer........................ 0xbc00
Burned In MAC Address............... 00:A0:98:4B:A9:AA
Software Version.................... 1.1.0.5
Operating System.................... Linux 2.6.21.7
Network Processing Device........... BCM56820_B0
Additional Packages................ FASTPATH QOS
                                     FASTPATH IPv6 Management
```

2. Bring up the ISL ports on cs1, the active switch.

`configure`

Show example

```
(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
```

3. Verify that the ISLs are operational:

`show port-channel 3/1`

The Link State field should indicate `Up`.

Show example

```
(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    True
        partner/long
0/16    actor/long      10G Full    True
        partner/long
```

4. Copy the `running-config` file to the `startup-config` file when you are satisfied with the software versions and switch settings.

Show example

```
(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!
```

5. Enable the second cluster port, e2a, on each node:

```
network port modify
```

```
cluster::*> network port modify -node node1 -port e2a -up-admin true
cluster::*> **network port modify -node node2 -port e2a -up-admin
true**
```

6. Revert clus2 that is associated with port e2a:

```
network interface revert
```

The LIF might revert automatically, depending on your version of ONTAP software.

```
cluster::*> network interface revert -vserver Cluster -lif n1_clus2
cluster::*> network interface revert -vserver Cluster -lif n2_clus2
```

7. Verify that the LIF is now home (`true`) on both nodes:

```
network interface show -role cluster
```

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

          Logical    Status     Network         Current  Current Is
  Vserver Interface  Admin/Oper Address/Mask    Node     Port    Home
  -------- ---------- ---------- -------------- -------- ------- ----
  vs1
          clus1      up/up      10.10.10.1/24   node1    e1a     true
          clus2      up/up      10.10.10.2/24   node1    e2a     true
  vs2
          clus1      up/up      10.10.10.1/24   node2    e1a     true
          clus2      up/up      10.10.10.2/24   node2    e2a     true
```

8. View the status of the nodes:

```
cluster show
```

Show example

```
cluster::> cluster show

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

9. Repeat the previous steps to install the FASTPATH software on the other switch, cs1.

10. If you suppressed automatic case creation, re-enable it by invoking an AutoSupport message:

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

Install a Reference Configuration File on a CN1610 switch

Follow this procedure to install a Reference Configuration File (RCF).

Before installing an RCF, you must first migrate the cluster LIFs away from switch cs2. After the RCF is installed and validated, the LIFs can be migrated back.

Review requirements

What you'll need

- A current backup of the switch configuration.

- A fully functioning cluster (no errors in the logs and no defective cluster network interface cards (NICs) or similar issues).

- Fully functional port connections on the cluster switch.

- All cluster ports set up.

- All cluster logical interfaces (LIFs) set up.

- A successful communication path: The ONTAP (privilege: advanced) `cluster ping-cluster -node node1` command must indicate that `larger than PMTU communication` is successful on all paths.

- A supported version of RCF and ONTAP.

  Make sure you consult the switch compatibility table on the NetApp CN1601 and CN1610 Switches page for the supported RCF and ONTAP versions.

Install the RCF

The following procedure uses the clustered Data ONTAP 8.2 syntax. As a result, the cluster Vserver, LIF names, and CLI output are different than those in Data ONTAP 8.3.

There can be command dependencies between command syntax in the RCF and FASTPATH versions.

(i) In RCF version 1.2, support for Telnet has been explicitly disabled because of security concerns. To avoid connectivity issues while installing RCF 1.2, verify that Secure Shell (SSH) is enabled. The NetApp CN1610 Switch Administrator's Guide has more information about SSH.

About the examples

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

- The two NetApp switches are cs1 and cs2.
- The two cluster LIFs are clus1 and clus2.
- The Vservers are vs1 and vs2.
- The `cluster::*>` prompt indicates the name of the cluster.
- The cluster ports on each node are named e1a and e2a.

  Hardware Universe has more information about the actual cluster ports that are supported on your platform.

- The supported Inter-Switch Links (ISLs) are ports 0/13 through 0/16.
- The supported node connections are ports 0/1 through 0/12.
- A supported version of FASTPATH, RCF, and ONTAP.

  Make sure you consult the switch compatibility table on the NetApp CN1601 and CN1610 Switches page for the supported FASTPATH, RCF, and ONTAP versions.

Step 1: Migrate cluster

1. Save your current switch configuration information:

   `write memory`

   Show example

   The following example shows the current switch configuration being saved to the startup configuration (`startup-config`) file on switch cs2:

   ```
   (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!
   ```

2. On the console of each node, migrate clus2 to port e1a:

```
network interface migrate
```

Show example

```
cluster::*> network interface migrate -vserver vs1 -lif clus2
-source-node node1 -destnode node1 -dest-port e1a

cluster::*> network interface migrate -vserver vs2 -lif clus2
-source-node node2 -destnode node2 -dest-port e1a
```

3. On the console of each node, verify that the migration occurred:

```
network interface show -role cluster
```

Show example

The following example shows that clus2 has migrated to port e1a on both nodes:

```
cluster::*> network port show -role cluster
        clus1      up/up      10.10.10.1/16   node2    e1a     true
        clus2      up/up      10.10.10.2/16   node2    e1a
false
```

4. Shut down port e2a on both nodes:

```
network port modify
```

Show example

The following example shows port e2a being shut down on both nodes:

```
cluster::*> network port modify -node node1 -port e2a -up-admin
false
cluster::*> network port modify -node node2 -port e2a -up-admin
false
```

5. Verify that port e2a is shut down on both nodes:

```
network port show
```

Show example

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

                                 Auto-Negot  Duplex      Speed
(Mbps)
Node   Port   Role      Link MTU   Admin/Oper  Admin/Oper  Admin/Oper
------ ------ --------- ---- ----- ----------- ----------
-----------
node1
       e1a    cluster   up   9000  true/true   full/full   auto/10000
       e2a    cluster   down 9000  true/true   full/full   auto/10000
node2
       e1a    cluster   up   9000  true/true   full/full   auto/10000
       e2a    cluster   down 9000  true/true   full/full   auto/10000
```

6. Shut down the ISL ports on cs1, the active NetApp switch.

Show example

```
(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
```

Step 2: Install RCF

1. Copy the RCF to the switch.

   (i) You must set the `.scr` extension as part of the file name 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.

Show example

```
(cs2) # copy tftp://10.10.0.1/CN1610_CS_RCF_v1.1.txt nvram:script
CN1610_CS_RCF_v1.1.scr

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

2. Verify that the script was downloaded and saved with the file name that you gave it.

Show example

```
(cs2) # script list
Configuration Script Name        Size(Bytes)
-------------------------------- -----------
running-config.scr                   6960
CN1610_CS_RCF_v1.1.scr               2199

2 configuration script(s) found.
6038 Kbytes free.
```

3. Validate the script.

> (i) The script is validated during the download to verify that each line is a valid switch command line.

Show example

```
(cs2) # script validate CN1610_CS_RCF_v1.1.scr
[the script is now displayed line by line]
Configuration script 'CN1610_CS_RCF_v1.1.scr' validated.
```

4. 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.
```

5. Verify that your changes have been implemented on the switch.

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

The example displays the `running-config` file on the switch. You must compare the file to the RCF to verify that the parameters that you set are as you expect.

6. Save the changes.

7. Set the `running-config` file to be the standard one.

```
(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.
```

8. Reboot the switch and verify that the `running-config` file is correct.

After the reboot completes, you must log in, view the `running-config` file, and then look for the description on interface 3/64, which is the version label for the RCF.

Show example

```
(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!
```

9. Bring up the ISL ports on cs1, the active switch.

   Show example

   ```
   (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
   ```

10. Verify that the ISLs are operational:

    ```
    show port-channel 3/1
    ```

    The Link State field should indicate `Up`.

Show example

```
(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  True
        partner/long
0/16    actor/long       10G Full  True
        partner/long
```

11. Bring up cluster port e2a on both nodes:

```
network port modify
```

Show example

The following example shows port e2a being brought up on node1 and node2:

```
cluster::*> network port modify -node node1 -port e2a -up-admin true
cluster::*> network port modify -node node2 -port e2a -up-admin true
```

Step 3: Validate installation

1. Verify that port e2a is up on both nodes:

```
network port show -role cluster
```

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

                                Auto-Negot  Duplex      Speed (Mbps)
Node    Port Role       Link MTU  Admin/Oper  Admin/Oper  Admin/Oper
------  ---- --------   ---- ----  ----------- ----------  ------------
node1
        e1a  cluster   up   9000  true/true   full/full   auto/10000
        e2a  cluster   up   9000  true/true   full/full   auto/10000
node2
        e1a  cluster   up   9000  true/true   full/full   auto/10000
        e2a  cluster   up   9000  true/true   full/full   auto/10000
```

2. On both nodes, revert clus2 that is associated with port e2a:

`network interface revert`

The LIF might revert automatically, depending on your version of ONTAP.

Show example

```
cluster::*> network interface revert -vserver node1 -lif clus2
cluster::*> network interface revert -vserver node2 -lif clus2
```

3. Verify that the LIF is now home (`true`) on both nodes:

`network interface show -role cluster`

Show example

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

        Logical    Status     Network        Current  Current Is
Vserver Interface  Admin/Oper Address/Mask   Node     Port    Home
------- ---------- ---------- -------------- -------- ------- ----
vs1
        clus1      up/up      10.10.10.1/24  node1    e1a     true
        clus2      up/up      10.10.10.2/24  node1    e2a     true
vs2
        clus1      up/up      10.10.10.1/24  node2    e1a     true
        clus2      up/up      10.10.10.2/24  node2    e2a     true
```

4. View the status of the node members:

`cluster show`

Show example

```
cluster::> cluster show

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

5. Copy the `running-config` file to the `startup-config` file when you are satisfied with the software versions and switch settings.

Show example

```
(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!
```

6. Repeat the previous steps to install the RCF on the other switch, cs1.

Install FASTPATH software and RCFs for ONTAP 8.3.1 and later

Follow this procedure to install FASTPATH software and RCFs for ONTAP 8.3.1 and later.

The installation steps are the same for both NetApp CN1601 management switches and CN1610 cluster switches running ONTAP 8.3.1 or later. However, the two models require different software and RCFs.

Review requirements

What you'll need

- A current backup of the switch configuration.

- A fully functioning cluster (no errors in the logs and no defective cluster network interface cards (NICs) or similar issues).

- Fully functional port connections on the cluster switch.

- All cluster ports set up.

- All cluster logical interfaces (LIFs) set up (must not have been migrated).

- A successful communication path: The ONTAP (privilege: advanced) `cluster ping-cluster -node node1` command must indicate that `larger than PMTU communication` is successful on all paths.

- A supported version of FASTPATH, RCF, and ONTAP.

  Make sure you consult the switch compatibility table on the NetApp CN1601 and CN1610 Switches page for the supported FASTPATH, RCF, and ONTAP versions.

Install the FASTPATH software

The following procedure uses the clustered Data ONTAP 8.2 syntax. As a result, the cluster Vserver, LIF names, and CLI output are different than those in Data ONTAP 8.3.

There can be command dependencies between command syntax in the RCF and FASTPATH versions.

> (i) In RCF version 1.2, support for Telnet has been explicitly disabled because of security concerns. To avoid connectivity issues while installing RCF 1.2, verify that Secure Shell (SSH) is enabled. The NetApp CN1610 Switch Administrator's Guide has more information about SSH.

About the examples

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. (You can have up to 24 nodes in a cluster.)

- The storage virtual machine (SVM) name is Cluster.

- The `cluster1::*>` prompt indicates the name of the cluster.

- The cluster ports on each node are named e0a and e0b.

  Hardware Universe has more information about the actual cluster ports that are supported on your platform.

- The supported Inter-Switch Links (ISLs) are ports 0/13 through 0/16.

- The supported node connections are ports 0/1 through 0/12.

Step 1: Migrate cluster

1. Display information about the network ports on the cluster:

   ```
   network port show -ipspace cluster
   ```

Show example

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

```
cluster1::> network port show -ipspace cluster
                                                     Speed
(Mbps)
Node    Port      IPspace       Broadcast Domain Link   MTU
Admin/Oper
------  --------- ------------ ---------------- ----- -------
------------
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.
```

2. Display information about the LIFs on the cluster:

   `network interface show -role cluster`

Show example

> The following example shows the logical interfaces on the cluster. In this example the `-role` parameter displays information about the LIFs that are associated 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
            node1_clus1  up/up     10.254.66.82/16     node1
e0a      true
            node1_clus2  up/up     10.254.206.128/16  node1
e0b      true
            node2_clus1  up/up     10.254.48.152/16    node2
e0a      true
            node2_clus2  up/up     10.254.42.74/16     node2
e0b      true
4 entries were displayed.
```

3. On each respective node, using a node management LIF, migrate node1_clus2 to e0a on node1 and node2_clus2 to e0a on node2:

```
network interface migrate
```

You must enter the commands on the controller consoles that own the respective cluster LIFs.

Show example

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

(i) For this command, the name of the cluster is case-sensitive and the command should be run on each node. It is not possible to run this command in the general cluster LIF.

4. Verify that the migration took place by using the `network interface show` command on a node.

Show example

The following example shows 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
          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.
```

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

```
set -privilege advanced
```

The advanced prompt (*>) appears.

6. Shut down cluster port e0b on both nodes:

```
network port modify -node node_name -port port_name -up-admin false
```

You must enter the commands on the controller consoles that own the respective cluster LIFs.

Show 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
```

7. Verify that port e0b is shut down on both nodes:

```
network port show
```

Show example

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

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

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

   Show example

   ```
   (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
   ```

9. Back up the current active image on cs2.

Show example

```
(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
```

Step 2: Install the FASTPATH software and RCF

1. Verify the running version of the FASTPATH software.

Show example

```
(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
                                               FASTPATH IPv6
Management
```

2. 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.

Show example

```
(cs2) #copy
sftp://root@10.22.201.50//tftpboot/NetApp_CN1610_1.2.0.7.stk active
Remote Password:********

Mode............................................ SFTP
Set Server IP................................... 10.22.201.50
Path............................................ /tftpboot/
Filename........................................
NetApp_CN1610_1.2.0.7.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.
```

3. Confirm the current and next-active boot image versions:

```
show bootvar
```

Show 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      1.1.0.8            1.1.0.8               1.2.0.7
```

4. Install the compatible RCF for the new image version to the switch.

   If the RCF version is already correct, bring up the ISL ports.

   Show example

```
(cs2) #copy tftp://10.22.201.50//CN1610_CS_RCF_v1.2.txt nvram:script
CN1610_CS_RCF_v1.2.scr

Mode........................................... TFTP
Set Server IP................................. 10.22.201.50
Path.......................................... /
Filename......................................
CN1610_CS_RCF_v1.2.txt
Data Type..................................... Config Script
Destination Filename..........................
CN1610_CS_RCF_v1.2.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.
```

> (i) The `.scr` extension must be set as part of the file name before invoking the script. This extension is for the FASTPATH operating system.

   The switch validates the script automatically as it is downloaded to the switch. The output goes to the console.

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

Show example

```
(cs2) #script list

Configuration Script Name        Size(Bytes)
-------------------------------- -----------
CN1610_CS_RCF_v1.2.scr                  2191

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

6. Apply the script to the switch.

Show example

```
(cs2) #script apply CN1610_CS_RCF_v1.2.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_v1.2.scr' applied.
```

7. Verify that the changes have been applied to the switch, and then save them:

`show running-config`

Show example

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

8. Save the running configuration so it becomes the startup configuration when you reboot the switch.

Show example

```
(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!
```

9. Reboot the switch.

Show example

```
(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!
```

Step 3: Validate installation

1. Log in again, and then verify that the switch is running the new version of the FASTPATH software.

Show example

```
(cs2) #show version

Switch: 1

System Description............................. NetApp CN1610,
1.2.0.7,Linux
                                                3.8.13-4ce360e8
Machine Type.................................. NetApp CN1610
Machine Model................................. CN1610
Serial Number................................. 20211200106
Burned In MAC Address......................... 00:A0:98:21:83:69
Software Version.............................. 1.2.0.7
Operating System.............................. Linux 3.8.13-
4ce360e8
Network Processing Device..................... BCM56820_B0
Part Number................................... 111-00893
CPLD version.................................. 0x5



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

After the reboot completes, you must log in to verify the image version, view the running configuration, and look for the description on interface 3/64, which is the version label for the RCF.

2. Bring up the ISL ports on cs1, the active switch.

Show example

```
(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
```

3. Verify that the ISLs are operational:

`show port-channel 3/1`

The Link State field should indicate `Up`.

Show example

```
(cs1) #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
```

4. Bring up cluster port e0b on all nodes:

   `network port modify`

   You must enter the commands on the controller consoles that own the respective cluster LIFs.

   Show example

   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
   ```

5. Verify that the port e0b is up on all nodes:

   `network port show -ipspace cluster`

Show example

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

                                             Speed
(Mbps)
Node    Port      IPspace       Broadcast Domain Link    MTU
Admin/Oper
------  --------- ------------  ---------------- ----- -------
------------
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.
```

6. Verify that the LIF is now home (`true`) on both nodes:

   `network interface show -role cluster`

Show example

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

          Logical    Status     Network               Current
Current Is
Vserver     Interface  Admin/Oper Address/Mask        Node
Port    Home
----------- ---------- ---------- ------------------ -------------
------- ----
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.
```

7. Show the status of the node members:

   ```
   cluster show
   ```

   Show example

   ```
   cluster1::*> cluster show

   Node                    Health  Eligibility   Epsilon
   -------------------- ------- ------------  ------------
   node1                   true    true          false
   node2                   true    true          false
   2 entries were displayed.
   ```

8. Return to the admin privilege level:

   ```
   set -privilege admin
   ```

9. Repeat the previous steps to install the FASTPATH software and RCF on the other switch, cs1.

Configure the hardware for the NetApp CN1610 switch

To configure the switch hardware and software for your cluster environment, refer to the CN1601 and CN1610 Switch Setup and Configuration Guide.