IP switch maintenance and replacement

ONTAP MetroCluster

NetApp
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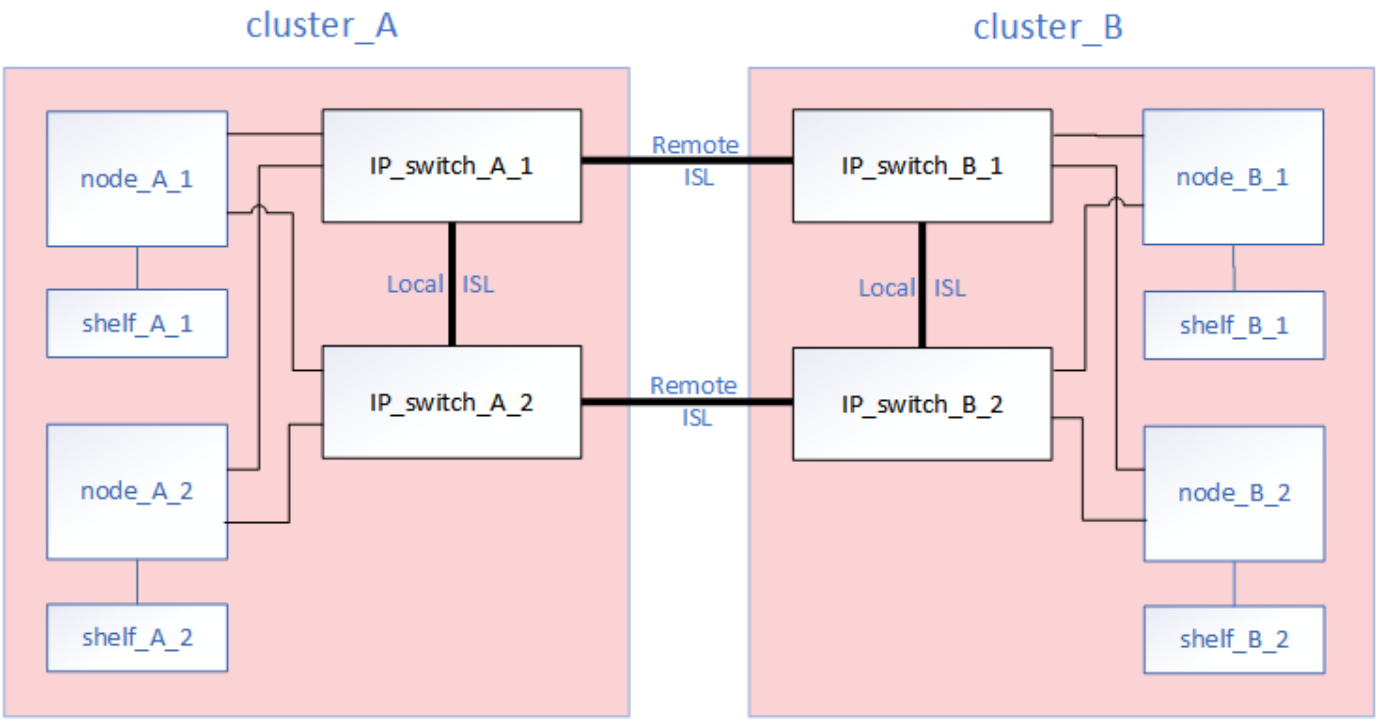
IP switch maintenance and replacement

Replacing an IP switch

You might need to replace a failed switch, or upgrade or downgrade a switch. The new switch can be the same as the old switch when a switch has failed, or you can change the switch type (upgrade or downgrade the switch).

If you want to replace a failed switch with the same type of switch, you only need to replace the failed switch. If you want to upgrade or downgrade a switch, you need to adjust two switches that are in the same network. Two switches are in the same network if they are connected with an inter-switch link (ISL) and are not located at the same site. For example, Network 1 includes IP_switch_A_1 and IP_switch_B_1. Network 2 includes IP_switch_A_2 and IP_switch_B_2 as shown in the diagram below:



This procedure applies when you are using NetApp-validated switches. If you are using MetroCluster-compliant switches, refer to the switch vendor.

If you upgrade or downgrade the networks, you must repeat this procedure for the second network.

Steps

1. Check the health of the configuration.
    a. Check that the MetroCluster is configured and in normal mode on each cluster: **`metrocluster show`**

```
cluster_A::> metrocluster show
Cluster                   Entry Name          State
------------------------- ------------------- -----------
 Local: cluster_A         Configuration state configured
                          Mode                normal
                          AUSO Failure Domain auso-on-cluster-
disaster
Remote: cluster_B         Configuration state configured
                          Mode                normal
                          AUSO Failure Domain auso-on-cluster-
disaster
```

b. Check that mirroring is enabled on each node: **`metrocluster node show`**

```
cluster_A::> metrocluster node show
DR                           Configuration  DR
Group Cluster Node           State          Mirroring Mode
----- ------- -------------- -------------- ---------
--------------------
1     cluster_A
              node_A_1       configured     enabled   normal
      cluster_B
              node_B_1       configured     enabled   normal
2 entries were displayed.
```

c. Check that the MetroCluster components are healthy: **`metrocluster check run`**

```
cluster_A::> metrocluster check run

Last Checked On: 10/1/2014 16:03:37

Component           Result
------------------- ---------
nodes               ok
lifs                ok
config-replication  ok
aggregates          ok
4 entries were displayed.

Command completed. Use the "metrocluster check show -instance"
command or sub-commands in "metrocluster check" directory for
detailed results.
To check if the nodes are ready to do a switchover or switchback
operation, run "metrocluster switchover -simulate" or "metrocluster
switchback -simulate", respectively.
```

d. Check that there are no health alerts: **`system health alert show`**

2. Configure the new switch before installation.

   If you are upgrading or downgrading the switches, you must configure all the switches in the network.

   Follow the steps in the section *Configuring the IP switches* in the MetroCluster IP installation and configuration.

   Make sure that you apply the correct RCF file for switch _A_1, _A_2, _B_1 or _B_2. If the new switch is the same as the old switch, you need to apply the same RCF file.

   If you upgrade or downgrade a switch, apply the latest supported RCF file for the new switch.

3. Run the port show command to view information about the network ports:

   `network port show`

4. Disconnect the ISL connections from the remote switch that connect to the old switch.

   You should disconnect the ISL connections from the ports on the IP_switch_A_1 that connect to IP_switch_B_1.

5. Power off the switch, remove the cables and physically remove IP_switch_B_1.
6. Install the new switch.

   Cable the new switch first (including the ISLs) according to the steps in the *Cabling the IP switches* section in the MetroCluster IP installation and configuration.

The used ports might be different from those on the old switch if the switch type is different. If you are upgrading or downgrading the switches, do **NOT** cable the local ISLs. Only cable the local ISLs if you are upgrading or downgrading the switches in the second network and both switches at one site are the same type.

7. Power up the switch or switches.

   If the new switch is the same, power up the new switch. If you are upgrading or downgrading the switches, then power up both switches. The configuration can operate with two different switches at each site until the second network is updated.

8. Verify that the MetroCluster configuration is healthy by repeating step 1.

   If you are upgrading or downgrading the switches in the first network, you might see some alerts related to local clustering.

If you upgrade or downgrade the networks, then repeat all of the steps for the second network.

Upgrading firmware on MetroCluster IP switches

You might need to upgrade the firmware on a MetroCluster IP switch.

You must repeat this task on each of the switches in succession.

Steps

1. Check the health of the configuration.
   a. Check that the MetroCluster is configured and in normal mode on each cluster:

      ```
      metrocluster show
      ```

      ```
      cluster_A::> metrocluster show
      Cluster                   Entry Name          State
      ------------------------- ------------------- -----------
       Local: cluster_A         Configuration state configured
                                Mode                normal
                                AUSO Failure Domain auso-on-cluster-
      disaster
      Remote: cluster_B         Configuration state configured
                                Mode                normal
                                AUSO Failure Domain auso-on-cluster-
      disaster
      ```

   b. Check that mirroring is enabled on each node:

      ```
      metrocluster node show
      ```

```
cluster_A::> metrocluster node show
DR                           Configuration  DR
Group Cluster Node           State          Mirroring Mode
----- ------- -------------- -------------- ---------
--------------------
1     cluster_A
              node_A_1       configured     enabled   normal
      cluster_B
              node_B_1       configured     enabled   normal
2 entries were displayed.
```

c. Check that the MetroCluster components are healthy:

```
metrocluster check run
```

```
cluster_A::> metrocluster check run

Last Checked On: 10/1/2014 16:03:37

Component           Result
------------------- ---------
nodes               ok
lifs                ok
config-replication  ok
aggregates          ok
4 entries were displayed.

Command completed. Use the "metrocluster check show -instance"
command or sub-commands in "metrocluster check" directory for
detailed results.
To check if the nodes are ready to do a switchover or switchback
operation, run "metrocluster switchover -simulate" or "metrocluster
switchback -simulate", respectively.
```

d. Check that there are no health alerts:

```
system health alert show
```

2. Install the software on the first switch.

> You must install the switch software on the switches in the following order: switch_A_1, switch_B_1, switch_A_2, switch_B_2.

Follow the steps for installing switch software in the relevant topic of the *MetroCluster IP Installation and Configuration* information depending on whether the switch type is Broadcom or Cisco:

- Downloading and installing the Broadcom switch EFOS software
- Downloading and installing the Cisco switch NX-OS software

3. Repeat the previous step for each of the switches.
4. Repeat Step 1 to check the health of the configuration.

Upgrade RCF files on MetroCluster IP switches

You might need to upgrade an RCF file on a MetroCluster IP switch. For example, an ONTAP upgrade or a switch firmware upgrade both require a new RCF file.

Ensure that the RCF file is supported

If you are changing the ONTAP version running on the switches, you should ensure that you have an RCF file that is supported for that version. If you use the RCF generator, the correct RCF file will be generated for you.

Steps

1. Use the following commands from the switches to verify the version of the RCF file:

From this switch…	Issue this command…
Broadcom switch	`(IP_switch_A_1) # show clibanner`
Cisco switch	`IP_switch_A_1# show banner motd`

   For either switch, find the line in the output that indicates the version of the RCF file. For example, the following output is from a Cisco switch, which indicates the RCF file version is “v1.80”.

```
Filename : NX3232_v1.80_Switch-A2.txt
```

2. To check which files are supported for a specific ONTAP version, switch, and platform, use the RcfFileGenerator. If you can generate the RCF file for the configuration that you have or that you want to upgrade to, then it is supported.
3. To verify that the switch firmware is supported, refer to the following:
   - Hardware Universe
   - NetApp Interoperability

Upgrade RCF files

If you are installing new switch firmware, you must install the switch firmware before upgrading the RCF file.

About this task

This procedure disrupts traffic on the switch where the RCF file is upgraded. Traffic will resume once the new RCF file is applied.

Steps

1. Verify the health of the configuration.

a. Verify that the MetroCluster components are healthy:

```
metrocluster check run
```

```
cluster_A::*> metrocluster check run
```

The operation runs in the background.

a. After the `metrocluster check run` operation completes, run `metrocluster check show` to view the results.

After approximately five minutes, the following results are displayed:

```
-----------
::*> metrocluster check show

Last Checked On: 4/7/2019 21:15:05

Component           Result
------------------- ---------
nodes               ok
lifs                ok
config-replication  ok
aggregates          warning
clusters            ok
connections         not-applicable
volumes             ok
7 entries were displayed.
```

b. Check the status of the running MetroCluster check operation:

```
metrocluster operation history show -job-id 38
```

c. Verify that there are no health alerts:

```
system health alert show
```

2. Prepare the IP switches for the application of the new RCF files.

Follow the steps for your switch vendor:

- Resetting the Broadcom IP switch to factory defaults
- Resetting the Cisco IP switch to factory defaults

3. Download and install the IP RCF file, depending on your switch vendor.

Update the switches in the following order: Switch_A_1, Switch_B_1, Switch_A_2, Switch_B_2

- Downloading and installing the Broadcom IP RCF files
- Downloading and installing the Cisco IP RCF files

If you have an L2 shared or L3 network configuration, you might need to adjust the ISL ports on the intermediate/customer switches. The switchport mode might change from 'access' to 'trunk' mode. Only proceed to upgrade the second switch pair (A_2, B_2) if the network connectivity between switches A_1 and B_1 is fully operational and the network is healthy.

Upgrade RCF files on Cisco IP switches using CleanUpFiles

You might need to upgrade an RCF file on a Cisco IP switch. For example, an ONTAP upgrade or a switch firmware upgrade both require a new RCF file.

About this task

Beginning with RcfFileGenerator version 1.4a, there is a new option to change (upgrade, downgrade, or replace) the switch configuration on Cisco IP switches without the need to perform a 'write erase'.

Before you begin

You can use this method if your configuration meets the following requirements:

- The standard RCF configuration is applied.
- The RcfFileGenerator must be able to create the same RCF file that is applied, with the same version and configuration (platforms, VLANs).
- The RCF file that is applied was not provided by NetApp for a special configuration.
- The RCF file was not altered before it was applied.
- The steps to reset the switch to factory defaults were followed before applying the current RCF file.
- No changes were made to the switch(port) configuration after the RCF was applied.

If you do not meet these requirements, then you cannot use the CleanUpFiles that are created when generating the RCF files. However, you can leverage the function to create generic CleanUpFiles — the cleanup using this method is derived from the output of `show running-config` and is best practice.

You must update the switches in the following order: Switch_A_1, Switch_B_1, Switch_A_2, Switch_B_2. Or, you can update the switches Switch_A_1 and Switch_B_1 at the same time followed by switches Switch_A_2 and Switch_B_2.

Steps

1. Determine the current RCF file version, and which ports and VLANs are used: `IP_switch_A_1# show banner motd`

You need to get this information from all four switches and complete the following information table.

```
* NetApp Reference Configuration File (RCF)
*
* Switch : NX9336C (SAS storage, L2 Networks, direct ISL)
* Filename : NX9336_v1.81_Switch-A1.txt
* Date : Generator version: v1.3c_2022-02-24_001, file creation time:
2021-05-11, 18:20:50
*
* Platforms : MetroCluster 1 : FAS8300, AFF-A400, FAS8700
*              MetroCluster 2 : AFF-A320, FAS9000, AFF-A700, AFF-A800
* Port Usage:
* Ports 1- 2: Intra-Cluster Node Ports, Cluster: MetroCluster 1, VLAN
111
* Ports 3- 4: Intra-Cluster Node Ports, Cluster: MetroCluster 2, VLAN
151
* Ports 5- 6: Ports not used
* Ports 7- 8: Intra-Cluster ISL Ports, local cluster, VLAN 111, 151
* Ports 9-10: MetroCluster 1, Node Ports, VLAN 119
* Ports 11-12: MetroCluster 2, Node Ports, VLAN 159
* Ports 13-14: Ports not used
* Ports 15-20: MetroCluster-IP ISL Ports, VLAN 119, 159, Port Channel 10
* Ports 21-24: MetroCluster-IP ISL Ports, VLAN 119, 159, Port Channel
11, breakout mode 10gx4
* Ports 25-30: Ports not used
* Ports 31-36: Ports not used
*

#
IP_switch_A_1#
```

From this output, you must collect the information shown in the following two tables.

Generic information	MetroCluster	Data
RCF file version		1.81
Switch type		NX9336
Network typology		L2 Networks, direct ISL
Storage type		SAS storage
Platforms	1	AFF A400
	2	FAS9000

VLAN information	Network	MetroCluster configuration	Switchports	Site A	Site B
VLAN local cluster	Network 1	1	1, 2	111	222
		2	3, 4	151	251
	Network 2	1	1, 2	111	222
		2	3, 4	151	251
VLAN MetroCluster	Network 1	1	9, 10	119	119
		2	11, 12	159	159
	Network 2	1	9, 10	219	219
		2	11, 12	259	259

2. Create the RCF files and CleanUpFiles, or create generic CleanUpFiles for the current configuration.

   If your configuration meets the requirements outlined in the prerequisites, select **Option 1**. If your configuration does **not** meet the requirements outlined in the prerequisites, select **Option 2**.

Option 1: Create the RCF files and CleanUpFiles

Use this procedure if the configuration meets the requirements.

Steps

a. Use the RcfFileGenerator 1.4a (or later) to create the RCF files with the information that you retrieved in Step 1. The new version of the RcfFileGenerator creates an additional set of CleanUpFiles that you can use to revert some configuration and prepare the switch to apply a new RCF configuration.

b. Compare the banner motd with the RCF files that are currently applied. The platform types, switch type, port and VLAN usage must be the same.

> You must use the CleanUpFiles from the same version as the RCF file and for the exact same configuration. Using any CleanUpFile will not work and might require a full reset of the switch.

> The storage type might be different — SAS storage or direct storage.

> The ONTAP version the RCF file is created for is not relevant. Only the RCF file version is important.

> The RCF file (even it is the same version) might list fewer or more platforms. Make sure that your platform is listed.

Option 2: Create generic CleanUpFiles

Use this procedure if the configuration does **not** meet all the requirements.

Steps

a. Retrieve the output of `show running-config` from each switch.

b. Open the RcfFileGenerator tool and click 'Create generic CleanUpFiles' at the bottom of the window

c. Copy the output that you retrieved in Step 1 from 'one' switch into the upper window. You can remove or leave the default output.

d. Click 'Create CUF files'.

e. Copy the output from the lower window into a text file (this file is the CleanUpFile).

f. Repeat Steps c, d, and e for all switches in the configuration.

At the end of this procedure, you should have four text files, one for each switch. You can use these files in the same way as the CleanUpFiles that you can create by using Option 1.

3. Create the 'new' RCF files for the new configuration. Create these files in the same way that you created the files in the previous step, except choose the respective ONTAP and RCF file version.

After completing this step you should have two sets of RCF files, each set consisting of twelve files.

4. Download the files to the bootflash.

a. Download the CleanUpFiles that you created in Create the RCF files and CleanUpFiles, or create generic CleanUpFiles for the current configuration

> This CleanUpFile is for the current RCF file that is applied and **NOT** for the new RCF that you want to upgrade to.

Example CleanUpFile for Switch-A1: `Cleanup_NX9336_v1.81_Switch-A1.txt`

b. Download the 'new' RCF files that you created in Create the 'new' RCF files for the new configuration.

Example RCF file for Switch-A1: `NX9336_v1.90_Switch-A1.txt`

c. Download the CleanUpFiles that you created in Create the 'new' RCF files for the new configuration. This step is optional — you can use the file in future to update the switch configuration. It matches the currently applied configuration.

Example CleanUpFile for Switch-A1: `Cleanup_NX9336_v1.90_Switch-A1.txt`

> You must use the CleanUpFile for the correct (matching) RCF version. If you use a CleanUpFile for a different RCF version, or a different configuration then the cleanup of the configuration might not work correctly.

The following example copies the three files to the bootflash:

```
IP_switch_A_1# copy sftp://user@50.50.50.50/RcfFiles/NX9336-direct-
SAS_v1.81_MetroCluster-
IP_L2Direct_A400FAS8700_xxx_xxx_xxx_xxx/Cleanup_NX9336_v1.81_Switch-
A1.txt bootflash:
IP_switch_A_1# copy sftp://user@50.50.50.50/RcfFiles/NX9336-direct-
SAS_v1.90_MetroCluster-
IP_L2Direct_A400FAS8700A900FAS9500_xxx_xxx_xxx_xxxNX9336_v1.90//NX933
6_v1.90_Switch-A1.txt bootflash:
IP_switch_A_1# copy sftp://user@50.50.50.50/RcfFiles/NX9336-direct-
SAS_v1.90_MetroCluster-
IP_L2Direct_A400FAS8700A900FAS9500_xxx_xxx_xxx_xxxNX9336_v1.90//Clean
up_NX9336_v1.90_Switch-A1.txt bootflash:
```

> You are prompted to specify Virtual Routing and Forwarding (VRF).

5. Apply the CleanUpFile or generic CleanUpFile.

Some of the configuration is reverted and switchports go 'offline'.

a. Confirm that there are no pending changes to the startup configuration: `show running-config diff`

```
IP_switch_A_1# show running-config diff
IP_switch_A_1#
```

6. If you see system output, save the running configuration to the startup configuration: `copy running-config startup-config`

   System output indicates that the startup configuration and running configuration are different and pending changes. If you do not save the pending changes, you are unable to roll back using a reload of the switch.

   a. Apply the CleanUpFile:

```
IP_switch_A_1# copy bootflash:Cleanup_NX9336_v1.81_Switch-A1.txt
running-config

IP_switch_A_1#
```

   The script might take a while to return to the switch prompt. No output is expected.

7. View the running configuration to verify that the configuration is cleared: `show running-config`

   The current configuration should show:

   - No class maps and IP access lists are configured
   - No policy maps are configured
   - No service policies are configured
   - No port-profiles are configured
   - All Ethernet interfaces (except mgmt0 which should not show any configuration, and only VLAN 1 should be configured).

     If you find that any of the above items are configured, you might not be able to apply a new RCF file configuration. However, you can revert to the previous configuration by reloading the switch **without** saving the running configuration to the startup configuration. The switch will come up with the previous configuration.

8. Apply the RCF file and verify that the ports are online.

   a. Apply the RCF files.

```
IP_switch_A_1# copy bootflash:NX9336_v1.90-X2_Switch-A1.txt running-
config
```

   Some warning messages appear while applying the configuration. Error messages are not expected.

b. After the configuration is applied, verify that the cluster and MetroCluster ports are coming online with one of the following commands, `show interface brief`, `show cdp neighbors`, or `show lldp neighbors`

> If you changed the VLAN for the local cluster and you upgraded the first switch at the site, then cluster health monitoring might not report the state as 'healthy' because the VLANs from the old and new configurations do not match. After the second switch is updated, the state should return to healthy.

If the configuration is not applied correctly, or you do not want to keep the configuration, you can revert to the previous configuration by reloading the switch **without** saving the running configuration to startup configuration. The switch will come up with the previous configuration.

9. Save the configuration and reload the switch.

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

IP_switch_A_1# reload
```

Renaming a Cisco IP switch

You might need to rename a Cisco IP switch to provide consistent naming throughout your configuration.

In the examples in this task, the switch name is changed from `myswitch` to `IP_switch_A_1`.

1. Enter global configuration mode:

   `configure terminal`

   The following example shows the configuration mode prompt. Both prompts show the switch name of `myswitch`.

```
myswitch# configure terminal
myswitch(config)#
```

2. Rename the switch:

   `switchname new-switch-name`

   If you are renaming both switches in the fabric, use the same command on each switch.

   The CLI prompt changes to reflect the new name:

```
myswitch(config)# switchname IP_switch_A_1
IP_switch_A_1(config)#
```

3. Exit configuration mode:

   exit

   The top-level switch prompt is displayed:

   ```
   IP_switch_A_1(config)# exit
   IP_switch_A_1#
   ```

4. Copy the current running configuration to the startup configuration file:

   copy running-config startup-config

5. Verify that the switch name change is visible from the ONTAP cluster prompt.

   Note that the new switch name is shown, and the old switch name (`myswitch`) does not appear.

   a. Enter advanced privilege mode, pressing **y** when prompted:
   set -privilege advanced

   b. Display the attached devices:
   network device-discovery show

   c. Return to admin privilege mode:
   set -privilege admin

   The following example shows that the switch appears with the new name, `IP_switch_A_1`:

```
cluster_A::storage show> set advanced

Warning: These advanced commands are potentially dangerous; use them
only when directed to do so by NetApp personnel.
Do you want to continue? {y|n}: y

cluster_A::storage show*> network device-discovery show
Node/       Local  Discovered
Protocol    Port   Device                    Interface
Platform
----------- ------ ------------------------ ----------------
----------------
node_A_2/cdp
            e0M    LF01-410J53.mycompany.com(SAL18516DZY)
                                             Ethernet125/1/28  N9K-
C9372PX
            e1a    IP_switch_A_1(FOC21211RBU)
                                             Ethernet1/2       N3K-
C3232C
            e1b    IP_switch_A_1(FOC21211RBU)
                                             Ethernet1/10      N3K-
C3232C
.
.
.                                             Ethernet1/18      N9K-
C9372PX
node_A_1/cdp
            e0M    LF01-410J53.mycompany.com(SAL18516DZY)
                                             Ethernet125/1/26  N9K-
C9372PX
            e0a    IP_switch_A_2(FOC21211RB5)
                                             Ethernet1/1       N3K-
C3232C
            e0b    IP_switch_A_2(FOC21211RB5)
                                             Ethernet1/9       N3K-
C3232C
            e1a    IP_switch_A_1(FOC21211RBU)
.
.
.
16 entries were displayed.
```

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