NetApp Cloud Volumes ONTAP 9

SVM Disaster Recovery Express Guide

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Deciding whether to use the SVM Disaster Recovery Express Guide

This guide describes how cluster administrators can quickly activate a destination Storage Virtual Machine (SVM) after a disaster, and then reactivate the source SVM. You can use the procedures listed in this guide to recover from an actual disaster.

You should use this guide if you want to activate the destination SVM and then reactivate the source SVM in the following situations:

- You are a cluster administrator.

- You have prepared the source SVM for disaster recovery by configuring the destination SVM. *Cloud Volumes ONTAP SVM disaster recovery express preparation*

- You are using the ONTAP command-line interface.

- You want to use best practices, not explore every available option.

- You do not want to read a lot of conceptual background.

SVM disaster recovery workflow

To recover from a disaster, you must activate the destination SVM. Activating the destination SVM involves quiescing scheduled SnapMirror transfers, aborting any ongoing SnapMirror transfers, breaking the SVM disaster recovery (DR) relationship, stopping the source SVM, and starting the destination SVM.

```
From the destination cluster, quiesce
scheduled SnapMirror transfers.
            │
            ▼
Abort any ongoing transfers.
            │
            ▼
Break the SVM DR relationship.
            │
            ▼
      Identity-preserve=true?
   Yes ◄─────┘        │ No
    │                 │
    ▼                 │
Stop the source SVM.  │
    │                 ▼
    └──────► Start the destination SVM.
```
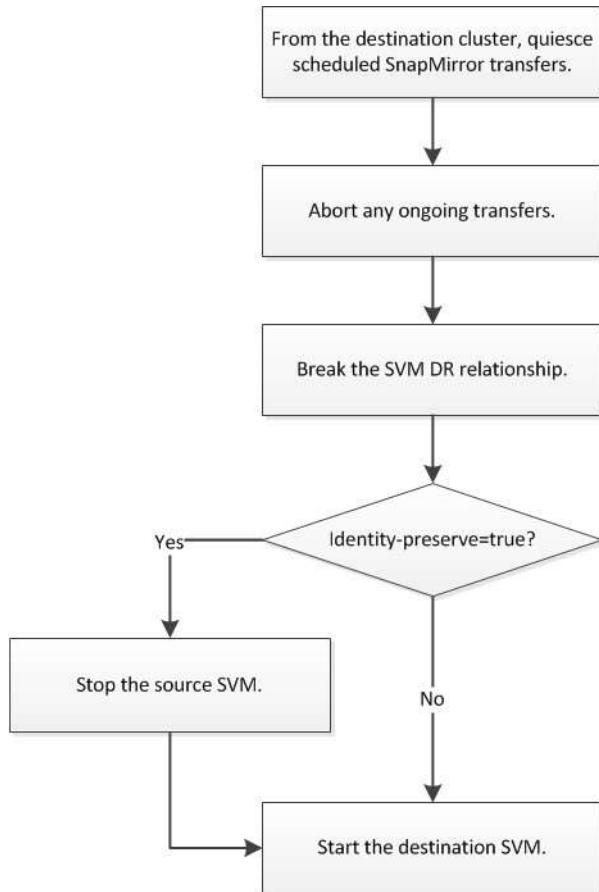
Note: The ONTAP version of the destination SVM must be at or above the version of the source. This is not a requirement for volume async-mirror and XDP relationship.

During a disaster, any new data that is written on the source SVM after the last SnapMirror transfer is lost.

Quiescing SnapMirror transfers

Before activating the destination Storage Virtual Machine (SVM), you must quiesce the SVM disaster recovery relationship to stop scheduled SnapMirror transfers from the source SVM.

About this task

You must perform this task from the destination cluster.

Steps

1. Stop the scheduled SnapMirror transfers by using the `snapmirror quiesce` command.

Example

```
destination_cluster::> snapmirror quiesce -destination-path dvs1:
```

2. Verify that the SnapMirror relationship between the source and the destination SVMs is in the
   `Quiescing` or `Quiesced` state by using the `snapmirror show` command.

   For viewing the detailed status of the relationship, you can use the `-instance` option.

   Example

```
destination_cluster::> snapmirror show

Progress
Source          Destination  Mirror        Relationship  Total              Last
Path     Type   Path         State         Status        Progress  Healthy  Updated
------   ----   -----------  -------        --------------  ---------  -------  -------
vs1:     DP     dvs1:        Snapmirrored  Quiesced      -         true     -
```

Aborting any ongoing SnapMirror transfers

You must abort any ongoing SnapMirror transfers or any long-running quiesce operations before
breaking the SVM disaster recovery relationship.

About this task

You must perform this task from the destination cluster.

Steps

1. Abort any ongoing SnapMirror transfers by using the `snapmirror abort` command.

   Example

```
destination_cluster::> snapmirror abort -destination-path dvs1:
```

2. Verify that the SnapMirror relationship between the source and destination SVMs is in the
   Idle state by using the `snapmirror show` command.

   For viewing the detailed status of the relationship, you can use the `-instance` option.

   Example

```
destination_cluster::> snapmirror show
                                                                   Progress
Source          Destination  Mirror        Relationship  Total      Last
Path     Type   Path         State         Status        Progress  Healthy  Updated
------   ----   -----------  -------        --------------  ---------  -------  -------
vs1:     DP     dvs1:        Snapmirrored  Idle          -         false    -
```

Breaking the SVM disaster recovery relationship

You must break the SnapMirror relationship created between the source and the destination SVMs
for disaster recovery before activating the destination SVM.

About this task

You must perform this task from the destination cluster.

Steps

1. Break the SVM disaster recovery relationship by using the `snapmirror break` command.

Example

```
destination_cluster::> snapmirror break -destination-path dvs1:
```

2. Verify that the SnapMirror relationship between the source and destination SVMs is in the `Broken-off` state by using the `snapmirror show` command.

Example

```
destination_cluster::> snapmirror show
                                                              Progress
Source          Destination  Mirror      Relationship  Total           Last
Path     Type   Path         State       Status        Progress Healthy Updated
------   ----   -----------  -------      -------------  --------- ------- -------
vs1:     DP     dvs1:        Broken-off  Idle          -         true    -
```

The subtype changes from `dp-destination` to `default`. The type of the volumes in the destination SVM changes from `DP` to `RW`.

Stopping the source SVM

If you chose to set `identity-preserve` to **true** or if you want to test the SVM disaster recovery setup, you must stop the source SVM before activating the destination SVM.

Before you begin

If the source SVM is available on the source cluster, then you must have ensured that all clients connected to the source SVM are disconnected.

About this task

You must perform this task from the source cluster.

Steps

1. Stop the source SVM by using the `vserver stop` command.

Example

```
source_cluster::> vserver stop -vserver vs1
```

2. Verify that the source SVM is in the **stopped** state by using the `vserver show` command.

Example

```
source_cluster::> vserver show
                               Admin      Operational Root
Vserver  Type   Subtype    State      tate        Volume   Aggregate
-------- ------ ---------  ---------  ----------  -------- -------vs1       data
default    stopped    stopped    vol1     aggr1
```

Starting the destination SVM

In case of a disaster, you must activate the destination SVM to provide data access from the destination SVM.

Before you begin

The source SVM must be in the **stopped** state.

About this task

You must perform this task from the destination cluster.

Steps

1. Start the destination SVM by using the `vserver start` command.

    Example

    ```
    destination_cluster::> vserver start -vserver dvs1
    [Job 30] Job succeeded: DONE
    ```

2. Verify that the destination SVM is in the **running** state and the subtype is **default** by using the `vserver show` command.

    Example

    ```
    destination_cluster::> vserver show
                                     Admin       Operational Root
    Vserver  Type    Subtype     State       State       Volume     Aggregate
    -------- ------- ----------- ----------- ----------- ---------- ---------
    dvs1     data    default     running     running     rv             aggr1
    ```

Source SVM reactivation workflow

If the source SVM exists after a disaster, you can reactivate it and protect it by recreating the SVM disaster recovery relationship between the source and the destination SVMs. If the source SVM does not exist, you must create and set up a new source SVM and then reactivate it.
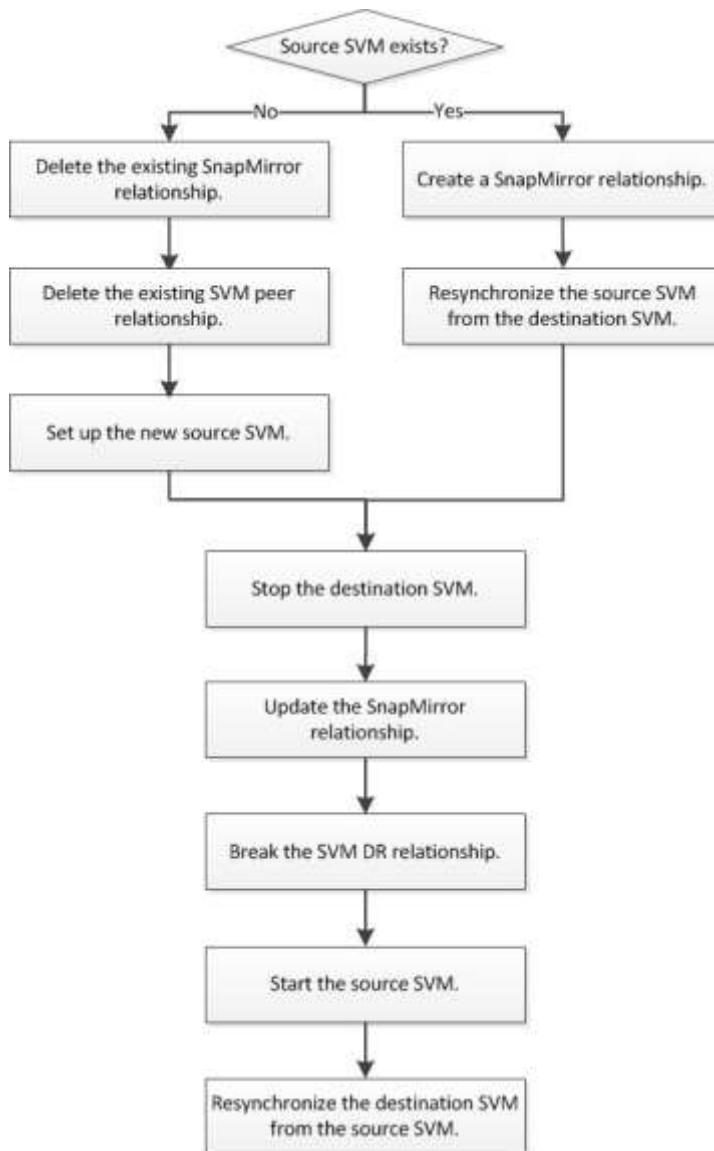
Reactivating the source SVM

Depending on whether the source SVM exists after a disaster, you can either use the existing source SVM or create a new source SVM for reactivation.

Choices

Creating the new source SVM

If the source SVM does not exist, you must delete the SnapMirror relationship between the source and destination SVMs, delete the SVM peer relationship, and create and set up a new source SVM to replicate the data and configuration from the destination SVM.

Steps

Deleting the SnapMirror relationship

If the source SVM no longer exists, you must delete the SnapMirror relationship between the source and the destination SVMs before setting up a new source SVM.

Steps

1. From the destination cluster, identify the SnapMirror relationship between the source SVM that no longer exists and its destination SVM by using the `snapmirror show` command.

   Example

   ```
   destination_cluster::> snapmirror show
                                                                 Progress
   Source          Destination  Mirror        Relationship  Total         Last
   Path      Type  Path         State         Status        Progress Healthy Updated
   -------   ----  ------------ -------        -------------- --------- ------- -------
   vs1:      DP    dvs1:        Broken-off    Idle          -         true    -
   ```

2. Delete the SnapMirror relationship by using the `snapmirror delete` command.

   Example

   ```
   destination_cluster::> snapmirror delete -destination-path dvs1:
   ```

3. Verify that the SnapMirror relationship is deleted by using the `snapmirror show` command.

   The deleted SnapMirror relationship entry is no longer displayed in the output.

Deleting the SVM peer relationship

If the source SVM no longer exists, you must delete the SVM peer relationship between that source SVM and its destination SVM before you create and configure a new source SVM.

Steps

1. From the destination cluster, identify the SVM peer relationship between the source SVM that no longer exists and its destination SVM by using the `vserver peer show` command.

   Example

   ```
   destination_cluster::>vserver peer show
               Peer          Peer          Peering
   Vserver     Vserver       State         Applications
   ----------- -----------   ------------  -----------------
   dvs1        vs1           peered        snapmirror
   ```

2. Delete the SVM peer relationship by using the `vserver peer delete` command.

Example

```
destination_cluster::> vserver peer delete -vserver dvs1 -peer-vserver vs1
Info: [Job 47] 'vserver peer delete' job queued
```

Setting up a new source SVM

After a disaster has occurred, you can set up a new source SVM by creating an SVM disaster recovery relationship to replicate the data and configuration from the original destination SVM.

About this task

You must set up the disaster recovery relationship by using the same method and configuration that you used to set up the SnapMirror relationship before the disaster. For example, if you chose to replicate data and all the configuration details when creating the SnapMirror relationship between the original source SVM and destination SVM, you must choose to replicate data and all the configuration details when creating the SnapMirror relationship between the new source SVM and the original destination SVM.

You must perform this task from the new source cluster.
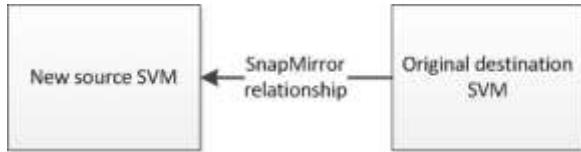
You can follow the detailed steps that are provided in the *SVM Disaster Recovery Preparation Express Guide* to set up the new source SVM.

Cloud Volumes ONTAP SVM disaster recovery express preparation

Steps

1. Prepare the new source cluster:

   a. Verify that the cluster peer relationship is healthy.

   b. Install all the required feature licenses and protocols.

   c. Create the required custom schedules.

   d. Ensure that a non-root aggregate with a minimum free space of 10 GB exists.

2. Create a source SVM of subtype `dp-destination`, which is now the destination SVM.

3. Create an SVM peer relationship between the new source SVM and the original destination SVM.

4. Create a SnapMirror policy with the `-discard-configs network` option.

5. Create a SnapMirror relationship between the new source SVM and the original destination SVM.

   You must use the SnapMirror policy that was created with the `-discard-configs network` option.

6. For CIFS: If you chose to replicate data and a subset of the SVM configuration by setting the `identity-preserve` option to `false`, create a CIFS server.

7. Initialize the new source SVM.

8. Configure NAS LIFs on the new source SVM.

9. If you chose to replicate data and a subset of the SVM configuration by setting the - identity-preserve option to **false**, configure network and protocol access on the new source SVM for data access.

Setting up the existing source SVM

If the source SVM exists after a disaster, you must create the SVM disaster recovery relationship between the destination and source SVMs and resynchronize the data and configuration from the destination SVM to the source SVM.

Steps

Creating a SnapMirror relationship

When recovering from a disaster, you must create a SnapMirror relationship between the existing source SVM and the destination SVM for replicating the data and configuration details from the destination SVM.

Before you begin

*   The destination cluster must have at least one non-root aggregate with a minimum free space of 10 GB for replicating the configuration.
    The best practice is to have at least two non-root aggregates with a minimum free space of 10 GB each.

*   The source cluster and destination cluster must be peered.

*   Any custom schedules that are being used by the destination SVM must be created on the source SVM.
*   The existing source SVM and the destination SVM must be peered.

About this task

You must perform this task only if you are reactivating the source SVM for the first time.

If you reactivated the source SVM earlier, you do not have to perform this task because the SnapMirror relationship between the source and destination SVMs is in the Broken-off state.

You must set up the disaster recovery relationship by using the same method and configuration that you used before the disaster. For example, if you chose to replicate data and all the configuration details when creating the SnapMirror relationship between the original source and destination SVMs, you must choose to replicate data and all the configuration details when recreating the SnapMirror relationship between the new source and destination SVMs.

You must perform this task from the source cluster.
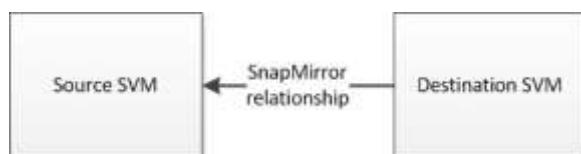
Steps

1. Create a SnapMirror policy to exclude LIFs from replication by using the `snapmirror policy create` command.

   Example

   ```
   source_cluster::> snapmirror policy create -vserver vs1 -policy
   exclude_LIF -type async-mirror -discard-configs network
   ```

2. Create a SnapMirror relationship between the source and destination SVMs by using the `snapmirror create` command:

   You can specify the source and destination SVMs as either paths or SVM names. If you want to specify the source and destination SVMs as paths, then the SVM name must be followed by a colon.

   - Replicate data and all the configuration information by setting the `-identity-preserve` option to **true**.

     The following command creates the SnapMirror relationship with the SVM names set as the `-destination-path` and `-source-path` parameters:

     ```
     source_cluster::> snapmirror create -source-path dvs1: -destination-path
     vs1: -type DP -throttle unlimited -policy DPDefault -schedule hourly -
     identity-preserve true
     ```

     The following command creates the SVM SnapMirror relationship with the SVM names as the `-destination-vserver` and `-source-vserver` parameters:

     ```
     source_cluster::> snapmirror create -source-vserver dvs1 -destination-
     vserver vs1 type DP -throttle unlimited -policy DPDefault -schedule hourly -
     identity-preserve true
     ```

     The following command creates the SVM SnapMirror relationship with the SVM names as the `-destination-path` and `-source-path` parameters and uses the SnapMirror policy **exclude_LIF** to exclude LIFs from replication:

     ```
     destination_cluster::> snapmirror create -source-path vs1: -destination-path
     dvs1: type DP -throttle unlimited -policy exclude_LIF -schedule hourly -
     identity-preserve true
     ```

   - Replicate data and a subset of the configuration information by setting the `-identitypreserve` option to **false**.

     The following command creates the SnapMirror relationship with the SVM names as the `-destination-path` and `-source-path` parameters:

     ```
     source_cluster::> snapmirror create -source-path dvs2: -destination-path
     vs2: -type DP -throttle unlimited -policy DPDefault -schedule hourly -
     identity-preserve false
     ```

     The following command creates the SnapMirror relationship with the SVM names as the `-destination-vserver` and `-source-vserver` parameters:

     ```
     source_cluster::> snapmirror create -source-vserver dvs2 -destination-
     vserver vs2 type DP -throttle unlimited -policy DPDefault -schedule hourly -
     identity-preserve false
     ```

3. Verify that the SnapMirror relationship is established, and is in the `Broken-off` state by using the `snapmirror show` command.

Example

```
destination_cluster::> snapmirror show
                                                                  Progress
Source          Destination  Mirror        Relationship  Total     Last
Path     Type  Path          State         Status        Progress  Healthy Updated
-------  ----  ------------  -------        --------------  ---------  -------  -------
dvs1:    DP    vs1:          Broken-off     Idle          -         true    -
```

Resynchronizing the source SVM from the destination SVM

Before activating the source SVM, you must resynchronize the data and configuration details from the destination SVM to the existing source SVM for data access.

Before you begin

- The SVM root volume must not contain any data other than metadata because other data is not replicated.
  Root volume metadata—such as volume junctions, symbolic links, and directories leading to junctions symbolic links—is replicated.

- The source SVM must not contain any load-sharing mirrors other than the load-sharing mirror that is created for SVM root volume protection.

- The source SVM must not contain any new protected volumes.
  You must delete such volumes on the source SVM to prevent failure of the resynchronization operation.

About this task
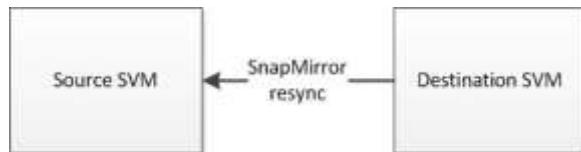
Steps

1. From the source cluster, resynchronize the source SVM from the destination SVM by using the `snapmirror resync` command.

   Example

   ```
   source_cluster::> snapmirror resync vs1:
   ```

2. Verify that the resynchronization operation is complete, and the SnapMirror relationship is in the **Snapmirrored** state by using the `snapmirror show` command.

   To view the detailed status of the SnapMirror relationship, you can use the `-instance` option.

Example

```
source_cluster::> snapmirror show
                                                                 Progress
Source           Destination  Mirror       Relationship Total        Last
Path      Type   Path         State        Status       Progress Healthy Updated
--------  ----   ------------ -------       -------------- --------- ------- -------
dvs1:     DP     vs1:         Snapmirrored Idle          -         true    -

source_cluster::> snapmirror show -instance

                    Source Path:  dvs1:
                 Destination Path: vs1:
                 Relationship Type: DP
         Relationship Group Type: vserver
               SnapMirror Schedule: -
           SnapMirror Policy Type: async-mirror
                 SnapMirror Policy: DPDefault
                      Mirror State: Snapmirrored

               ......
               .....
                 Total Transfer Bytes: -
 Total Transfer Time in Seconds: -
```

After resynchronization, you cannot delete load-sharing mirrors from the source SVM; you can only promote them from the source SVM.

Stopping the destination SVM

If you chose to set identity-preserve to **true**, you must stop the destination SVM before starting the source SVM to prevent any data corruption.

Before you begin

You must have ensured that all clients of the destination SVM are disconnected.

Steps

1. From the destination cluster, stop the destination SVM by using the vserver stop command.

Example

```
destination_cluster::> vserver stop -vserver dvs1
```

2. Verify that the destination SVM is in the stopped state by using the vserver show command.

Example

```
destination_cluster::> vserver show
                            Admin      Operational Root
Vserver  Type    Subtype    State      State       Volume     Aggregate
--------  -------  ---------- ---------- ----------- ---------- ---------
dvs1     data    default    stopped    stopped     rv         aggr1
```

Note: You must not perform any configuration changes on the destination SVM.

Updating the SnapMirror relationship

You must update the SnapMirror relationship to replicate the changes from the destination SVM to the source SVM since the last resynchronization operation.

Steps

1. From the source cluster, perform a SnapMirror update by using the `snapmirror update` command.

   Example

   ```
   source_cluster::> snapmirror update -destination-path vs1:
   ```

2. Verify that the SnapMirror update operation is complete and the SnapMirror relationship is in the `Snapmirrored` state.

   For viewing the detailed status of the relationship, you can use the `-instance` option.

   Example

   ```
   source_cluster::> snapmirror show

                                                              Progress
   Source          Destination  Mirror          Relationship Total              Last
   Path     Type   Path         State           Status       Progress  Healthy Updated
   -------  ----   -----------  -------          -------------- --------- ------- -------
   dvs1:    DP     vs1:         Snapmirrored    Idle          -         true    -
   ```

Breaking the SVM disaster recovery relationship

You must break the SnapMirror relationship created between the source and the destination Storage Virtual Machines (SVMs) for disaster recovery before reactivating the source SVM.

About this task

You must perform this task from the source cluster.

Steps

1. Break the SVM disaster recovery relationship by using the `snapmirror break` command.

   Example

   ```
   source_cluster::> snapmirror break -destination-path vs1:
   ```

2. Verify that the SnapMirror relationship between the source and the destination SVMs is in the `Broken-off` state by using the `snapmirror show` command.

   Example

   ```
   source_cluster::> snapmirror show

                                                              Progress
   Source          Destination  Mirror          Relationship Total              Last
   Path     Type   Path         State           Status       Progress  Healthy Updated
   ------  ----    -----------  -------          -------------- --------- ------- -------
   dvs1:    DP     vs1:         Broken-off      Idle          -         true    -
   ```

   The source SVM continues to be in the `Stopped` state and the subtype changes from **dpdestination** to **default**. The state of the volumes in the source SVM changes from **DP** to **RW**.

Starting the source SVM

For providing data access from the source SVM after a disaster, you must reactivate the source SVM by starting it.

Before you begin

The destination SVM must be in the **stopped** state.

About this task

You must perform this task from the source cluster.

Steps

1. From the source cluster, start the source SVM by using the `vserver start` command.

   Example

   ```
   source_cluster::> vserver start -vserver vs1 [Job 30]
   Job succeeded: DONE
   ```

   The `-status-admin` option of the LIFs configured on the source SVM is set to **up**.

2. Verify that the source SVM is in the **running** state and the subtype is **default** by using the `vserver show` command.

   Example

   ```
   source_cluster::> vserver show
                                   Admin      Operational Root
   Vserver   Type    Subtype    State      State       Volume     Aggregate
   --------- ------- ---------- ---------- ----------- ---------- ----------
   vs1       data    default    running    running     vol1       aggr1
   ```

Resynchronizing the destination SVM from the source SVM

You can protect the reactivated source SVM by resynchronizing the data and configuration details from the source SVM to the destination SVM.

Before you begin

- The SVM root volume must not contain any other data apart from metadata because the other data is not replicated.
  Root volume metadata such as volume junctions, symbolic links, and directories leading to junctions symbolic links are replicated.

- The destination SVM must not contain load-sharing mirrors apart from the load-sharing mirror created for SVM root volume protection.

- The destination SVM must not contain any new protected volumes.
  You must delete such volumes on the destination SVM to prevent resynchronization failure.

About this task

The following illustration shows the resynchronization of the destination volume.
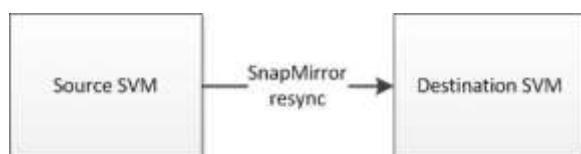
Steps

1. Ensure that a SnapMirror relationship exists between the source and the destination SVMs:

    a. Verify that a SnapMirror relationship exists by using the `snapmirror show` command.

    b. If a SnapMirror relationship does not exist, then create a SnapMirror relationship by using the `snapmirror create` command.

2. From the destination cluster, resynchronize the destination SVM from the source SVM by using the `snapmirror resync` command.

    Example

    ```
    destination_cluster::> snapmirror resync dvs1:
    ```

3. Verify that the resynchronization operation is complete and the SnapMirror relationship is in the `Snapmirrored` state by using the `snapmirror show` command.

    For viewing the detailed status of the relationship, you can use the `-instance` option.

    Example

    ```
    destination_cluster::> snapmirror show
                                                               Progress
    Source          Destination Mirror       Relationship Total        Last
    Path      Type  Path        State        Status       Progress Healthy Updated
    --------  ----  ----------- -------      -------------- --------- ------- -------
    vs1:      DP    dvs1:       Snapmirrored Idle           -        true

    source_cluster::> snapmirror show -instance

                        Source Path:  vs1:
                        Destination Path: dvs1:
                      Relationship Type: DP
              Relationship Group Type: vserver
                   SnapMirror Schedule: -
              SnapMirror Policy Type: async-mirror
                     SnapMirror Policy: DPDefault
                         Mirror State: Snapmirrored

                    ......
                    .....
                    Total Transfer Bytes: -
      Total Transfer Time in Seconds: -
    ```

    After the resynchronization, you can only promote load-sharing mirrors and cannot delete them from the destination SVM.

Where to find additional information

Additional information is available to help you to manage the Storage Virtual Machine (SVM) disaster recovery relationships and set up other data protection solutions.

• Man pages for ONTAP commands

  ◦ *ONTAP 9 commands*

• Data protection conceptual information

  ◦ *ONTAP concepts*

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