



Configuring Broadcom IP switches

ONTAP MetroCluster

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Configuring Broadcom IP switches

You must configure the Broadcom IP switches for use as the cluster interconnect and for backend MetroCluster IP connectivity.

Resetting the Broadcom IP switch to factory defaults

Before installing a new switch software version and RCFs, you must erase the Broadcom switch settings and perform basic configuration.

About this task

- You must repeat these steps on each of the IP switches in the MetroCluster IP configuration.
- 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 (#): `enable`

```
(IP_switch_A_1)> enable
(IP_switch_A_1) #
```

2. Erase the startup configuration and remove the banner

- a. Erase the startup configuration:

erase startup-config

```
(IP_switch_A_1) #erase startup-config

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

(IP_switch_A_1) #
```

This command does not erase the banner.

- b. Remove the banner:

no set clibanner

```
(IP_switch_A_1) # no set clibanner
(IP_switch_A_1) #
```

3. Reboot the switch: **(IP_switch_A_1) #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) >
```

5. Change to the elevated command prompt:

```
enable
```

```
Routing) > enable  
Routing) #
```

6. Set the service port protocol to none:

```
serviceport protocol none
```

```
Routing) #serviceport protocol none  
Changing protocol mode will reset ip configuration.  
Are you sure you want to continue? (y/n) y  
  
Routing) #
```

7. Assign the IP address to the service port:

```
serviceport ip ip-address netmask gateway
```

The following example shows a service port assigned IP address "10.10.10.10" with subnet "255.255.255.0" and gateway "10.10.10.1":

```
Routing) #serviceport ip 10.10.10.10 255.255.255.0 10.10.10.1
```

8. Verify that the service port is correctly configured:

```
show serviceport
```

The following example shows that the port is up and the correct addresses have been assigned:

```
(Routing) #show serviceport
```

```
Interface Status..... Up
IP Address..... 10.10.10.10
Subnet Mask..... 255.255.255.0
Default Gateway..... 10.10.10.1
IPv6 Administrative Mode..... Enabled
IPv6 Prefix is .....
fe80::dac4:97ff:fe56:87d7/64
IPv6 Default Router..... fe80::222:bdff:fef8:19ff
Configured IPv4 Protocol..... None
Configured IPv6 Protocol..... None
IPv6 AutoConfig Mode..... Disabled
Burned In MAC Address..... D8:C4:97:56:87:D7
```

```
(Routing) #
```

9. If desired, configure the SSH server.



The RCF file disables the Telnet protocol. If you do not configure the SSH server, you can only access the bridge using the serial port connection.

a. Generate RSA keys.

```
(Routing) #configure
(Routing) (Config)#crypto key generate rsa
```

b. Generate DSA keys (optional)

```
(Routing) #configure
(Routing) (Config)#crypto key generate dsa
```

c. If you are using the FIPS compliant version of EFOS, generate the ECDSA keys. The following example creates the keys with a length of 256. Valid values are 256, 384 or 521.

```
(Routing) #configure
(Routing) (Config)#crypto key generate ecdsa 256
```

d. Enable the SSH server.

If necessary, exit the configuration context.

```
(Routing) (Config) #end
(Routing) #ip ssh server enable
```



If keys already exist, then you might be asked to overwrite them.

10. If desired, configure the domain and name server:

```
configure
```

The following example shows the `ip domain` and `ip name server` commands:

```
(Routing) # configure
(Routing) (Config) #ip domain name lab.netapp.com
(Routing) (Config) #ip name server 10.99.99.1 10.99.99.2
(Routing) (Config) #exit
(Routing) (Config) #
```

11. If desired, configure the time zone and time synchronization (SNTP).

The following example shows the `sntp` commands, specifying the IP address of the SNTP server and the relative time zone.

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

12. Configure the switch name:

```
hostname IP_switch_A_1
```

The switch prompt will display the new name:

```
(Routing) # hostname IP_switch_A_1

(IP_switch_A_1) #
```

13. Save the configuration:

```
write memory
```

You receive prompts and output similar to the following example:

```
(IP_switch_A_1) #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!

```
(IP_switch_A_1) #
```

14. Repeat the previous steps on the other three switches in the MetroCluster IP configuration.

Downloading and installing the Broadcom switch EFOS software

You must download the switch operating system file and RCF file to each switch in the MetroCluster IP configuration.

About this task

This task must be repeated on each switch in the MetroCluster IP configuration.

Note the following:

- When upgrading from EFOS 3.4.x.x to EFOS 3.7.x.x, the switch must be running EFOS 3.4.4.6 (or later 3.4.x.x release). If you are running a release prior to that, then upgrade the switch to EFOS 3.4.4.6 (or later 3.4.x.x release) first, then upgrade the switch to EFOS 3.7.x.x.
- The configuration for EFOS 3.4.x.x and 3.7.x.x are different. Changing the EFOS version from 3.4.x.x to 3.7.x.x or vice versa requires the switch to be reset to factory defaults and the RCF files for the corresponding EFOS version to be (re)applied. This procedure requires access through the serial console port.
- Starting with EFOS version 3.7.x.x, a non-FIPS compliant and a FIPS compliant version is available. Different steps apply when moving to from a non-FIPS compliant to a FIPS compliant version or vice versa. Changing EFOS from a non-FIPS compliant to a FIPS compliant version or vice versa will reset the switch to factory defaults. This procedure requires access through the serial console port.

Procedure	Current EFOS version	New EFOS version	High level steps
Steps to upgrade EFOS between two (non) FIPS compliant versions	3.4.x.x	3.4.x.x	Install the new EFOS image using method 1) The configuration and license information is retained
	3.4.4.6 (or later 3.4.x.x)	3.7.x.x non-FIPS compliant	Upgrade EFOS using method 1. Reset the switch to factory defaults and apply the RCF file for EFOS 3.7.x.x
	3.7.x.x non-FIPS compliant	3.4.4.6 (or later 3.4.x.x)	Downgrade EFOS using method 1. Reset the switch to factory defaults and apply the RCF file for EFOS 3.4.x.x
		3.7.x.x non-FIPS compliant	Install the new EFOS image using method 1. The configuration and license information is retained
	3.7.x.x FIPS compliant	3.7.x.x FIPS compliant	Install the new EFOS image using method 1. The configuration and license information is retained
Steps to upgrade to/from a FIPS compliant EFOS version	Non-FIPS compliant	FIPS compliant	Installation of the EFOS image using method 2. The switch configuration and license information will be lost.
	FIPS compliant	Non-FIPS compliant	

- Method 1: [Steps to upgrade EFOS with downloading the software image to the backup boot partition](#)
- Method 2: [Steps to upgrade EFOS using the ONIE OS installation](#)

Steps to upgrade EFOS with downloading the software image to the backup boot partition

You can perform the following steps only if both EFOS versions are non-FIPS compliant or both EFOS versions are FIPS compliant.



Do not use these steps if one version is FIPS compliant and the other version is non-FIPS compliant.

Steps

1. Copy the switch software to the switch: `copy sftp://user@50.50.50.50/switchsoftware/efos-3.4.4.6.stk backup`

In this example, the efos-3.4.4.6.stk operating system file is copied from the SFTP server at 50.50.50.50 to

the backup partition. You need to use the IP address of your TFTP/SFTP server and the file name of the RCF file that you need to install.

```
(IP_switch_A_1) #copy sftp://user@50.50.50.50/switchsoftware/efos-3.4.4.6.stk backup
Remote Password:*****

Mode..... SFTP
Set Server IP..... 50.50.50.50
Path..... /switchsoftware/
Filename..... efos-3.4.4.6.stk
Data Type..... Code
Destination Filename..... backup

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...
SFTP Code transfer starting...

File transfer operation completed successfully.

(IP_switch_A_1) #
```

2. Set the switch to boot from the backup partition on the next switch reboot:

```
boot system backup
```

```
(IP_switch_A_1) #boot system backup
Activating image backup ..

(IP_switch_A_1) #
```

3. Verify that the new boot image will be active on the next boot:

```
show bootvar
```

```
(IP_switch_A_1) #show bootvar
```

Image Descriptions

active :

backup :

Images currently available on Flash

unit	active	backup	current-active	next-active
1	3.4.4.2	3.4.4.6	3.4.4.2	3.4.4.6

```
(IP_switch_A_1) #
```

4. Save the configuration:

```
write memory
```

```
(IP_switch_A_1) #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

Configuration Saved!

```
(IP_switch_A_1) #
```

5. Reboot the switch:

```
reload
```

```
(IP_switch_A_1) #reload
```

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

6. Wait for the switch to reboot.



In rare scenarios the switch may fail to boot. Follow the [Steps to upgrade EFOS using the ONIE OS installation](#) to install the new image.

7. If you change the switch from EFOS 3.4.x.x to EFOS 3.7.x.x or vice versa then follow the following two procedures to apply the correct configuration (RCF):
 - a. [Resetting the Broadcom IP switch to factory defaults](#)
 - b. [Downloading and installing the Broadcom RCF files](#)
8. Repeat these steps on the remaining three IP switches in the MetroCluster IP configuration.

Steps to upgrade EFOS using the ONIE OS installation

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. Boot the switch into ONIE installation mode.

During boot, select ONIE when the following screen appears:

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

After selecting "ONIE", the switch will then load and present you with the following choices:

```

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

```

The switch now will boot into ONIE installation mode.

2. Stop the ONIE discovery and configure the ethernet interface

Once 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 will continue and messages will be printed to the console.

```

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

```

3. Configure the ethernet interface 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

```

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

```

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:/ #

```

5. Install the new switch software

```

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 will install and then reboot the switch. Let the switch reboot normally into the new EFOS version.

6. Verify that the new switch software is installed

show bootvar

```

(Routing) #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         3.7.0.4
(Routing) #

```

7. Complete the installation

The switch will reboot with no configuration applied and reset to factory defaults. Follow the two procedures to configure the switch basic settings and apply the RCF file as outlined in the following two documents:

- a. Configure the switch basic settings. Follow step 4 and later: [Resetting the Broadcom IP switch to factory defaults](#)
- b. Create and apply the RCF file as outlined in [Downloading and installing the Broadcom RCF files](#)

Downloading and installing the Broadcom RCF files

You must download and install the switch RCF file to each switch in the MetroCluster IP configuration.

Before you begin

This task requires file transfer software, such as FTP, TFTP, SFTP, or SCP, to copy the files to the switches.

About this task

These steps must be repeated on each of the IP switches in the MetroCluster IP configuration.

There are four RCF files, one for each of the four switches in the MetroCluster IP configuration. You must use the correct RCF files for the switch model you are using.

Switch	RCF file
IP_switch_A_1	v1.32_Switch-A1.txt
IP_switch_A_2	v1.32_Switch-A2.txt
IP_switch_B_1	v1.32_Switch-B1.txt
IP_switch_B_2	v1.32_Switch-B2.txt



The RCF files for EFOS version 3.4.4.6 or later 3.4.x.x. release and EFOS version 3.7.0.4 are different. You need to make sure that you have created the correct RCF files for the EFOS version that the switch is running.

EFOS version	RCF file version
3.4.x.x	v1.3x, v1.4x
3.7.x.x	v2.x

Steps

1. Generate the Broadcom RCF files for MetroCluster IP.
 - a. Download the [RcfFileGenerator for MetroCluster IP](#)
 - b. Generate the RCF file for your configuration using the RcfFileGenerator for MetroCluster IP
2. Copy the RCF files to the switches:
 - a. Copy the RCF files to the first switch: `copy sftp://user@FTP-server-IP-address/RcfFiles/switch-specific-RCF nvram:script BES-53248_v1.32_Switch-`

```
A1.txt nvram:script BES-53248_v1.32_Switch-A1.scr
```

In this example, the "BES-53248_v1.32_Switch-A1.txt" RCF file is copied from the SFTP server at "50.50.50.50" to the local bootflash. You need to use the IP address of your TFTP/SFTP server and the file name of the RCF file that you need to install.


```

(IP_switch_A_1) #copy sftp://user@50.50.50.50/RcfFiles/BES-
53248_v1.32_Switch-A1.txt nvram:script BES-53248_v1.32_Switch-A1.scr

Remote Password:*****

Mode..... SFTP
Set Server IP..... 50.50.50.50
Path..... /RcfFiles/
Filename..... BES-
53248_v1.32_Switch-A1.txt
Data Type..... Config Script
Destination Filename..... BES-
53248_v1.32_Switch-A1.scr

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...
File transfer operation completed successfully.

Validating configuration script...

config

set clibanner
"*****
*****

* NetApp Reference Configuration File (RCF)

*

* Switch      : BES-53248

...
The downloaded RCF is validated. Some output is being logged here.
...

Configuration script validated.
File transfer operation completed successfully.

(IP_switch_A_1) #

```

b. Verify that the RCF file is saved as a script:

```
script list
```

```
(IP_switch_A_1) #script list

Configuration Script Name          Size(Bytes)  Date of Modification
-----
BES-53248_v1.32_Switch-A1.scr      852         2019 01 29 18:41:25

1 configuration script(s) found.
2046 Kbytes free.
(IP_switch_A_1) #
```

c. Apply the RCF script:

```
script apply BES-53248_v1.32_Switch-A1.scr
```

```
(IP_switch_A_1) #script apply BES-53248_v1.32_Switch-A1.scr

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

config

set clibanner
"*****
*****

* NetApp Reference Configuration File (RCF)

*

* Switch      : BES-53248

...
The downloaded RCF is validated. Some output is being logged here.
...

Configuration script 'BES-53248_v1.32_Switch-A1.scr' applied.

(IP_switch_A_1) #
```

d. Save the configuration:

```
write memory
```

```
(IP_switch_A_1) #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

Configuration Saved!

```
(IP_switch_A_1) #
```

e. Reboot the switch:

```
reload
```

```
(IP_switch_A_1) #reload
```

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

- f. Repeat the previous steps for each of the other three switches, being sure to copy the matching RCF file to the corresponding switch.

3. Reload the switch:

```
reload
```

```
IP_switch_A_1# reload
```

4. Repeat the previous steps on the other three switches in the MetroCluster IP configuration.

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