Configure the software

Install and maintain

NetApp
February 13, 2026

This PDF was generated from https://docs.netapp.com/us-en/ontap-systems-switches/switch-bes-53248/configure-software-overview-bes53248.html on February 13, 2026. Always check docs.netapp.com for the latest.

Table of Contents

Configure the software . . . 1
- Software install workflow for BES-53248 switches . . . 1
- Configure the BES-53248 cluster switch . . . 1
- Install the EFOS software . . . 6
  - Prepare for installation . . . 6
  - Install the software . . . 6
- Install the Reference Configuration File (RCF) and license file . . . 15
  - Review requirements . . . 15
  - Install the configuration file . . . 15
  - Step 1: Prepare for the installation . . . 16
  - Step 2: Configure ports . . . 22
  - Step 3: Verify the configuration . . . 41
- Install licenses for BES-53248 cluster switches . . . 47
  - Review available licenses . . . 47
  - Legacy licenses . . . 47
  - Install license files . . . 48
  - Troubleshoot install issues . . . 55
  - Activate newly licensed ports . . . 57
- Install the Reference Configuration File (RCF) . . . 60
  - Review requirements . . . 60
  - Install the configuration file . . . 61
  - Step 1: Prepare for the installation . . . 61
  - Step 2: Configure ports . . . 68
  - Step 3: Verify the configuration . . . 87
- Enable SSH on BES-53248 cluster switches . . . 93
- Reset the BES-53248 cluster switch to factory defaults . . . 97

Configure the software

Software install workflow for BES-53248 switches

To install and configure the software for a BES-53248 cluster switch, follow these steps:

1. **Configure the switch**

Configure the BES-53248 cluster switch.

2. **Install the EFOS software**

Download and install the Ethernet Fabric OS (EFOS) software on the BES-53248 cluster switch.

3. **Install licenses for BES-53248 cluster switches**

Optionally, add new ports by purchasing and installing more licenses. The switch base model is licensed for 16 10GbE or 25GbE ports and two 100GbE ports.

4. **Install the Reference Configuration File (RCF)**

Install or upgrade the RCF on the BES-53248 cluster switch, and then verify the ports for an additional license after the RCF is applied.

5. **Enable SSH on BES-53248 cluster switches**

If you use the Ethernet Switch Health Monitor (CSHM) and log collection features, enable SSH on the switches.

6. **Reset the switch to factory defaults**

Erase the BES-53248 cluster switch settings.

Configure the BES-53248 cluster switch

Follow these steps to perform an initial setup of the BES-53248 cluster switch.

Before you begin

- Hardware is installed, as described in Install the hardware.
- You have reviewed the following:
  - Configuration requirements
  - Components and part numbers
  - Documentation requirements

About the examples

The examples in the configuration procedures use the following switch and node nomenclature:

- The NetApp switch names are `cs1` and `cs2`. The upgrade starts on the second switch, *cs2.*
- The cluster LIF names are `node1_clus1` and `node1_clus2` for node1, and `node2_clus1` and `node2_clus2` for node2.
- The IPspace name is Cluster.
- The `cluster1::>` prompt indicates the name of the cluster.
- The cluster ports on each node are named `e0a` and `e0b`. See the NetApp Hardware Universe for the actual cluster ports supported on your platform.
- The Inter-Switch Links (ISLs) supported for the NetApp switches are ports 0/55 and 0/56.
- The node connections supported for the NetApp switches are ports 0/1 through 0/16 with default licensing.
- The examples use two nodes, but you can have up to 24 nodes in a cluster.

Steps

1. Connect the serial port to a host or serial port.
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:
   - 115200 baud
   - 8 data bits
   - 1 stop bit
   - parity: none
   - flow control: none
4. Log in to the switch as `admin` and press **Enter** when prompted for a password. The default switch name is **routing**. At the prompt, enter `enable`. This gives you access to Privileged EXEC mode for switch configuration.

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

5. Change the switch name to **cs2**.

```
(Routing)# hostname cs2
(cs2)#
```

6. To set a static IPv4 or IPv6 management address for the switch's service port:

IPv4

The serviceport is set to use DHCP by default. The IP address, subnet mask, and default gateway address are assigned automatically.

```
(cs2)# serviceport protocol none
(cs2)# network protocol none
(cs2)# serviceport ip <ip-address> <netmask> <gateway>
```

IPv6

The serviceport is set to use DHCP by default. The IP address, subnet mask, and default gateway address are assigned automatically.

```
(cs2)# serviceport protocol none
(cs2)# network protocol none
(cs2)# serviceport ipv6 <address>
(cs2)# serviceport ipv6 <gateway>
```

7. Verify the results using the command:

   `show serviceport`

```
(cs2)# show serviceport
Interface Status.............................. Up
IP Address.................................... 172.19.2.2
Subnet Mask................................... 255.255.255.0
Default Gateway............................... 172.19.2.254
IPv6 Administrative Mode...................... Enabled
IPv6 Prefix is ..............................
fe80::dac4:97ff:fe71:123c/64
IPv6 Default Router........................... fe80::20b:45ff:fea9:5dc0
Configured IPv4 Protocol...................... DHCP
Configured IPv6 Protocol...................... None
IPv6 AutoConfig Mode.......................... Disabled
Burned In MAC Address......................... D8:C4:97:71:12:3C
```

8. Configure the domain and name server:

```
ip domain name <domain_name>
ip name server <server_name>
```

```
(cs2)# configure
(cs2)(Config)# ip domain name company.com
(cs2)(Config)# ip name server 10.10.99.1 10.10.99.2
(cs2)(Config)# exit
(cs2)#
```

9. Configure the NTP server.

EFOS 3.10.0.3 and later

Configure the time zone and time synchronization (NTP):

```
sntp server <server_name>
clock
```

```
(cs2)# configure
(cs2)(Config)# ntp server 10.99.99.5
(cs2)(Config)# clock timezone -7
(cs2)(Config)# exit
(cs2)#
```

EFOS 3.9.0.2 and earlier

Configure the time zone and time synchronization (SNTP):

```
sntp client mode <client_mode>
sntp server <server_name>
clock
```

```
(cs2)# configure
(cs2)(Config)# sntp client mode unicast
(cs2)(Config)# sntp server 10.99.99.5
(cs2)(Config)# clock timezone -7
(cs2)(Config)# exit
(cs2)#
```

10. Configure the time manually if you did not configure an NTP server in the previous step.

EFOS 3.10.0.3 and later

Configure the time manually.

`clock`

```
(cs2)# configure
(cs2)(Config)# clock summer-time recurring 1 sun mar 02:00 1 sun nov
02:00 offset 60 zone EST
(cs2)(Config)# clock timezone -5 zone EST
(cs2)(Config)# clock set 07:00:00
(cs2)(Config)# clock set 10/20/2023
(cs2)(Config)# show clock

07:00:11 EST(UTC-5:00) Oct 20 2023
No time source

(cs2)(Config)# exit
(cs2)#
```

EFOS 3.9.0.2 and earlier

Configure the time manually.

`clock`

```
(cs2)# configure
(cs2)(Config)# no sntp client mode
(cs2)(Config)# clock summer-time recurring 1 sun mar 02:00 1 sun nov
02:00 offset 60 zone EST
(cs2)(Config)# clock timezone -5 zone EST
(cs2)(Config)# clock set 07:00:00
(cs2)(Config)# clock set 10/20/2023
(cs2)(Config)# show clock

07:00:11 EST(UTC-5:00) Oct 20 2023
No time source

(cs2)(Config)# exit
(cs2)#
```

11. Save the running configuration to the startup configuration:

```
write memory
```

```
(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!
```

What's next?

After you've configured your switches, you can install the EFOS software.

Install the EFOS software

Follow these steps to install the Ethernet Fabric OS (EFOS) software on the BES-53248 cluster switch.

EFOS software includes a set of advanced networking features and protocols for developing Ethernet and IP infrastructure systems. This software architecture is suitable for any network organizational device using applications that require thorough packet inspection or separation.

Prepare for installation

Before you begin

- This procedure is only suitable for new installations.
- Download the applicable Broadcom EFOS software for your cluster switches from the Broadcom Ethernet Switch Support site.
- Ensure the BES-53248 cluster switch is configured.

Install the software

Use one of the following methods to install the EFOS software:

- Method 1: Install EFOS. Use for most cases.
- Method 2: Install EFOS in ONIE mode. Use if one EFOS version is FIPS compliant and the other EFOS version is non-FIPS compliant.

Method 1: Install EFOS

Perform the following steps to install the EFOS software.

Steps

1. Log in to the switch serial console port or connect with SSH.
2. Use the `ping` command to verify connectivity to the server hosting EFOS, licenses, and the RCF file.

Show example

This example verifies that the switch is connected to the server at IP address 172.19.2.1:

```
(cs2)# ping 172.19.2.1
Pinging 172.19.2.1 with 0 bytes of data:

Reply From 172.19.2.1: icmp_seq = 0. time= 5910 usec.
```

3. Download the image file to the switch.

   Check the following table for information on supported copy protocols:

Protocol	Prerequisite
Trivial File Transfer Protocol (TFTP)	None
SSH File Transfer Protocol (SFTP)	Your software package must support secure management
FTP	Password required
XMODEM	None
YMODEM	None
ZMODEM	None
Secure Copy Protocol (SCP)	Your software package must support secure management
HTTP	CLI-based file transfers supported on selected platforms when a native WGET utility is available
HTTPS	CLI-based file transfers supported on selected platforms when a native WGET utility is available

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

Show example

```
(cs2)# copy sftp://root@172.19.2.1//tmp/EFOS-3.10.0.3.stk active
Remote Password:**

Mode..................................... SFTP
Set Server IP.................................. 172.19.2.1
Path..................................... //tmp/
Filename..................................... EFOS-3.10.0.3.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.
```

4. Display 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      3.7.0.4     3.7.0.4     3.7.0.4           3.10.0.3
```

5. Reboot the switch:

   `reload`

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!
```

6. Log in again and verify the new version of the EFOS software:

```
show version
```

Show example

```
(cs2)# show version

Switch: 1

System Description..............................  BES-53248A1,
3.10.0.3, Linux 4.4.211-28a6fe76, 2016.05.00.04
Machine Type....................................  BES-53248A1,
Machine Model...................................  BES-53248
Serial Number...................................  QTFCU38260023
Maintenance Level...............................  A
Manufacturer....................................  0xbc00
Burned In MAC Address...........................  D8:C4:97:71:0F:40
Software Version................................  3.10.0.3
Operating System................................  Linux 4.4.211-
28a6fe76
Network Processing Device.......................  BCM56873_A0
CPLD Version....................................  0xff040c03

Additional Packages.............................  BGP-4
.............................................  QOS
.............................................  Multicast
.............................................  IPv6
.............................................  Routing
.............................................  Data Center
.............................................  OpEN API
.............................................  Prototype Open API
```

7. Complete the installation. Follow these four steps to reconfigure the switch:
    a. Install licenses
    b. Install the RCF file
    c. Enable SSH
    d. Configure switch health monitoring
8. Repeat steps 1 to 7 on the partner switch.

Method 2: Install EFOS in ONIE mode

You can perform the following steps if one EFOS version is FIPS compliant and the other EFOS version is non-FIPS compliant. These steps can be used to install the non-FIPS or FIPS compliant EFOS 3.7.x.x image from ONIE if the switch fails to boot.

Steps

1. Connect to a console that is attached to the serial port of the switch.
2. Boot the switch into ONIE installation mode.

    During boot, select ONIE when you see the prompt.

Show example

```
+--------------------------------------------------------------------
-+
|EFOS
|
|*ONIE
|
|
|
|
|
|
|
|
|
|
|
|
|
|
|
|
|
|
|
|
|
|
+--------------------------------------------------------------------
-+
```

After you select **ONIE**, the switch loads and presents you with several choices. Select **Install OS**.

Show example

```
+-----------------------------------------------------------------
-+
|*ONIE: Install OS
|
| ONIE: Rescue
|
| ONIE: Uninstall OS
|
| ONIE: Update ONIE
|
| ONIE: Embed ONIE
|
| DIAG: Diagnostic Mode
|
| DIAG: Burn-In Mode
|
|
|
|
|
|
|
|
|
|
|
+-----------------------------------------------------------------
-+
```

The switch boots into ONIE installation mode.

3. Stop the ONIE discovery and configure the Ethernet interface.

   When the following message appears, press **Enter** to invoke the ONIE console:

```
Please press Enter to activate this console. Info: eth0:  Checking
link... up.
 ONIE:/ #
```

   The ONIE discovery continues and messages are printed to the console.

```
Stop the ONIE discovery
ONIE:/ # onie-discovery-stop
discover: installer mode detected.
Stopping: discover... done.
ONIE:/ #
```

4. Configure the Ethernet interface of the switch management port and add the route using `ifconfig eth0 <ipAddress> netmask <netmask> up` and `route add default gw <gatewayAddress>`

```
ONIE:/ # ifconfig eth0 10.10.10.10 netmask 255.255.255.0 up
ONIE:/ # route add default gw 10.10.10.1
```

5. Verify that the server hosting the ONIE installation file is reachable:

   `ping`

   Show example

```
ONIE:/ # ping 50.50.50.50
PING 50.50.50.50 (50.50.50.50): 56 data bytes
64 bytes from 50.50.50.50: seq=0 ttl=255 time=0.429 ms
64 bytes from 50.50.50.50: seq=1 ttl=255 time=0.595 ms
64 bytes from 50.50.50.50: seq=2 ttl=255 time=0.369 ms
^C
--- 50.50.50.50 ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max = 0.369/0.464/0.595 ms
ONIE:/ #
```

6. Install the new switch software:

```
ONIE:/ # onie-nos-install http://50.50.50.50/Software/onie-installer-x86_64
```

Show example

```
ONIE:/ # onie-nos-install http://50.50.50.50/Software/onie-
installer-x86_64
discover: installer mode detected.
Stopping: discover... done.
Info: Fetching http://50.50.50.50/Software/onie-installer-3.7.0.4
...
Connecting to 50.50.50.50 (50.50.50.50:80)
installer            100% |*******************************| 48841k
0:00:00 ETA
ONIE: Executing installer: http://50.50.50.50/Software/onie-
installer-3.7.0.4
Verifying image checksum ... OK.
Preparing image archive ... OK.
```

The software installs and then reboots the switch. Let the switch reboot normally into the new EFOS version.

7. Log in and verify that the new switch software is installed:

   `show bootvar`

   Show example

```
(cs2)# show bootvar
Image Descriptions
active :
backup :
Images currently available on Flash
----    ----------- -------- --------------- ------------
unit    active      backup   current-active  next-active
----    ----------- -------- --------------- ------------
 1      3.7.0.4     3.7.0.4    3.7.0.4        3.10.0.3
(cs2) #
```

8. Complete the installation. The switch reboots with no configuration applied and resets to factory defaults. Follow these five steps to reconfigure the switch:
   a. Configure switch
   b. Install licenses
   c. Install the RCF file
   d. Enable SSH

e. Configure switch health monitoring

9. Repeat steps 1 to 8 on the partner switch.

What's next

After you've installed the EFOS software, you can install your licenses.

Install the Reference Configuration File (RCF) and license file

Beginning with EFOS 3.12.0.1, you can install the Reference Configuration File (RCF) and license file after configuring the BES-53248 cluster switch.

All ports are configured when you install the RCF, but you need to install your license to activate the configured ports.

Review requirements

Before you begin

Verify that the following are in place:

- A current backup of the switch configuration.
- A fully functioning cluster (no errors in the logs or similar issues).
- The current RCF, available from the Broadcom Cluster Switches page.
- A boot configuration in the RCF that reflects the desired boot images, required if you are installing only EFOS and keeping your current RCF version. If you need to change the boot configuration to reflect the current boot images, you must do so before reapplying the RCF so that the correct version is instantiated on future reboots.
- A console connection to the switch, required when installing the RCF from a factory-default state. This requirement is optional if you have used the Knowledge Base article How to clear configuration on a Broadcom interconnect switch while retaining remote connectivity to clear the configuration, beforehand.

Suggested documentation

Consult the switch compatibility table for the supported ONTAP and RCF versions. See the EFOS Software download page. Note that there can be command dependencies between the command syntax in the RCF and that found in versions of EFOS.

Install the configuration file

About the examples

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

- The names of the two BES-53248 switches are cs1 and cs2.
- The node names are cluster1-01, cluster1-02, cluster1-03, and cluster1-04.
- The cluster LIF names are cluster1-01_clus1, cluster1-01_clus2, cluster1-02_clus1, cluster1-02_clus2, cluster1-03_clus1, cluster1-03_clus2, cluster1-04_clus1, and cluster1-04_clus2.
- The `cluster1::*>` prompt indicates the name of the cluster.

- The examples in this procedure use four nodes. These nodes use two 10GbE cluster interconnect ports `e0a` and `e0b`. See the Hardware Universe to verify the correct cluster ports on your platforms.

The command outputs might vary depending on different releases of ONTAP.

About this task

The procedure requires the use of both ONTAP commands and Broadcom switch commands; ONTAP commands are used unless otherwise indicated.

No operational inter-switch link (ISL) is needed during this procedure. This is by design because RCF version changes can affect ISL connectivity temporarily. To ensure non-disruptive cluster operations, the following procedure migrates all the cluster LIFs to the operational partner switch while performing the steps on the target switch.

Before installing a new switch software version and RCFs, use the Knowledge Base article How to clear configuration on a Broadcom interconnect switch while retaining remote connectivity. If you must erase the switch settings completely, then you need to perform the basic configuration again. You must be connected to the switch using the serial console because a complete configuration erasure resets the configuration of the management network.

Step 1: Prepare for the installation

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
```

where *x* is the duration of the maintenance window in hours.

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

The following command suppresses automatic case creation for two hours:

```
cluster1::*> system node autosupport invoke -node \* -type all -message
MAINT=2h
```

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

```
set -privilege advanced
```

The advanced prompt (*>) appears.

3. Display the cluster ports on each node that are connected to the cluster switches:

```
network device-discovery show
```

Show example

```
cluster1::*> network device-discovery show
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface
Platform
----------- ------ ------------------------- ----------------
--------
cluster1-01/cdp
            e0a    cs1                       0/2               BES-
53248
            e0b    cs2                       0/2               BES-
53248
cluster1-02/cdp
            e0a    cs1                       0/1               BES-
53248
            e0b    cs2                       0/1               BES-
53248
cluster1-03/cdp
            e0a    cs1                       0/4               BES-
53248
            e0b    cs2                       0/4               BES-
53248
cluster1-04/cdp
            e0a    cs1                       0/3               BES-
53248
            e0b    cs2                       0/3               BES-
53248
cluster1::*>
```

4. Check the administrative and operational status of each cluster port.
   a. Verify that all the cluster ports are up with a healthy status:

```
network port show -ipspace Cluster
```

Show example

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

Node: cluster1-01

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0b       Cluster      Cluster          up   9000  auto/100000
healthy false

Node: cluster1-02

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0b       Cluster      Cluster          up   9000  auto/100000
healthy false
8 entries were displayed.

Node: cluster1-03

   Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false
```

```
Node: cluster1-04

Ignore
                                                          Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false
cluster1::*>
```

b. Verify that all the cluster interfaces (LIFs) are on the home port:

```
network interface show -vserver Cluster
```

Show example

```
cluster1::*> network interface show -vserver Cluster
            Logical            Status     Network
Current      Current Is
Vserver     Interface          Admin/Oper Address/Mask      Node
Port    Home
----------- ------------------ ---------- -----------------
------------ ------- ----
Cluster
            cluster1-01_clus1  up/up     169.254.3.4/23
cluster1-01  e0a     true
            cluster1-01_clus2  up/up     169.254.3.5/23
cluster1-01  e0b     true
            cluster1-02_clus1  up/up     169.254.3.8/23
cluster1-02  e0a     true
            cluster1-02_clus2  up/up     169.254.3.9/23
cluster1-02  e0b     true
            cluster1-03_clus1  up/up     169.254.1.3/23
cluster1-03  e0a     true
            cluster1-03_clus2  up/up     169.254.1.1/23
cluster1-03  e0b     true
            cluster1-04_clus1  up/up     169.254.1.6/23
cluster1-04  e0a     true
            cluster1-04_clus2  up/up     169.254.1.7/23
cluster1-04  e0b     true
```

5. Verify that the cluster displays information for both cluster switches.

ONTAP 9.8 and later

Beginning with ONTAP 9.8, use the command:

```
system switch ethernet show -is-monitoring-enabled-operational true
```

```
cluster1::*> system switch ethernet show -is-monitoring-enabled
-operational true
Switch                      Type               Address          Model
--------------------------- ------------------ ----------------
---------------
cs1                         cluster-network    10.228.143.200   BES-
53248
           Serial Number: QTWCU22510008
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP

cs2                         cluster-network    10.228.143.202   BES-
53248
           Serial Number: QTWCU22510009
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP
cluster1::*>
```

ONTAP 9.7 and earlier

For ONTAP 9.7 and earlier, use the command:

```
system cluster-switch show -is-monitoring-enabled-operational true
```

```
cluster1::*> system cluster-switch show -is-monitoring-enabled
-operational true
Switch                        Type               Address          Model
----------------------------- ------------------ ----------------
---------------
cs1                           cluster-network    10.228.143.200   BES-
53248
           Serial Number: QTWCU22510008
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP

cs2                           cluster-network    10.228.143.202   BES-
53248
           Serial Number: QTWCU22510009
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP
cluster1::*>
```

6. Disable auto-revert on the cluster LIFs.

```
network interface modify -vserver Cluster -lif * -auto-revert false
```

Step 2: Configure ports

1. On switch cs2, confirm the list of ports that are connected to the nodes in the cluster.

```
show isdp neighbor
```

2. On cluster switch cs2, shut down the ports connected to the cluster ports of the nodes. For example, if ports 0/1 to 0/16 are connected to ONTAP nodes:

```
(cs2)> enable
(cs2)# configure
(cs2)(Config)# interface 0/1-0/16
(cs2)(Interface 0/1-0/16)# shutdown
(cs2)(Interface 0/1-0/16)# exit
(cs2)(Config)#
```

3. Verify that the cluster LIFs have migrated to the ports hosted on cluster switch cs1. This might take a few seconds.

```
network interface show -vserver Cluster
```

Show example

```
cluster1::*> network interface show -vserver Cluster
            Logical           Status     Network            Current
Current Is
Vserver     Interface         Admin/Oper Address/Mask       Node
Port    Home
----------- ----------------- ---------- ------------------
------------ ------- ----
Cluster
            cluster1-01_clus1 up/up      169.254.3.4/23
cluster1-01   e0a     true
            cluster1-01_clus2 up/up      169.254.3.5/23
cluster1-01   e0a     false
            cluster1-02_clus1 up/up      169.254.3.8/23
cluster1-02   e0a     true
            cluster1-02_clus2 up/up      169.254.3.9/23
cluster1-02   e0a     false
            cluster1-03_clus1 up/up      169.254.1.3/23
cluster1-03   e0a     true
            cluster1-03_clus2 up/up      169.254.1.1/23
cluster1-03   e0a     false
            cluster1-04_clus1 up/up      169.254.1.6/23
cluster1-04   e0a     true
            cluster1-04_clus2 up/up      169.254.1.7/23
cluster1-04   e0a     false
cluster1::*>
```

4. Verify that the cluster is healthy:

```
cluster show
```

Show example

```
cluster1::*> cluster show
Node                  Health  Eligibility   Epsilon
--------------------- ------- ------------  -------
cluster1-01           true    true          false
cluster1-02           true    true          false
cluster1-03           true    true          true
cluster1-04           true    true          false
```

5. If you have not already done so, save the current switch configuration by copying the output of the following command to a log file:

```
show running-config
```

6. Clean the configuration on switch cs2 and perform a basic setup.

When updating or applying a new RCF, you must erase the switch settings and perform basic configuration. You must be connected to the switch using the serial console to erase switch settings. This requirement is optional if you have used the Knowledge Base article How to clear the configuration on a Broadcom interconnect switch while retaining remote connectivity to clear the configuration, beforehand.

Clearing the configuration does not delete licenses.

a. SSH into the switch.

   Only proceed when all the cluster LIFs have been removed from the ports on the switch and the switch is prepared to have the configuration cleared.

b. Enter privilege mode:

```
(cs2)> enable
(cs2)#
```

c. Copy and paste the following commands to remove the previous RCF configuration (depending on the previous RCF version used, some commands might generate an error if a particular setting is not present):

```
clear config interface 0/1-0/56
y
clear config interface lag 1
y
configure
```

```
deleteport 1/1 all
no policy-map CLUSTER
no policy-map WRED_25G
no policy-map WRED_100G
no policy-map InShared
no policy-map InMetroCluster
no policy-map InCluster
no policy-map InClusterRdma
no class-map CLUSTER
no class-map HA
no class-map RDMA
no class-map c5
no class-map c4
no class-map CLUSTER
no class-map CLUSTER_RDMA
no class-map StorageSrc
no class-map StorageDst
no class-map RdmaSrc
no class-map RdmaDst
no classofservice dot1p-mapping
no random-detect queue-parms 0
no random-detect queue-parms 1
no random-detect queue-parms 2
no random-detect queue-parms 3
no random-detect queue-parms 4
no random-detect queue-parms 5
no random-detect queue-parms 6
no random-detect queue-parms 7
no cos-queue min-bandwidth
no cos-queue random-detect 0
no cos-queue random-detect 1
no cos-queue random-detect 2
no cos-queue random-detect 3
no cos-queue random-detect 4
no cos-queue random-detect 5
no cos-queue random-detect 6
no cos-queue random-detect 7
exit
vlan database
no vlan 17
no vlan 18
exit
```

d. Save the running configuration to the startup configuration:

```
(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!
```

e. Perform a reboot of the switch:

```
(cs2)# reload

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

f. Log in to the switch again using SSH to complete the RCF installation.

7. Record any customizations that were made in the previous RCF and apply these to the new RCF. For example, setting port speeds or hard-coding FEC mode.
8. Copy the RCF to the bootflash of switch cs2 using one of the following transfer protocols: FTP, HTTP, TFTP, SFTP, or SCP.

   This example shows HTTP being used to copy an RCF to the bootflash on switch cs2:

Show example

```
(cs2)# copy http://<ip-to-webserver>/path/to/BES-53248-RCF-v1.12-
Cluster-HA.txt nvram:reference-config

Mode..................................... HTTP
Set Server IP.............................. 172.19.2.1
Path..................................... <ip-to-
webserver>/path/to/
Filename................................. BES-53248-RCF-v1.12-
Cluster-HA.txt
Data Type................................ Unknown

Management access will be blocked for the duration of the transfer
Are you sure you want to start? (y/n) y
File transfer in progress.
Management access will be blocked for the duration of the transfer.
Please wait...
HTTP Unknown file type transfer starting...
Validating configuration script.....
Configuration script validated.
File transfer operation completed successfully.
```

9. Verify that the script was downloaded and saved under the file name you gave it:

   `script list`

Show example

```
(cs2)# script list

Configuration Script Name                 Size(Bytes)  Date of
Modification
----------------------------------------  -----------
--------------------
Reference-config.scr                      2680         2024 05 31
21:54:22
1 configuration script(s) found.
2045 Kbytes free.
```

10. Apply the script to the switch:

    `script apply`

Show example

```
(cs2)# script apply reference-config.scr

Are you sure you want to apply the configuration script? (y/n) y

The system has unsaved changes.
Would you like to save them now? (y/n) y
Config file 'startup-config' created successfully.
Configuration Saved!
...
...
Configuration script 'reference-config.scr' applied.
```

11. Install the license file.

Show example

```
(cs2)# copy http://<ip-to-webserver>/path/to/BES-53248-LIC.dat
nvram:license-key 1
Mode........................................... HTTP
Set Server IP.................................. 172.19.2.1
Path........................................... <ip-to-
webserver>/path/to/
Filename....................................... BES-53248-LIC.dat
Data Type...................................... license

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

File transfer in progress. Management access will be blocked for the
duration of the transfer.

Please wait...

License Key transfer operation completed successfully.

System reboot is required.
(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!

(cs2)# reload
Are you sure you would like to reset the system? (y/n) y
...
...
```

12. Examine the banner output from the `show clibanner` command. You must read and follow these instructions to verify the proper configuration and operation of the switch.

Show example

```
(cs2)# show clibanner

Banner Message configured :
=========================
BES-53248 Reference Configuration File v1.12 for Cluster/HA/RDMA

Switch   : BES-53248
Filename : BES-53248-RCF-v1.12-Cluster.txt
Date     : 11-04-2024
Version  : v1.12
Port Usage:
Ports 01 - 16: 10/25GbE Cluster Node Ports, base config
Ports 17 - 48: 10/25GbE Cluster Node Ports, with licenses
Ports 49 - 54: 40/100GbE Cluster Node Ports, with licenses, added
right to left
Ports 55 - 56: 100GbE Cluster ISL Ports, base config
NOTE:
- The 48 SFP28/SFP+ ports are organized into 4-port groups in terms
of port speed:
  Ports 1-4, 5-8, 9-12, 13-16, 17-20, 21-24, 25-28, 29-32, 33-36,
37-40, 41-44, 45-48
  The port speed should be the same (10GbE or 25GbE) across all
ports in a 4-port group
- If additional licenses are purchased, follow the 'Additional Node
Ports
  activated with Licenses' section for instructions
- If SSH is active, it will have to be re-enabled manually after
'erase startup-config'
  command has been executed and the switch rebooted"
```

13. On the switch, verify that the additional licensed ports appear after the RCF is applied:

```
show port all | exclude Detach
```

Show example

```
(cs2)# show port all | exclude Detach

                Admin     Physical     Physical   Link   Link
LACP   Actor
Intf      Type  Mode      Mode         Status     Status Trap
Mode   Timeout
--------- ------ --------- ------------ ---------- ------ -------
------ --------
0/1             Enable    Auto                    Down   Enable
Enable long
0/2             Enable    Auto                    Down   Enable
Enable long
0/3             Enable    Auto                    Down   Enable
Enable long
0/4             Enable    Auto                    Down   Enable
Enable long
0/5             Enable    Auto                    Down   Enable
Enable long
0/6             Enable    Auto                    Down   Enable
Enable long
0/7             Enable    Auto                    Down   Enable
Enable long
0/8             Enable    Auto                    Down   Enable
Enable long
0/9             Enable    Auto                    Down   Enable
Enable long
0/10            Enable    Auto                    Down   Enable
Enable long
0/11            Enable    Auto                    Down   Enable
Enable long
0/12            Enable    Auto                    Down   Enable
Enable long
0/13            Enable    Auto                    Down   Enable
Enable long
0/14            Enable    Auto                    Down   Enable
Enable long
0/15            Enable    Auto                    Down   Enable
Enable long
0/16            Enable    Auto                    Down   Enable
Enable long
0/49            Enable    40G Full                Down   Enable
Enable long
0/50            Enable    40G Full                Down   Enable
Enable long
```

```
0/51            Enable    100G Full               Down   Enable
Enable long
0/52            Enable    100G Full               Down   Enable
Enable long
0/53            Enable    100G Full               Down   Enable
Enable long
0/54            Enable    100G Full               Down   Enable
Enable long
0/55            Enable    100G Full               Down   Enable
Enable long
0/56            Enable    100G Full               Down   Enable
Enable long
```

14. On the switch, verify that your changes have been made:

```
show running-config
```

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

15. Save the running configuration so that it becomes the startup configuration when you reboot the switch:

```
write memory
```

```
(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!
```

16. Reboot the switch and verify that the running configuration is correct:

```
reload
```

```
(cs2)# reload

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

System will now restart!
```

17. On cluster switch cs2, bring up the ports connected to the cluster ports of the nodes. For example, if ports 0/1 to 0/16 are connected to ONTAP nodes:

```
(cs2)> enable
(cs2)# configure
(cs2)(Config)# interface 0/1-0/16
(cs2)(Interface 0/1-0/16)# no shutdown
(cs2)(Interface 0/1-0/16)# exit
(cs2)(Config)#
```

18. Verify the ports on switch cs2:

```
show interfaces status all | exclude Detach
```

Show example

```
(cs1)# show interfaces status all | exclude Detach

                                Link    Physical    Physical
Media       Flow
Port       Name                 State   Mode        Status      Type
Control     VLAN
---------  -------------------  ------  ----------  ----------
----------  ----------  ------
.
.
.
0/16       10/25GbE Node Port   Down    Auto
Inactive    Trunk
0/17       10/25GbE Node Port   Down    Auto
Inactive    Trunk
0/18       10/25GbE Node Port   Up      25G Full    25G Full
25GBase-SR  Inactive    Trunk
0/19       10/25GbE Node Port   Up      25G Full    25G Full
25GBase-SR  Inactive    Trunk
.
.
.
0/50       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/51       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/52       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/53       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/54       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/55       Cluster   ISL Port   Up      Auto        100G Full
Copper      Inactive    Trunk
0/56       Cluster   ISL Port   Up      Auto        100G Full
Copper      Inactive    Trunk
```

19. Verify the health of cluster ports on the cluster.
    a. Verify that e0b ports are up and healthy across all nodes in the cluster:

```
network port show -ipspace Cluster
```

Show example

```
cluster1::*> network port show -ipspace Cluster
Node: cluster1-01

Ignore
                                                  Speed(Mbps)
Health  Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status  Status
--------- ------------ ---------------- ---- ---- -----------
-------- -----
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false

Node: cluster1-02


Ignore
                                                  Speed(Mbps)
Health  Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status  Status
--------- ------------ ---------------- ---- ---- -----------
-------- -----
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false

Node: cluster1-03

Ignore
                                                  Speed(Mbps)
Health  Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status  Status
--------- ------------ ---------------- ---- ---- -----------
-------- -----
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0b       Cluster      Cluster          up   9000  auto/100000
healthy false
```

```
Node: cluster1-04

Ignore
                                                          Speed(Mbps)
Health  Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status  Status
--------- ------------ ---------------- ---- ---- -----------
-------- -----
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0b       Cluster      Cluster          up   9000  auto/100000
healthy false
```

b. Verify the switch health from the cluster:

```
network device-discovery show -protocol cdp
```

Show example

```
cluster1::*> network device-discovery show -protocol cdp
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface
Platform
----------- ------ ------------------------- -----------------
--------
cluster1-01/cdp
            e0a    cs1                       0/2
BES-53248
            e0b    cs2                       0/2
BES-53248
cluster01-2/cdp
            e0a    cs1                       0/1
BES-53248
            e0b    cs2                       0/1
BES-53248
cluster01-3/cdp
            e0a    cs1                       0/4
BES-53248
            e0b    cs2                       0/4
BES-53248
cluster1-04/cdp
            e0a    cs1                       0/3
BES-53248
            e0b    cs2                       0/2
BES-53248
```

20. Verify that the cluster displays information for both cluster switches.

ONTAP 9.8 and later

Beginning with ONTAP 9.8, use the command:

```
system switch ethernet show -is-monitoring-enabled-operational true
```

```
cluster1::*> system switch ethernet show -is-monitoring-enabled
-operational true
Switch                      Type               Address          Model
--------------------------- ------------------ ----------------
---------------
cs1                         cluster-network    10.228.143.200   BES-
53248
           Serial Number: QTWCU22510008
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP

cs2                         cluster-network    10.228.143.202   BES-
53248
           Serial Number: QTWCU22510009
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP
cluster1::*>
```

ONTAP 9.7 and earlier

For ONTAP 9.7 and earlier, use the command:

```
system cluster-switch show -is-monitoring-enabled-operational true
```

```
cluster1::*> system cluster-switch show -is-monitoring-enabled
-operational true
Switch                        Type               Address          Model
----------------------------- ------------------ ----------------
---------------
cs1                           cluster-network    10.228.143.200   BES-
53248
           Serial Number: QTWCU22510008
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP

cs2                           cluster-network    10.228.143.202   BES-
53248
           Serial Number: QTWCU22510009
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP
cluster1::*>
```

21. On cluster switch cs1, shut down the ports connected to the cluster ports of the nodes.

    The following example uses the interface example output:

```
(cs1)> enable
(cs1)# configure
(cs1)(Config)# interface 0/1-0/16
(cs1)(Interface 0/1-0/16)# shutdown
```

22. Verify that the cluster LIFs have migrated to the ports hosted on switch cs2. This might take a few seconds.

```
network interface show -vserver Cluster
```

Show example

```
cluster1::*> network interface show -vserver Cluster
            Logical             Status     Network             Current
Current  Is
Vserver     Interface           Admin/Oper Address/Mask        Node
Port     Home
----------- ------------------ ---------- ------------------
------------------ -------- ----
Cluster
            cluster1-01_clus1  up/up      169.254.3.4/23
cluster1-01        e0a      false
            cluster1-01_clus2  up/up      169.254.3.5/23
cluster1-01        e0b      true
            cluster1-02_clus1  up/up      169.254.3.8/23
cluster1-02        e0a      false
            cluster1-02_clus2  up/up      169.254.3.9/23
cluster1-02        e0b      true
            cluster1-03_clus1  up/up      169.254.1.3/23
cluster1-03        e0a      false
            cluster1-03_clus2  up/up      169.254.1.1/23
cluster1-03        e0b      true
            cluster1-04_clus1  up/up      169.254.1.6/23
cluster1-04        e0a      false
            cluster1-04_clus2  up/up      169.254.1.7/23
cluster1-04        e0b      true
cluster1::*>
```

23. Verify that the cluster is healthy:

    `cluster show`

    Show example

```
cluster1::*> cluster show
Node                 Health   Eligibility   Epsilon
-------------------- -------- ------------- -------
cluster1-01          true     true          false
cluster1-02          true     true          false
cluster1-03          true     true          true
cluster1-04          true     true          false
```

24. Repeat steps 4 to 19 on switch cs1.

25. Enable auto-revert on the cluster LIFs:

```
network interface modify -vserver Cluster -lif * -auto-revert true
```

26. Reboot switch cs1. This triggers the cluster LIFs to revert to their home ports. You can ignore the “cluster ports down” events reported on the nodes while the switch reboots.

```
(cs1)# 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: Verify the configuration

1. On switch cs1, verify that the switch ports connected to the cluster ports are **up**:

```
show interfaces status all | exclude Detach
```

Show example

```
(cs1)# show interfaces status all | exclude Detach

                                Link    Physical    Physical
Media       Flow
Port       Name                 State   Mode        Status      Type
Control     VLAN
---------  -------------------  ------  ----------  ----------
----------  ----------  ------
.
.
.
0/16       10/25GbE Node Port   Down    Auto
Inactive    Trunk
0/17       10/25GbE Node Port   Down    Auto
Inactive    Trunk
0/18       10/25GbE Node Port   Up      25G Full    25G Full
25GBase-SR  Inactive    Trunk
0/19       10/25GbE Node Port   Up      25G Full    25G Full
25GBase-SR  Inactive    Trunk
.
.
.
0/50       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/51       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/52       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/53       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/54       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/55       Cluster   ISL Port   Up      Auto        100G Full
Copper      Inactive    Trunk
0/56       Cluster   ISL Port   Up      Auto        100G Full
Copper      Inactive    Trunk
```

2. Verify that the ISL between switches cs1 and cs2 is functional:

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

Show example

```
(cs1)# show port-channel 1/1
Local Interface................................ 1/1
Channel Name................................... Cluster-ISL
Link State..................................... Up
Admin Mode..................................... Enabled
Type........................................... Dynamic
Port-channel Min-links......................... 1
Load Balance Option............................ 7
(Enhanced hashing mode)
Mbr     Device/       Port      Port
Ports   Timeout       Speed     Active
------- ------------- --------- -------
0/55    actor/long    Auto      True
        partner/long
0/56    actor/long    Auto      True
        partner/long
```

3. Verify that the cluster LIFs have reverted to their home port:

```
network interface show -vserver Cluster
```

Show example

```
cluster1::*> network interface show -vserver Cluster
            Logical            Status     Network            Current
Current Is
Vserver     Interface          Admin/Oper Address/Mask       Node
Port    Home
----------- ------------------ ---------- ------------------
------------------- ------- ----
Cluster
            cluster1-01_clus1  up/up      169.254.3.4/23
cluster1-01         e0a     true
            cluster1-01_clus2  up/up      169.254.3.5/23
cluster1-01         e0b     true
            cluster1-02_clus1  up/up      169.254.3.8/23
cluster1-02         e0a     true
            cluster1-02_clus2  up/up      169.254.3.9/23
cluster1-02         e0b     true
            cluster1-03_clus1  up/up      169.254.1.3/23
cluster1-03         e0a     true
            cluster1-03_clus2  up/up      169.254.1.1/23
cluster1-03         e0b     true
            cluster1-04_clus1  up/up      169.254.1.6/23
cluster1-04         e0a     true
            cluster1-04_clus2  up/up      169.254.1.7/23
cluster1-04         e0b     true
```

4. Verify that the cluster is healthy:

   `cluster show`

   Show example

```
cluster1::*> cluster show
Node                 Health  Eligibility   Epsilon
-------------------- ------- ------------- -------
cluster1-01          true    true          false
cluster1-02          true    true          false
cluster1-03          true    true          true
cluster1-04          true    true          false
```

5. Verify the connectivity of the remote cluster interfaces:

ONTAP 9.9.1 and later

You can use the `network interface check cluster-connectivity` command to start an accessibility check for cluster connectivity and then display the details:

`network interface check cluster-connectivity start` and `network interface check cluster-connectivity show`

```
cluster1::*> network interface check cluster-connectivity start
```

NOTE: Wait for a number of seconds before running the `show` command to display the details.

```
cluster1::*> network interface check cluster-connectivity show
                                  Source              Destination
Packet
Node   Date                       LIF                 LIF
Loss
------ -------------------------- -------------------
------------------- -------
cluster1-01
       3/5/2022 19:21:18 -06:00   cluster1-01_clus2   cluster01-
02_clus1  none
       3/5/2022 19:21:20 -06:00   cluster1-01_clus2   cluster01-
02_clus2  none

cluster1-02
       3/5/2022 19:21:18 -06:00   cluster1-02_clus2   cluster1-02_clus1
none
       3/5/2022 19:21:20 -06:00   cluster1-02_clus2   cluster1-02_clus2
none
```

All ONTAP releases

For all ONTAP releases, you can also use the `cluster ping-cluster -node <name>` command to check the connectivity:

```
cluster ping-cluster -node <name>
```

```
cluster1::*> cluster ping-cluster -node local
Host is cluster1-03
Getting addresses from network interface table...
Cluster cluster1-03_clus1 169.254.1.3 cluster1-03 e0a
Cluster cluster1-03_clus2 169.254.1.1 cluster1-03 e0b
Cluster cluster1-04_clus1 169.254.1.6 cluster1-04 e0a
Cluster cluster1-04_clus2 169.254.1.7 cluster1-04 e0b
Cluster cluster1-01_clus1 169.254.3.4 cluster1-01 e0a
Cluster cluster1-01_clus2 169.254.3.5 cluster1-01 e0b
Cluster cluster1-02_clus1 169.254.3.8 cluster1-02 e0a
Cluster cluster1-02_clus2 169.254.3.9 cluster1-02 e0b
Local = 169.254.1.3 169.254.1.1
Remote = 169.254.1.6 169.254.1.7 169.254.3.4 169.254.3.5 169.254.3.8
169.254.3.9
Cluster Vserver Id = 4294967293
Ping status:
............
Basic connectivity succeeds on 12 path(s)
Basic connectivity fails on 0 path(s)
................................................
Detected 9000 byte MTU on 12 path(s):
  Local 169.254.1.3 to Remote 169.254.1.6
  Local 169.254.1.3 to Remote 169.254.1.7
  Local 169.254.1.3 to Remote 169.254.3.4
  Local 169.254.1.3 to Remote 169.254.3.5
  Local 169.254.1.3 to Remote 169.254.3.8
  Local 169.254.1.3 to Remote 169.254.3.9
  Local 169.254.1.1 to Remote 169.254.1.6
  Local 169.254.1.1 to Remote 169.254.1.7
  Local 169.254.1.1 to Remote 169.254.3.4
  Local 169.254.1.1 to Remote 169.254.3.5
  Local 169.254.1.1 to Remote 169.254.3.8
  Local 169.254.1.1 to Remote 169.254.3.9
Larger than PMTU communication succeeds on 12 path(s)
RPC status:
6 paths up, 0 paths down (tcp check)
6 paths up, 0 paths down (udp check)
```

6. Change the privilege level back to admin:

```
set -privilege admin
```

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

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

What's next?

After you've installed the RCF and license file, you can enable SSH.

Install licenses for BES-53248 cluster switches

The BES-53248 cluster switch base model is licensed for 16 10GbE or 25GbE ports and two 100GbE ports. You can add new ports by purchasing more licenses.

For EFOS 3.12 and later, follow the installation steps in Install the Reference Configuration File (RCF) and license file.

Review available licenses

The following licenses are available for use on the BES-53248 cluster switch:

License type	License details	Supported firmware version
SW-BES-53248A2-8P-2P	Broadcom 8PT-10G25G + 2PT-40G100G License Key, X190005/R	EFOS 3.4.4.6 and later
SW-BES-53248A2-8P-1025G	Broadcom 8 Port 10G25G License Key, X190005/R	EFOS 3.4.4.6 and later
SW-BES53248A2-6P-40-100G	Broadcom 6 Port 40G100G License Key, X190005/R	EFOS 3.4.4.6 and later

To redeem a transaction key for a port license key file, go to the License Portal for Broadcom Supported Ethernet Switches page. See the Knowledge Base article How to add Additional Port Licensing for the Broadcom BES-53248 Switch for further details.

Legacy licenses

The following table lists the legacy licenses that were available for use on the BES-53248 cluster switch:

License type	License details	Supported firmware version
SW-BES-53248A1-G1-8P-LIC	Broadcom 8P 10-25,2P40-100 License Key, X190005/R	EFOS 3.4.3.3 and later

License type	License details	Supported firmware version
SW-BES-53248A1-G1-16P-LIC	Broadcom 16P 10-25,4P40-100 License Key, X190005/R	EFOS 3.4.3.3 and later
SW-BES-53248A1-G1-24P-LIC	Broadcom 24P 10-25,6P40-100 License Key, X190005/R	EFOS 3.4.3.3 and later
SW-BES54248-40-100G-LIC	Broadcom 6Port 40G100G License Key, X190005/R	EFOS 3.4.4.6 and later
SW-BES53248-8P-10G25G-LIC	Broadcom 8Port 10G25G License Key, X190005/R	EFOS 3.4.4.6 and later
SW-BES53248-16P-1025G-LIC	Broadcom 16Port 10G25G License Key, X190005/R	EFOS 3.4.4.6 and later
SW-BES53248-24P-1025G-LIC	Broadcom 24Port 10G25G License Key, X190005/R	EFOS 3.4.4.6 and later

A license is not required for the base configuration.

Install license files

Follow these steps to install licenses for BES-53248 cluster switches.

Steps

1. Connect the cluster switch to the management network.
2. Use the `ping` command to verify connectivity to the server hosting EFOS, licenses, and the RCF file.

   Show example

   This example verifies that the switch is connected to the server at IP address 172.19.2.1:

   ```
   (cs2)# ping 172.19.2.1
   Pinging 172.19.2.1 with 0 bytes of data:

   Reply From 172.19.2.1: icmp_seq = 0. time= 5910 usec.
   ```

3. Check the current license usage on switch cs2:

   ```
   show license
   ```

Show example

```
(cs2)# show license
Reboot needed.................................. No
Number of active licenses..................... 0

License Index  License Type     Status
-------------- ---------------- -----------

No license file found.
```

4. Install the license file.

   Repeat this step to load more licenses and to use different key index numbers.

   Show example

   The following example uses SFTP to copy a license file to a key index 1.

```
(cs2)# copy sftp://root@172.19.2.1/var/lib/tftpboot/license.dat
nvram:license-key 1
Remote Password:**

Mode........................................... SFTP
Set Server IP.................................. 172.19.2.1
Path........................................... /var/lib/tftpboot/
Filename....................................... license.dat
Data Type...................................... license

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

File transfer in progress. Management access will be blocked for the
duration of the transfer. Please wait...


License Key transfer operation completed successfully. System reboot
is required.
```

5. Display all current license information and note the license status before switch cs2 is rebooted:

   `show license`

Show example

```
(cs2)# show license

Reboot needed.................................. Yes
Number of active licenses...................... 0


License Index  License Type      Status
-------------- ----------------- --------------------------------
1              Port              License valid but not applied
```

6. Display all licensed ports:

   `show port all | exclude Detach`

   The ports from the additional license files are not displayed until after the switch is rebooted.

Show example

```
(cs2)# show port all | exclude Detach

                Admin     Physical   Physical   Link   Link    LACP
Actor
Intf      Type  Mode      Mode       Status     Status Trap    Mode
Timeout
--------- ------ --------- ---------- ---------- ------ -------
------ --------
0/1             Disable   Auto                  Down   Enable
Enable long
0/2             Disable   Auto                  Down   Enable
Enable long
0/3             Disable   Auto                  Down   Enable
Enable long
0/4             Disable   Auto                  Down   Enable
Enable long
0/5             Disable   Auto                  Down   Enable
Enable long
0/6             Disable   Auto                  Down   Enable
Enable long
0/7             Disable   Auto                  Down   Enable
Enable long
0/8             Disable   Auto                  Down   Enable
Enable long
0/9             Disable   Auto                  Down   Enable
Enable long
0/10            Disable   Auto                  Down   Enable
Enable long
0/11            Disable   Auto                  Down   Enable
Enable long
0/12            Disable   Auto                  Down   Enable
Enable long
0/13            Disable   Auto                  Down   Enable
Enable long
0/14            Disable   Auto                  Down   Enable
Enable long
0/15            Disable   Auto                  Down   Enable
Enable long
0/16            Disable   Auto                  Down   Enable
Enable long
0/55            Disable   Auto                  Down   Enable
Enable long
0/56            Disable   Auto                  Down   Enable
Enable long
```

7. Reboot the switch:

   `reload`

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

8. Check that the new license is active and note that the license has been applied:

   `show license`

   Show example

   ```
   (cs2)# show license

   Reboot needed.................................. No
   Number of installed licenses................... 1
   Total Downlink Ports enabled................... 16
   Total Uplink Ports enabled..................... 8

   License Index  License Type              Status
   -------------- ------------------------
   ----------------------------------
   1              Port                      License applied
   ```

9. Check that all new ports are available:

   `show port all | exclude Detach`

Show example

```
(cs2)# show port all | exclude Detach

                Admin     Physical   Physical   Link   Link    LACP
Actor
Intf      Type  Mode      Mode       Status     Status Trap    Mode
Timeout
--------- ------ --------- ---------- ---------- ------ -------
------ --------
0/1             Disable    Auto                  Down   Enable
Enable long
0/2             Disable    Auto                  Down   Enable
Enable long
0/3             Disable    Auto                  Down   Enable
Enable long
0/4             Disable    Auto                  Down   Enable
Enable long
0/5             Disable    Auto                  Down   Enable
Enable long
0/6             Disable    Auto                  Down   Enable
Enable long
0/7             Disable    Auto                  Down   Enable
Enable long
0/8             Disable    Auto                  Down   Enable
Enable long
0/9             Disable    Auto                  Down   Enable
Enable long
0/10            Disable    Auto                  Down   Enable
Enable long
0/11            Disable    Auto                  Down   Enable
Enable long
0/12            Disable    Auto                  Down   Enable
Enable long
0/13            Disable    Auto                  Down   Enable
Enable long
0/14            Disable    Auto                  Down   Enable
Enable long
0/15            Disable    Auto                  Down   Enable
Enable long
0/16            Disable    Auto                  Down   Enable
Enable long
0/49            Disable   100G Full              Down   Enable
Enable long
0/50            Disable   100G Full              Down   Enable
Enable long
```

```
0/51              Disable   100G Full              Down   Enable
Enable long
0/52              Disable   100G Full              Down   Enable
Enable long
0/53              Disable   100G Full              Down   Enable
Enable long
0/54              Disable   100G Full              Down   Enable
Enable long
0/55              Disable   100G Full              Down   Enable
Enable long
0/56              Disable   100G Full              Down   Enable
Enable long
```

When installing additional licenses, you must configure the new interfaces manually. Do not re-apply an RCF to an existing working production switch.

Troubleshoot install issues

Where problems arise when installing a license, run the following debug commands before running the `copy` command again.

Debug commands to use: `debug transfer` and `debug license`

Show example

```
(cs2)# debug transfer
Debug transfer output is enabled.
(cs2)# debug license
Enabled capability licensing debugging.
```

When you run the `copy` command with the `debug transfer` and `debug license` options enabled, the log output is returned.

Show example

```
transfer.c(3083):Transfer process  key or certificate file type = 43
transfer.c(3229):Transfer process  key/certificate cmd = cp
/mnt/download//license.dat.1 /mnt/fastpath/ >/dev/null 2>&1CAPABILITY
LICENSING :
Fri Sep 11 13:41:32 2020: License file with index 1 added.
CAPABILITY LICENSING : Fri Sep 11 13:41:32 2020: Validating hash value
29de5e9a8af3e510f1f16764a13e8273922d3537d3f13c9c3d445c72a180a2e6.
CAPABILITY LICENSING : Fri Sep 11 13:41:32 2020: Parsing JSON buffer {
  "license": {
    "header": {
      "version": "1.0",
      "license-key": "964B-2D37-4E52-BA14",
      "serial-number": "QTFCU38290012",
      "model": "BES-53248"
  },
  "description": "",
  "ports": "0+6"
  }
}.
CAPABILITY LICENSING : Fri Sep 11 13:41:32 2020: License data does not
contain 'features' field.
CAPABILITY LICENSING : Fri Sep 11 13:41:32 2020: Serial number
QTFCU38290012 matched.
CAPABILITY LICENSING : Fri Sep 11 13:41:32 2020: Model BES-53248
matched.
CAPABILITY LICENSING : Fri Sep 11 13:41:32 2020: Feature not found in
license file with index = 1.
CAPABILITY LICENSING : Fri Sep 11 13:41:32 2020: Applying license file
1.
```

Check for the following in the debug output:

- Check that the Serial number matches: `Serial number QTFCU38290012 matched.`
- Check that the switch Model matches: `Model BES-53248 matched.`
- Check that the specified license index was not used previously. Where a license index is already used, the following error is returned: `License file /mnt/download//license.dat.1 already exists.`
- A port license is not a feature license. Therefore, the following statement is expected: `Feature not found in license file with index = 1.`

Use the `copy` command to back up port licenses to the server:

```
(cs2)# copy nvram:license-key 1
scp://<UserName>@<IP_address>/saved_license_1.dat
```

If you need to downgrade the switch software from version 3.4.4.6, the licenses are removed. This is expected behavior.

You must install an appropriate older license before reverting to an older version of the software.

Activate newly licensed ports

To activate newly licensed ports, you need to edit the latest version of the RCF and uncomment the applicable port details.

The default license activates ports 0/1 to 0/16 and 0/55 to 0/56 while the newly licensed ports will be between ports 0/17 to 0/54 depending on the type and number of licenses available. For example, to activate the SW-BES54248-40-100G-LIC license, you must uncomment the following section in the RCF:

Show example

```
.
.
!
! 2-port or 6-port 40/100GbE node port license block
!
interface 0/49
no shutdown
description "40/100GbE Node Port"
!speed 100G full-duplex
speed 40G full-duplex
service-policy in WRED_100G
spanning-tree edgeport
mtu 9216
switchport mode trunk
datacenter-bridging
priority-flow-control mode on
priority-flow-control priority 5 no-drop
exit
exit
!
interface 0/50
no shutdown
description "40/100GbE Node Port"
!speed 100G full-duplex
speed 40G full-duplex
service-policy in WRED_100G
spanning-tree edgeport
mtu 9216
switchport mode trunk
datacenter-bridging
priority-flow-control mode on
priority-flow-control priority 5 no-drop
exit
exit
!
interface 0/51
no shutdown
description "40/100GbE Node Port"
speed 100G full-duplex
!speed 40G full-duplex
service-policy in WRED_100G
spanning-tree edgeport
mtu 9216
switchport mode trunk
```

```
datacenter-bridging
priority-flow-control mode on
priority-flow-control priority 5 no-drop
exit
exit
!
interface 0/52
no shutdown
description "40/100GbE Node Port"
speed 100G full-duplex
!speed 40G full-duplex
service-policy in WRED_100G
spanning-tree edgeport
mtu 9216
switchport mode trunk
datacenter-bridging
priority-flow-control mode on
priority-flow-control priority 5 no-drop
exit
exit
!
interface 0/53
no shutdown
description "40/100GbE Node Port"
speed 100G full-duplex
!speed 40G full-duplex
service-policy in WRED_100G
spanning-tree edgeport
mtu 9216
switchport mode trunk
datacenter-bridging
priority-flow-control mode on
priority-flow-control priority 5 no-drop
exit
exit
!
interface 0/54
no shutdown
description "40/100GbE Node Port"
speed 100G full-duplex
!speed 40G full-duplex
service-policy in WRED_100G
spanning-tree edgeport
mtu 9216
switchport mode trunk
datacenter-bridging
```

```
priority-flow-control mode on
priority-flow-control priority 5 no-drop
exit
exit
!
.
.
```

For high-speed ports between 0/49 to 0/54 inclusive, uncomment each port but only uncomment one **speed** line in the RCF for each of these ports, either: **speed 100G full-duplex** or **speed 40G full-duplex** as shown in the example. For low-speed ports between 0/17 to 0/48 inclusive, uncomment the entire 8-port section when an appropriate license has been activated.

What's next?

After you've installed the licenses, you can install the Reference Configuration File (RCF) or upgrade the RCF.

Install the Reference Configuration File (RCF)

You can install the Reference Configuration File (RCF) after configuring the BES-53248 cluster switch and after applying the new licenses.

For EFOS 3.12 and later, follow the installation steps in Install the Reference Configuration File (RCF) and license file.

Review requirements

Before you begin

Verify that the following are in place:

- A current backup of the switch configuration.
- A fully functioning cluster (no errors in the logs or similar issues).
- The current RCF file, available from the Broadcom Cluster Switches page.
- A boot configuration in the RCF that reflects the desired boot images, required if you are installing only EFOS and keeping your current RCF version. If you need to change the boot configuration to reflect the current boot images, you must do so before reapplying the RCF so that the correct version is instantiated on future reboots.
- A console connection to the switch, required when installing the RCF from a factory-default state. This requirement is optional if you have used the Knowledge Base article How to clear configuration on a Broadcom interconnect switch while retaining remote connectivity to clear the configuration, beforehand.

Suggested documentation

Consult the switch compatibility table for the supported ONTAP and RCF versions. See the EFOS Software download page. Note that there can be command dependencies between the command syntax in the RCF and that found in versions of EFOS.

Install the configuration file

About the examples

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

- The names of the two BES-53248 switches are cs1 and cs2.
- The node names are cluster1-01, cluster1-02, cluster1-03, and cluster1-04.
- The cluster LIF names are cluster1-01_clus1, cluster1-01_clus2, cluster1-02_clus1, cluster1-02_clus2, cluster1-03_clus1, cluster1-03_clus2, cluster1-04_clus1, and cluster1-04_clus2.
- The `cluster1::*>` prompt indicates the name of the cluster.
- The examples in this procedure use four nodes. These nodes use two 10GbE cluster interconnect ports `e0a` and `e0b`. See the Hardware Universe to verify the correct cluster ports on your platforms.

The command outputs might vary depending on different releases of ONTAP.

About this task

The procedure requires the use of both ONTAP commands and Broadcom switch commands; ONTAP commands are used unless otherwise indicated.

No operational inter-switch link (ISL) is needed during this procedure. This is by design because RCF version changes can affect ISL connectivity temporarily. To ensure non-disruptive cluster operations, the following procedure migrates all the cluster LIFs to the operational partner switch while performing the steps on the target switch.

Before installing a new switch software version and RCFs, use the Knowledge Base article How to clear configuration on a Broadcom interconnect switch while retaining remote connectivity. If you must erase the switch settings completely, then you need to perform the basic configuration again. You must be connected to the switch using the serial console because a complete configuration erasure resets the configuration of the management network.

Step 1: Prepare for the installation

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
```

where *x* is the duration of the maintenance window in hours.

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

The following command suppresses automatic case creation for two hours:

```
cluster1::*> system node autosupport invoke -node \* -type all -message
MAINT=2h
```

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

```
set -privilege advanced
```

The advanced prompt (*>) appears.

3. Display the cluster ports on each node that are connected to the cluster switches:

```
network device-discovery show
```

Show example

```
cluster1::*> network device-discovery show
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface
Platform
----------- ------ ------------------------- ----------------
--------
cluster1-01/cdp
            e0a    cs1                       0/2               BES-
53248
            e0b    cs2                       0/2               BES-
53248
cluster1-02/cdp
            e0a    cs1                       0/1               BES-
53248
            e0b    cs2                       0/1               BES-
53248
cluster1-03/cdp
            e0a    cs1                       0/4               BES-
53248
            e0b    cs2                       0/4               BES-
53248
cluster1-04/cdp
            e0a    cs1                       0/3               BES-
53248
            e0b    cs2                       0/3               BES-
53248
cluster1::*>
```

4. Check the administrative and operational status of each cluster port.
   a. Verify that all the cluster ports are up with a healthy status:

```
network port show -ipspace Cluster
```

Show example

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

Node: cluster1-01

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0b       Cluster      Cluster          up   9000  auto/100000
healthy false

Node: cluster1-02

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0b       Cluster      Cluster          up   9000  auto/100000
healthy false
8 entries were displayed.

Node: cluster1-03

   Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false
```

```
Node: cluster1-04

Ignore
                                                          Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false
cluster1::*>
```

b. Verify that all the cluster interfaces (LIFs) are on the home port:

```
network interface show -vserver Cluster
```

Show example

```
cluster1::*> network interface show -vserver Cluster
            Logical             Status     Network
Current      Current Is
Vserver     Interface           Admin/Oper Address/Mask      Node
Port    Home
----------- ------------------ ---------- -----------------
------------ ------- ----
Cluster
            cluster1-01_clus1  up/up     169.254.3.4/23
cluster1-01  e0a     true
            cluster1-01_clus2  up/up     169.254.3.5/23
cluster1-01  e0b     true
            cluster1-02_clus1  up/up     169.254.3.8/23
cluster1-02  e0a     true
            cluster1-02_clus2  up/up     169.254.3.9/23
cluster1-02  e0b     true
            cluster1-03_clus1  up/up     169.254.1.3/23
cluster1-03  e0a     true
            cluster1-03_clus2  up/up     169.254.1.1/23
cluster1-03  e0b     true
            cluster1-04_clus1  up/up     169.254.1.6/23
cluster1-04  e0a     true
            cluster1-04_clus2  up/up     169.254.1.7/23
cluster1-04  e0b     true
```

5. Verify that the cluster displays information for both cluster switches.

ONTAP 9.8 and later

Beginning with ONTAP 9.8, use the command:

```
system switch ethernet show -is-monitoring-enabled-operational true
```

```
cluster1::*> system switch ethernet show -is-monitoring-enabled
-operational true
Switch                      Type               Address          Model
--------------------------- ------------------ ----------------
---------------
cs1                         cluster-network    10.228.143.200   BES-
53248
           Serial Number: QTWCU22510008
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP

cs2                         cluster-network    10.228.143.202   BES-
53248
           Serial Number: QTWCU22510009
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP
cluster1::*>
```

ONTAP 9.7 and earlier

For ONTAP 9.7 and earlier, use the command:

```
system cluster-switch show -is-monitoring-enabled-operational true
```

```
cluster1::*> system cluster-switch show -is-monitoring-enabled
-operational true
Switch                      Type               Address          Model
--------------------------- ------------------ ----------------
---------------
cs1                         cluster-network    10.228.143.200   BES-
53248
           Serial Number: QTWCU22510008
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP

cs2                         cluster-network    10.228.143.202   BES-
53248
           Serial Number: QTWCU22510009
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP
cluster1::*>
```

6. Disable auto-revert on the cluster LIFs.

```
network interface modify -vserver Cluster -lif * -auto-revert false
```

Step 2: Configure ports

1. On switch cs2, confirm the list of ports that are connected to the nodes in the cluster.

```
show isdp neighbor
```

2. On cluster switch cs2, shut down the ports connected to the cluster ports of the nodes. For example, if ports 0/1 to 0/16 are connected to ONTAP nodes:

```
(cs2)> enable
(cs2)# configure
(cs2)(Config)# interface 0/1-0/16
(cs2)(Interface 0/1-0/16)# shutdown
(cs2)(Interface 0/1-0/16)# exit
(cs2)(Config)#
```

3. Verify that the cluster LIFs have migrated to the ports hosted on cluster switch cs1. This might take a few seconds.

```
network interface show -vserver Cluster
```

Show example

```
cluster1::*> network interface show -vserver Cluster
            Logical           Status     Network            Current
Current Is
Vserver     Interface         Admin/Oper Address/Mask       Node
Port    Home
----------- ----------------- ---------- ------------------
------------ ------- ----
Cluster
            cluster1-01_clus1 up/up      169.254.3.4/23
cluster1-01   e0a     true
            cluster1-01_clus2 up/up      169.254.3.5/23
cluster1-01   e0a     false
            cluster1-02_clus1 up/up      169.254.3.8/23
cluster1-02   e0a     true
            cluster1-02_clus2 up/up      169.254.3.9/23
cluster1-02   e0a     false
            cluster1-03_clus1 up/up      169.254.1.3/23
cluster1-03   e0a     true
            cluster1-03_clus2 up/up      169.254.1.1/23
cluster1-03   e0a     false
            cluster1-04_clus1 up/up      169.254.1.6/23
cluster1-04   e0a     true
            cluster1-04_clus2 up/up      169.254.1.7/23
cluster1-04   e0a     false
cluster1::*>
```

4. Verify that the cluster is healthy:

```
cluster show
```

Show example

```
cluster1::*> cluster show
Node                  Health  Eligibility   Epsilon
--------------------- ------- ------------  -------
cluster1-01           true    true          false
cluster1-02           true    true          false
cluster1-03           true    true          true
cluster1-04           true    true          false
```

5. If you have not already done so, save the current switch configuration by copying the output of the following command to a log file:

```
show running-config
```

6. Clean the configuration on switch cs2 and perform a basic setup.

> When updating or applying a new RCF, you must erase the switch settings and perform basic configuration. You must be connected to the switch using the serial console to erase switch settings. This requirement is optional if you have used the Knowledge Base article How to clear the configuration on a Broadcom interconnect switch while retaining remote connectivity to clear the configuration, beforehand.

> Clearing the configuration does not delete licenses.

a. SSH into the switch.

   Only proceed when all the cluster LIFs have been removed from the ports on the switch and the switch is prepared to have the configuration cleared.

b. Enter privilege mode:

```
(cs2)> enable
(cs2)#
```

c. Copy and paste the following commands to remove the previous RCF configuration (depending on the previous RCF version used, some commands might generate an error if a particular setting is not present):

```
clear config interface 0/1-0/56
y
clear config interface lag 1
y
configure
deleteport 1/1 all
no policy-map CLUSTER
no policy-map WRED_25G
no policy-map WRED_100G
no class-map CLUSTER
no class-map HA
no class-map RDMA
no classofservice dot1p-mapping
no random-detect queue-parms 0
no random-detect queue-parms 1
no random-detect queue-parms 2
no random-detect queue-parms 3
no random-detect queue-parms 4
no random-detect queue-parms 5
no random-detect queue-parms 6
no random-detect queue-parms 7
no cos-queue min-bandwidth
no cos-queue random-detect 0
no cos-queue random-detect 1
no cos-queue random-detect 2
no cos-queue random-detect 3
no cos-queue random-detect 4
no cos-queue random-detect 5
no cos-queue random-detect 6
no cos-queue random-detect 7
exit
vlan database
no vlan 17
no vlan 18
exit
```

d. Save the running configuration to the startup configuration:

```
(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!
```

e. Perform a reboot of the switch:

```
(cs2)# reload

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

f. Log in to the switch again using SSH to complete the RCF installation.

7. Note the following:

a. If additional port licenses have been installed on the switch, you must modify the RCF to configure the additional licensed ports. See Activate newly licensed ports for details.

b. Record any customizations that were made in the previous RCF and apply these to the new RCF. For example, setting port speeds or hard-coding FEC mode.

EFOS version 3.12.x and later

8. Copy the RCF to the bootflash of switch cs2 using one of the following transfer protocols: HTTP, HTTPS, FTP, TFTP, SFTP, or SCP.

   This example shows SFTP being used to copy an RCF to the bootflash on switch cs2:

```
(cs2)# copy tftp://172.19.2.1/BES-53248-RCF-v1.9-Cluster-HA.txt
nvram:reference-config
Remote Password:**
Mode..................................... TFTP
Set Server IP.................................. 172.19.2.1
Path..................................... /
Filename..................................... BES-53248_RCF_v1.9-
Cluster-HA.txt
Data Type.................................... Config Script
Destination Filename.......................... reference-config.scr
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.
```

9. Verify that the script was downloaded and saved under the file name you gave it:

   `script list`

```
(cs2)# script list

Configuration Script Name                  Size(Bytes)  Date of
Modification
-----------------------------------------  -----------
--------------------
reference-config.scr                       2680         2024 05 31
21:54:22
2 configuration script(s) found.
2042 Kbytes free.
```

10. Apply the script to the switch:

    `script apply`

```
(cs2)# script apply reference-config.scr

Are you sure you want to apply the configuration script? (y/n) y

The system has unsaved changes.
Would you like to save them now? (y/n) y
Config file 'startup-config' created successfully.
Configuration Saved!

Configuration script 'reference-config.scr' applied.
```

All other EFOS versions

8. Copy the RCF to the bootflash of switch cs2 using one of the following transfer protocols: HTTP, HTTPS, FTP, TFTP, SFTP, or SCP.

   This example shows SFTP being used to copy an RCF to the bootflash on switch cs2:

```
(cs2)# copy sftp://172.19.2.1/tmp/BES-53248_RCF_v1.9-Cluster-HA.txt
nvram:script BES-53248_RCF_v1.9-Cluster-HA.scr
Remote Password:**
Mode..................................... SFTP
Set Server IP.................................. 172.19.2.1
Path..................................... //tmp/
Filename..................................... BES-53248_RCF_v1.9-
Cluster-HA.txt
Data Type..................................... Config Script
Destination Filename.......................... BES-53248_RCF_v1.9-
Cluster-HA.scr
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.
```

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

```
script list
```

```
(cs2)# script list

Configuration Script Name                    Size(Bytes)  Date of
Modification
-----------------------------------------  -----------
--------------------
BES-53248_RCF_v1.9-Cluster-HA.scr          2241         2020 09 30
05:41:00

1 configuration script(s) found.
```

10. Apply the script to the switch:

    `script apply`

```
(cs2)# script apply BES-53248_RCF_v1.9-Cluster-HA.scr

Are you sure you want to apply the configuration script? (y/n) y

The system has unsaved changes.
Would you like to save them now? (y/n) y
Config file 'startup-config' created successfully.
Configuration Saved!

Configuration script 'BES-53248_RCF_v1.9-Cluster-HA.scr' applied.
```

11. Examine the banner output from the `show clibanner` command. You must read and follow these instructions to verify the proper configuration and operation of the switch.

Show example

```
(cs2)# show clibanner

Banner Message configured :
=========================
BES-53248 Reference Configuration File v1.9 for Cluster/HA/RDMA

Switch   : BES-53248
Filename : BES-53248-RCF-v1.9-Cluster.txt
Date     : 10-26-2022
Version  : v1.9
Port Usage:
Ports 01 - 16: 10/25GbE Cluster Node Ports, base config
Ports 17 - 48: 10/25GbE Cluster Node Ports, with licenses
Ports 49 - 54: 40/100GbE Cluster Node Ports, with licenses, added
right to left
Ports 55 - 56: 100GbE Cluster ISL Ports, base config
NOTE:
- The 48 SFP28/SFP+ ports are organized into 4-port groups in terms
of port
speed:
Ports 1-4, 5-8, 9-12, 13-16, 17-20, 21-24, 25-28, 29-32, 33-36, 37-
40, 41-44,
45-48
The port speed should be the same (10GbE or 25GbE) across all ports
in a 4-port
group
- If additional licenses are purchased, follow the 'Additional Node
Ports
activated with Licenses' section for instructions
- If SSH is active, it will have to be re-enabled manually after
'erase
startup-config'
command has been executed and the switch rebooted
```

12. On the switch, verify that the additional licensed ports appear after the RCF is applied:

```
show port all | exclude Detach
```

Show example

```
(cs2)# show port all | exclude Detach

                Admin     Physical     Physical   Link   Link
LACP   Actor
Intf      Type  Mode      Mode         Status     Status Trap
Mode   Timeout
--------- ------ --------- ------------ ---------- ------ -------
------ --------
0/1             Enable    Auto                    Down   Enable
Enable long
0/2             Enable    Auto                    Down   Enable
Enable long
0/3             Enable    Auto                    Down   Enable
Enable long
0/4             Enable    Auto                    Down   Enable
Enable long
0/5             Enable    Auto                    Down   Enable
Enable long
0/6             Enable    Auto                    Down   Enable
Enable long
0/7             Enable    Auto                    Down   Enable
Enable long
0/8             Enable    Auto                    Down   Enable
Enable long
0/9             Enable    Auto                    Down   Enable
Enable long
0/10            Enable    Auto                    Down   Enable
Enable long
0/11            Enable    Auto                    Down   Enable
Enable long
0/12            Enable    Auto                    Down   Enable
Enable long
0/13            Enable    Auto                    Down   Enable
Enable long
0/14            Enable    Auto                    Down   Enable
Enable long
0/15            Enable    Auto                    Down   Enable
Enable long
0/16            Enable    Auto                    Down   Enable
Enable long
0/49            Enable    40G Full                Down   Enable
Enable long
0/50            Enable    40G Full                Down   Enable
Enable long
```

```
0/51            Enable    100G Full               Down   Enable
Enable long
0/52            Enable    100G Full               Down   Enable
Enable long
0/53            Enable    100G Full               Down   Enable
Enable long
0/54            Enable    100G Full               Down   Enable
Enable long
0/55            Enable    100G Full               Down   Enable
Enable long
0/56            Enable    100G Full               Down   Enable
Enable long
```

13. Verify on the switch that your changes have been made:

```
show running-config
```

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

14. Save the running configuration so that it becomes the startup configuration when you reboot the switch:

```
write memory
```

```
(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!
```

15. Reboot the switch and verify that the running configuration is correct:

```
reload
```

```
(cs2)# reload

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

System will now restart!
```

16. On cluster switch cs2, bring up the ports connected to the cluster ports of the nodes. For example, if ports 0/1 to 0/16 are connected to ONTAP nodes:

```
(cs2)> enable
(cs2)# configure
(cs2)(Config)# interface 0/1-0/16
(cs2)(Interface 0/1-0/16)# no shutdown
(cs2)(Interface 0/1-0/16)# exit
(cs2)(Config)#
```

17. Verify the ports on switch cs2:

```
show interfaces status all | exclude Detach
```

Show example

```
(cs1)# show interfaces status all | exclude Detach

                                Link    Physical    Physical
Media       Flow
Port       Name                 State   Mode        Status      Type
Control     VLAN
---------  -------------------  ------  ----------  ----------
----------  ----------  ------
.
.
.
0/16       10/25GbE Node Port   Down    Auto
Inactive    Trunk
0/17       10/25GbE Node Port   Down    Auto
Inactive    Trunk
0/18       10/25GbE Node Port   Up      25G Full    25G Full
25GBase-SR  Inactive    Trunk
0/19       10/25GbE Node Port   Up      25G Full    25G Full
25GBase-SR  Inactive    Trunk
.
.
.
0/50       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/51       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/52       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/53       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/54       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/55       Cluster   ISL Port   Up      Auto        100G Full
Copper      Inactive    Trunk
0/56       Cluster   ISL Port   Up      Auto        100G Full
Copper      Inactive    Trunk
```

18. Verify the health of cluster ports on the cluster.
    a. Verify that e0b ports are up and healthy across all nodes in the cluster:

```
network port show -ipspace Cluster
```

Show example

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

Node: cluster1-01

Ignore
                                                  Speed(Mbps)
Health  Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status  Status
--------- ------------ ---------------- ---- ---- -----------
-------- -----
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false

Node: cluster1-02


Ignore
                                                  Speed(Mbps)
Health  Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status  Status
--------- ------------ ---------------- ---- ---- -----------
-------- -----
e0a       Cluster      Cluster          up   9000  auto/10000
healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000
healthy  false

Node: cluster1-03

Ignore
                                                  Speed(Mbps)
Health  Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status  Status
--------- ------------ ---------------- ---- ---- -----------
-------- -----
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0b       Cluster      Cluster          up   9000  auto/100000
healthy false
```

```
Node: cluster1-04

Ignore
                                                          Speed(Mbps)
Health  Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status  Status
--------- ------------ ---------------- ---- ---- -----------
-------- -----
e0a       Cluster      Cluster          up   9000  auto/100000
healthy false
e0b       Cluster      Cluster          up   9000  auto/100000
healthy false
```

b. Verify the switch health from the cluster:

```
network device-discovery show -protocol cdp
```

Show example

```
cluster1::*> network device-discovery show -protocol cdp
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface
Platform
----------- ------ ------------------------- -----------------
--------
cluster1-01/cdp
            e0a    cs1                       0/2
BES-53248
            e0b    cs2                       0/2
BES-53248
cluster01-2/cdp
            e0a    cs1                       0/1
BES-53248
            e0b    cs2                       0/1
BES-53248
cluster01-3/cdp
            e0a    cs1                       0/4
BES-53248
            e0b    cs2                       0/4
BES-53248
cluster1-04/cdp
            e0a    cs1                       0/3
BES-53248
            e0b    cs2                       0/2
BES-53248
```

19. Verify that the cluster displays information for both cluster switches.

ONTAP 9.8 and later

Beginning with ONTAP 9.8, use the command:

```
system switch ethernet show -is-monitoring-enabled-operational true
```

```
cluster1::*> system switch ethernet show -is-monitoring-enabled
-operational true
Switch                      Type               Address          Model
--------------------------- ------------------ ----------------
---------------
cs1                         cluster-network    10.228.143.200   BES-
53248
           Serial Number: QTWCU22510008
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP

cs2                         cluster-network    10.228.143.202   BES-
53248
           Serial Number: QTWCU22510009
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP
cluster1::*>
```

ONTAP 9.7 and earlier

For ONTAP 9.7 and earlier, use the command:

```
system cluster-switch show -is-monitoring-enabled-operational true
```

```
cluster1::*> system cluster-switch show -is-monitoring-enabled
-operational true
Switch                        Type               Address          Model
----------------------------- ------------------ ----------------
---------------
cs1                           cluster-network    10.228.143.200   BES-
53248
           Serial Number: QTWCU22510008
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP

cs2                           cluster-network    10.228.143.202   BES-
53248
           Serial Number: QTWCU22510009
            Is Monitored: true
                  Reason: None
        Software Version: 3.10.0.3
          Version Source: CDP/ISDP
cluster1::*>
```

20. On cluster switch cs1, shut down the ports connected to the cluster ports of the nodes.

    The following example uses the interface example output:

```
(cs1)> enable
(cs1)# configure
(cs1)(Config)# interface 0/1-0/16
(cs1)(Interface 0/1-0/16)# shutdown
```

21. Verify that the cluster LIFs have migrated to the ports hosted on switch cs2. This might take a few seconds.

```
network interface show -vserver Cluster
```

Show example

```
cluster1::*> network interface show -vserver Cluster
            Logical             Status     Network             Current
Current  Is
Vserver     Interface          Admin/Oper Address/Mask       Node
Port     Home
----------- ------------------ ---------- ------------------
------------------ -------- ----
Cluster
            cluster1-01_clus1  up/up      169.254.3.4/23
cluster1-01        e0a      false
            cluster1-01_clus2  up/up      169.254.3.5/23
cluster1-01        e0b      true
            cluster1-02_clus1  up/up      169.254.3.8/23
cluster1-02        e0a      false
            cluster1-02_clus2  up/up      169.254.3.9/23
cluster1-02        e0b      true
            cluster1-03_clus1  up/up      169.254.1.3/23
cluster1-03        e0a      false
            cluster1-03_clus2  up/up      169.254.1.1/23
cluster1-03        e0b      true
            cluster1-04_clus1  up/up      169.254.1.6/23
cluster1-04        e0a      false
            cluster1-04_clus2  up/up      169.254.1.7/23
cluster1-04        e0b      true
cluster1::*>
```

22. Verify that the cluster is healthy:

    `cluster show`

    Show example

```
cluster1::*> cluster show
Node                 Health   Eligibility   Epsilon
-------------------- -------- ------------- -------
cluster1-01          true     true          false
cluster1-02          true     true          false
cluster1-03          true     true          true
cluster1-04          true     true          false
```

23. Repeat steps 4 to 19 on switch cs1.

24. Enable auto-revert on the cluster LIFs:

```
network interface modify -vserver Cluster -lif * -auto-revert true
```

25. Reboot switch cs1. This triggers the cluster LIFs to revert to their home ports. You can ignore the “cluster ports down” events reported on the nodes while the switch reboots.

```
(cs1)# 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: Verify the configuration

1. On switch cs1, verify that the switch ports connected to the cluster ports are **up**:

```
show interfaces status all | exclude Detach
```

Show example

```
(cs1)# show interfaces status all | exclude Detach

                                Link    Physical    Physical
Media       Flow
Port       Name                 State   Mode        Status      Type
Control     VLAN
---------  -------------------  ------  ----------  ----------
----------  ----------  ------
.
.
.
0/16       10/25GbE Node Port   Down    Auto
Inactive    Trunk
0/17       10/25GbE Node Port   Down    Auto
Inactive    Trunk
0/18       10/25GbE Node Port   Up      25G Full    25G Full
25GBase-SR  Inactive    Trunk
0/19       10/25GbE Node Port   Up      25G Full    25G Full
25GBase-SR  Inactive    Trunk
.
.
.
0/50       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/51       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/52       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/53       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/54       40/100GbE Node Port  Down    Auto
Inactive    Trunk
0/55       Cluster   ISL Port   Up      Auto        100G Full
Copper      Inactive    Trunk
0/56       Cluster   ISL Port   Up      Auto        100G Full
Copper      Inactive    Trunk
```

2. Verify that the ISL between switches cs1 and cs2 is functional:

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

Show example

```
(cs1)# show port-channel 1/1
Local Interface................................ 1/1
Channel Name................................... Cluster-ISL
Link State..................................... Up
Admin Mode..................................... Enabled
Type........................................... Dynamic
Port-channel Min-links......................... 1
Load Balance Option............................ 7
(Enhanced hashing mode)
Mbr     Device/       Port      Port
Ports   Timeout       Speed     Active
------- ------------- --------- -------
0/55    actor/long    Auto      True
        partner/long
0/56    actor/long    Auto      True
        partner/long
```

3. Verify that the cluster LIFs have reverted to their home port:

```
network interface show -vserver Cluster
```

Show example

```
cluster1::*> network interface show -vserver Cluster
            Logical            Status     Network            Current
Current Is
Vserver     Interface          Admin/Oper Address/Mask       Node
Port    Home
----------- ------------------ ---------- ------------------
------------------- ------- ----
Cluster
            cluster1-01_clus1  up/up      169.254.3.4/23
cluster1-01         e0a     true
            cluster1-01_clus2  up/up      169.254.3.5/23
cluster1-01         e0b     true
            cluster1-02_clus1  up/up      169.254.3.8/23
cluster1-02         e0a     true
            cluster1-02_clus2  up/up      169.254.3.9/23
cluster1-02         e0b     true
            cluster1-03_clus1  up/up      169.254.1.3/23
cluster1-03         e0a     true
            cluster1-03_clus2  up/up      169.254.1.1/23
cluster1-03         e0b     true
            cluster1-04_clus1  up/up      169.254.1.6/23
cluster1-04         e0a     true
            cluster1-04_clus2  up/up      169.254.1.7/23
cluster1-04         e0b     true
```

4. Verify that the cluster is healthy:

   `cluster show`

   Show example

```
cluster1::*> cluster show
Node                 Health  Eligibility   Epsilon
-------------------- ------- ------------- -------
cluster1-01          true    true          false
cluster1-02          true    true          false
cluster1-03          true    true          true
cluster1-04          true    true          false
```

5. Verify the connectivity of the remote cluster interfaces:

ONTAP 9.9.1 and later

You can use the `network interface check cluster-connectivity` command to start an accessibility check for cluster connectivity and then display the details:

`network interface check cluster-connectivity start` and `network interface check cluster-connectivity show`

```
cluster1::*> network interface check cluster-connectivity start
```

NOTE: Wait for a number of seconds before running the `show` command to display the details.

```
cluster1::*> network interface check cluster-connectivity show
                                  Source              Destination
Packet
Node   Date                       LIF                 LIF
Loss
------ -------------------------- -------------------
------------------- -------
cluster1-01
       3/5/2022 19:21:18 -06:00   cluster1-01_clus2   cluster01-
02_clus1  none
       3/5/2022 19:21:20 -06:00   cluster1-01_clus2   cluster01-
02_clus2  none

cluster1-02
       3/5/2022 19:21:18 -06:00   cluster1-02_clus2   cluster1-02_clus1
none
       3/5/2022 19:21:20 -06:00   cluster1-02_clus2   cluster1-02_clus2
none
```

All ONTAP releases

For all ONTAP releases, you can also use the `cluster ping-cluster -node <name>` command to check the connectivity:

```
cluster ping-cluster -node <name>
```

```
cluster1::*> cluster ping-cluster -node local
Host is cluster1-03
Getting addresses from network interface table...
Cluster cluster1-03_clus1 169.254.1.3 cluster1-03 e0a
Cluster cluster1-03_clus2 169.254.1.1 cluster1-03 e0b
Cluster cluster1-04_clus1 169.254.1.6 cluster1-04 e0a
Cluster cluster1-04_clus2 169.254.1.7 cluster1-04 e0b
Cluster cluster1-01_clus1 169.254.3.4 cluster1-01 e0a
Cluster cluster1-01_clus2 169.254.3.5 cluster1-01 e0b
Cluster cluster1-02_clus1 169.254.3.8 cluster1-02 e0a
Cluster cluster1-02_clus2 169.254.3.9 cluster1-02 e0b
Local = 169.254.1.3 169.254.1.1
Remote = 169.254.1.6 169.254.1.7 169.254.3.4 169.254.3.5 169.254.3.8
169.254.3.9
Cluster Vserver Id = 4294967293
Ping status:
............
Basic connectivity succeeds on 12 path(s)
Basic connectivity fails on 0 path(s)
................................................
Detected 9000 byte MTU on 12 path(s):
  Local 169.254.1.3 to Remote 169.254.1.6
  Local 169.254.1.3 to Remote 169.254.1.7
  Local 169.254.1.3 to Remote 169.254.3.4
  Local 169.254.1.3 to Remote 169.254.3.5
  Local 169.254.1.3 to Remote 169.254.3.8
  Local 169.254.1.3 to Remote 169.254.3.9
  Local 169.254.1.1 to Remote 169.254.1.6
  Local 169.254.1.1 to Remote 169.254.1.7
  Local 169.254.1.1 to Remote 169.254.3.4
  Local 169.254.1.1 to Remote 169.254.3.5
  Local 169.254.1.1 to Remote 169.254.3.8
  Local 169.254.1.1 to Remote 169.254.3.9
Larger than PMTU communication succeeds on 12 path(s)
RPC status:
6 paths up, 0 paths down (tcp check)
6 paths up, 0 paths down (udp check)
```

6. Change the privilege level back to admin:

```
set -privilege admin
```

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

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

What's next?

After you've installed the RCF, you can enable SSH.

Enable SSH on BES-53248 cluster switches

If you are using the Ethernet Switch Health Monitor (CSHM) and log collection features, you must generate the SSH keys and then enable SSH on the cluster switches.

Steps

1. Verify that SSH is disabled:

   ```
   show ip ssh
   ```

   Show example

   ```
   (switch)# show ip ssh

   SSH Configuration

   Administrative Mode: ..... Disabled
   SSH Port: ..... 22
   Protocol Level: ..... Version 2
   SSH Sessions Currently Active: ..... 0
   Max SSH Sessions Allowed: ..... 5
   SSH Timeout (mins): ..... 5
   Keys Present: ..... DSA(1024) RSA(1024)
   ECDSA(521)
   Key Generation In Progress: ..... None
   SSH Public Key Authentication Mode: ..... Disabled
   SCP server Administrative Mode: ..... Disabled
   ```

   - If SSH is not disabled, disable it as follows:

     ```
     no ip ssh server enable

     no ip scp server enable
     ```

     - For EFOS 3.12 and later, console access is required as active SSH sessions are lost when SSH is disabled.
     - For EFOS 3.11 and earlier, current SSH sessions are kept open after disabling the SSH server.

Make sure that you disable SSH before you modify the keys, otherwise, a warning is reported on the switch.

2. In config mode, generate the SSH keys:

   `crypto key generate`

   Show example

   ```
   (switch)# config

   (switch) (Config)# crypto key generate rsa

   Do you want to overwrite the existing RSA keys? (y/n): y


   (switch) (Config)# crypto key generate dsa

   Do you want to overwrite the existing DSA keys? (y/n): y


   (switch) (Config)# crypto key generate ecdsa 521

   Do you want to overwrite the existing ECDSA keys? (y/n): y
   ```

3. In config mode, set AAA authorization for ONTAP log collection:

   `aaa authorization commands "noCmdAuthList" none`

   Show example

   ```
   (switch) (Config)# aaa authorization commands "noCmdAuthList" none
   (switch) (Config)# exit
   ```

4. Re-enable SSH/SCP.

   Show example

   ```
   (switch)# ip ssh server enable
   (switch)# ip scp server enable
   (switch)# ip ssh pubkey-auth
   ```

5. Save these changes to the startup-config:

   ```
   write memory
   ```

   Show example

   ```
   (switch)# 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. Encrypt the SSH keys (for **FIPS-mode only**):

   In FIPS mode, the keys are required to be encrypted with a passphrase for security. In the absence of an encrypted key, the application fails to start. The keys are created and encrypted using the following commands:

Show example

```
(switch) configure
(switch) (Config)# crypto key encrypt write rsa passphrase
<passphase>

The key will be encrypted and saved on NVRAM.
This will result in saving all existing configuration also.
Do you want to continue? (y/n): y

Config file 'startup-config' created successfully.

(switch) (Config)# crypto key encrypt write dsa passphrase
<passphase>

The key will be encrypted and saved on NVRAM.
This will result in saving all existing configuration also.
Do you want to continue? (y/n): y

Config file 'startup-config' created successfully.

(switch)(Config)# crypto key encrypt write ecdsa passphrase
<passphase>

The key will be encrypted and saved on NVRAM.
This will result in saving all existing configuration also.
Do you want to continue? (y/n): y

Config file 'startup-config' created successfully.

(switch) (Config)# end
(switch)# 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!
```

7. Reboot the switch:

```
reload
```

8. Verify that SSH is enabled:

   ```
   show ip ssh
   ```

   Show example

   ```
   (switch)# show ip ssh

   SSH Configuration

   Administrative Mode: ..... Enabled
   SSH Port: ..... 22
   Protocol Level: ..... Version 2
   SSH Sessions Currently Active: ..... 0
   Max SSH Sessions Allowed: ..... 5
   SSH Timeout (mins): ..... 5
   Keys Present: ..... DSA(1024) RSA(1024)
   ECDSA(521)
   Key Generation In Progress: ..... None
   SSH Public Key Authentication Mode: ..... Enabled
   SCP server Administrative Mode: ..... Enabled
   ```

What's next?

After you've enabled SSH, you can configure switch health monitoring.

Reset the BES-53248 cluster switch to factory defaults

To reset the BES-53248 cluster switch to factory defaults, you must erase the BES-53248 switch settings.

About this task

- You must be connected to the switch using the serial console.
- This task resets the configuration of the management network.

Steps

1. Change to the elevated command prompt.

   ```
   (cs2)> enable
   (cs2)#
   ```

2. Erase the startup configuration.

   ```
   erase startup-config
   ```

```
(cs2)# erase startup-config

Are you sure you want to clear the configuration? (y/n) y
```

3. Reboot the switch.

```
(cs2)# reload
Are you sure you would like to reset the system? (y/n) y
```

If the system asks whether to save the unsaved or changed configuration before reloading the switch, select **No**.

4. Wait for the switch to reload, and then log in to the switch.

The default user is “admin”, and no password is set. A prompt similar to the following is displayed:

```
(Routing)>
```

Copyright information

Copyright © 2026 NetApp, Inc. All Rights Reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP “AS IS” AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

LIMITED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (b)(3) of the Rights in Technical Data -Noncommercial Items at DFARS 252.227-7013 (FEB 2014) and FAR 52.227-19 (DEC 2007).

Data contained herein pertains to a commercial product and/or commercial service (as defined in FAR 2.101) and is proprietary to NetApp, Inc. All NetApp technical data and computer software provided under this Agreement is commercial in nature and developed solely at private expense. The U.S. Government has a non-exclusive, non-transferrable, nonsublicensable, worldwide, limited irrevocable license to use the Data only in connection with and in support of the U.S. Government contract under which the Data was delivered. Except as provided herein, the Data may not be used, disclosed, reproduced, modified, performed, or displayed without the prior written approval of NetApp, Inc. United States Government license rights for the Department of Defense are limited to those rights identified in DFARS clause 252.227-7015(b) (FEB 2014).

Trademark information

NETAPP, the NETAPP logo, and the marks listed at http://www.netapp.com/TM are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.