



Refreshing a four-node MetroCluster IP configuration (ONTAP 9.8 and later)

ONTAP MetroCluster

aherbin, netapp-ivanad, netapp-martyh
April 19, 2021

This PDF was generated from https://docs.netapp.com/us-en/ontap-metrocluster/upgrade/task_refresh_a_four_node_mcc_configuration_us_volume_move.html on April 28, 2021. Always check docs.netapp.com for the latest.

Table of Contents

- Refreshing a four-node MetroCluster IP configuration (ONTAP 9.8 and later) 1
 - Adding new nodes to the MetroCluster IP configuration 4

Refreshing a four-node MetroCluster IP configuration (ONTAP 9.8 and later)

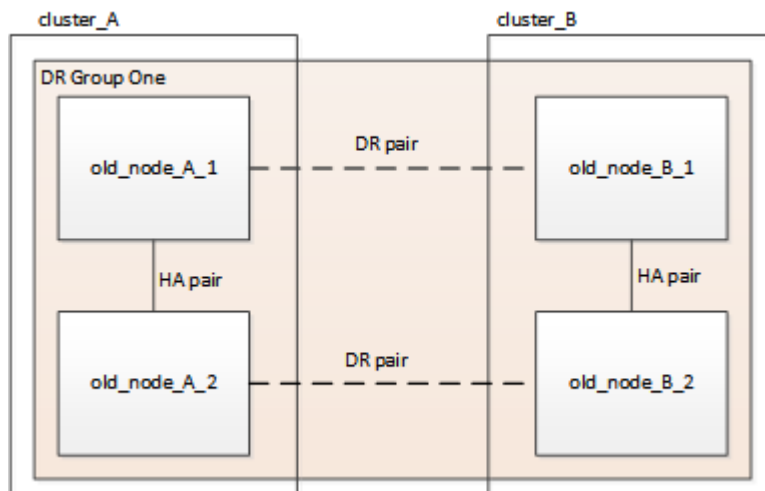
Starting with ONTAP 9.8, you can upgrade the controllers and storage in a four-node MetroCluster IP configuration by expanding the configuration to become a temporary eight-node configuration and then removing the old disaster recovery (DR) group.

- This procedure is supported on systems running ONTAP 9.8 and later.
- If you are upgrading the IP switches, they should be upgraded before performing this refresh procedure.
- References to "old nodes" mean the nodes that you intend to replace.
- This procedure is not supported on AFF A320 systems configured with Broadcom BES-53248 switches.

Steps

1. Gather information from the old nodes.

At this stage, the four-node configuration appears as shown in the following image:



2. To prevent automatic support case generation, send an Autosupport message to indicate the upgrade is underway.

- a. Issue the following command:

```
system node autosupport invoke -node * -type all -message "MAINT=10h  
Upgrading old-model to new-model"
```

Our example specifies a 10 hour maintenance window. You may want to allow additional time depending on your plan.

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.

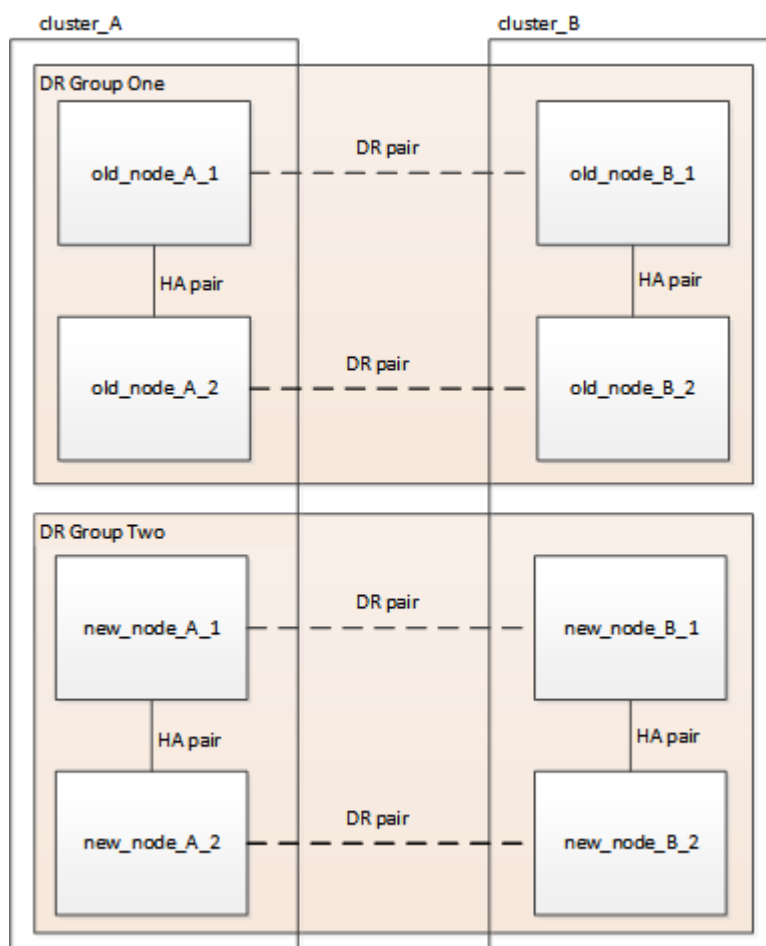
3. Remove the existing MetroCluster configuration from Tiebreaker, Mediator, or other software that can initiate switchover.

If you are using...	Use this procedure...
Tiebreaker	Removing MetroCluster Configurations in the <i>MetroCluster Tiebreaker Installation and Configuration Guide</i>
Mediator	Issue the following command from the ONTAP prompt: metrocluster configuration-settings mediator remove
Third-party applications	Refer to the product documentation.

- Perform all of the steps in the procedure to add nodes to your MetroCluster IP configuration.

[Adding new nodes to the MetroCluster IP configuration](#)

When the expansion procedure is complete, the configuration appears as shown in the following image:



- Move the CRS volumes.

Perform the steps in [Moving a metadata volume in MetroCluster configurations](#).

6. Move the data from the old nodes to new nodes using the following procedures from the *Controller Hardware Upgrade Express Guide*.

Other platform procedures: [Controller Hardware Upgrade Express Guide](#)

- a. Perform all the steps in [Creating an aggregate and moving volumes to the new nodes](#).



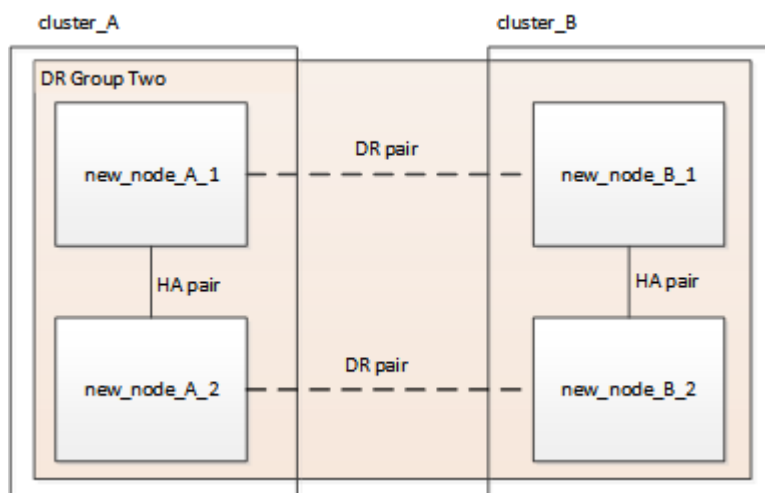
You might choose to mirror the aggregate when or after it is created.

- b. Perform all the steps in [Moving non-SAN data LIFs and cluster management LIFs to the new nodes](#).

7. Follow the steps in the procedure for removing the old DR group.

Removing a Disaster Recovery group

After you have removed the old DR group (DR group one), the configuration appears as shown in the following image:



8. Confirm the operational mode of the MetroCluster configuration and perform a MetroCluster check.
 - a. Confirm the MetroCluster configuration and that the operational mode is normal:

```
metrocluster show
```

- b. Confirm that all expected nodes are shown:

```
metrocluster node show
```

- c. Issue the following command:

```
metrocluster check run
```

- d. Display the results of the MetroCluster check:

```
metrocluster check show
```

9. Restore monitoring if necessary, using the procedure for your configuration.

If you are using...	Use this procedure
Tiebreaker	Adding MetroCluster configurations in the <i>MetroCluster Tiebreaker Installation and Configuration Guide</i>
Mediator	Configuring the ONTAP Mediator service from a MetroCluster IP configuration in the <i>MetroCluster IP Installation and Configuration Guide</i>
Third-party applications	Refer to the product documentation.

10. To resume automatic support case generation, send an Autosupport message to indicate that the maintenance is complete.
 - a. Issue the following command:

```
system node autosupport invoke -node * -type all -message MAINT=end
```

- b. Repeat the command on the partner cluster.

Adding new nodes to the MetroCluster IP configuration

You can add four new nodes to the MetroCluster IP configuration as a second DR group. This creates a temporary eight-node MetroCluster configuration.

- You must complete the initial steps in [Refreshing a four-node MetroCluster IP configuration \(ONTAP 9.8 and later\)](#).

After completing this procedure, return to [Refreshing a four-node MetroCluster IP configuration \(ONTAP 9.8 and later\)](#) to complete the refresh of the configuration.

- The old and new nodes must be running the same version of ONTAP.
- You must ensure that the old and new platform models are supported for platform mixing.

[NetApp Hardware Universe](#)

- You must ensure that the old and new platform models are both supported by the IP switches.

[NetApp Hardware Universe](#)

- The new nodes must have enough storage to accommodate the data of the old nodes, along with adequate disks for root aggregates and spare disks.

Example naming in this procedure

This procedure uses example names throughout to identify the DR groups, nodes, and switches involved.

DR groups	cluster_A at site_A	cluster_B at site_B
dr_group_1-old	<ul style="list-style-type: none"> • node_A_1-old • node_A_2-old 	<ul style="list-style-type: none"> • node_B_1-old • node_B_2-old
dr_group_2-new	<ul style="list-style-type: none"> • node_A_3-new • node_A_4-new 	<ul style="list-style-type: none"> • node_B_3-new • node_B_4-new

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.

Steps

1. To prevent automatic support case generation, send an Autosupport message to indicate the upgrade is underway.
 - a. Issue the following command:

```
system node autosupport invoke -node * -type all -message "MAINT=10h
Upgrading old-model to new-model"
```

Our example specifies a 10 hour maintenance window. You may want to allow additional time depending on your plan.

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.

Verifying the health of the MetroCluster configuration

You must verify the health and connectivity of the MetroCluster configuration prior to performing the transition

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. Run Config Advisor.

[NetApp Downloads: Config Advisor](#)

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

2. Verify that the cluster is healthy:

```
cluster show -vserver Cluster
```

```
cluster_A::> cluster show -vserver Cluster
Node           Health  Eligibility  Epsilon
-----
node_A_1       true    true         false
node_A_2       true    true         false

cluster_A::>
```

3. Verify that all cluster ports are up:

```
network port show -ipspace cluster
```



```
cluster_A::> network port show -ipspace cluster
```

```
Node: node_A_1-old
```

Port	IPspace	Broadcast	Domain	Link	MTU	Speed(Mbps) Admin/Oper	Health Status
e0a	Cluster	Cluster		up	9000	auto/10000	healthy
e0b	Cluster	Cluster		up	9000	auto/10000	healthy

```
Node: node_A_2-old
```

Port	IPspace	Broadcast	Domain	Link	MTU	Speed(Mbps) Admin/Oper	Health Status
e0a	Cluster	Cluster		up	9000	auto/10000	healthy
e0b	Cluster	Cluster		up	9000	auto/10000	healthy

```
4 entries were displayed.
```

```
cluster_A::>
```

4. Verify that all cluster LIFs are up and operational:

```
network interface show -vserver Cluster
```

Each cluster LIF should display true for Is Home and have a Status Admin/Oper of up/up

```
cluster_A::> network interface show -vserver cluster
```

Current Is	Logical	Status	Network	Current	
Vserver	Interface	Admin/Oper	Address/Mask	Node	Port
Home					
-----	-----	-----	-----	-----	
-----	-----				
Cluster					
	node_A_1-old_clus1				
		up/up	169.254.209.69/16	node_A_1	e0a
true					
	node_A_1-old_clus2				
		up/up	169.254.49.125/16	node_A_1	e0b
true					
	node_A_2-old_clus1				
		up/up	169.254.47.194/16	node_A_2	e0a
true					
	node_A_2-old_clus2				
		up/up	169.254.19.183/16	node_A_2	e0b
true					

4 entries were displayed.

```
cluster_A::>
```

5. Verify that auto-revert is enabled on all cluster LIFs:

```
network interface show -vserver Cluster -fields auto-revert
```

```

cluster_A::> network interface show -vserver Cluster -fields auto-revert

      Logical
Vserver  Interface      Auto-revert
-----  -
Cluster
      node_A_1-old_clus1
                        true
      node_A_1-old_clus2
                        true
      node_A_2-old_clus1
                        true
      node_A_2-old_clus2
                        true

      4 entries were displayed.

cluster_A::>

```

Removing the configuration from monitoring applications

If the existing configuration is monitored with the MetroCluster Tiebreaker software, the ONTAP Mediator or other third-party applications (for example, ClusterLion) that can initiate a switchover, you must remove the MetroCluster configuration from the monitoring software prior to upgrade.

1. Remove the existing MetroCluster configuration from Tiebreaker, Mediator, or other software that can initiate switchover.

If you are using...	Use this procedure...
Tiebreaker	Removing MetroCluster Configurations in the <i>MetroCluster Tiebreaker Installation and Configuration Guide</i>
Mediator	Issue the following command from the ONTAP prompt: metrocluster configuration-settings mediator remove
Third-party applications	Refer to the product documentation.

2. Remove the existing MetroCluster configuration from any third-party application that can initiate switchover.

Refer to the documentation for the application.

Preparing the new controller modules

You must prepare the four new MetroCluster nodes and install the correct ONTAP version.

This task must be performed on each of the new nodes:

- node_A_3-new
- node_A_4-new
- node_B_3-new
- node_B_4-new

In these steps, you clear the configuration on the nodes and clear the mailbox region on new drives.

Steps

1. Rack the new controllers.
2. Cable the new MetroCluster IP nodes to the IP switches as shown in the *MetroCluster Installation and Configuration Guide*.

Cabling the IP switches

3. Configure the MetroCluster IP nodes using the following sections of the *MetroCluster Installation and Configuration Guide*.
 - a. [Gathering required information](#)
 - b. [Restoring system defaults on a controller module](#)
 - c. [Verifying the ha-config state of components](#)
 - d. [Manually assigning drives for pool 0 \(ONTAP 9.4 and later\)](#)
4. From Maintenance mode, issue the halt command to exit Maintenance mode, and then issue the boot_ontap command to boot the system and get to cluster setup.

Do not complete the cluster wizard or node wizard at this time.

Joining the new 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.

Steps

1. Add the new MetroCluster IP nodes to the existing MetroCluster configuration.
 - a. Join the first new MetroCluster IP node (node_A_1-new) to the existing MetroCluster IP 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]: 172.17.8.93

172.17.8.93 is not a valid port.

The physical port that is connected to the node management network.
Examples of

node management ports are "e4a" or "e0M".

You can type "back", "exit", or "help" at any question.

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 new MetroCluster IP node (node_A_2-new) to the existing MetroCluster IP configuration.

2. Repeat these steps to join node_B_1-new and node_B_2-new 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 using the procedures in the *MetroCluster IP Installation and Configuration Guide*.

[Configuring intercluster LIFs on dedicated ports](#)

[Configuring intercluster LIFs on shared data ports](#)

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
cluster_B::>
```

3. Create the DR group for the MetroCluster IP nodes:

metrocluster configuration-settings dr-group create -partner-cluster

For more information on the MetroCluster configuration settings and connections, see the *MetroCluster IP Installation and Configuration Guide*.

[Considerations for MetroCluster IP configuration](#)

[Creating the DR group](#)

```
cluster_A::> metrocluster configuration-settings dr-group create
-partner-cluster
cluster_B -local-node node_A_1-new -remote-node node_B_1-new
[Job 259] Job succeeded: DR Group Create is successful.
cluster_A::>
```

4. Verify that the DR group was created.

metrocluster configuration-settings dr-group show

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

DR Group ID	Cluster	Node	DR Partner
1	cluster_A	node_A_1-old	node_B_1-old
		node_A_2-old	node_B_2-old
	cluster_B	node_B_1-old	node_A_1-old
		node_B_2-old	node_A_2-old
2	cluster_A	node_A_1-new	node_B_1-new
		node_A_2-new	node_B_2-new
	cluster_B	node_B_1-new	node_A_1-new
		node_B_2-new	node_A_2-new

8 entries were displayed.

```
cluster_A::>
```

5. Configure the MetroCluster IP interfaces for the newly joined MetroCluster IP nodes:

metrocluster configuration-settings interface create -cluster-name



Starting with ONTAP 9.8, certain platforms use a VLAN for the MetroCluster IP interface. By default, each of the two ports uses a different VLAN: 10 and 20. You can also specify a different (non-default) VLAN higher than 100 (between 101—4095) using the `-vlan-id` parameter in the `metrocluster configuration-settings interface create` command.

The following platform models use VLANs and allow configuration of a non-default VLAN ID.

AFF platforms	FAS platforms
<ul style="list-style-type: none"> • AFF A220 • AFF A250 • AFF A400 	<ul style="list-style-type: none"> • FAS2750 • FAS500f • FAS8300 • FAS8700

+ NOTE: You can configure the MetroCluster IP interfaces from either cluster.

+


```

cluster_A::> metrocluster configuration-settings interface create -cluster
-name cluster_A -home-node node_A_1-new -home-port el1a -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_1-new -home-port elb -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_2-new -home-port el1a -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_2-new -home-port elb -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_1-new -home-port el1a -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_1-new -home-port elb -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_2-new -home-port el1a -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_2-new -home-port elb -address
172.17.27.13 -netmask 255.255.255.0
[Job 267] Job succeeded: Interface Create is successful.

```

1. 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
-----
1      cluster_A
      node_A_1-old
      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_2-old
      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_1-old
      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_1-old
      Home Port: e1a
      172.17.26.12      255.255.255.0      -
completed
      Home Port: e1b
      172.17.27.12      255.255.255.0      -
completed
2      cluster_A
      node_A_3-new
      Home Port: e1a
      172.17.28.10      255.255.255.0      -
completed
      Home Port: e1b
      172.17.29.10      255.255.255.0      -
completed
      node_A_3-new

```

```

                Home Port: ela
                172.17.28.11      255.255.255.0    -
completed
                Home Port: elb
                172.17.29.11      255.255.255.0    -
completed
    cluster_B
        node_B_3-new
            Home Port: ela
            172.17.28.13      255.255.255.0    -
completed
            Home Port: elb
            172.17.29.13      255.255.255.0    -
completed
        node_B_3-new
            Home Port: ela
            172.17.28.12      255.255.255.0    -
completed
            Home Port: elb
            172.17.29.12      255.255.255.0    -
completed
8 entries were displayed.

cluster_A>

```

2. 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::>

```

3. Verify the connections are properly established: **metrocluster configuration-settings connection show**

```

cluster_A::> metrocluster configuration-settings connection show

DR
Group Cluster Node      Source          Destination
Config State   Network Address Network Address Partner Type
-----
-----
-----

```

```

1      cluster_A
      node_A_1-old
      Home Port: ela
      172.17.28.10      172.17.28.11      HA Partner
completed
      Home Port: ela
      172.17.28.10      172.17.28.12      DR Partner
completed
      Home Port: ela
      172.17.28.10      172.17.28.13      DR Auxiliary
completed
      Home Port: elb
      172.17.29.10      172.17.29.11      HA Partner
completed
      Home Port: elb
      172.17.29.10      172.17.29.12      DR Partner
completed
      Home Port: elb
      172.17.29.10      172.17.29.13      DR Auxiliary
completed
      node_A_2-old
      Home Port: ela
      172.17.28.11      172.17.28.10      HA Partner
completed
      Home Port: ela
      172.17.28.11      172.17.28.13      DR Partner
completed
      Home Port: ela
      172.17.28.11      172.17.28.12      DR Auxiliary
completed
      Home Port: elb
      172.17.29.11      172.17.29.10      HA Partner
completed
      Home Port: elb
      172.17.29.11      172.17.29.13      DR Partner
completed
      Home Port: elb
      172.17.29.11      172.17.29.12      DR Auxiliary
completed

DR      Source      Destination
Group Cluster Node      Network Address      Network Address      Partner Type
Config State
-----
-----
1      cluster_B

```

```

node_B_2-old
  Home Port: ela
    172.17.28.13    172.17.28.12    HA Partner
completed
  Home Port: ela
    172.17.28.13    172.17.28.11    DR Partner
completed
  Home Port: ela
    172.17.28.13    172.17.28.10    DR Auxiliary
completed
  Home Port: elb
    172.17.29.13    172.17.29.12    HA Partner
completed
  Home Port: elb
    172.17.29.13    172.17.29.11    DR Partner
completed
  Home Port: elb
    172.17.29.13    172.17.29.10    DR Auxiliary
completed
node_B_1-old
  Home Port: ela
    172.17.28.12    172.17.28.13    HA Partner
completed
  Home Port: ela
    172.17.28.12    172.17.28.10    DR Partner
completed
  Home Port: ela
    172.17.28.12    172.17.28.11    DR Auxiliary
completed
  Home Port: elb
    172.17.29.12    172.17.29.13    HA Partner
completed
  Home Port: elb
    172.17.29.12    172.17.29.10    DR Partner
completed
  Home Port: elb
    172.17.29.12    172.17.29.11    DR Auxiliary
completed

DR          Source          Destination
Group Cluster Node    Network Address Network Address Partner Type
Config State
-----
2      cluster_A
      node_A_1-new**

```

```

        Home Port: ela
        172.17.26.10      172.17.26.11      HA Partner
completed

        Home Port: ela
        172.17.26.10      172.17.26.12      DR Partner
completed

        Home Port: ela
        172.17.26.10      172.17.26.13      DR Auxiliary
completed

        Home Port: elb
        172.17.27.10      172.17.27.11      HA Partner
completed

        Home Port: elb
        172.17.27.10      172.17.27.12      DR Partner
completed

        Home Port: elb
        172.17.27.10      172.17.27.13      DR Auxiliary
completed

node_A_2-new
  Home Port: ela
  172.17.26.11      172.17.26.10      HA Partner
completed

  Home Port: ela
  172.17.26.11      172.17.26.13      DR Partner
completed

  Home Port: ela
  172.17.26.11      172.17.26.12      DR Auxiliary
completed

  Home Port: elb
  172.17.27.11      172.17.27.10      HA Partner
completed

  Home Port: elb
  172.17.27.11      172.17.27.13      DR Partner
completed

  Home Port: elb
  172.17.27.11      172.17.27.12      DR Auxiliary
completed

DR
Group Cluster Node      Source      Destination
Config State      Network Address Network Address Partner Type
-----
2      cluster_B
      node_B_2-new
      Home Port: ela

```

```

172.17.26.13      172.17.26.12      HA Partner
completed
Home Port: ela
172.17.26.13      172.17.26.11      DR Partner
completed
Home Port: ela
172.17.26.13      172.17.26.10      DR Auxiliary
completed
Home Port: elb
172.17.27.13      172.17.27.12      HA Partner
completed
Home Port: elb
172.17.27.13      172.17.27.11      DR Partner
completed
Home Port: elb
172.17.27.13      172.17.27.10      DR Auxiliary
completed
node_B_1-new
Home Port: ela
172.17.26.12      172.17.26.13      HA Partner
completed
Home Port: ela
172.17.26.12      172.17.26.10      DR Partner
completed
Home Port: ela
172.17.26.12      172.17.26.11      DR Auxiliary
completed
Home Port: elb
172.17.27.12      172.17.27.13      HA Partner
completed
Home Port: elb
172.17.27.12      172.17.27.10      DR Partner
completed
Home Port: elb
172.17.27.12      172.17.27.11      DR Auxiliary
completed
48 entries were displayed.

cluster_A::>

```

4. Verify disk autoassignment and partitioning:

disk show -pool Pool1

```
cluster_A::> disk show -pool Pool1
```

Disk Owner	Usable Size	Shelf	Bay	Disk Type	Container Type	Container Name
-----	-----	-----	-----	-----	-----	-----
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::>
```

5. Mirror the root aggregates:

storage aggregate mirror -aggregate aggr0_node_A_1-new



You must complete this step on each MetroCluster IP node.


```
cluster_A::> aggr mirror -aggregate aggr0_node_A_1-new

Info: Disks would be added to aggregate "aggr0_node_A_1-new"on node
"node_A_1-new"
    in the following manner:

    Second Plex

        RAID Group rg0, 3 disks (block checksum, raid_dp)

Physical                                     Usable
Size      Position   Disk                               Type      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::>
```

6. 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-old
      349.0GB   16.84GB   95% online      1 node_A_1-old
raid_dp,
mirrored,
normal
```

```

aggr0_node_A_2-old
      349.0GB    16.84GB    95% online      1 node_A_2-old
raid_dp,

mirrored,

normal
aggr0_node_A_1-new
      467.6GB    22.63GB    95% online      1 node_A_1-new
raid_dp,

mirrored,

normal
aggr0_node_A_2-new
      467.6GB    22.62GB    95% online      1 node_A_2-new
raid_dp,

mirrored,

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

mirrored,

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

mirrored,

```

Finalizing the addition of the new 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. Refresh the MetroCluster configuration:

a. Enter advanced privilege mode:

```
set -privilege advanced
```

b. Refresh the MetroCluster configuration on one of the new nodes:

```
metrocluster configure
```

The following example shows the MetroCluster configuration refreshed on both DR groups:

```

cluster_A::*> metrocluster configure -refresh true

[Job 726] Job succeeded: Configure is successful.

```

c. Return to admin privilege mode:

```
set -privilege admin
```

3. Verify that the nodes are added to their DR group.

```
cluster_A::*> metrocluster node show
```

DR	Configuration	DR
Group Cluster Node	State	Mirroring Mode
-----	-----	-----
1	cluster_A	
	node_A_1-old	configured enabled normal
	node_A_2-old	configured enabled normal
	cluster_B	
	node_B_1-old	configured enabled normal
	node_B_2-old	configured enabled normal
2	cluster_A	
	node_A_3-new	configured enabled normal
	node_A_4-new	configured enabled normal
	cluster_B	
	node_B_3-new	configured enabled normal
	node_B_4-new	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 vservice-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

5. Move epsilon from an old node to a new node:

a. Identify which node currently has epsilon:

cluster show -fields epsilon

```
cluster_B::> cluster show -fields epsilon
node                epsilon
-----
node_A_1-old        true
node_A_2-old        false
node_A_3-new        false
node_A_4-new        false
4 entries were displayed.
```

- b. Set epsilon to false on the old node (node_A_1-old):

```
cluster modify -node old-node -epsilon false
```

- c. Set epsilon to true on the new node (node_A_3-new):

```
cluster modify -node new-node -epsilon true
```

- d. Verify that epsilon has moved to the correct node:

```
cluster show -fields epsilon
```

```
cluster_A::> cluster show -fields epsilon
node                epsilon
-----
node_A_1-old        false
node_A_2-old        false
node_A_3-new        true
node_A_4-new        false
4 entries were displayed.
```

6. Complete the remaining steps in [Refreshing a four-node MetroCluster IP configuration \(ONTAP 9.8 and later\)](#).

You have now completed step 4, adding the new nodes to the MetroCluster IP configuration.

Copyright Information

Copyright © 2021 NetApp, Inc. All rights reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system- without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP “AS IS” AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

Trademark Information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.