



Upgrade a switch in an NDO/NDU environment

ONTAP Systems Switches

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Table of Contents

- Upgrade a switch in an NDO/NDU environment 1
 - Upgrade a BES-53248 cluster switch in an NDO/NDU environment 1
 - Prepare the controller for a cluster switch upgrade 2
 - Install the EFOS software 4
 - Install licenses for BES-53248 cluster switches 9
 - Install the Reference Configuration File (RCF) 20
 - Configure the cluster switch log collection feature 24
 - Install the Cluster Switch Health Monitor (CSHM) configuration file 28
 - Verify the configuration after a cluster switch upgrade - BES-53248 switches 30

Upgrade a switch in an NDO/NDU environment

Upgrade a BES-53248 cluster switch in an NDO/NDU environment

Upgrading BES-53248 cluster switches starts with preparing the controller for upgrade, installing the EFOS software, licenses, and reference configuration file (RCF). After the installation, you can restore the controller configuration in a nondisruptive upgrade (NDU) and nondisruptive operation (NDO) environment.

What you'll need

The following conditions must exist before you install the EFOS software, licenses, and the RCF file on an existing NetApp BES-53248 cluster switch:

- The cluster must be a fully functioning cluster (no error log messages or other issues).
- The cluster must not contain any defective cluster network interface cards (NICs).
- All connected ports on both cluster switches must be functional.
- All cluster ports must be up.
- All cluster LIFs must be administratively and operationally up and on their home ports.
- The ONTAP `cluster ping-cluster -node node1 advanced privilege` command must indicate that `larger than PMTU communication is successful` on all paths.
- There might be command dependencies between command syntax in the RCF and EFOS versions.

About this task

You must consult the switch compatibility table on the NetApp BES-53248 switches page for the supported EFOS, RCF, and ONTAP versions at: [NetApp BES-53248 switches](#).

This procedure applies to a functioning cluster and allows for NDU and NDO. The examples in this procedure use the following switch and node nomenclature:

- The NetApp switch names are `cs1` and `cs2`.
- The example used in this procedure starts the upgrade 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 *Hardware Universe* for the actual cluster ports supported on your platform.

[NetApp Hardware Universe](#)

- The Inter-Switch Links (ISLs) supported for the NetApp cluster switches are ports `0/55` and `0/56`.
- The node connections supported for the NetApp cluster switches are ports `0/1` through `0/16` with default licensing.

- The examples in this procedure use two nodes, but you can have up to 24 nodes in a cluster.
- Repeat all procedures in this section to upgrade the EFOS software and RCF file on the other switch, **cs1**.

Prepare the controller for a cluster switch upgrade

You can use this procedure to prepare the controller for a BES-53248 cluster switch upgrade.

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.

If this is an issue, use a nonrouted network and configure the service port using IP address 192.168.x or 172.19.x. You can reconfigure the service port to the production management IP address later.

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. Verify that the cluster ports are healthy and have a link using the command:

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

The following example shows the type of output with all ports having a `Link` value of `up` and a `Health Status` of `healthy`:

```

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

Node: node1

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: node2

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

4 entries were displayed.

```

- Verify that the cluster LIFs are administratively and operationally up and reside on their home ports, using the command:

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

In this example, the `-vserver` parameter displays information about the LIFs that are associated with cluster ports. Status Admin/Oper must be up and Is Home must be true:

```
cluster1::>**network interface show -vserver Cluster**
```

| Current Is | Logical Interface | Status Admin/Oper | Network Address/Mask | Current Node | Port |
|------------|-------------------|-------------------|----------------------|--------------|-------|
| Home | | | | | |
| ----- | ----- | ----- | ----- | ----- | ----- |
| Cluster | node1_clus1 | up/up | 169.254.217.125/16 | node1 | e0a |
| true | node1_clus2 | up/up | 169.254.205.88/16 | node1 | e0b |
| true | node2_clus1 | up/up | 169.254.252.125/16 | node2 | e0a |
| true | node2_clus2 | up/up | 169.254.110.131/16 | node2 | e0b |
| true | | | | | |

```
4 entries were displayed.
```

Install the EFOS software

You can use this procedure to install the EFOS software on the BES-53248 cluster switch. You can download the applicable Broadcom EFOS software for your cluster switches from the Broadcom Ethernet Switch Support site.

Steps

1. Connect the BES-53248 cluster switch to the management network.
2. Use the ping command to verify connectivity to the server hosting EFOS, licenses, and the RCF file.

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. Back up the current active image on cs2:

```
show bootvar
```

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

```
Image Descriptions
```

```
active :
```

```
backup :
```

```
Images currently available on Flash
```

```
-----  
unit      active      backup      current-active  next-active  
-----  
1         3.4.3.3      Q.10.22.1   3.4.3.3         3.4.3.3
```

```
(cs2) # **copy active backup**
```

```
Copying active to backup
```

```
Management access will be blocked for the duration of the operation
```

```
Copy operation successful
```

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

```
Image Descriptions
```

```
active :
```

```
backup :
```

```
Images currently available on Flash
```

```
-----  
unit      active      backup      current-active  next-active  
-----  
1         3.4.3.3      3.4.3.3     3.4.3.3         3.4.3.3
```

```
(cs2) #
```

4. Verify the running version of the EFOS software:

```
show version
```

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

```
Switch: 1
```

```
System Description..... Quanta IX8-B 48x25GB SFP
8x100GB QSFP, 3.4.3.3, Linux 4.4.117-ceeeb99d, 2016.05.00.04
Machine Type..... Quanta IX8-B 48x25GB SFP
8x100GB QSFP
Machine Model..... IX8-B
Serial Number..... QTFCU38260014
Maintenance Level..... A
Manufacturer..... 0xbc00
Burned In MAC Address..... D8:C4:97:71:12:3D
Software Version..... 3.4.3.3
Operating System..... Linux 4.4.117-ceeeb99d
Network Processing Device..... BCM56873_A0
CPLD Version..... 0xff040c03

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

5. Download the image file to the switch.

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


```
(cs2) # **copy sftp://root@172.19.2.1//tmp/EFOS-3.4.4.6.stk active**
Remote Password:*****

Mode..... SFTP
Set Server IP..... 172.19.2.1
Path..... //tmp/
Filename..... EFOS-3.4.4.6.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.
```

6. Display the boot images for the active and backup configuration:

show bootvar

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

Image Descriptions

active :
backup :

Images currently available on Flash

-----
unit      active      backup      current-active      next-active
-----
1         3.4.3.3      3.4.3.3      3.4.3.3              3.4.4.6
```

7. Reboot the switch:

reload

```
(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!
```

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

```
show version
```

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

```
Switch: 1
```

```
System Description..... x86_64-  
quanta_common_rglbmc-r0, 3.4.4.6, Linux 4.4.211-28a6fe76, 2016.05.00.04  
Machine Type..... x86_64-  
quanta_common_rglbmc-r0  
Machine Model..... BES-53248  
Serial Number..... QTFCU38260023  
Maintenance Level..... A  
Manufacturer..... 0xbc00  
Burned In MAC Address..... D8:C4:97:71:0F:40  
Software Version..... 3.4.4.6  
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
```

Related information

[Broadcom Ethernet Switch Support](#)

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. New ports can be added by purchasing more licenses.

The following licenses are 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 |
| 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 |

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.

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
```

```
(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. The following example uses HTTP to copy a license file to a key index 1.

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

```
(cs2) # **copy http://172.19.2.1/tmp/efos/license1.dat nvram:license-key
1**

Mode..... HTTP
Set Server IP..... 172.19.2.1
Path..... tmp/efos/
Filename..... license1.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
```

```
(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.

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

| Actor | Admin | Physical | Physical | Link | Link | LACP | |
|---------|---------|----------|----------|--------|--------|--------|------|
| 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
```

```
(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
```

```
(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
(cs2) #
```

9. Check that all new ports are available:

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

```
(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 | | | | | |


```
(cs2) #
```

Restrictions and limitations - BES-53248 switches

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

Debug commands to use:

```
debug transferdebug license
```

```
(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 following log output is returned:

```

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 backup port licenses to the server:

```

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

```

See [Installing licenses for BES-53248 cluster switches](#) for details of the firmware versions supported for available licenses.



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.

Edit the Reference Configuration File (RCF)

In order 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.



If you try to edit a previously installed RCF, the process might fail because there is an existing configuration for other areas in the RCF, see [Edit a previously installed RCF file](#).

For details of the available license types for use on the BES-53248 cluster switch, see [Installing licenses for BES-53248 cluster switches](#).

For example to activate the SW-BES54248-40-100G-LIC license, you must uncomment the following section in the RCF:

```
.
.
!
! 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
- 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.

Edit a previously installed RCF file

After you edit a previously installed RCF file and run the `script apply` command, you might get the following error message:

```

(CS1) #script apply BES-53248_RCF_v1.6-Cluster-HA.scr
Are you sure you want to apply the configuration script? (y/n)

```

After you select `y`, you get the following error message:

```
config
...
match cos 5
Unrecognized command : match cos 5
Error! in configuration script file at line number 40.
CLI Command :: match cos 5.
Aborting script.
```

To either avoid or resolve this issue, you can choose one of the following options:

- To avoid the error, you can use following procedure:

1. Create a second a RCF file containing the new port configuration only.
2. Copy the second RCF file to the switch.
3. Apply the script to the switch:

```
script apply
```

- To resolve the error, see the Knowledge Base article: [Error! in configuration script file at line number XX when applying a new RCF](#)

Install the Reference Configuration File (RCF)

You can install the RCF after setting up the BES-53248 cluster switch for the first time and after the new license or licenses have been applied. If you are upgrading an RCF from an older version, the files are effectively merged together and you complete the steps as detailed here.

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.

If connectivity is an issue, use a nonrouted network and configure the service port using IP address 192.168.x or 172.19.x. You can reconfigure the service port to the production management IP address later.

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. Install the RCF on the BES-53248 cluster switch using the copy command.

```
(cs2) # **copy http://172.19.2.1/tmp/BES-53248_RCF_v1.6-Cluster-HA.txt
nvram:script BES-53248_RCF_v1.6-Cluster-HA.scr**
```

Remote Password *****

```
Mode..... HTTP
Set Server IP..... 172.19.2.1
Path..... //tmp/
Filename..... BES-53248_RCF_v1.6-
Cluster-HA.txt
Data Type..... Config Script
Destination Filename..... BES-53248_RCF_v1.6-
Cluster-HA.scr
```

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

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

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

Validating configuration script...
[the script is now displayed line by line]

Configuration script validated.
File transfer operation completed successfully.



Depending on your environment, you might need to use a double slash in the copy command, for example: `copy http://172.19.2.1//tmp/BES-53248_RCF_v1.6-Cluster-HA.txt nvram:script BES-53248_RCF_v1.6-Cluster-HA.scr`.



The `.scr` extension must be set as part of the file name before invoking the script. This extension is the extension for the EFOS operating system. The switch validates the script automatically when it is downloaded to the switch, and the output goes to the console. Also, you can change the name of the `.scr` to fit your console screen for easier readability, for example: `copy http://172.19.2.1/tmp/BES-53248_RCF_v1.6-Cluster-HA.txt nvram:script RCF_v1.6-Cluster-HA.scr`.

4. 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_v1.6-Cluster-HA.scr  2241        2020 09 30
05:41:00

1 configuration script(s) found.
```

5. Apply the script to the switch.

```
script apply
```

```
(cs2) # **script apply BES-53248_RCF_v1.6-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_v1.6-Cluster-HA.scr' applied.
```

6. Verify the ports for an additional license after the RCF is applied:

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

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

```
Actor
Intf      Type  Admin  Physical  Physical  Link  Link  LACP
Timeout  Mode  Mode   Status    Status Trap  Mode
-----
0/1      long  Enable  Auto      Down      Enable  Enable
0/2      long  Enable  Auto      Down      Enable  Enable
0/3      long  Enable  Auto      Down      Enable  Enable
```



```

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

```

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

```
show running-config
```

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

8. 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!
```

9. 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!
```

Configure the cluster switch log collection feature

The cluster switch health monitor log collection feature is used to collect switch-related log files in ONTAP. You must make sure that you have set up your environment using the BES-53248 cluster switch CLI as detailed here.

Steps

1. Generate the SSH keys:

```
crypto key generate
```

```

(sw) #**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
SCP server Administrative Mode: ..... Disabled

(sw) #**config**

(sw) (Config)#**crypto key generate rsa**

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

(sw) (Config)#**crypto key generate dsa**

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

(sw) (Config)#**crypto key generate ecdsa 521**

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

(sw) (Config)#**aaa authorization commands "noCmdAuthList" none**
(sw) (Config)#**exit**
(sw) #**ip ssh server enable**
(sw) #**ip ssh pubkey-auth**
(sw) #**ip scp server enable**
(sw) #**write mem**
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!

(sw) #

```

2. Enable SSH:

```
ip ssh server enable
```

```
(switch) #**ip ssh server enable**

(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
SCP server Administrative Mode: ..... Disabled

(switch) #
```

3. For ONTAP 9.8 and later, enable the cluster switch health monitor log collection feature for collecting switch-related log files, using the commands:

```
system switch ethernet log setup-password system switch ethernet log enable-
collection
```

```

cluster1::*> **system switch ethernet log setup-password**
Enter the switch name: <return>
The switch name entered is not recognized.
Choose from the following list:
cs1
cs2

cluster1::*> **system switch ethernet log setup-password**

Enter the switch name: **cs1**
RSA key fingerprint is e5:8b:c6:dc:e2:18:18:09:36:63:d9:63:dd:03:d9:cc
Do you want to continue? {y|n}::[n] **y**

Enter the password: <enter switch password>
Enter the password again: <enter switch password>

cluster1::*> **system switch ethernet log setup-password**
Enter the switch name: **cs2**
RSA key fingerprint is 57:49:86:a1:b9:80:6a:61:9a:86:8e:3c:e3:b7:1f:b1
Do you want to continue? {y|n}:: [n] **y**

Enter the password: <enter switch password>
Enter the password again: <enter switch password>

cluster1::*> **system switch ethernet log enable-collection**

Do you want to enable cluster log collection for all nodes in the
cluster?
{y|n}: [n] **y**

Enabling cluster switch log collection.

cluster1::*>

```

4. For ONTAP 9.5P15, 9.6P11, 9.7P8 and later patch releases, enable the cluster switch health monitor log collection feature for collecting switch-related log files, using the commands:

```

system cluster-switch log setup-password system cluster-switch log enable-
collection

```

```

cluster1::*> **system cluster-switch log setup-password**
Enter the switch name: <return>
The switch name entered is not recognized.
Choose from the following list:
cs1
cs2

cluster1::*> **system cluster-switch log setup-password**

Enter the switch name: **cs1**
RSA key fingerprint is e5:8b:c6:dc:e2:18:18:09:36:63:d9:63:dd:03:d9:cc
Do you want to continue? {y|n}::[n] **y**

Enter the password: <enter switch password>
Enter the password again: <enter switch password>

cluster1::*> **system cluster-switch log setup-password**

Enter the switch name: **cs2**
RSA key fingerprint is 57:49:86:a1:b9:80:6a:61:9a:86:8e:3c:e3:b7:1f:b1
Do you want to continue? {y|n}:: [n] **y**

Enter the password: <enter switch password>
Enter the password again: <enter switch password>

cluster1::*> **system cluster-switch log enable-collection**

Do you want to enable cluster log collection for all nodes in the
cluster?
{y|n}: [n] **y**

Enabling cluster switch log collection.

cluster1::*>

```



If any of these commands return an error, contact NetApp support.

Install the Cluster Switch Health Monitor (CSHM) configuration file

You can use this procedure to install the applicable configuration file for cluster switch health monitoring of BES-53248 cluster switches. In ONTAP releases 9.5P7 and earlier and 9.6P2 and earlier, you must download the cluster switch health monitor configuration file separately. In ONTAP releases 9.5P8 and later, 9.6P3 and later, and 9.7 and later, the

cluster switch health monitor configuration file is bundled with ONTAP.

What you'll need

Before you setup the switch health monitor for BES-53248 cluster switches, you must ensure that the ONTAP cluster is up and running.



It is advisable to enable SSH in order to use all features available in CSHM.

Steps

1. Download the cluster switch health monitor configuration zip file based on the corresponding ONTAP release version. This file is available from the page: [NetApp Software download](#)
 - a. On the Software download page, select **Switch Health Monitor Configuration Files**
 - b. Select Platform = **ONTAP** and click **Go!**
 - c. On the Switch Health Monitor Configuration Files for ONTAP page, click **View & Download**
 - d. On the Switch Health Monitor Configuration Files for ONTAP - Description page, click **Download** for the applicable cluster switch model, for example: **Broadcom-supported BES-53248**
 - e. On the End User License Agreement page, click **Accept**
 - f. On the Switch Health Monitor Configuration Files for ONTAP - Download page, select the applicable configuration file, for example, **Broadcom_BES-53248.zip**
2. Upload the applicable zip file to your internal web server where the IP address is X.X.X.X.

For an internal web server IP address of 192.168.2.20 and assuming a /usr/download directory exists, you can upload your zip file to your web server using scp:

```
% scp Broadcom_BES-53248.zip  
admin@192.168.2.20:/usr/download/Broadcom_BES-53248.zip
```

3. Access the advanced mode setting from one of the ONTAP systems in the cluster, using the command `set -privilege advanced`:

```
cluster1::> set -privilege advanced
```

4. Run the switch health monitor configure command `system cluster-switch configure-health-monitor -node * -package-url http://server/file-location`:

```
cluster1::> system cluster-switch configure-health-monitor -node *  
-package-url  
http://192.168.2.20/usr/download/Broadcom_BES-53248.zip
```

5. Verify that the command output contains the text string "downloaded package processed successfully". If an error occurs, contact NetApp support.
6. Run the command `system cluster-switch show` on the ONTAP system and ensure that the cluster switches are discovered with the monitored field set to "True".

```
cluster1::> system cluster-switch show
```



If at any time you revert to an earlier version of ONTAP, you will need to install the CSHM configuration file again to enable switch health monitoring of BES-53248 cluster switches.

Verify the configuration after a cluster switch upgrade - BES-53248 switches

You can use the commands provided here to verify that all is operational after a BES-53248 cluster switch upgrade.

Steps

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

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

Link must have the value up and Health Status must be healthy.

The following example shows the output from the command:


```

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

Node: node1

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: node2

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

4 entries were displayed.

```

2. Verify that for each LIF Is Home is true and Status Admin/Oper is up on both nodes using the command:

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

```
cluster1::> **network interface show -vserver Cluster**
```

| Current Is Vserver Home | Logical Interface | Status Admin/Oper | Network Address/Mask | Current Node | Port |
|-------------------------------|----------------------|----------------------|-------------------------|-----------------|------|
| Cluster true | node1_clus1 | up/up | 169.254.217.125/16 | node1 | e0a |
| true | node1_clus2 | up/up | 169.254.205.88/16 | node1 | e0b |
| true | node2_clus1 | up/up | 169.254.252.125/16 | node2 | e0a |
| true | node2_clus2 | up/up | 169.254.110.131/16 | node2 | e0b |

```
4 entries were displayed.
```

3. Verify that the Health Status of each node is true using the command: `cluster show`

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

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

```
2 entries were displayed.
```

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