Hot-removing storage from a MetroCluster FC configuration

ONTAP MetroCluster

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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…	a. Use the **`storage aggregate delete -aggregate`** ***`aggregate name`*** command to remove the aggregate. b. 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.

Scenario	Steps

To remove a plex from a mirrored aggregate, you need to unmirror the aggregate.	a. Identify the plex that you want to remove by using the **`run -node local sysconfig -r`** command.
	
	In the following example, you can identify the plex from the line `Plex /dpg_mcc_8020_13_a1_aggr1/plex0`. In this case, the plex to specify is plex0.
	
	`dpgmcc_8020_13_a1a2::storage aggregate> 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/plex0 (online, normal, active, pool0)`
	`    RAID group /dpg_mcc_8020_13_a1_aggr1/plex0/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`

```
274845/562884296
      data      mcc-cisco-8Gb-
fab-2:1-1.126L21  0c    32   20
FC:B   0   SAS 15000
272000/557056000
274845/562884296
      data      mcc-cisco-8Gb-
fab-2:1-1.126L22  0c    32   21
FC:B   0   SAS 15000
272000/557056000
274845/562884296

Plex
/dpg_mcc_8020_13_a1_aggr1/plex
1 (online, normal, active,
pool1)

RAID group
/dpg_mcc_8020_13_a1_aggr1/plex
1/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-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.