Configuring Brocade FC switches with RCF files

ONTAP MetroCluster

NetApp
April 28, 2021

Table of Contents

Configuring Brocade FC switches with RCF files

To configure a Brocade FC switch, you must reset the switch settings to factory defaults, install the switch software, and download and apply the reference configuration (RCF) files that provide the complete switch settings for certain configurations.

You must have access to an FTP server. The switches must have connectivity with the FTP server.

Each configuration file is different and must be used with the correct switch. Only one of the configuration files for each switch fabric contains zoning commands.

Resetting the Brocade FC switch to factory defaults

Before installing a new software version and RCF files, you must erase the current switch configuration and perform basic configuration.

You must repeat these steps on each of the FC switches in the MetroCluster fabric configuration.

1. Log in to the switch as an administrator.
2. Disable the Brocade Virtual Fabrics (VF) feature: **`fosconfig options`**

```
FC_switch_A_1:admin> fosconfig --disable vf
WARNING:  This is a disruptive operation that requires a reboot to take
effect.
Would you like to continue  [Y/N]: y
```

3. Disconnect the ISL cables from the ports on the switch.
4. Disable the switch: **`switchcfgpersistentdisable`**

```
FC_switch_A_1:admin> switchcfgpersistentdisable
```

5. Disable the configuration: **`cfgDisable`**

```
FC_switch_A_1:admin> cfgDisable
You are about to disable zoning configuration. This action will disable
any previous zoning configuration enabled.
Do you want to disable zoning configuration? (yes, y, no, n): [no] y
Updating flash ...
Effective configuration is empty. "No  Access" default zone mode is ON.
```

6. Clear the configuration: **`cfgClear`**

```
FC_switch_A_1:admin> cfgClear
The Clear All action will clear all Aliases, Zones, FA Zones
and configurations in the Defined configuration.
Run cfgSave to commit the transaction or cfgTransAbort to
cancel the transaction.
Do you really want to clear all configurations?  (yes, y, no, n): [no] y
```

7. Save the configuration: **cfgSave**

```
FC_switch_A_1:admin> cfgSave
You are about to save the Defined zoning configuration. This
action will only save the changes on Defined configuration.
Do you want to save the Defined zoning configuration only?  (yes, y, no,
n): [no] y
Updating flash ...
```

8. Set the default configuration: **configDefault**

```
FC_switch_A_1:admin> configDefault
WARNING:  This is a disruptive operation that requires a switch reboot.
Would you like to continue [Y/N]: y
Executing configdefault...Please wait
2020/10/05-08:04:08, [FCR-1069], 1016, FID 128, INFO, FC_switch_A_1, The
FC Routing service is enabled.
2020/10/05-08:04:08, [FCR-1068], 1017, FID 128, INFO, FC_switch_A_1, The
FC Routing service is disabled.
2020/10/05-08:04:08, [FCR-1070], 1018, FID 128, INFO, FC_switch_A_1, The
FC Routing configuration is set to default.
Committing configuration ... done.
2020/10/05-08:04:12, [MAPS-1113], 1019, FID 128, INFO, FC_switch_A_1,
Policy dflt_conservative_policy activated.
2020/10/05-08:04:12, [MAPS-1145], 1020, FID 128, INFO, FC_switch_A_1,
FPI Profile dflt_fpi_profile is activated for E-Ports.
2020/10/05-08:04:12, [MAPS-1144], 1021, FID 128, INFO, FC_switch_A_1,
FPI Profile dflt_fpi_profile is activated for F-Ports.
The switch has to be rebooted to allow the changes to take effect.
2020/10/05-08:04:12, [CONF-1031], 1022, FID 128, INFO, FC_switch_A_1,
configDefault completed successfully for switch.
```

9. Set the port configuration to default for all ports:

   portcfgdefault *port-number*

```
FC_switch_A_1:admin> portcfgdefault <port number>
```

You must complete this step for each port.

10. Verify that the switch is using the dynamic Port on Demand (POD) method.

> For Brocade Fabric OS versions before 8.0, you run the following commands as admin, and for versions 8.0 and later, you run them as root.

a. Run the command **`licenseport --show`**

```
FC_switch_A_1:admin> licenseport -show
24 ports are available in this switch
Full POD license is installed
Dynamic POD method is in use
```

b. Enable the root user if it is disabled by Brocade.

```
FC_switch_A_1:admin> userconfig --change root -e yes
FC_switch_A_1:admin> rootaccess --set consoleonly
```

c. Run the license command: **`licenseport --show`**

```
FC_switch_A_1:root> licenseport -show
24 ports are available in this switch
Full POD license is installed
Dynamic POD method is in use
```

d. Change the license method to dynamic: **`licenseport --method dynamic`**

> If the dynamic POD method is not in use (if POD method is in static) you must change the license assignment method to dynamic. Skip this step if the dynamic POD method is in use.

```
FC_switch_A_1:admin> licenseport --method dynamic
The POD method has been changed to dynamic.
Please reboot the switch now for this change to take effect
```

11. Reboot the switch: **`fastBoot`**

```
FC_switch_A_1:admin> fastboot
Warning: This command would cause the switch to reboot
and result in traffic disruption.
Are you sure you want to reboot the switch [y/n]?y
```

12. Confirm that the default settings have been implemented: **`switchShow`**
13. Verify that the IP address is set correctly: **`ipAddrShow`**

    You can set the IP address with the following command, if required: **`ipAddrSet`**

Downloading the Brocade FC switch RCF file

You must download the reference configuration (RCF) file to each switch in the MetroCluster fabric configuration.

To use these RCF files, the system must be running ONTAP 9.1 or later and you must use the port layout for ONTAP 9.1 or later.

If you are planning to use only one of the FC ports on the FibreBridge bridges, configure the back-end fibre channel switches manually using the instructions found in the section, Port assignments for FC switches when using ONTAP 9.1 and later.

Steps

1. Refer to the RCF file table on the Brocade RCF download page and identify the correct RCF file for each switch in your configuration.

   The RCF files must be applied to the correct switches.

2. Download the RCF files for the switches from the Brocade RCF download page.

   The files must be placed in a location where they can be transferred to the switch. There is a separate file for each of the four switches that make up the two-switch fabric.

3. Repeat these steps on each switch in the configuration.

Installing the Brocade FC switch RCF file

When you configure a Brocade FC switch, you can install the switch configuration files that provide the complete switch settings for certain configurations.

These steps must be repeated on each of the Brocade FC switches in the MetroCluster fabric configuration.

Steps

1. Initiate the download and configuration process:

   `configDownload`

   Respond to the prompts as shown in the following example.

```
FC_switch_A_1:admin> configDownload
Protocol (scp, ftp, sftp, local) [ftp]:
Server Name or IP Address [host]: <user input>
User Name [user]:<user input>
Path/Filename [<home dir>/config.txt]:path to configuration file
Section (all|chassis|switch [all]): all
.
.
.
Do you want to continue [y/n]: y
Password: <user input>
```

After entering your password, the switch downloads and executes the configuration file.

2. Persistently enable the switch: **`switchcfgpersistentenable`**

   The example shows how to persistently enable FC switch_A_1.

```
FC_switch_A_1:admin> switchcfgpersistentenable
```

3. Run the following command to confirm that the configuration file has set the switch domain:

   `switchShow`

   Each switch is assigned a different domain number depending on which configuration file the switch used.

```
FC_switch_A_1:admin> switchShow
switchName: FC_switch_A_1
switchType: 109.1
switchState: Online
switchMode: Native
switchRole: Subordinate
switchDomain: 5
```

4. Verify that your switch is assigned the correct domain value as indicated in the following table.

Fabric	Switch	Switch domain
1	A_1	5
	B_1	7

Fabric	Switch	Switch domain
2	A_2	6
	B_2	8

5. Change the port speed: **portcfgspeed**

```
FC_switch_A_1:admin> portcfgspeed port number port speed
```

By default, all the ports are configured to operate at 16 Gbps. You might change the port speed for the following reasons:

- The interconnect switch ports speed should be changed when an 8-Gbps FC-VI adapter is used and the switch port speed should set to 8 Gbps.
- The switch ports speed should be changed when an 8-Gbps HBA adapter is used for ATTO FibreBridge 6500N.
- The ISL ports' speed must be changed when the ISL is not capable of running at 16 Gbps. ====

1. Calculate the ISL distance.

   Due to the behavior of the FC-VI, you must set the distance to 1.5 times the real distance with a minimum of 10 (LE). The distance for the ISL is calculated as follows, rounded up to the next full kilometer: 1.5 × real distance = distance.

   If the distance is 3 km, then 1.5 × 3 km = 4.5. This is lower than 10; therefore, you must set the ISL to the LE distance level.

   The distance is 20 km, then 1.5 × 20 km = 30. You must set the ISL to the LS distance level.

2. Set the distance for each ISL port using the following command: **portcfglongdistance** *port levelvc_link_initdistance*

   A vc_link_init value of 1 uses the fillword 'ARB' by default. A value of 0 uses the fillword 'IDLE'. The required value might vary depending on the link you use. In this example, the default is set and the distance is assumed to be 20 km. Hence, the setting is '30' with a vc_link_init value of 1, and the ISL port is 21.

   Example: LS

```
FC_switch_A_1:admin> portcfglongdistance 21 LS 1
-distance 30
```

   Example: LE

```
FC_switch_A_1:admin> portcfglongdistance 21 LE 1
```

3. Verify if the IP address is set correctly: **ipAddrshow**

```
FC_switch_A_1:admin> ipAddrshow
```

You can set the IP address with the following command if required: **ipAddrSet**

4. Set the timezone from the switch prompt: **tstimezone --interactive**

You should respond to the prompts as required.

```
FC_switch_A_1:admin>  tstimezone --interactive
```

5. Reboot the switch: **reboot**

The example shows how to reboot FC switch _A_1.

```
FC_switch_A_1:admin> reboot
```

6. Verify the distance setting: **portbuffershow**

A distance setting of LE appears as 10 km.

```
FC_Switch_A_1:admin> portbuffershow
User Port Lx   Max/Resv Buffer Needed  Link
Remaining
Port Type Mode Buffers  Usage  Buffers Distance
Buffers
---- ---- ---- ------- ------ ------- ---------
----------
...
21    E    -      8      67     67      30 km
22    E    -      8      67     67      30 km
...
23    -    8      0       -      -      466
```

7. Reconnect the ISL cables to the ports on the switches where they were removed.

The ISL cables were disconnected when the factory settings were reset to the default settings.

Resetting the Brocade FC switch to factory defaults

8. Validate the configuration.

   a. Verify that the switches form one fabric: **switchshow**

      The following example shows the output for a configuration that uses ISLs on ports 20 and 21.

```
FC_switch_A_1:admin> switchshow
switchName: FC_switch_A_1
switchType: 109.1
switchState:Online
switchMode: Native
switchRole: Subordinate
switchDomain:       5
switchId:   fffc01
switchWwn:  10:00:00:05:33:86:89:cb
zoning:             OFF
switchBeacon:       OFF

Index Port Address Media Speed State  Proto
==========================================
...
20   20  010C00   id    16G  Online FC  LE E-Port
10:00:00:05:33:8c:2e:9a "FC_switch_B_1"
(downstream)(trunk master)
21   21  010D00   id    16G  Online FC  LE E-Port
(Trunk port, master is Port 20)
...
```

   b. Confirm the configuration of the fabrics: **fabricshow**

```
FC_switch_A_1:admin> fabricshow
   Switch ID   Worldwide Name      Enet IP Addr FC
IP Addr Name
-------------------------------------------------
--------------
1: fffc01 10:00:00:05:33:86:89:cb 10.10.10.55
0.0.0.0    "FC_switch_A_1"
3: fffc03 10:00:00:05:33:8c:2e:9a 10.10.10.65
0.0.0.0   >"FC_switch_B_1"
```

   c. Very that the ISLs are working: **islshow**

```
FC_switch_A_1:admin> islshow
```

d. Confirm that zoning is properly replicated by running the following commands:
cfgshow
zoneshow

Both outputs should show the same configuration information and zoning information for both switches.

e. If trunking is used, you can confirm the trunking with the following command:
trunkShow

```
FC_switch_A_1:admin> trunkshow
```

= Configuring the Cisco FC switches with RCF files :icons: font

To configure a Cisco FC switch, you must reset the switch settings to factory defaults, install the switch software, and download and apply the reference configuration (RCF) files that provide the complete switch settings for certain configurations.

= Resetting the Cisco FC switch to factory defaults :icons: font

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

You must repeat these steps on each of the FC switches in the MetroCluster fabric configuration.

The outputs shown are for Cisco IP switches; however, these steps are also applicable for Cisco FC switches.

Steps

1. Reset the switch to factory defaults:
   a. Erase the existing configuration:
   write erase
   b. Reload the switch software:
   reload

   The system reboots and enters the configuration wizard. During the boot, if you receive the prompt Abort Auto Provisioning and continue with normal setup?(yes/no)[n], you should respond **yes** to proceed.

   c. In the configuration wizard, enter the basic switch settings:
      - Admin password
      - Switch name
      - Out-of-band management configuration
      - Default gateway

- SSH service (Remote Support Agent) After completing the configuration wizard, the switch reboots.

d. When prompted, enter the user name and password to log in to the switch.

The following example shows the prompts and system responses when logging in to the switch. The angle brackets (**<<<**) show where you enter the information.

```
---- System Admin Account Setup ----
Do you want to enforce secure password standard
(yes/no) [y]:y  **<<<**

    Enter the password for "admin": password  **<<<**
  Confirm the password for "admin": password  **<<<**
         ---- Basic System Configuration Dialog VDC:
1 ----

This setup utility will guide you through the basic
configuration of
the system. Setup configures only enough connectivity
for management
of the system.

Please register Cisco Nexus3000 Family devices
promptly with your
supplier. Failure to register may affect response
times for initial
service calls. Nexus3000 devices must be registered
to receive
entitled support services.

Press Enter at anytime to skip a dialog. Use ctrl-c
at anytime
to skip the remaining dialogs.
```

e. Enter basic information in the next set of prompts, including the switch name, management address, and gateway, and enter **rsa** for the SSH key as shown in the example:

```
Would you like to enter the basic configuration
dialog (yes/no): yes
  Create another login account (yes/no) [n]:
  Configure read-only SNMP community string (yes/no)
[n]:
  Configure read-write SNMP community string (yes/no)
[n]:
  Enter the switch name : switch-name **<<<**
  Continue with Out-of-band (mgmt0) management
configuration? (yes/no) [y]:
    Mgmt0 IPv4 address : management-IP-address
**<<<**
    Mgmt0 IPv4 netmask : management-IP-netmask
**<<<**
  Configure the default gateway? (yes/no) [y]: y
**<<<**
    IPv4 address of the default gateway : gateway-IP-
address  **<<<**
  Configure advanced IP options? (yes/no) [n]:
  Enable the telnet service? (yes/no) [n]:
  Enable the ssh service? (yes/no) [y]: y  **<<<**
    Type of ssh key you would like to generate
(dsa/rsa) [rsa]: rsa **<<<**
    Number of rsa key bits <1024-2048> [1024]:
  Configure the ntp server? (yes/no) [n]:
  Configure default interface layer (L3/L2) [L2]:
  Configure default switchport interface state
(shut/noshut) [noshut]: shut **<<<**
  Configure CoPP system profile
(strict/moderate/lenient/dense) [strict]:
```

The final set of prompt completes the configuration:

```
The following configuration will be applied:
  password strength-check
  switchname IP_switch_A_1
vrf context management
ip route 0.0.0.0/0 10.10.99.1
exit
  no feature telnet
  ssh key rsa 1024 force
  feature ssh
  system default switchport
  system default switchport shutdown
  copp profile strict
interface mgmt0
ip address 10.10.99.10 255.255.255.0
no shutdown

Would you like to edit the configuration? (yes/no)
[n]:

Use this configuration and save it? (yes/no) [y]:
2017 Jun 13 21:24:43 A1 %$ VDC-1 %$ %COPP-2-
COPP_POLICY: Control-Plane is protected with policy
copp-system-p-policy-strict.

[########################################] 100%
Copy complete.

User Access Verification
IP_switch_A_1 login: admin
Password:
Cisco Nexus Operating System (NX-OS) Software
.
.
.
IP_switch_A_1#
```

2. Save the configuration:

```
IP_switch_A_1# copy running-config startup-config
```

3. Reboot the switch and wait for the switch to reload:

```
IP_switch_A_1# reload
```

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

= Downloading and installing the Cisco FC switch NX-OS software :icons: font

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

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

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

You must use the supported switch software version.

NetApp Hardware Universe

The outputs shown are for Cisco IP switches; however, these steps are also applicable for Cisco FC switches.

1. Download the supported NX-OS software file.

   Cisco download page

2. Copy the switch software to the switch:

   +copy sftp://root@server-ip-address/tftpboot/NX-OS-file-name bootflash: vrf management+

   In this example, the `nxos.7.0.3.I4.6.bin` file is copied from SFTP server 10.10.99.99 to the local bootflash:

```
IP_switch_A_1# copy
sftp://root@10.10.99.99/tftpboot/nxos.7.0.3.I4.6.bin
bootflash: vrf management
root@10.10.99.99's password: password
sftp> progress
Progress meter enabled
sftp> get   /tftpboot/nxos.7.0.3.I4.6.bin
/bootflash/nxos.7.0.3.I4.6.bin
Fetching /tftpboot/nxos.7.0.3.I4.6.bin to
/bootflash/nxos.7.0.3.I4.6.bin
/tftpboot/nxos.7.0.3.I4.6.bin                  100%
666MB   7.2MB/s   01:32
sftp> exit
Copy complete, now saving to disk (please wait)...
```

3. Verify on each switch that the switch NX-OS files are present in each switch's bootflash directory:

dir bootflash

The following example shows that the files are present on `IP_switch_A_1`:

```
IP_switch_A_1# dir bootflash:
                    .
                    .
                    .
  698629632    Jun 13 21:37:44 2017  nxos.7.0.3.I4.6.bin
                    .
                    .
                    .

Usage for bootflash://sup-local
 1779363840 bytes used
13238841344 bytes free
15018205184 bytes total
IP_switch_A_1#
```

4. Install the switch software:

   install all system bootflash:nxos.version-number.bin kickstart bootflash:nxos.version-kickstart-number.bin

```
IP_switch_A_1#  install all system
bootflash:nxos.7.0.3.I4.6.bin kickstart
bootflash:nxos.7.0.3.I4.6.bin
Installer will perform compatibility check first. Please
wait.

Verifying image bootflash:/nxos.7.0.3.I4.6.bin for boot
variable "kickstart".
[####################] 100% -- SUCCESS

Verifying image bootflash:/nxos.7.0.3.I4.6.bin for boot
variable "system".
[####################] 100% -- SUCCESS

Performing module support checks.
[####################] 100% -- SUCCESS

Verifying image type.
[####################] 100% -- SUCCESS

Extracting "system" version from image
bootflash:/nxos.7.0.3.I4.6.bin.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image
bootflash:/nxos.7.0.3.I4.6.bin.
[####################] 100% -- SUCCESS
...
```

The switch reboot automatically after the switch software has installed.

5. Wait for the switch to reload and then log in to the switch.

   After the switch has rebooted the login prompt is displayed:

```
User Access Verification
IP_switch_A_1 login: admin
Password:
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (C) 2002-2017, Cisco and/or its affiliates.
All rights reserved.
.
.
.
MDP database restore in progress.
IP_switch_A_1#

The switch software is now installed.
```

6. Verify that the switch software has been installed:

   `show version`

   The following example shows the output:

```
IP_switch_A_1# show version
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (C) 2002-2017, Cisco and/or its affiliates.
All rights reserved.
.
.
.

Software
  BIOS: version 04.24
  NXOS: version 7.0(3)I4(6)   **<<< switch software
version**
  BIOS compile time:  04/21/2016
  NXOS image file is: bootflash:///nxos.7.0.3.I4.6.bin
  NXOS compile time:  3/9/2017 22:00:00 [03/10/2017
07:05:18]


Hardware
  cisco Nexus 3132QV Chassis
  Intel(R) Core(TM) i3- CPU @ 2.50GHz with 16401416 kB
of memory.
  Processor Board ID FOC20123GPS

  Device name: A1
  bootflash:   14900224 kB
  usb1:               0 kB (expansion flash)

Kernel uptime is 0 day(s), 0 hour(s), 1 minute(s), 49
second(s)

Last reset at 403451 usecs after  Mon Jun 10 21:43:52
2017

  Reason: Reset due to upgrade
  System version: 7.0(3)I4(1)
  Service:

plugin
  Core Plugin, Ethernet Plugin
IP_switch_A_1#
```

7. Repeat these steps on the remaining three FC switches in the MetroCluster fabric configuration.

= Downloading and installing the Cisco FC RCF files :icons: font

You must download the RCF file to each switch in the MetroCluster fabric configuration.

This task requires file transfer software, such as FTP, Trivial File Transfer Protocol (TFTP), SFTP, or Secure Copy Protocol (SCP), to copy the files to the switches.

These steps must be repeated on each of the Cisco FC switches in the MetroCluster fabric configuration.

You must use the supported switch software version.

NetApp Hardware Universe

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

Switch	RCF file
FC_switch_A_1	`NX3232_v1.80_Switch-A1.txt`
FC_switch_A_2	`NX3232_v1.80_Switch-A2.txt`
FC_switch_B_1	`NX3232_v1.80_Switch-B1.txt`
FC_switch_B_2	`NX3232_v1.80_Switch-B2.txt`

The outputs shown are for Cisco IP switches; however, these steps are also applicable for Cisco FC switches.

Steps

1. Download the Cisco FC RCF files.
2. Copy the RCF files to the switches.
   a. Copy the RCF files to the first switch:
   copy sftp://root@FTP-server-IP-address/tftpboot/switch-specific-RCF bootflash: vrf management

   In this example, the `NX3232_v1.80_Switch-A1.txt` RCF file is copied from the SFTP server at `10.10.99.99` to the local bootflash. You must 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://root@10.10.99.99/tftpboot/NX3232_v1.8T-
X1_Switch-A1.txt bootflash: vrf management
root@10.10.99.99's password: password
sftp> progress
Progress meter enabled
sftp> get   /tftpboot/NX3232_v1.80_Switch-A1.txt
/bootflash/NX3232_v1.80_Switch-A1.txt
Fetching /tftpboot/NX3232_v1.80_Switch-A1.txt to
/bootflash/NX3232_v1.80_Switch-A1.txt
/tftpboot/NX3232_v1.80_Switch-A1.txt          100%
5141     5.0KB/s   00:00
sftp> exit
Copy complete, now saving to disk (please wait)...
IP_switch_A_1#
```

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

3. Verify on each switch that the RCF file is present in each switch's `bootflash` directory:

   `dir bootflash:`

   The following example shows that the files are present on IP_switch_A_1:

```
IP_switch_A_1# dir bootflash:
                  .
                  .
                  .
       5514    Jun 13 22:09:05 2017
NX3232_v1.80_Switch-A1.txt
                  .
                  .
                  .

Usage for bootflash://sup-local
 1779363840 bytes used
13238841344 bytes free
15018205184 bytes total
IP_switch_A_1#
```

4. Copy the matching RCF file from the local bootflash to the running configuration on each switch:

   `copy bootflash:`*`switch-specific-RCF`*`.txt running-config`

5. Copy the RCF files from the running configuration to the startup configuration on each switch:

   copy running-config startup-config

   You should see output similar to the following:

   ```
   IP_switch_A_1# copy bootflash:NX3232_v1.80_Switch-A1.txt
   running-config
   IP_switch_A_1# copy running-config startup-config
   ```

6. Reload the switch: **reload**

   ```
   IP_switch_A_1# reload
   ```

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