



# Hot-removing storage from a MetroCluster FC configuration

## ONTAP MetroCluster

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April 12, 2021

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# Table of Contents

Hot-removing storage from a MetroCluster FC configuration ..... 1

# Hot-removing storage from a MetroCluster FC configuration

You can hot-remove drive shelves—physically remove shelves that have had the aggregates removed from the drives—from a MetroCluster FC configuration that is up and serving data. You can hot-remove one or more shelves from anywhere within a stack of shelves or remove a stack of shelves.

- Your system must be a multipath HA, multipath, quad-path HA, or quad-path configuration.
- In a four-node MetroCluster FC configuration, the local HA pair cannot be in a takeover state.
- You must have already removed all aggregates from the drives in the shelves that you are removing.



If you attempt this procedure on non-MetroCluster FC configurations with aggregates on the shelf you are removing, you could cause the system to fail with a multidrive panic.

Removing aggregates involves splitting the mirrored aggregates on the shelves you are removing, and then re-creating the mirrored aggregates with another set of drives.

## Disk and aggregate management

- You must have removed drive ownership after removing the aggregates from the drives in the shelves that you are removing.

## Disk and aggregate management

- If you are removing one or more shelves from within a stack, you must have factored the distance to bypass the shelves that you are removing.

If the current cables are not long enough, you need to have longer cables available.

This task applies to the following MetroCluster FC configurations:

- Direct-attached MetroCluster FC configurations, in which the storage shelves are directly connected to the storage controllers with SAS cables
- Fabric-attached or bridge-attached MetroCluster FC configurations, in which the storage shelves are connected using FC-to-SAS bridges

## Steps

1. Verify the operation of the MetroCluster configuration in ONTAP:

- a. Check whether the system is multipathed:

```
node run -node node-name sysconfig -a
```

- b. Check for any health alerts on both clusters:

```
system health alert show
```

- c. Confirm the MetroCluster configuration and that the operational mode is normal:

```
metrocluster show
```

- d. Perform a MetroCluster check:

**metrocluster check run**

- e. Display the results of the MetroCluster check:

**metrocluster check show**

- f. Check for any health alerts on the switches (if present):

**storage switch show**

- g. Run Config Advisor.

[NetApp Downloads: Config Advisor](#)

- h. After running Config Advisor, review the tool's output and follow the recommendations in the output to address any issues discovered.

2. Set the privilege level to advanced:

**set -privilege advanced**

3. Verify that no mailbox drive is on the shelves: **storage failover mailbox-disk show**

4. Remove the shelf according to the steps for the relevant scenario.

Scenario	Steps
To remove an aggregate when the shelf contains either unmirrored, mirrored, or both types of aggregate...	<p>a. Use the <b>storage aggregate delete -aggregate aggregate name</b> command to remove the aggregate.</p> <p>b. Use the standard procedure to remove ownership of all drives in that shelf, and then physically remove the shelf.</p> <p>Follow the instructions in the <i>SAS Disk Shelves Service Guide</i> for your shelf model to hot-remove shelves.</p>

Scenario	Steps
<p>To remove a plex from a mirrored aggregate, you need to unmirror the aggregate.</p>	<p>a. Identify the plex that you want to remove by using the <b>run -node local sysconfig -r</b> command.</p> <p>In the following example, you can identify the plex from the line <b>Plex /dpg_mcc_8020_13_a1_aggr1/plex0</b>. In this case, the plex to specify is plex0.</p> <pre> dpgmcc_8020_13_a1a2::storage aggregate&gt; run -node local sysconfig -r *** This system has taken over dpg-mcc-8020-13-a1 Aggregate dpg_mcc_8020_13_a1_aggr1 (online, raid_dp, mirrored) (block checksums)     Plex     /dpg_mcc_8020_13_a1_aggr1/plex     0 (online, normal, active,     pool0)         RAID group         /dpg_mcc_8020_13_a1_aggr1/plex         0/rg0 (normal, block         checksums)             RAID Disk Device HA  SHELF BAY CHAN Pool Type RPM  Used (MB/blks)      Phys (MB/blks) ----- ----- ----- dparity  mcc-cisco-8Gb- fab-2:1-1.126L16 0c 32 15 FC:B 0 SAS 15000 272000/557056000 274845/562884296     parity  mcc-cisco-8Gb- fab-2:1-1.126L18 0c 32 17 FC:B 0 SAS 15000 272000/557056000 274845/562884296         data  mcc-cisco-8Gb- fab-2:1-1.126L19 0c 32 18 FC:B 0 SAS 15000 272000/557056000 </pre>

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```
FC:B 0 SAS 15000
272000/557056000
274845/562884296

data mcc-cisco-8Gb-
fab-3:1-1.126L41 0d 34 20
FC:B 0 SAS 15000
272000/557056000
274845/562884296

plex
1 (online, normal, active
pool1)
RAMP group
20_13_aggr1/plex
1/rg0 (normal, block
checksums)

RAID Disk Device
Data and Computer Software clause at DFARS
RPM Used (MB/blks) Phys
(MB/blks)
-----
dparity mcc-cisco-8Gb-
fab-3:1-1.126L37 0d 34 10
FC:A 1 SAS 15000
272000/557056000
280104/573653840
parity mcc-cisco-8Gb-
fab-3:1-1.126L14 0d 33 13
FC:A 1 SAS 15000
272000/557056000
280104/573653840
data mcc-cisco-8Gb-
fab-3:1-1.126L41 0d 34 14
FC:A 1 SAS 15000
272000/557056000
280104/573653840
data mcc-cisco-8Gb-
fab-3:1-1.126L15 0d 33 14
FC:A 1 SAS 15000
272000/557056000
```

```
280104/573653840
      data      mcc-cisco-8Gb-
fab-3:1-1.126L45 0d      34  18
FC:A      1      SAS 15000
272000/557056000
280104/573653840
```

- b. Use the **storage aggregate plex delete**  
**-aggregate** **aggr\_name** **-plex**  
**plex\_name** command to remove the plex.

plex defines the plex name, such as **plex3** or  
**plex6**.

- c. Use the standard procedure to remove ownership of all drives in that shelf, and then physically remove the shelf.

Follow the instructions in the *SAS Disk Shelves Service Guide* for your shelf model to hot-remove shelves.