Configure the MetroCluster for transition

ONTAP MetroCluster

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To prepare the configuration for transition you add the new nodes to the existing MetroCluster configuration and then move data to the new nodes.

Sending a custom AutoSupport message prior to maintenance

Before performing the maintenance, you should issue an AutoSupport message to notify NetApp technical support that maintenance is underway. Informing technical support that maintenance is underway prevents them from opening a case on the assumption that a disruption has occurred.

This task must be performed on each MetroCluster site.

1. To prevent automatic support case generation, send an Autosupport message to indicate maintenance is underway.
   a. Issue the following command: `system node autosupport invoke -node * -type all -message MAINT=maintenance-window-in-hours`

      maintenance-window-in-hours specifies the length of the maintenance window, with a maximum of 72 hours. If the maintenance is completed before the time has elapsed, you can invoke an AutoSupport message indicating the end of the maintenance period:`system node autosupport invoke -node * -type all -message MAINT=end`

   b. Repeat the command on the partner cluster.

Enabling transition mode and disabling cluster HA

You must enable the MetroCluster transition mode to allow the old and new nodes to operate together in the MetroCluster configuration, and disable cluster HA.

1. Enable transition:
   a. Change to the advanced privilege level: `set -privilege advanced`
   b. Enable transition mode: `metrocluster transition enable -transition-mode non-disruptive`

      Run this command on one cluster only.

```
cluster_A::*> metrocluster transition enable -transition-mode non-
disruptive

Warning: This command enables the start of a "non-disruptive"
MetroCluster
         FC-to-IP transition. It allows the addition of hardware for
another DR
         group that uses IP fabrics, and the removal of a DR group
that uses FC
         fabrics. Clients will continue to access their data during a
         non-disruptive transition.

         Automatic unplanned switchover will also be disabled by this
command.
Do you want to continue? {y|n}: y

cluster_A::*>
```

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

2. Verify that transition is enabled on both the clusters.

```
cluster_A::> metrocluster transition show-mode
Transition Mode

non-disruptive

cluster_A::*>


cluster_B::*> metrocluster transition show-mode
Transition Mode

non-disruptive

Cluster_B::>
```

3. Disable cluster HA.

You must run this command on both clusters.

```
cluster_A::*> cluster ha modify -configured false

Warning: This operation will unconfigure cluster HA. Cluster HA must be
configured on a two-node cluster to ensure data access availability in
the event of storage failover.
Do you want to continue? {y|n}: y
Notice: HA is disabled.

cluster_A::*>


cluster_B::*> cluster ha modify -configured false

Warning: This operation will unconfigure cluster HA. Cluster HA must be
configured on a two-node cluster to ensure data access availability in
the event of storage failover.
Do you want to continue? {y|n}: y
Notice: HA is disabled.

cluster_B::*>
```

4. Verify that cluster HA is disabled.

   You must run this command on both clusters.

```
cluster_A::> cluster ha show

High Availability Configured: false
Warning: Cluster HA has not been configured. Cluster HA must be
configured
on a two-node cluster to ensure data access availability in the
event of storage failover. Use the "cluster ha modify -configured
true" command to configure cluster HA.

cluster_A::>

cluster_B::> cluster ha show

High Availability Configured: false
Warning: Cluster HA has not been configured. Cluster HA must be
configured
on a two-node cluster to ensure data access availability in the
event of storage failover. Use the "cluster ha modify -configured
true" command to configure cluster HA.

cluster_B::>
```

Joining the MetroCluster IP nodes to the clusters

You must add the four new MetroCluster IP nodes to the existing MetroCluster configuration.

You must perform this task on both clusters.

1. Add the MetroCluster IP nodes to the existing MetroCluster configuration.
   a. Join the first MetroCluster IP node (node_A_1-IP) to the existing MetroCluster FC configuration.

```
Welcome to the cluster setup wizard.

You can enter the following commands at any time:
  "help" or "?" - if you want to have a question clarified,
  "back" - if you want to change previously answered questions, and
  "exit" or "quit" - if you want to quit the cluster setup wizard.
     Any changes you made before quitting will be saved.

You can return to cluster setup at any time by typing "cluster
setup".
To accept a default or omit a question, do not enter a value.
```

```
This system will send event messages and periodic reports to NetApp
Technical
Support. To disable this feature, enter autosupport modify -support
disable
within 24 hours.

Enabling AutoSupport can significantly speed problem determination
and
resolution, should a problem occur on your system.
For further information on AutoSupport, see:
http://support.netapp.com/autosupport/

Type yes to confirm and continue {yes}: yes

Enter the node management interface port [e0M]:
Enter the node management interface IP address: 172.17.8.93
Enter the node management interface netmask: 255.255.254.0
Enter the node management interface default gateway: 172.17.8.1
A node management interface on port e0M with IP address 172.17.8.93
has been created.

Use your web browser to complete cluster setup by accessing
https://172.17.8.93

Otherwise, press Enter to complete cluster setup using the command
line
interface:

Do you want to create a new cluster or join an existing cluster?
{create, join}:
join


Existing cluster interface configuration found:

Port    MTU     IP              Netmask
e0c     9000    169.254.148.217 255.255.0.0
e0d     9000    169.254.144.238 255.255.0.0

Do you want to use this configuration? {yes, no} [yes]: yes
.
.
.
```

b. Join the second MetroCluster IP node (node_A_2-IP) to the existing MetroCluster FC configuration.

2. Repeat these steps to join node_B_1-IP and node_B_2-IP to cluster_B.

Configuring intercluster LIFs, creating the MetroCluster interfaces, and mirroring root aggregates

You must create cluster peering LIFs, create the MetroCluster interfaces on the new MetroCluster IP nodes.

The home port used in the examples are platform-specific. You should use the appropriate home port specific to MetroCluster IP node platform.

1. On the new MetroCluster IP nodes, configure the intercluster LIFs.
2. On each site, verify that cluster peering is configured: `cluster peer show`

   The following example shows the cluster peering configuration on cluster_A:

   ```
   cluster_A:> cluster peer show
   Peer Cluster Name         Cluster Serial Number Availability
   Authentication
   ------------------------- --------------------- --------------
   --------------
   cluster_B                 1-80-000011           Available      ok
   ```

   The following example shows the cluster peering configuration on cluster_B:

   ```
   cluster_B:> cluster peer show
   Peer Cluster Name         Cluster Serial Number Availability
   Authentication
   ------------------------- --------------------- --------------
   --------------
   cluster_A 1-80-000011 Available ok
   ```

3. Configure the DR group for the MetroCluster IP nodes: `metrocluster configuration-settings dr-group create -partner-cluster`

   ```
   cluster_A::> metrocluster configuration-settings dr-group create
   -partner-cluster
   cluster_B -local-node node_A_3-IP -remote-node node_B_3-IP
   [Job 259] Job succeeded: DR Group Create is successful.
   cluster_A::>
   ```

4. Verify that the DR group is created. `metrocluster configuration-settings dr-group show`

```
cluster_A::> metrocluster configuration-settings dr-group show

DR Group ID Cluster                    Node               DR Partner
Node
----------- -------------------------- ------------------
------------------
2           cluster_A
                                       node_A_3-IP        node_B_3-IP
                                       node_A_4-IP        node_B_4-IP
            cluster_B
                                       node_B_3-IP        node_A_3-IP
                                       node_B_4-IP        node_A_4-IP

4 entries were displayed.

cluster_A::>
```

You will notice that the DR group for the old MetroCluster FC nodes (DR Group 1) is not listed when you run the `metrocluster configuration-settings dr-group show` command.

You can use `metrocluster node show` command on both sites to list all nodes.

```
cluster_A::> metrocluster node show

DR                               Configuration  DR
Group Cluster Node               State          Mirroring Mode
----- ------- ------------------ -------------- ---------
--------------------
1     cluster_A
              node_A_1-FC         configured     enabled   normal
              node_A_2-FC         configured     enabled   normal
      cluster_B
              node_B_1-FC         configured     enabled   normal
              node_B_2-FC         configured     enabled   normal
2     cluster_A
              node_A_1-IP      ready to configure
                                                 -         -
              node_A_2-IP      ready to configure
                                                 -         -

cluster_B::> metrocluster node show

DR                               Configuration  DR
Group Cluster Node               State          Mirroring Mode
----- ------- ------------------ -------------- ---------
--------------------
1     cluster_B
              node_B_1-FC         configured     enabled   normal
              node_B_2-FC         configured     enabled   normal
      cluster_A
              node_A_1-FC         configured     enabled   normal
              node_A_2-FC         configured     enabled   normal
2     cluster_B
              node_B_1-IP      ready to configure
                                                 -         -
              node_B_2-IP      ready to configure
                                                 -         -
```

5. Configure the MetroCluster IP interfaces for the newly joined MetroCluster IP nodes: `metrocluster configuration-settings interface create -cluster-name`

   See Configuring and connecting the MetroCluster IP interfaces for considerations when configuring the IP interfaces. NOTE: You can configure the MetroCluster IP interfaces from either cluster. Also, starting with ONTAP 9.9.1, if you are using a layer 3 configuration, you must also specify the `-gateway` parameter when creating MetroCluster IP interfaces. Refer to xref:./transition/../install-ip/concept_considerations_layer_3.html.

```
cluster_A::> metrocluster configuration-settings interface create
-cluster-name cluster_A -home-node node_A_3-IP -home-port e1a -address
172.17.26.10 -netmask 255.255.255.0
[Job 260] Job succeeded: Interface Create is successful.

cluster_A::> metrocluster configuration-settings interface create
-cluster-name cluster_A -home-node node_A_3-IP -home-port e1b -address
172.17.27.10 -netmask 255.255.255.0
[Job 261] Job succeeded: Interface Create is successful.

cluster_A::> metrocluster configuration-settings interface create
-cluster-name cluster_A -home-node node_A_4-IP -home-port e1a -address
172.17.26.11 -netmask 255.255.255.0
[Job 262] Job succeeded: Interface Create is successful.

cluster_A::> :metrocluster configuration-settings interface create
-cluster-name cluster_A -home-node node_A_4-IP -home-port e1b -address
172.17.27.11 -netmask 255.255.255.0
[Job 263] Job succeeded: Interface Create is successful.

cluster_A::> metrocluster configuration-settings interface create
-cluster-name cluster_B -home-node node_B_3-IP -home-port e1a -address
172.17.26.12 -netmask 255.255.255.0
[Job 264] Job succeeded: Interface Create is successful.

cluster_A::> metrocluster configuration-settings interface create
-cluster-name cluster_B -home-node node_B_3-IP -home-port e1b -address
172.17.27.12 -netmask 255.255.255.0
[Job 265] Job succeeded: Interface Create is successful.

cluster_A::> metrocluster configuration-settings interface create
-cluster-name cluster_B -home-node node_B_4-IP -home-port e1a -address
172.17.26.13 -netmask 255.255.255.0
[Job 266] Job succeeded: Interface Create is successful.

cluster_A::> metrocluster configuration-settings interface create
-cluster-name cluster_B -home-node node_B_4-IP -home-port e1b -address
172.17.27.13 -netmask 255.255.255.0
[Job 267] Job succeeded: Interface Create is successful.
```

6. Verify the MetroCluster IP interfaces are created: `metrocluster configuration-settings interface show`

```
cluster_A::>metrocluster configuration-settings interface show

DR
Config
Group Cluster Node    Network Address Netmask         Gateway
State
----- ------- ------- --------------- --------------- ---------------
---------
2     cluster_A
             node_A_3-IP
                 Home Port: e1a
                      172.17.26.10    255.255.255.0   -
completed
                 Home Port: e1b
                      172.17.27.10    255.255.255.0   -
completed
              node_A_4-IP
                 Home Port: e1a
                      172.17.26.11    255.255.255.0   -
completed
                 Home Port: e1b
                      172.17.27.11    255.255.255.0   -
completed
      cluster_B
             node_B_3-IP
                 Home Port: e1a
                      172.17.26.13    255.255.255.0   -
completed
                 Home Port: e1b
                      172.17.27.13    255.255.255.0   -
completed
              node_B_3-IP
                 Home Port: e1a
                      172.17.26.12    255.255.255.0   -
completed
                 Home Port: e1b
                      172.17.27.12    255.255.255.0   -
completed
8 entries were displayed.

cluster_A>
```

7. Connect the MetroCluster IP interfaces: `metrocluster configuration-settings connection connect`

This command might take several minutes to complete.

```
cluster_A::> metrocluster configuration-settings connection connect

cluster_A::>
```

8. Verify the connections are properly established: `metrocluster configuration-settings connection show`

```
cluster_A::> metrocluster configuration-settings connection show

DR                    Source          Destination
Group Cluster Node    Network Address Network Address Partner Type
Config State
----- ------- ------- --------------- --------------- ------------
------------
2     cluster_A
              node_A_3-IP**
                 Home Port: e1a
                      172.17.26.10    172.17.26.11    HA Partner
completed
                 Home Port: e1a
                      172.17.26.10    172.17.26.12    DR Partner
completed
                 Home Port: e1a
                      172.17.26.10    172.17.26.13    DR Auxiliary
completed
                 Home Port: e1b
                      172.17.27.10    172.17.27.11    HA Partner
completed
                 Home Port: e1b
                      172.17.27.10    172.17.27.12    DR Partner
completed
                 Home Port: e1b
                      172.17.27.10    172.17.27.13    DR Auxiliary
completed
              node_A_4-IP
                 Home Port: e1a
                      172.17.26.11    172.17.26.10    HA Partner
completed
                 Home Port: e1a
                      172.17.26.11    172.17.26.13    DR Partner
completed
                 Home Port: e1a
```

```
                     172.17.26.11    172.17.26.12    DR Auxiliary
completed
                Home Port: e1b
                     172.17.27.11    172.17.27.10    HA Partner
completed
                Home Port: e1b
                     172.17.27.11    172.17.27.13    DR Partner
completed
                Home Port: e1b
                     172.17.27.11    172.17.27.12    DR Auxiliary
completed

DR                   Source          Destination
Group Cluster Node   Network Address Network Address Partner Type
Config State
----- ------- ------- --------------- --------------- ------------
------------
2     cluster_B
              node_B_4-IP
                 Home Port: e1a
                     172.17.26.13    172.17.26.12    HA Partner
completed
                Home Port: e1a
                     172.17.26.13    172.17.26.11    DR Partner
completed
                Home Port: e1a
                     172.17.26.13    172.17.26.10    DR Auxiliary
completed
                Home Port: e1b
                     172.17.27.13    172.17.27.12    HA Partner
completed
                Home Port: e1b
                     172.17.27.13    172.17.27.11    DR Partner
completed
                Home Port: e1b
                     172.17.27.13    172.17.27.10    DR Auxiliary
completed
              node_B_3-IP
                 Home Port: e1a
                     172.17.26.12    172.17.26.13    HA Partner
completed
                Home Port: e1a
                     172.17.26.12    172.17.26.10    DR Partner
completed
                Home Port: e1a
                     172.17.26.12    172.17.26.11    DR Auxiliary
```

```
completed
                 Home Port: e1b
                      172.17.27.12    172.17.27.13    HA Partner
completed
                 Home Port: e1b
                      172.17.27.12    172.17.27.10    DR Partner
completed
                 Home Port: e1b
                      172.17.27.12    172.17.27.11    DR Auxiliary
completed
24 entries were displayed.

cluster_A::>
```

9. Verify disk autoassignment and partitioning: `disk show -pool Pool1`

```
cluster_A::> disk show -pool Pool1
                     Usable           Disk    Container   Container
Disk                   Size Shelf Bay Type    Type        Name
Owner
---------------- ---------- ----- --- ------- ----------- ---------
--------
1.10.4                    -    10   4 SAS     remote      -
node_B_2
1.10.13                   -    10  13 SAS     remote      -
node_B_2
1.10.14                   -    10  14 SAS     remote      -
node_B_1
1.10.15                   -    10  15 SAS     remote      -
node_B_1
1.10.16                   -    10  16 SAS     remote      -
node_B_1
1.10.18                   -    10  18 SAS     remote      -
node_B_2
...
2.20.0               546.9GB    20   0 SAS     aggregate   aggr0_rha1_a1
node_a_1
2.20.3               546.9GB    20   3 SAS     aggregate   aggr0_rha1_a2
node_a_2
2.20.5               546.9GB    20   5 SAS     aggregate   rha1_a1_aggr1
node_a_1
2.20.6               546.9GB    20   6 SAS     aggregate   rha1_a1_aggr1
node_a_1
2.20.7               546.9GB    20   7 SAS     aggregate   rha1_a2_aggr1
node_a_2
2.20.10              546.9GB    20  10 SAS     aggregate   rha1_a1_aggr1
node_a_1
...
43 entries were displayed.

cluster_A::>
```

10. Mirror the root aggregates: `storage aggregate mirror -aggregate aggr0_node_A_3-IP`

    You must complete this step on each MetroCluster IP node.

```
cluster_A::> aggr mirror -aggregate aggr0_node_A_3-IP

Info: Disks would be added to aggregate "aggr0_node_A_3-IP"on node
"node_A_3-IP"
      in the following manner:

      Second Plex

        RAID Group rg0, 3 disks (block checksum, raid_dp)
                                                                  Usable
Physical
          Position   Disk                      Type           Size
Size
          ---------- ------------------------- ---------- --------
--------
          dparity    4.20.0                    SAS               -
-
          parity     4.20.3                    SAS               -
-
          data       4.20.1                    SAS         546.9GB
558.9GB

      Aggregate capacity available forvolume use would be 467.6GB.

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

cluster_A::>
```

11. Verify that the root aggregates are mirrored: `storage aggregate show`

```
cluster_A::> aggr show

Aggregate     Size Available Used% State   #Vols  Nodes            RAID
Status
--------- -------- --------- ----- ------- ------ ----------------
------------
aggr0_node_A_1-FC
           349.0GB   16.84GB   95% online       1 node_A_1-FC
raid_dp,

mirrored,

normal
aggr0_node_A_2-FC
           349.0GB   16.84GB   95% online       1 node_A_2-FC
```

```
raid_dp,

mirrored,

normal
aggr0_node_A_3-IP
           467.6GB   22.63GB   95% online       1 node_A_3-IP
raid_dp,

mirrored,

normal
aggr0_node_A_4-IP
           467.6GB   22.62GB   95% online       1 node_A_4-IP
raid_dp,

mirrored,

normal
aggr_data_a1
            1.02TB    1.01TB    1% online       1 node_A_1-FC
raid_dp,

mirrored,

normal
aggr_data_a2
            1.02TB    1.01TB    1% online       1 node_A_2-FC
raid_dp,

mirrored,
```

Finalizing the addition of the MetroCluster IP nodes

You must incorporate the new DR group into the MetroCluster configuration and create mirrored data aggregates on the new nodes.

1. Create mirrored data aggregates on each of the new MetroCluster nodes: `storage aggregate create -aggregate aggregate-name -node node-name -diskcount no-of-disks -mirror true`

> ⓘ You must create at least one mirrored data aggregate per site. It is recommended to have two mirrored data aggregates per site on MetroCluster IP nodes to host the MDV volumes, however a single aggregate per site is supported (but not recommended). It is support that one site of the MetroCluster has a single mirrored data aggregate and the other site has more than one mirrored data aggregate.

The following example shows the creation of an aggregate on node_A_1-new.

```
cluster_A::> storage aggregate create -aggregate data_a3 -node node_A_1-
new -diskcount 10 -mirror t

Info: The layout for aggregate "data_a3" on node "node_A_1-new" would
be:

      First Plex

        RAID Group rg0, 5 disks (block checksum, raid_dp)
                                                                  Usable
Physical
          Position   Disk                      Type           Size
Size
          ---------- ------------------------- ---------- --------
--------
          dparity    5.10.15                   SAS               -
-
          parity     5.10.16                   SAS               -
-
          data       5.10.17                   SAS         546.9GB
547.1GB
          data       5.10.18                   SAS         546.9GB
558.9GB
          data       5.10.19                   SAS         546.9GB
558.9GB

      Second Plex

        RAID Group rg0, 5 disks (block checksum, raid_dp)
                                                                  Usable
Physical
          Position   Disk                      Type           Size
Size
          ---------- ------------------------- ---------- --------
--------
          dparity    4.20.17                   SAS               -
-
          parity     4.20.14                   SAS               -
-
          data       4.20.18                   SAS         546.9GB
547.1GB
          data       4.20.19                   SAS         546.9GB
547.1GB
          data       4.20.16                   SAS         546.9GB
```

```
547.1GB

      Aggregate capacity available for volume use would be 1.37TB.

Do you want to continue? {y|n}: y
[Job 440] Job succeeded: DONE

cluster_A::>
```

2. Configure the MetroCluster to implement the changes: `metrocluster configure`

```
cluster_A::*> metrocluster configure

[Job 439] Job succeeded: Configure is successful.

cluster_A::*>
```

3. Verify that the nodes are added to their DR group: `metrocluster node show`

```
cluster_A::*> metrocluster node show

DR                               Configuration  DR
Group Cluster Node               State          Mirroring Mode
----- ------- ------------------ -------------- ---------
--------------------
1     cluster_A
              node-A-1-FC        configured     enabled   normal
              node-A-2-FC        configured     enabled   normal
      Cluster-B
              node-B-1-FC        configured     enabled   normal
              node-B-2-FC        configured     enabled   normal
2     cluster_A
              node-A-3-IP        configured     enabled   normal
              node-A-4-IP        configured     enabled   normal
      Cluster-B
              node-B-3-IP        configured     enabled   normal
              node-B-4-IP        configured     enabled   normal
8 entries were displayed.

cluster_A::*>
```

4. Move the MDV_CRS volumes from the old nodes to the new nodes in advanced privilege.
   a. Display the volumes to identify the MDV volumes:

If you have a single mirrored data aggregate per site then move both the MDV volumes to this single aggregate. If you have two or more mirrored data aggregates, then move each MDV volume to a different aggregate.

The following example shows the MDV volumes in the volume show output:

```
cluster_A::> volume show
Vserver   Volume       Aggregate    State      Type       Size
Available Used%
--------- ------------ ------------ ---------- ---- ----------
---------- -----
...

cluster_A   MDV_CRS_2c78e009ff5611e9b0f300a0985ef8c4_A
                       aggr_b1      -          RW            -
-     -
cluster_A   MDV_CRS_2c78e009ff5611e9b0f300a0985ef8c4_B
                       aggr_b2      -          RW            -
-     -
cluster_A   MDV_CRS_d6b0b313ff5611e9837100a098544e51_A
                       aggr_a1      online     RW         10GB
9.50GB    0%
cluster_A   MDV_CRS_d6b0b313ff5611e9837100a098544e51_B
                       aggr_a2      online     RW         10GB
9.50GB    0%
...
11 entries were displayed.mple
```

b. Set the advanced privilege level: `set -privilege advanced`

c. Move the MDV volumes, one at a time: `volume move start -volume mdv-volume -destination-aggregate aggr-on-new-node -vserver vserver-name`

   The following example shows the command and output for moving MDV_CRS_d6b0b313ff5611e9837100a098544e51_A to aggregate data_a3 on node_A_3.

```
cluster_A::> vol move start -volume
MDV_CRS_d6b0b313ff5611e9837100a098544e51_A -destination-aggregate
data_a3 -vserver cluster_A

Warning: You are about to modify the system volume
         "MDV_CRS_d6b0b313ff5611e9837100a098544e51_A". This might
cause severe
         performance or stability problems. Do not proceed unless
directed to
         do so by support. Do you want to proceed? {y|n}: y
[Job 494] Job is queued: Move
"MDV_CRS_d6b0b313ff5611e9837100a098544e51_A" in Vserver "cluster_A"
to aggregate "data_a3". Use the "volume move show -vserver cluster_A
-volume MDV_CRS_d6b0b313ff5611e9837100a098544e51_A" command to view
the status of this operation.
```

d. Use the volume show command to check that the MDV volume has been successfully moved: `volume show mdv-name`

   The following output shows that the MDV volume has been successfully moved.

```
cluster_A::> vol show MDV_CRS_d6b0b313ff5611e9837100a098544e51_B
Vserver     Volume       Aggregate    State      Type       Size
Available Used%
---------   ------------ ------------ ---------- ---- ----------
---------- -----
cluster_A   MDV_CRS_d6b0b313ff5611e9837100a098544e51_B
                       aggr_a2      online     RW         10GB
9.50GB    0%
```

e. Return to admin mode: `set -privilege admin`