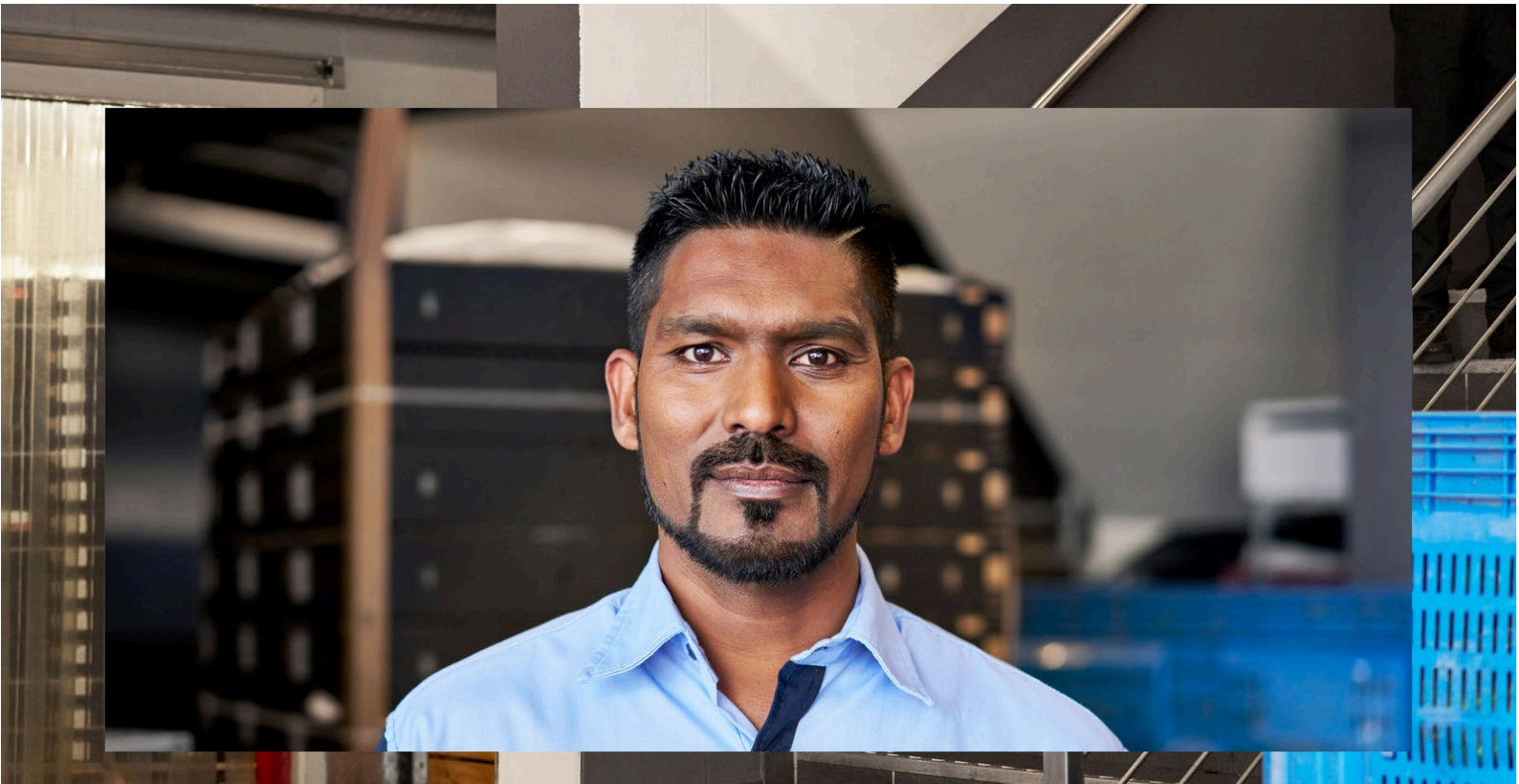
HPE Storage

Technical white paper

Upgrading HPE Storage Fibre Channel Switch C-series from 8/16Gbps to 32/64Gbps

Migration reference document

HPE GreenLake



Contents

Introduction

This guide explains the process of migrating from HPE Storage Fibre Channel Switch C-series 8/16Gbps switches to HPE Storage Fibre Channel Switch C-series 32/64Gbps switches. It includes detailed steps for transferring configurations between switches. Most storage area network (SAN) setups have two fabrics. Upgrading one fabric at a time ensures a smooth process, with the second fabric handling the workload during migration. This upgrade is essential for addressing the increasing demands for higher bandwidth and improved performance in today's data-intensive environments. By transitioning to the latest switch technology, organizations can benefit from enhanced efficiency, scalability, and reliability. This guide will provide a comprehensive overview of the process, ensuring a smooth and successful transition to the new HPE Storage Fibre Channel Switch C-series 32/64Gbps switches.

Note
Some parts of these actions may cause disruptions and should only be done during scheduled maintenance.

Approaches

This document describes two methods for performing the migration. Choose the one that best fits your fabric configuration's complexity.

Method 1

The first method is simple and works well for most fabrics if you don't use interface-based zoning and inter VSAN routing (IVR).

1. Set up the new switch with basic settings, such as its management IP
2. Ensure the new switch's domain ID is higher than the current one
3. Connect both switches to the same fabric and merge them to transfer the zone configuration to the new switch
4. Move storage and host connections from the current switch to the new switch one at a time, verifying connectivity after each move

Method 2

The second method involves (if you use interface-based zoning and IVR):

1. Backing up the existing switch configuration
2. Modifying the configuration in a text editor to suit the new switch, updating the management IP, and loading the modified configuration
3. Replacing the current switch with the new switch and moving all connections to the new switch
4. Verifying connectivity after moving all connections

Choose the method that best matches your needs.

Prerequisites

Before beginning the process, make sure to prepare a list of hosts, targets, and switches, including their hardware, software, and firmware versions, and verify this inventory against the software and hardware compatibility matrix. Also, ensure all required licenses are available and added to the smart account or virtual account. Confirm that the new switch has the latest supported firmware installed and that the required power and space are available at the rack. Additionally, collecting the port assignments from the Fabric Login (FLOGI) database will help us verify the connections once they are moved to the new switches.

Note that the principal switch will automatically populate the zoning configuration across all other member fabric switches. A new switch cannot become the principal switch when it joins a stable fabric. During the principal switch selection phase, the switch with the highest priority becomes the principal switch. By default, the configured priority is 128. If two switches have the same configured priority, the switch with the lower World Wide Name (WWN) will become the principal switch.

Note
For the latest information on supported HPE Storage Fibre Channel Switch C-series and firmware versions, visit the SPOCK website. Sign up for an HPE Passport to enable access.

1. Type in the following command to check the license usage on the current switch.

```
switch1# show license usage
License Authorization:
  Status: Not Applicable

(DCNM-SAN):
  Description: DCNM for SAN Adv License for MDS9100
  Count: 1
  Version: 1.0
  Status: IN USE
  Enforcement Type: NOT ENFORCED
  License Type: Generic

(PORT_ACTIV_9148S_PKG):
  Description: MDS 9148S 16G FC 12 port-activation
  Count: 36
  Version: 1.0
  Status: IN USE
  Enforcement Type: ENFORCED
  License Type: Enforced
switch1#
```

2. Note down the Host ID of the current switch.

```
switch1# show license host-id
License hostid: VDH=JAE18160CWV
switch1#
```

3. Make sure you have the necessary licenses for the new switches. If you need help, contact the HPE software and licensing support team. For more details, look at the HPE C-Series Smart Licensing document. For details about the HPE Storage Fibre Channel Switch C-series products, including supported software licenses, QuickSpecs for each product, visit HPE Storage Networking

4. Note down the port assignments from the FLOGI database. This helps ensure that all cables are connected correctly between devices and interfaces.

```
switch1# show flogi database details
--------------------------------------------------------------------------------
INTERFACE        VSAN    FCID           PORT NAME               NODE NAME           FLAGS
--------------------------------------------------------------------------------
fc1/5            100   0x2f0000  10:00:70:10:6f:76:27:47 20:00:70:10:6f:76:27:47  P
                                 [HOST1_HBA1_PORT2]
fc1/15           100   0x2f0200  21:33:00:02:ac:02:56:ad 2f:f7:00:02:ac:02:56:ad  P
                                 [Storage1_Port1]
fc1/25           200   0xca0200  10:00:14:02:ec:ec:7d:7e 20:00:14:02:ec:ec:7d:7e  P
                                 [HOST2_HBA2_PORT1]
switch1#
```

Method 1

1. Set up the new switch with basic settings, such as its management IP.

```
interface mgmt0
  ip address 172.x.x.x 255.255.255.0
```

2. Configure required VSANs and assign ports to them.

   Use **show vsan** command to display information about all VSANs.

```
switch2# show vsan
vsan 1 information
         name:VSAN0001  state:active
         interoperability mode:default
         loadbalancing:src-id/dst-id/oxid
         operational state:up

vsan 100 information
         name:VSAN0100  state:active
         interoperability mode:default
         loadbalancing:src-id/dst-id/oxid
         operational state:up

vsan 200 information
         name:VSAN0200  state:active
         interoperability mode:default
         loadbalancing:src-id/dst-id/oxid
         operational state:up

vsan 4079:evfp_isolated_vsan
vsan 4094:isolated_vsan

switch2#
```

3. Ensure the new switch's domain ID is higher than the current one.

   Use the command **show wwn switch** to see the wwn of the switch and show **fcdomain domain-list** command to see the current domain ID for a specific VSAN.

```
switch2# show fcdomain domain-list vsan 200
Number of domains: 6
Domain ID              WWN
---------    -----------------------
0xd7(215)    20:c8:00:08:31:0a:b6:51 [Local] [Principal]
0xd6(214)    20:c8:8c:60:4f:9e:3b:01
0xd5(213)    20:c8:00:2a:6a:a4:c3:01
0xd3(211)    20:c8:00:3a:9c:ed:fb:c1
0xd4(212)    20:c8:00:3a:9c:ed:fc:c1
0xd1(209)    20:c8:00:08:31:0a:b7:51
```

4. Connect ISLs, configure the port channel, bring the new switch to the same fabric, and merge them to transfer the zone configuration to the new switch.
5. Use **show zone status** command to check the status of the zones.

```
switch2# show zone status vsan 100
VSAN: 100 default-zone: deny distribute: full Interop: default
    mode: enhanced merge-control: allow
    session: none
    single-session: disabled
    hard-zoning: enabled broadcast: unsupported
    smart-zoning: disabled
    rscn-format: fabric-address
    activation overwrite control: disabled
Default zone:
    qos: none broadcast: unsupported ronly: unsupported
Full Zoning Database :
    DB size: 20572 bytes
    Zonesets:  1 Zones: 59 Aliases: 23 Attribute-groups: 2
Active Zoning Database :
    DB Size: 12452 bytes
    Name: VSAN100 Zonesets: 1 Zones: 35
Current Total Zone DB Usage: 33024 / 4000000 bytes (0 % used)
Pending (Session) DB size:
    Full DB Copy size: 0 bytes
    Active DB Copy size: 0 bytes
SFC size: 0 / 4000000 bytes (0 % used)
Status: Activation completed at 11:00:47 est Jun  7 2024
switch2#
```

6. Move storage and host connections from the current switch to the new switch one at a time, verifying connectivity after each move.

   Use **show flogi database details** command to verify the device logins.

```
switch2# show flogi database details
--------------------------------------------------------------------------------
INTERFACE      VSAN  FCID      PORT NAME               NODE NAME               FLAGS
--------------------------------------------------------------------------------
fc1/5          100   0xd50020  10:00:70:10:6f:76:27:47 20:00:70:10:6f:76:27:47  P
                               [HOST1_HBA1_PORT2]
fc1/15         100   0xd50101  21:33:00:02:ac:02:56:ad 2f:f7:00:02:ac:02:56:ad  P
                               [Storage1_Port1]
fc1/25         200   0xd70060  10:00:14:02:ec:ec:7d:7e 20:00:14:02:ec:ec:7d:7e  P
                               [HOST2_HBA2_PORT1]
Switch2#
```

Method 2 (If IVR or interface-based zoning (fc X/Y) is configured)

In this method, we will back up the current switch configuration and make a copy of this file to keep the original safe. Then, we will modify the copied configuration file to suit the new switch. Follow the following steps for guidance.

1. Save the current configuration by typing the following command on the switch.

```
switch1# copy running-config startup-config
```

2. Use any method (such as FTP, TFTP, SFTP, or SCP) to copy the startup configuration to the file server.

```
switch1# copy startup-config scp://user@host1/switch1.config
```

Provide the necessary login details when prompted.

3. If IVR is configured on the switch, you will need to update the IVR settings because they depend on the switch's WWN. This means you have to replace the old WWN with the new one.

```
Switch1# ivr vsan-topology database

autonomous-fabric-id 1 switch-wwn 20:00:00:2a:6a:b9:cd:f0 vsan-ranges 500,3002

autonomous-fabric-id 1 switch-wwn 20:00:00:2a:6a:09:df:00 vsan-ranges 500,3000
```

To remove the switch from the IVR virtual storage area network (VSAN) topology, use the **ivr vsan-topology database** command on the IVR master switch

```
Switch(config)# ivr vsan-topology database

switch(config-ivr-topology-db)# no autonomous-fabric-id 1 switch-wwn

 20:00:00:2a:6a:b9:cd:f0 vsan-ranges 500,3002

switch(config-ivr-topology-db)# end

switch(config)# ivr vsan-topology activate

switch(config)# ivr commit

switch(config)# exit

switch# copy running-config startup-config

switch# show ivr vsan-topology database

autonomous-fabric-id 1 switch-wwn 20:00:00:2a:6a:09:df:00 vsan-ranges 500,3000
```

Make sure that the current switch's WWN does not show up in the results when you run the ivr vsan-topology database command.

Note

If there are several IVR-enabled switches in the network, you need to remove the current switch WWN from all the IVR configurations and replace it with the new switch WWN. Do this before you add the new switch to the fabric. You can make these changes for the other switches using either the CLI or management software such as the Cisco Data Center Network Manager (DCNM) or Cisco Nexus Dashboard Fabric Controller (NDFC).

4. If the current switch configuration shows that it's using interface-based zoning (fc X/Y), replace the switch's WWN in the zone member commands with the WWN of the new switch. If not, you can skip this step. Use the `show wwn switch` command to see the switch WWN.

   To see the switch WWN, type `show wwn switch`

```
switch1# show wwn switch

Switch WWN is 20:00:00:2a:6a:b9:cd:f0

switch1#
```

Here is an example of the switch WWN in the zoning:

```
zone name Zone_1 vsan 100
member interface fc1/9 swwn 20:00:00:2a:6a:b9:cd:f0
member interface fc1/8 swwn 20:00:00:2a:6a:b9:cd:f0
```

5. Open the copied switch1.config file (using the commands mentioned earlier) in a text editor such as Notepad and make the following changes:
   a. If interface-based zoning was done, make sure to find and replace the original switch WWN (20:00:00:2a:6a:b9:cd:f0) with the new switch WWN (20:00:00:08:31:0a:b6:50) wherever needed.
   b. You can ignore the Fibre Channel ID (FCID)-related error messages that show up when you apply the modified switch configuration to the new switch. Alternatively, you can remove the lines related to dynamic FCID allocation under the fcdomain fcid database for the devices in the modified switch configuration file.

```
fcdomain fcid database
  vsan 1 wwn 24:70:00:c0:ff:50:72:32 fcid 0xd00f00 dynamic
  vsan 1 wwn 25:70:00:c0:ff:50:72:32 fcid 0xd01000 dynamic
  vsan 1 wwn 21:24:00:02:ac:00:c5:29 fcid 0xd01100 dynamic
  vsan 1 wwn 21:23:00:02:ac:00:c5:29 fcid 0xd01200 dynamic
  vsan 1 wwn 10:00:54:80:28:45:3f:61 fcid 0xd01300 dynamic
  vsan 1 wwn 51:40:2e:c0:12:44:55:1e fcid 0xd01400 dynamic
```

   c. Remove the lines that contain Simple Network Management Protocol (SNMP) user accounts because their encrypted passwords are linked to the chassis's MAC address. These user accounts are grouped together and start with the snmp-server user in the configuration file. Here is an example:

```
snmp-server user admin network-admin auth md5 0xbbacbb0765686e9d3580c9901efddfc6 priv aes-128
0xbbacbb0765686e9d3580c9901efddfc6 localizedkey
snmp-server user storagefm_user network-operator auth md5 0x16ca49606205b106bacf1b8f524341f5
priv aes-128 0x16ca49606205b106bacf1b8f524341f5 localizedkey
```

   Delete all lines that start with snmp-server user <user-id>.

   d. Check the interface mgmt0 IP address in the original configuration. If you want to use the same IP address for the new switch, no changes are needed. However, if the new switch will use a different IP address for the management port, make sure to update this line in the configuration before applying it to the new switch:

```
interface mgmt0
  ip address 172.x.x.x 255.255.255.0
```

6. After making all the necessary changes to the new configuration file, copy it to the bootflash of the new switch and apply it.
   a. Turn off the current switch and/or unplug the management cable from the network
   b. Turn on the new switch and do the basic setup to get to the switch prompt. Assign the management IP address to the new switch
   c. Apply the new licenses from the smart account/virtual account to the new switch. (Refer to the HPE C-Series Smart Licensing if required)
   d. Then copy the modified configuration file to the new switch

```
Switch2# copy bootflash:<modified_ config_filename> running-config
```

7. Recreate all the SNMP user accounts:

```
switch2(config)# snmp-server user admin network-admin
 auth md5 <actual_password>
switch2(config)# snmp-server user storagefm_user network-operator
 auth md5 <actual_password>
```

8. If you plan to enable IVR on the new switch, add it to the IVR topology. Otherwise, you can skip this step.

Note
Before adding the new switch to the IVR topology, make sure all Inter-Switch Link (ISL) protocol ports are online and connected to the adjacent switches in the fabric.

```
switch2#show wwn switch
Switch WWN is 20:00:00:08:31:0a:b6:50
Switch2# config t
switch2(config)# ivr vsan-topology database
switch2(config-ivr-topology-db)# autonomous-fabric-id 1 switch-wwn
 20:00:00:08:31:0a:b6:50 vsan-ranges 1,4
switch2(config-ivr-topology-db)# exit
switch2(config)# ivr vsan-topology activate
switch2(config)# ivr commit
switch2(config)# exit
switch2# copy running-config startup-config
```

9. Connect the ISL cables and make sure all the VSANs are up and running. Use the command

```
show vsan
switch2# show vsan
vsan 1 information
         name:VSAN0001  state:active
         interoperability mode:default
         loadbalancing:src-id/dst-id/oxid
         operational state:up
vsan 100 information
         name:VSAN0100  state:active
         interoperability mode:default
         loadbalancing:src-id/dst-id/oxid
         operational state:up
```

```
vsan 200 information
         name:VSAN0200  state:active
         interoperability mode:default
         loadbalancing:src-id/dst-id/oxid
         operational state:up
vsan 4079:evfp_isolated_vsan
vsan 4094:isolated_vsan
switch2#
```

10. Now move all hosts and storage connections from the original switch to the new switch. Use the **`show flogi database`** command to verify that the devices are logged in to the new switch.

```
switch2# show flogi database details
--------------------------------------------------------------------------------
INTERFACE        VSAN    FCID           PORT NAME               NODE NAME           FLAGS
--------------------------------------------------------------------------------
fc1/5            100   0xd50020  10:00:70:10:6f:76:27:47 20:00:70:10:6f:76:27:47  P
                                 [HOST1_HBA1_PORT2]
fc1/15           100   0xd50101  21:33:00:02:ac:02:56:ad 2f:f7:00:02:ac:02:56:ad  P
                                 [Storage1_Port1]
fc1/25           200   0xd70060  10:00:14:02:ec:ec:7d:7e 20:00:14:02:ec:ec:7d:7e  P
                                 [HOST2_HBA2_PORT1]
Switch2#
```

Enter the **`show zoneset active vsan x`** command in order to verify that all of the devices are actively logged on to zoneset.

Conclusion

Migrating from HPE Storage Fibre Channel Switch C-series 8/16Gbps switches to HPE Storage Fibre Channel Switch C-series 32/64Gbps switches represents a significant enhancement in fabric performance and capacity. With increased bandwidth capabilities and advanced features, the new switches promise to deliver improved efficiency, scalability, and reliability to meet the growing demands of modern data environments. This upgrade not only ensures better support for current applications but also prepares the fabric for future growth and technological advancements, making it a strategic investment in enhancing overall fabric infrastructure.

Learn more at

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