Administration

ONTAP System Manager

NetApp
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Administration

Creating a common Snapshot copy

In addition to the regularly scheduled Snapshot copy operations, you can manually create a common Snapshot copy between the volumes in the primary SnapMirror consistency group and the volumes in the secondary SnapMirror consistency group.

Before you begin

The SnapMirror group relationship must be in sync.

Steps

1. Create a common Snapshot copy:

   ```
   destination::>snapmirror update -destination-path vs1_dst:/cg/cg_dst
   ```

2. Monitor the progress of the update:

   ```
   destination::>snapmirror show -fields -newest-snapshot
   ```

Performing a planned failover

You can perform a planned failover to test your disaster recovery configuration or to perform maintenance on the primary cluster.

Before you begin

- The relationship must be in sync

- Nondisruptive operations must not be running

- The ONTAP Mediator must be configured, connected, and in quorum

About this task

A planned failover is initiated by the administrator of the secondary cluster. The operation requires switching the primary and secondary roles so that the secondary cluster takes over from the primary. The new primary cluster can then begin processing input and output requests locally without disrupting client operations.

Steps

1. Start the failover operation:

   ```
   destination::>snapmirror failover start -destination-path vs1_dst:/cg/cg_dst
   ```

2. Monitor the progress of the failover:

```
destination::>snapmirror failover show
```

3. When the failover operation is complete, you can monitor the Synchronous SnapMirror protection relationship status from the destination:

```
destination::>snapmirror show
```

Automatic unplanned failover operations

An automatic unplanned failover (AUFO) operation occurs when the primary cluster is down or isolated. When this occurs, the secondary cluster is converted to the primary and begins serving clients. This operation is performed only with assistance from the ONTAP Mediator.

> After the automatic unplanned failover, it is important to rescan the host LUN I/O paths so that there is no loss of I/O paths.

You can monitor the status of the automatic unplanned failover by using the `snapmirror failover show` command.

Basic monitoring

There are several SM-BC components and operations you can monitor.

ONTAP mediator

During normal operation, the Mediator state should be connected. If it is in any other state, this might indicate an error condition. You can review the Event Management System (EMS) messages to determine the error and appropriate corrective actions.

EMS Name	Description
sm.mediator.added	Mediator is added successfully
sm.mediator.removed	Mediator is removed successfully
sm.mediator.unusable	Mediator is unusable due to a corrupted Mediator server
sm.mediator.misconfigured	Mediator is repurposed or the Mediator package is no longer installed on the Mediator server
sm.mediator.unreachable	Mediator is unreachable
sm.mediator.removed.force	Mediator is removed from the cluster using the "force" option

EMS Name	Description
sm.mediator.cacert.expiring	Mediator certificate authority (CA) certificate is due to expire in 30 days or less
sm.mediator.serverc.expiring	Mediator server certificate is due to expire in 30 days or less
sm.mediator.clientc.expiring	Mediator client certificate is due to expire in 30 days or less
sm.mediator.cacert.expired	Mediator certificate authority (CA) certificate has expired
sm.mediator.serverc.expired	Mediator server certificate has expired
sm.mediator.clientc.expired	Mediator client certificate has expired
sm.mediator.in.quorum	All the SM-BC records are resynchronized with Mediator

Planned failover operations

You can monitor status and progress of a planned failover operation using the `snapmirror failover show` command. For example:

```
ClusterB::> snapmirror failover start -destination-path vs1:/cg/dcg1
```

Once the failover operation is complete, you can monitor the Synchronous SnapMirror protection status from the new destination cluster. For example:

```
ClusterA::> snapmirror show
```

You can also review the following messages to determine if there is an error and take the appropriate corrective actions.

EMS Name	Description
smbc.pfo.failed	SMBC planned failover operation failed. Destination path:
smbc.pfo.start. Destination path:	SMBC planned failover operation started

Automatic unplanned failover operations

During an unplanned automatic failover, you can monitor the status of the operation using the `snapmirror failover show` command. For example:

```
ClusterB::> snapmirror failover show -instance
Start Time: 9/23/2020 22:03:29
         Source Path: vs1:/cg/scg3
    Destination Path: vs3:/cg/dcg3
     Failover Status: completed
        Error Reason:
            End Time: 9/23/2020 22:03:30
Primary Data Cluster: cluster-2
Last Progress Update: -
       Failover Type: unplanned
  Error Reason codes: -
```

You can also review the following messages to determine if there is an error and take the appropriate corrective actions.

EMS Name	Description
smbc.aufo.failed	SnapMirror automatic planned failover operation failed. Destination path:
smbc.aufo.start. Destination path:	SMBC planned failover operation started
smbc.aufo.completed:	SnapMirror automatic planned failover operation completed. Destination path:
smbc.aufo.failover.incapable	block.giveback.during.aufo

SM-BC availability

You can check the availability of the SM-BC relationship using a series of commands, either on the primary cluster, the secondary cluster, or both.

Commands you use include the `snapmirror mediator show` command on both the primary and secondary cluster to check the connection and quorum status, the `snapmirror show` command, and the `volume show` command. For example:

```
SMBC_A::*> snapmirror mediator show
Mediator Address Peer Cluster     Connection Status Quorum Status
---------------- ---------------- ----------------- -------------
10.236.172.86    SMBC_B           connected         true


SMBC_B::*> snapmirror mediator show
Mediator Address Peer Cluster     Connection Status Quorum Status
---------------- ---------------- ----------------- -------------
10.236.172.86    SMBC_A           connected         true


SMBC_B::*> snapmirror show -expand

                                                       Progress
Source            Destination Mirror  Relationship  Total       Last
Path        Type  Path        State   Status        Progress Healthy Updated
----------- ----  ----------- ------- ------------- --------- ------- --------
vs0:/cg/cg1 XDP   vs1:/cg/cg1_dp Snapmirrored InSync  -         true    -
vs0:vol1    XDP   vs1:vol1_dp  Snapmirrored InSync    -         true    -
2 entries were displayed.


SMBC_A::*> volume show -fields is-smbc-master,smbc-consensus,is-smbc-failover-capable
-volume vol1
vserver volume is-smbc-master is-smbc-failover-capable smbc-consensus
------- ------ -------------- ------------------------ --------------
vs0     vol1   true           false                    Consensus


SMBC_B::*> volume show -fields is-smbc-master,smbc-consensus,is-smbc-failover-capable
-volume vol1_dp
vserver volume  is-smbc-master is-smbc-failover-capable smbc-consensus
------- ------- -------------- ------------------------ --------------
vs1     vol1_dp false          true                     No-consensus
```

Adding and removing volumes in a consistency group

If you want to change the composition of the consistency group by adding or removing a volume, you must first delete the original relationship and then create the consistency group again with the new composition.

About this task

- The composition change is not allowed when the consistency group is in the "InSync" state.
- The destination volume should be of type DP.

The new volume you add to expand the consistency group must have a pair of common Snapshot copies between the source and destination volumes.

1. Delete the zero RTO consistency group relationship:

   ```
   destination::>snapmirror delete -destination-path vs1_dst:/cg/cg_dst
   ```

2. Release the source side SnapMirror relationship and retain common Snapshot copies:

   ```
   source::>snapmirror release -relationship-info-only true -destination-path vs1_dst:/cg/cg_dst
   ```

3. Create the new consistency group with the new composition:

   ```
   destination::>  snapmirror  create  -source-path  vs1_src:/cg/cg_src  -destination-path
   vs1_dst:/cg/cg_dst -cg-item-mappings vol_src2:@vol_dst2
   ```

4. Resynchronize the zero RTO consistency group relationship to ensure it is in sync:

   ```
   destination::> snapmirror resync -destination-path vs1_dst:/cg/cg_dst
   ```

5. Rescan host LUN I/O paths to restore all paths to the LUNs.

Converting existing relationships to SM-BC relationships

You can convert an existing zero recovery point protection (zero RPO) Synchronous SnapMirror relationship to an SM-BC zero RTO Synchronous SnapMirror consistency group relationship.

Before you begin

- A zero RPO Synchronous SnapMirror relationship exists between the primary and secondary
- All LUNs on the destination volume are unmapped before the zero RTO SnapMirror relationship is created

About this task

- You must be a cluster and SVM administrator on the source and destination.
- You cannot convert zero RPO to zero RTO sync by changing the SnapMirror policy.
- If existing LUNs on the secondary volume are mapped, `snapmirror create` with AutomatedFailover policy triggers an error.
  You must ensure the LUNs are unmapped before issuing the `snapmirror create` command.

Steps

1. Perform a SnapMirror update operation on the existing relationship:

   ```
   destination::>snapmirror update -destination-path vs1_dst:vol1
   ```

2. Verify that the SnapMirror update completed successfully:

   ```
   destination::>snapmirror show
   ```

3. Quiesce each of the zero RPO synchronous relationships:

```
destination::>snapmirror quiesce -destination-path vs1_dst:vol1

destination::>snapmirror quiesce -destination-path vs1_dst:vol2
```

4. Delete each of the zero RPO synchronous relationships:

```
destination::>snapmirror delete -destination-path vs1_dst:vol1

destination::>snapmirror delete -destination-path vs1_dst:vol2
```

5. Release the source SnapMirror relationship but retain the common Snapshot copies:

```
source::>snapmirror release -relationship-info-only true -destination-path vs1_dst:vol1

source::>snapmirror release -relationship-info-only true -destination-path vs1_dst:vol2
```

6. Create a group zero RTO Synchronous Snapmirror relationship:

```
destination::> snapmirror create -source-path vs1_src:/cg/cg_src -destination-path
vs1_dst:/cg/cg_dst -cg-item-mappings vol1:@vol1,vol2:@vol2 -policy AutomatedFailover
```

7. Resynchronize the zero RTO consistency group:

```
destination::> snapmirror resync -destination-path vs1_dst:/cg/cg_dst
```

8. Rescan host LUN I/O paths to restore all paths to the LUNs.

SM-BC upgrade and revert considerations

You should be aware of the requirements for upgrading and reverting an SM-BC configuration.

Upgrade

Before you can configure and use SM-BC, you must upgrade all nodes on the source and destination clusters to ONTAP 9.8 or later.

> ℹ️ SM-BC is not supported mixed ONTAP 9.7 and ONTAP 9.8 clusters.

Reverting to ONTAP 9.7 from ONTAP 9.8

When you revert from ONTAP 9.8 to ONTAP 9.7, you must be aware of the following:

- If the cluster is hosting an SM-BC destination, reverting to ONTAP 9.7 is not allowed until the relationship is broken and deleted.

- If the cluster is hosting an SM-BC source, reverting to ONTAP 9.7 is not allowed until the relationship is released.

- All user-created custom SM-BC SnapMirror policies must be deleted before reverting to ONTAP 9.7.

Steps

1. Perform a revert check from one of the clusters in the SM-BC relationship:

   ```
   cluster::*> system node revert-to -version 9.7 -check-only
   ```

   Example:

```
cluster::*> system node revert-to -version 9.7 -check-only
Error: command failed: The revert check phase failed. The following issues must be
resolved before revert can be completed. Bring the data LIFs down on running vservers.
Command to list the running vservers: vserver show -admin-state running Command to
list the data LIFs that are up: network interface show -role data -status-admin up
Command to bring all data LIFs down: network interface modify {-role data} -status
-admin down
Disable snapshot policies.
    Command to list snapshot policies: "snapshot policy show".
    Command to disable snapshot policies: "snapshot policy modify -vserver
   * -enabled false"

   Break off the initialized online data-protection (DP) volumes and delete
   Uninitialized online data-protection (DP) volumes present on the local
   node.
    Command to list all online data-protection volumes on the local node:
   volume show -type DP -state online -node <local-node-name>
    Before breaking off the initialized online data-protection volumes,
   quiesce and abort transfers on associated SnapMirror relationships and
   wait for the Relationship Status to be Quiesced.
    Command to quiesce a SnapMirror relationship: snapmirror quiesce
    Command to abort transfers on a SnapMirror relationship: snapmirror
   abort
    Command to see if the Relationship Status of a SnapMirror relationship
   is Quiesced: snapmirror show
    Command to break off a data-protection volume: snapmirror break
    Command to break off a data-protection volume which is the destination
   of a SnapMirror relationship with a policy of type "vault": snapmirror
   break -delete-snapshots
    Uninitialized data-protection volumes are reported by the "snapmirror
   break" command when applied on a DP volume.
    Command to delete volume: volume delete

   Delete current version snapshots in advanced privilege level.
    Command to list snapshots: "snapshot show -fs-version 9.8"
    Command to delete snapshots: "snapshot prepare-for-revert -node
   <nodename>"

   Delete all user-created policies of the type active-strict-sync-mirror
   and active-sync-mirror.
   The command to see all active-strict-sync-mirror and active-sync-mirror
   type policies is:
    snapmirror policy show -type
   active-strict-sync-mirror,active-sync-mirror
   The command to delete a policy is :
    snapmirror policy delete -vserver <vserver-name> -policy <policy-name>
```

Removing an SM-BC configuration

You can remove zero RTO Synchronous SnapMirror protection and delete the SM-BC relationship configuration.

About this task

Before you delete the SM-BC relationship, all LUNs in the destination cluster must be unmapped.
After the LUNs are unmapped and the host is rescanned, the SCSI target notifies the hosts that the LUN inventory has changed. The existing LUNs on the zero RTO secondary volumes change to reflect a new identity after the zero RTO relationship is deleted. Hosts discover the secondary volume LUNs as new LUNs that have no relationship to the source volume LUNs.
The secondary volumes remain DP volumes after the relationship is deleted. You can issue the snapmirror break command to convert them to read/write.
Deleting the relationship is not allowed in the failed-over state when the relationship is not reversed.

Steps

1. Delete the SM-BC consistency group relationship:

    ```
    Destination::>snapmirror delete -destination-path vs1_dst:/cg/cg_dst
    ```

2. From the source cluster, release the consistency group relationship and the Snapshot copies created for the relationship:

    ```
    Source::>snapmirror release -destination-path vs1_dst:/cg/cg_dst
    ```

3. Perform a host rescan to update the LUN inventory.

Removing ONTAP Mediator

If you want to remove an existing ONTAP Mediator configuration from your ONTAP clusters, you can do so by using the `snapmirror mediator remove` command.

Steps

1. Remove ONTAP Mediator:

    ```
    snapmirror mediator remove -mediator-address 12.345.678.90 -peer-cluster cluster_xyz
    ```