NetApp

Completing recovery

ONTAP MetroCluster

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April 15, 2021

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Reestablishing object stores for FabricPool configurations

If one of the object stores in a FabricPool mirror was co-located with the MetroCluster disaster site and was destroyed, you must reestablish the object store and the FabricPool mirror.

- If the object-stores are remote and a MetroCluster site is destroyed, you do not need to rebuild the object store, and the original object store configurations as well as cold data contents are retained.

- For more information about FabricPool configurations, see the Disk and Aggregates Power Guide.

  1. Follow the procedure "Replacing a FabricPool mirror on a MetroCluster configuration" in the Disk and Aggregates Power Guide.

Verifying licenses on the replaced nodes

You must install new licenses for the replacement nodes if the impaired nodes were using ONTAP features that require a standard (node-locked) license. For features with standard licenses, each node in the cluster should have its own key for the feature.

Until you install license keys, features requiring standard licenses continue to be available to the replacement node. However, if the impaired node was the only node in the cluster with a license for the feature, no configuration changes to the feature are allowed. Also, using unlicensed features on the node might put you out of compliance with your license agreement, so you should install the replacement license key or keys on the replacement node as soon as possible.

The licenses keys must be in the 28-character format.

You have a 90-day grace period in which to install the license keys. After the grace period, all old licenses are invalidated. After a valid license key is installed, you have 24 hours to install all of the keys before the grace period ends.

> If all nodes at a site have been replaced (a single node in the case of a two-node MetroCluster configuration), license keys must be installed on the replacement node or nodes prior to switchback.

1. Identify the licenses on the node: `license show`

   The following example displays the information about licenses in the system:

```
cluster_B::>  license show
          (system license show)

Serial Number: 1-80-00050
Owner: site1-01
Package              Type       Description              Expiration
-------              -------    -------------            ------------
Base                 license    Cluster Base License        -
NFS                  site       NFS License                 -
CIFS                 site       CIFS License                -
iSCSI                site       iSCSI License               -
FCP                  site       FCP License                 -
FlexClone            site       FlexClone License           -

6 entries were displayed.
```

2. Verify that the licenses are good for the node after switchback: `metrocluster check license show`

   The following example displays the licenses that are good for the node:

```
cluster_B::> metrocluster check license show

Cluster              Check                          Result
-------              -------                        -------------
Cluster_B            negotiated-switchover-ready    not-applicable
NFS                  switchback-ready               not-applicable
CIFS                 job-schedules                  ok
iSCSI                licenses                       ok
FCP                  periodic-check-enabled         ok
```

3. If you need new license keys, obtain replacement license keys on the NetApp Support Site in the My Support section under Software licenses.

   ℹ The new license keys that you require are automatically generated and sent to the email address on file. If you fail to receive the email with the license keys within 30 days, you should contact technical support.

4. Install each license key: `system license add -license-code license-key, license-key...`

5. Remove the old licenses, if desired:

   a. Check for unused licenses: `license clean-up -unused -simulate`

   b. If the list looks correct, remove the unused licenses: `license clean-up -unused`

Performing a switchback

After you heal the MetroCluster configuration, you can perform the MetroCluster switchback operation. The MetroCluster switchback operation returns the configuration to its normal operating state, with the sync-source storage virtual machines (SVMs) on the disaster site active and serving data from the local disk pools.

- The disaster cluster must have successfully switched over to the surviving cluster.

- Healing must have been performed on the data and root aggregates.

- The surviving cluster nodes must not be in the HA failover state (all nodes must be up and running for each HA pair).

- The disaster site controller modules must be completely booted and not in the HA takeover mode.

- The root aggregate must be mirrored.

- The Inter-Switch Links (ISLs) must be online.

- Any required licenses must be installed on the system.

  1. Confirm that all nodes are in the enabled state: `metrocluster node show`

     The following example displays the nodes that are in the enabled state:

     ```
     cluster_B::>  metrocluster node show

     DR                              Configuration  DR
     Group Cluster Node           State          Mirroring Mode
     ----- ------- -----------  -------------- ---------
     --------------------
     1     cluster_A
                   node_A_1    configured     enabled   heal roots
     completed
                   node_A_2    configured     enabled   heal roots
     completed
           cluster_B
                   node_B_1    configured     enabled   waiting for
     switchback recovery
                   node_B_2    configured     enabled   waiting for
     switchback recovery
     4 entries were displayed.
     ```

  2. Confirm that resynchronization is complete on all SVMs: `metrocluster vserver show`

  3. Verify that any automatic LIF migrations being performed by the healing operations have been successfully completed: metrocluster check lif show

  4. Perform the switchback by running the metrocluster switchback command from any node in the surviving cluster.

  5. Check the progress of the switchback operation: `metrocluster show`

The switchback operation is still in progress when the output displays waiting-for-switchback:

```
cluster_B::> metrocluster show
Cluster                         Entry Name          State
------------------------- ------------------- -----------
 Local: cluster_B               Configuration state configured
                                Mode                switchover
                                AUSO Failure Domain -
 Remote: cluster_A              Configuration state configured
                                Mode                waiting-for-switchback
                                AUSO Failure Domain -
```

The switchback operation is complete when the output displays normal:

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

If a switchback takes a long time to finish, you can check on the status of in-progress baselines by using the metrocluster config-replication resync-status show command. This command is at the advanced privilege level.

6. Reestablish any SnapMirror or SnapVault configurations.

In ONTAP 8.3, you need to manually reestablish a lost SnapMirror configuration after a MetroCluster switchback operation. In ONTAP 9.0 and later, the relationship is reestablished automatically.

Verifying a successful switchback

After performing the switchback, you want to confirm that all aggregates and storage virtual machines (SVMs) are switched back and online.

1. Verify that the switched-over data aggregates are switched back: `storage aggregate show`

In the following example, aggr_b2 on node B2 has switched back:

```
node_B_1::> storage aggregate show
Aggregate      Size Available Used% State   #Vols  Nodes            RAID
Status
--------- -------- --------- ----- ------- ------ ----------------
------------
...
aggr_b2    227.1GB   227.1GB    0% online       0 node_B_2   raid_dp,

mirrored,

normal

node_A_1::> aggr show
Aggregate      Size Available Used% State   #Vols  Nodes            RAID
Status
--------- -------- --------- ----- ------- ------ ----------------
------------
...
aggr_b2         -         -     - unknown      - node_A_1
```

If the disaster site included unmirrored aggregates and the unmirrored aggregates are no longer present, the aggregate may show up with a State of unknown in the output of the storage aggregate show command. Contact technical support to remove the out-of-date entries for the unmirrored aggregates.

2. Verify that all sync-destination SVMs on the surviving cluster are dormant (showing an Admin State of stopped) and the sync-source SVMs on the disaster cluster are up and running: `vserver show -subtype sync-source`

```
node_B_1::> vserver show -subtype sync-source
                                    Admin       Root
Name     Name
Vserver       Type     Subtype     State       Volume      Aggregate
Service Mapping
-----------  -------  ----------  ----------  ----------  ----------
-------  -------
...
vs1a         data     sync-source
                                    running     vs1a_vol    node_B_2
file     file

aggr_b2

node_A_1::> vserver show -subtype sync-destination
                                    Admin       Root
Name     Name
Vserver                Type     Subtype     State       Volume      Aggregate
Service Mapping
-----------           -------  ----------  ----------  ----------  ----------
-------  -------
...
cluster_A-vs1a-mc  data     sync-destination
                                            stopped     vs1a_vol    sosb_
file     file

aggr_b2
```

Sync-destination aggregates in the MetroCluster configuration have the suffix "-mc" automatically appended to their name to help identify them.

3. Confirm that the switchback operations succeeded by using the metrocluster operation show command.

If the command output shows…	Then…
That the switchback operation state is successful.	The switchback process is complete and you can proceed with operation of the system.
That the switchback operation or switchback-continuation-agent operation is partially successful.	Perform the suggested fix provided in the output of the metrocluster operation show command.

You must repeat the previous sections to perform the switchback in the opposite direction. If site_A did a switchover of site_B, have site_B do a switchover of site_A.

Mirroring the root aggregates of the replacement nodes

If disks were replaced, you must mirror the root aggregates of the new nodes on the disaster site.

1. On the disaster site, identify the aggregates which are not mirrored: `storage aggregate show`

```
cluster_A::> storage aggregate show

Aggregate     Size Available Used% State   #Vols  Nodes          RAID
Status
--------- -------- --------- ----- ------- ------ ----------------
------------
node_A_1_aggr0
          1.49TB   74.12GB   95% online      1 node_A_1
raid4,

normal
node_A_2_aggr0
          1.49TB   74.12GB   95% online      1 node_A_2
raid4,

normal
node_A_1_aggr1
          1.49TB   74.12GB   95% online      1 node_A_1         raid
4, normal

mirrored
node_A_2_aggr1
          1.49TB   74.12GB   95% online      1 node_A_2         raid
4, normal

mirrored
4 entries were displayed.

cluster_A::>
```

2. Mirror one of the root aggregates: `storage aggregate mirror -aggregate root-aggregate`

   The following example shows how the command selects disks and prompts for confirmation when mirroring the aggregate.

```
cluster_A::> storage aggregate mirror -aggregate node_A_2_aggr0

Info: Disks would be added to aggregate "node_A_2_aggr0" on node
"node_A_2" in
      the following manner:

      Second Plex

        RAID Group rg0, 3 disks (block checksum, raid4)
          Position   Disk                          Type
Size
          ----------  ------------------------  ----------
---------------
          parity     2.10.0                        SSD
-
          data       1.11.19                       SSD
894.0GB
          data       2.10.2                        SSD
894.0GB

      Aggregate capacity available for volume use would be 1.49TB.

Do you want to continue? {y|n}: y

cluster_A::>
```

3. Verify that mirroring of the root aggregate is complete: `storage aggregate show`

   The following example shows that the root aggregates are mirrored.

```
cluster_A::> storage aggregate show

Aggregate     Size Available Used% State   #Vols  Nodes        RAID
Status
--------- -------- --------- ----- ------- ------ -----------
------------
node_A_1_aggr0
          1.49TB   74.12GB   95% online      1 node_A_1    raid4,
                                                           mirrored,
                                                           normal
node_A_2_aggr0
          2.24TB   838.5GB   63% online      1 node_A_2    raid4,
                                                           mirrored,
                                                           normal
node_A_1_aggr1
          1.49TB   74.12GB   95% online      1 node_A_1    raid4,
                                                           mirrored,
                                                           normal
node_A_2_aggr1
          1.49TB   74.12GB   95% online      1 node_A_2    raid4
                                                           mirrored,
                                                           normal
4 entries were displayed.

cluster_A::>
```

4. Repeat these steps for the other root aggregates.

   Any root aggregate that does not have a status of mirrored must be mirrored.

Reconfiguring the ONTAP Mediator service (MetroCluster IP configurations)

If you have a MetroCluster IP configuration that was configured with the ONTAP Mediator service, you must remove and reconfigure the association with the mediator.

- You must have the IP address and username and password for the ONTAP Mediator service.
- The ONTAP Mediator service must be configured and operating on the Linux host.
  1. Remove the existing ONTAP Mediator configuration: `metrocluster configuration-settings mediator remove`
  2. Reconfigure the ONTAP Mediator configuration: `metrocluster configuration-settings mediator add -mediator-address mediator-IP-address`

Verifying the health of the MetroCluster configuration

You should check the health of the MetroCluster configuration to verify proper operation.

1. 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
```

2. 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.
```

3. 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.
```

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

5. Simulate a switchover operation:

   a. From any node's prompt, change to the advanced privilege level: `set -privilege advanced`

      You need to respond with `y` when prompted to continue into advanced mode and see the advanced mode prompt (*>).

   b. Perform the switchover operation with the -simulate parameter: `metrocluster switchover -simulate`

   c. Return to the admin privilege level: `set -privilege admin`

6. For MetroCluster IP configurations using the ONTAP Mediator service, confirm that the Mediator service is up and operating.

   a. Check that the Mediator disks are visible to the system: `storage failover mailbox-disk show`

      The following example shows that the mailbox disks have been recognized.

```
node_A_1::*> storage failover mailbox-disk show
                  Mailbox
Node              Owner      Disk     Name        Disk UUID
-------------     ------     -----    -----       ----------------
sti113-vsim-ucs626g
.
.
      local      0m.i2.3L26
7BBA77C9:AD702D14:831B3E7E:0B0730EE:00000000:00000000:00000000:000000
00:00000000:00000000
      local      0m.i2.3L27
928F79AE:631EA9F9:4DCB5DE6:3402AC48:00000000:00000000:00000000:000000
00:00000000:00000000
      local      0m.i1.0L60
B7BCDB3C:297A4459:318C2748:181565A3:00000000:00000000:00000000:000000
00:00000000:00000000
.
.
.
      partner    0m.i1.0L14
EA71F260:D4DD5F22:E3422387:61D475B2:00000000:00000000:00000000:000000
00:00000000:00000000
      partner    0m.i2.3L64
4460F436:AAE5AB9E:D1ED414E:ABF811F7:00000000:00000000:00000000:000000
00:00000000:00000000
28 entries were displayed.
```

b. Change to the advanced privilege level: `set -privilege advanced`

c. Check that the mailbox LUNs are visible to the system: `storage iscsi-initiator show`

The output will show the presence of the mailbox LUNs:

```
Node     Type        Label       Target Portal     Target Name
Admin/Op
----     ----        --------     ---------         ---------
-------------------------------       --------
.
.
.
.node_A_1
              mailbox
                    mediator 172.16.254.1     iqn.2012-
05.local:mailbox.target.db5f02d6-e3d3     up/up
.
.
.
17 entries were displayed.
```

d. Return to the administrative privilege level: `set -privilege admin`

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