Configure SnapMirror volume replication

ONTAP 9

NetApp

January 23, 2026

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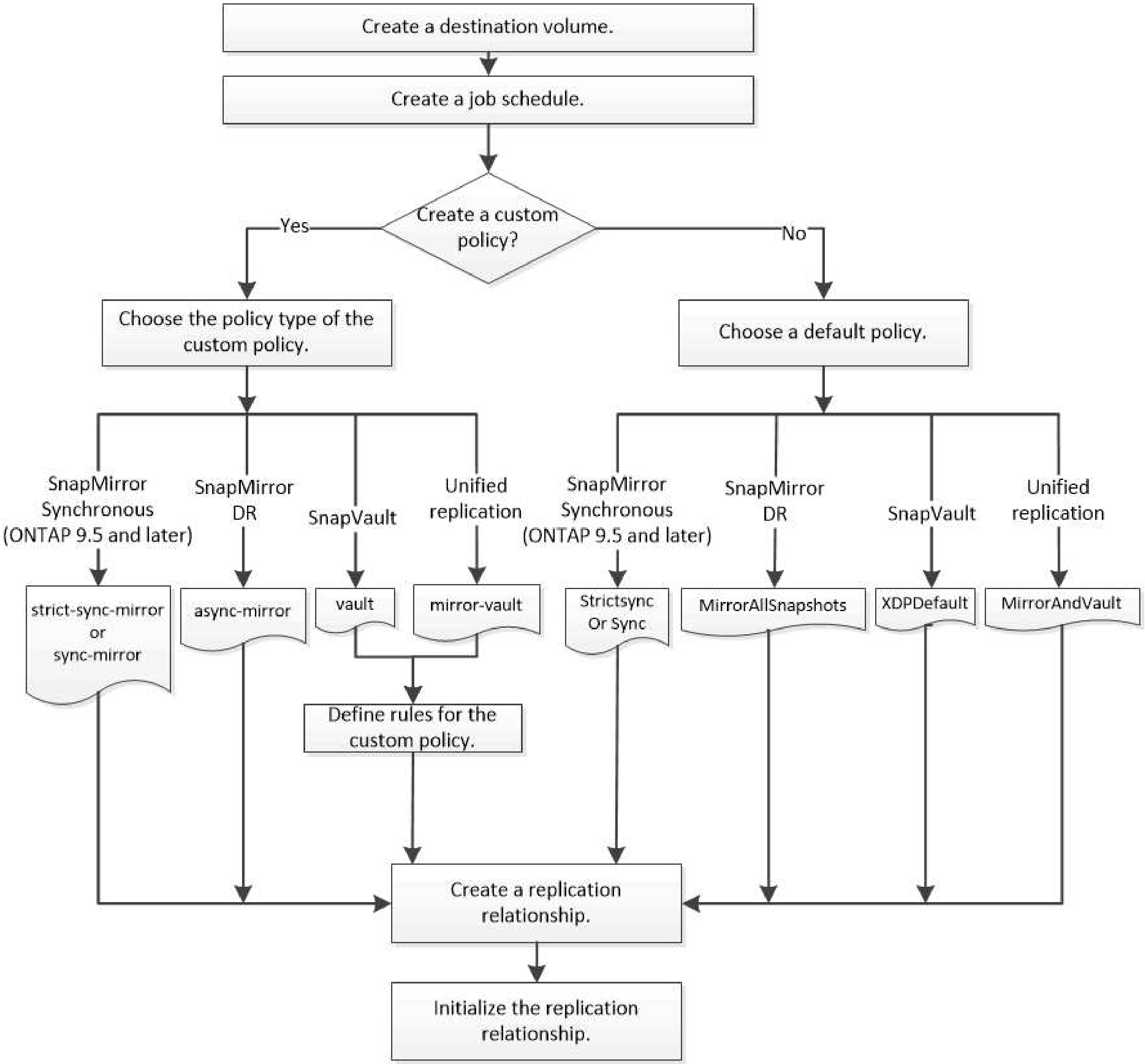
ONTAP SnapMirror replication workflow

SnapMirror offers three types of data protection relationship: SnapMirror DR, archive (previously known as SnapVault), and unified replication. You can follow the same basic workflow to configure each type of relationship.

Beginning with general availability in ONTAP 9.9.1, SnapMirror active sync provides Zero Recovery Time Objective (Zero RTO) or Transparent Application Failover (TAF) to enable automatic failover of business-critical applications in SAN environments.

For each type of SnapMirror data protection relationship, the workflow is the same: create a destination volume, create a job schedule, specify a policy, create and initialize the relationship.

Beginning with ONTAP 9.3, you can use the `snapmirror protect` command to configure a data protection relationship in a single step. Even if you use `snapmirror protect`, you need to understand each step in the workflow.


Create a destination volume.
Create a job schedule.
Create a custom policy?
Yes
No
Choose the policy type of the custom policy.
Choose a default policy.
SnapMirror Synchronous (ONTAP 9.5 and later)
SnapMirror DR
SnapVault
Unified replication
SnapMirror Synchronous (ONTAP 9.5 and later)
SnapMirror DR
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Unified replication
strict-sync-mirror or sync-mirror
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mirror-vault
Strictsync Or Sync
MirrorAllSnapshots
XDPDefault
MirrorAndVault
Define rules for the custom policy.
Create a replication relationship.
Initialize the replication relationship.

Related information

- snapmirror protect

Configure an ONTAP SnapMirror replication relationship in one step

Beginning with ONTAP 9.3, you can use the `snapmirror protect` command to configure a data protection relationship in a single step. You specify a list of volumes to be replicated, an SVM on the destination cluster, a job schedule, and a SnapMirror policy. `snapmirror protect` does the rest.

Before you begin

- The source and destination clusters and SVMs must be peered.

Cluster and SVM peering

- The language on the destination volume must be the same as the language on the source volume.

About this task

The `snapmirror protect` command chooses an aggregate associated with the specified SVM. If no aggregate is associated with the SVM, it chooses from all the aggregates in the cluster. The choice of aggregate is based on the amount of free space and the number of volumes on the aggregate.

The `snapmirror protect` command then performs the following steps:

- Creates a destination volume with an appropriate type and amount of reserved space for each volume in the list of volumes to be replicated.
- Configures a replication relationship appropriate for the policy you specify.
- Initializes the relationship.

The name of the destination volume is of the form *`source_volume_name_dst`*. In case of a conflict with an existing name, the command appends a number to the volume name. You can specify a prefix and/or suffix in the command options. The suffix replaces the system-supplied `dst` suffix.

In ONTAP 9.4 and later, a destination volume can contain up to 1019 snapshots. In ONTAP 9.3 and earlier, a destination volume can contain up to 251 snapshots.

> Initialization can be time-consuming. `snapmirror protect` does not wait for initialization to complete before the job finishes. For this reason, you should use the `snapmirror show` command rather than the `job show` command to determine when initialization is complete.

Beginning with ONTAP 9.5, SnapMirror synchronous relationships can be created by using the `snapmirror protect` command.

Learn more about `snapmirror protect` in the ONTAP command reference.

Step

1. Create and initialize a replication relationship in one step:

   You must replace the variables in angle brackets with the required values before running this command.

   ```
   snapmirror protect -path-list <SVM:volume> -destination-vserver
   <destination_SVM> -policy <policy> -schedule <schedule> -auto-initialize
   <true|false> -destination-volume-prefix <prefix> -destination-volume
   -suffix <suffix>
   ```

   > You must run this command from the destination SVM or the destination cluster. The `-auto -initialize` option defaults to “true”.

   The following example creates and initializes a SnapMirror DR relationship using the default `MirrorAllSnapshots` policy:

```
cluster_dst::> snapmirror protect -path-list svm1:volA, svm1:volB
-destination-vserver svm_backup -policy MirrorAllSnapshots -schedule
replication_daily
```

You can use a custom policy if you prefer. For more information, see Creating a custom replication policy.

The following example creates and initializes a SnapVault relationship using the default `XDPDefault` policy:

```
cluster_dst::> snapmirror protect -path-list svm1:volA, svm1:volB
-destination-vserver svm_backup -policy XDPDefault -schedule
replication_daily
```

The following example creates and initializes a unified replication relationship using the default `MirrorAndVault` policy:

```
cluster_dst::> snapmirror protect -path-list svm1:volA, svm1:volB
-destination-vserver svm_backup -policy MirrorAndVault
```

The following example creates and initializes a SnapMirror synchronous relationship using the default `Sync` policy:

```
cluster_dst::> snapmirror protect -path-list svm1:volA, svm1:volB
-destination-vserver svm_sync -policy Sync
```

For SnapVault and unified replication policies, you might find it useful to define a schedule for creating a copy of the last transferred snapshot on the destination. For more information, see Defining a schedule for creating a local copy on the destination.

After you finish

Use the `snapmirror show` command to verify that the SnapMirror relationship was created.

Learn more about `snapmirror show` in the ONTAP command reference.

Related information

- job show

Configure a replication relationship one step at a time

Create an ONTAP SnapMirror destination volume

You can use the `volume create` command on the destination to create a destination volume. The destination volume should be the same or greater in size than the source volume. Learn more about `volume create` in the ONTAP command reference.

Step

1. Create a destination volume:

   ```
   volume create -vserver SVM -volume volume -aggregate aggregate -type DP -size
   size
   ```

   The following example creates a 2-GB destination volume named `volA_dst`:

   ```
   cluster_dst::> volume create -vserver SVM_backup -volume volA_dst
   -aggregate node01_aggr -type DP -size 2GB
   ```

Create an ONTAP SnapMirror replication job schedule

The job schedule determines when SnapMirror automatically updates the data protection relationship to which the schedule is assigned. You can use System Manager or the `job schedule cron create` command to create a replication job schedule. Learn more about `job schedule cron create` in the ONTAP command reference.

About this task

You assign a job schedule when you create a data protection relationship. If you do not assign a job schedule, you must update the relationship manually.

Steps

You can create a replication job schedule using System Manager or the ONTAP CLI.

System Manager

1. Navigate to **Protection > Overview** and and expand **Local policy settings**.
2. In the **Schedules** pane, click →.
3. In the **Schedules** window, click + Add.
4. In the **Add schedule** window, enter the schedule name, and choose the context and schedule type.
5. Click **Save**.

CLI

1. Create a job schedule:

```
job schedule cron create -name <job_name> -month <month> -dayofweek
<day_of_week> -day <day_of_month> -hour <hour> -minute <minute>
```

For `-month`, `-dayofweek`, and `-hour`, you can specify `all` to run the job every month, day of the week, and hour, respectively.

Beginning with ONTAP 9.10.1, you can include the Vserver for your job schedule:

```
job schedule cron create -name <job_name> -vserver <Vserver_name>
-month <month> -dayofweek <day_of_week> -day <day_of_month> -hour
<hour> -minute <minute>
```

> The minimum supported schedule (RPO) for FlexVol volumes in a volume SnapMirror relationship is 5 minutes. The minimum supported schedule (RPO) for FlexGroup volumes in a volume SnapMirror relationship is 30 minutes.

The following example creates a job schedule named `my_weekly` that runs on Saturdays at 3:00 a.m.:

```
cluster_dst::> job schedule cron create -name my_weekly -dayofweek
"Saturday" -hour 3 -minute 0
```

Customize a SnapMirror replication policy

Create a custom ONTAP SnapMirror replication policy

You can create a custom replication policy if the default policy for a relationship is not suitable. You might want to compress data in a network transfer, for example, or modify the number of attempts SnapMirror makes to transfer snapshots.

You can use a default or custom policy when you create a replication relationship. For a custom archive (formerly SnapVault) or unified replication policy, you must define one or more *rules* that determine which snapshots are transferred during initialization and update. You might also want to define a schedule for creating local snapshots on the destination.

The *policy type* of the replication policy determines the type of relationship it supports. The table below shows the available policy types.

Policy type	Relationship type
async-mirror	SnapMirror DR
vault	SnapVault
mirror-vault	Unified replication
strict-sync-mirror	SnapMirror synchronous in the StrictSync mode (supported beginning with ONTAP 9.5)
sync-mirror	SnapMirror synchronous in the Sync mode (supported beginning with ONTAP 9.5)

When you create a custom replication policy, it is a good idea to model the policy after a default policy.

Steps

You can create custom data protection policies with System Manager or the ONTAP CLI. Beginning with ONTAP 9.11.1, you can use System Manager to create custom mirror and vault policies, and to display and select legacy policies. This capability is also available in ONTAP 9.8P12 and later patches of ONTAP 9.8.

Create custom protection policies on both the source and destination cluster.

System Manager

1. Click **Protection > Overview > Local Policy Settings**.
2. Under **Protection Policies**, click →.
3. In the **Protection Policies** pane, click + Add .
4. Enter the new policy name, and select the policy scope.
5. Choose a policy type. To add a vault-only or mirror-only policy, choose **Asynchronous**, and click **Use a legacy policy type**.
6. Complete the required fields.
7. Click **Save**.
8. Repeat these steps on the other cluster.

CLI

1. Create a custom replication policy:

```
snapmirror policy create -vserver <SVM> -policy _policy_ -type
<async-mirror|vault|mirror-vault|strict-sync-mirror|sync-mirror>
-comment <comment> -tries <transfer_tries> -transfer-priority
<low|normal> -is-network-compression-enabled <true|false>
```

Beginning with ONTAP 9.5, you can specify the schedule for creating a common snapshot schedule for SnapMirror synchronous relationships by using the `-common-snapshot-schedule` parameter. By default, the common snapshot schedule for SnapMirror synchronous relationships is one hour. You can specify a value from 30 minutes to two hours for the snapshot schedule for SnapMirror synchronous relationships.

The following example creates a custom replication policy for SnapMirror DR that enables network compression for data transfers:

```
cluster_dst::> snapmirror policy create -vserver svm1 -policy
DR_compressed -type async-mirror -comment "DR with network
compression enabled" -is-network-compression-enabled true
```

The following example creates a custom replication policy for SnapVault:

```
cluster_dst::> snapmirror policy create -vserver svm1 -policy
my_snapvault -type vault
```

The following example creates a custom replication policy for unified replication:

```
cluster_dst::> snapmirror policy create -vserver svm1 -policy
my_unified -type mirror-vault
```

The following example creates a custom replication policy for SnapMirror synchronous relationship in the StrictSync mode:

```
cluster_dst::> snapmirror policy create -vserver svm1 -policy
my_strictsync -type strict-sync-mirror -common-snapshot-schedule
my_sync_schedule
```

Learn more about `snapmirror policy create` in the ONTAP command reference.

After you finish

For "vault" and "mirror-vault" policy types, you must define rules that determine which snapshots are transferred during initialization and update.

Use the `snapmirror policy show` command to verify that the SnapMirror policy was created.

Learn more about `snapmirror policy show` in the ONTAP command reference.

Define a rule for an ONTAP SnapMirror policy

For custom policies with the `vault` or `mirror-vault` policy type, you must define at least one rule that determines which snapshots are transferred during initialization and update. You can also define rules for default policies with the `vault` or `mirror-vault` policy type.

About this task

Every policy with the `vault` or `mirror-vault` policy type must have a rule that specifies which snapshots to replicate. The rule `bi-monthly`, for example, indicates that only snapshots assigned the SnapMirror label `bi-monthly` should be replicated. You specify the SnapMirror label when you configure the snapshot policy on the source.

Each policy type is associated with one or more system-defined rules. These rules are automatically assigned to a policy when you specify its policy type. The table below shows the system-defined rules.

System-defined rule	Used in policy types	Result
sm_created	async-mirror, mirror-vault, Sync, StrictSync	A snapshot created by SnapMirror is transferred on initialization and update.
all_source_snapshots	async-mirror	New snapshots on the source are transferred on initialization and update.
daily	vault,mirror-vault	New snapshots on the source with the SnapMirror label `daily` are transferred on initialization and update.

weekly	vault,mirror-vault	New snapshots on the source with the SnapMirror label `weekly` are transferred on initialization and update.
monthly	mirror-vault	New snapshots on the source with the SnapMirror label `monthly` are transferred on initialization and update.
app_consistent	Sync, StrictSync	Snapshots with the SnapMirror label `app_consistent` on source are synchronously replicated to the destination. Supported beginning with ONTAP 9.7.

Except for the “async-mirror” policy type, you can specify additional rules as needed, for default or custom policies. For example:

- For the default `MirrorAndVault` policy, you might create a rule called `bi-monthly` to match snapshots on the source with the `bi-monthly` SnapMirror label.
- For a custom policy with the `mirror-vault` policy type, you might create a rule called `bi-weekly` to match snapshots on the source with the `bi-weekly` SnapMirror label.

Step

1. Define a rule for a policy:

   `snapmirror policy add-rule -vserver` *`SVM`* `-policy` *`policy_for_rule`* `-snapmirror -label` *`snapmirror-label`* `-keep` *`retention_count`*

   The following example adds a rule with the SnapMirror label `bi-monthly` to the default `MirrorAndVault` policy:

   ```
   cluster_dst::> snapmirror policy add-rule -vserver svm1 -policy
   MirrorAndVault -snapmirror-label bi-monthly -keep 6
   ```

   The following example adds a rule with the SnapMirror label `bi-weekly` to the custom `my_snapvault` policy:

   ```
   cluster_dst::> snapmirror policy add-rule -vserver svm1 -policy
   my_snapvault -snapmirror-label bi-weekly -keep 26
   ```

   The following example adds a rule with the SnapMirror label `app_consistent` to the custom `Sync` policy:

```
cluster_dst::> snapmirror policy add-rule -vserver svm1 -policy Sync
-snapmirror-label app_consistent -keep 1
```

Learn more about `snapmirror policy add-rule` in the ONTAP command reference.

You can then replicate snapshots from the source cluster that match this SnapMirror label:

```
cluster_src::> snapshot create -vserver vs1 -volume vol1 -snapshot
snapshot1 -snapmirror-label app_consistent
```

Define an ONTAP SnapMirror schedule to create a local copy on the destination

For SnapVault and unified replication relationships, you can protect against the possibility that an updated snapshot is corrupted by creating a copy of the last transferred snapshot on the destination. This "local copy" is retained regardless of the retention rules on the source, so that even if the snapshot originally transferred by SnapMirror is no longer available on the source, a copy of it will be available on the destination.

About this task

You specify the schedule for creating a local copy in the `-schedule` option of the `snapmirror policy add-rule` command.

Step

1. Define a schedule for creating a local copy on the destination:

   ```
   snapmirror policy add-rule -vserver SVM -policy policy_for_rule -snapmirror
   -label snapmirror-label -schedule schedule
   ```

   For an example of how to create a job schedule, see Creating a replication job schedule.

   The following example adds a schedule for creating a local copy to the default `MirrorAndVault` policy:

   ```
   cluster_dst::> snapmirror policy add-rule -vserver svm1 -policy
   MirrorAndVault -snapmirror-label my_monthly -schedule my_monthly
   ```

   The following example adds a schedule for creating a local copy to the custom `my_unified` policy:

   ```
   cluster_dst::> snapmirror policy add-rule -vserver svm1 -policy
   my_unified -snapmirror-label my_monthly -schedule my_monthly
   ```

   Learn more about `snapmirror policy add-rule` in the ONTAP command reference.

Create an ONTAP SnapMirror replication relationship

The relationship between the source volume in primary storage and the destination volume in secondary storage is called a *data protection relationship.* You can use the `snapmirror create` command to create SnapMirror DR, SnapVault, or unified replication data protection relationships.

> This procedure applies to FAS, AFF, and ASA systems. If you have an ASA r2 system (ASA A1K, ASA A90, ASA A70, ASA A50, ASA A30, ASA A20, or ASA C30), follow these steps to create a replication relationship. ASA r2 systems provide a simplified ONTAP experience specific to SAN-only customers.

Beginning with ONTAP 9.11.1, you can use System Manager to select pre-created and custom mirror and vault policies, to display and select legacy policies, and to override the transfer schedules defined in a protection policy when protecting volumes and storage VMs. This capability is also available in ONTAP 9.8P12 and later patches of ONTAP 9.8.

> If you are using ONTAP 9.8P12 or later ONTAP 9.8 patch release and you configured SnapMirror using System Manager, you should use ONTAP 9.9.1P13 or later and ONTAP 9.10.1P10 or later patch releases if you plan to upgrade to ONTAP 9.9.1 or ONTAP 9.10.1 releases.

Before you begin

- The source and destination clusters and SVMs must be peered.

  Cluster and SVM peering

- The language on the destination volume must be the same as the language on the source volume.

About this task

Until ONTAP 9.3, SnapMirror invoked in DP mode and SnapMirror invoked in XDP mode used different replication engines, with different approaches to version-dependence:

- SnapMirror invoked in DP mode used a *version-dependent* replication engine in which the ONTAP version was required to be the same on primary and secondary storage:

  ```
  cluster_dst::>  snapmirror create -type DP -source-path ... -destination
  -path ...
  ```

- SnapMirror invoked in XDP mode used a *version-flexible* replication engine that supported different ONTAP versions on primary and secondary storage:

  ```
  cluster_dst::>  snapmirror create -type XDP -source-path ...
  -destination-path ...
  ```

With improvements in performance, the significant benefits of version-flexible SnapMirror outweigh the slight advantage in replication throughput obtained with version-dependent mode. For this reason, beginning with ONTAP 9.3, XDP mode has been made the new default, and any invocations of DP mode on the command line or in new or existing scripts are automatically converted to XDP mode.

Existing relationships are not affected. If a relationship is already of type DP, it will continue to be of type DP. The table below shows the behavior you can expect.

If you specify…	**The type is…**	**The default policy (if you do not specify a policy) is…**
DP	XDP	MirrorAllSnapshots (SnapMirror DR)
Nothing	XDP	MirrorAllSnapshots (SnapMirror DR)
XDP	XDP	XDPDefault (SnapVault)

See also the examples in the procedure below.

The only exceptions to conversion are as follows:

- SVM data protection relationships continue to default to DP mode.

  Specify XDP explicitly to obtain XDP mode with the default `MirrorAllSnapshots` policy.
- Load-sharing data protection relationships continue to default to DP mode.
- SnapLock data protection relationships continue to default to DP mode.
- Explicit invocations of DP continue to default to DP mode if you set the following cluster-wide option:

  ```
  options replication.create_data_protection_rels.enable on
  ```

  This option is ignored if you do not explicitly invoke DP.

Beginning with ONTAP 9.14.1, the `-backoff-level` option is added to the `snapmirror create`, `snapmirror modify`, and `snapmirror restore` commands to enable you to specify the backoff level per relationship. The option is supported only with FlexVol SnapMirror relationships. The optional command specifies the SnapMirror backoff level due to client ops. Backoff values can be high, medium or none. The default value is high.

Beginning with ONTAP 9.5, SnapMirror synchronous relationships are supported.

In ONTAP 9.4 and later, a destination volume can contain up to 1019 snapshots. In ONTAP 9.3 and earlier, a destination volume can contain up to 251 snapshots.

Steps

You can use System Manager or the ONTAP CLI to create a replication relationship.

System Manager

1. Select the volume or LUN to protect: click **Storage > Volumes** or **Storage > LUNs**, and then click the desired volume or LUN name.
2. Click Protect.
3. Select the destination cluster and storage VM.
4. The asynchronous policy is selected by default. To select a synchronous policy, click **More Options**.
5. Click **Protect**.
6. Click the **SnapMirror (Local or Remote)** tab for the selected volume or LUN to verify that protection is set up correctly.

CLI

1. From the destination cluster, create a replication relationship:

   You must replace the variables in angle brackets with the required values before running this command.

   ```
   snapmirror create -source-path <SVM:volume> -destination-path
   <SVM:volume> -type <DP|XDP> -schedule <schedule> -policy <policy>
   ```

   The `schedule` parameter is not applicable when creating SnapMirror synchronous relationships.

   The following example creates a SnapMirror DR relationship using the default `MirrorLatest` policy:

   ```
   cluster_dst::> snapmirror create -source-path svm1:volA -destination
   -path svm_backup:volA_dst -type XDP -schedule my_daily -policy
   MirrorLatest
   ```

   The following example creates a SnapVault relationship using the default `XDPDefault` policy:

   ```
   cluster_dst::> snapmirror create -source-path svm1:volA -destination
   -path svm_backup:volA_dst -type XDP -schedule my_daily -policy
   XDPDefault
   ```

   The following example creates a unified replication relationship using the default `MirrorAndVault` policy:

   ```
   cluster_dst:> snapmirror create -source-path svm1:volA -destination
   -path svm_backup:volA_dst -type XDP -schedule my_daily -policy
   MirrorAndVault
   ```

The following example creates a unified replication relationship using the custom `my_unified` policy:

```
cluster_dst::> snapmirror create -source-path svm1:volA -destination
-path svm_backup:volA_dst -type XDP -schedule my_daily -policy
my_unified
```

The following example creates a SnapMirror synchronous relationship using the default `Sync` policy:

```
cluster_dst::> snapmirror create -source-path svm1:volA -destination
-path svm_backup:volA_dst -type XDP -policy Sync
```

The following example creates a SnapMirror synchronous relationship using the default `StrictSync` policy:

```
cluster_dst::> snapmirror create -source-path svm1:volA -destination
-path svm_backup:volA_dst -type XDP -policy StrictSync
```

The following example creates a SnapMirror DR relationship. With the DP type automatically converted to XDP and with no policy specified, the policy defaults to the `MirrorAllSnapshots` policy:

```
cluster_dst::> snapmirror create -source-path svm1:volA -destination
-path svm_backup:volA_dst -type DP -schedule my_daily
```

The following example creates a SnapMirror DR relationship. With no type or policy specified, the policy defaults to the `MirrorAllSnapshots` policy:

```
cluster_dst::> snapmirror create -source-path svm1:volA -destination
-path svm_backup:volA_dst -schedule my_daily
```

The following example creates a SnapMirror DR relationship. With no policy specified, the policy defaults to the `XDPDefault` policy:

```
cluster_dst::> snapmirror create -source-path svm1:volA -destination
-path svm_backup:volA_dst -type XDP -schedule my_daily
```

The following example creates a SnapMirror synchronous relationship with the predefined policy `SnapCenterSync`:

```
cluster_dst::> snapmirror create -source-path svm1:volA -destination
-path svm_backup:volA_dst -type XDP -policy SnapCenterSync
```

The predefined policy `SnapCenterSync` is of type `Sync`. This policy replicates any snapshot that is created with the `snapmirror-label` of "app_consistent".

After you finish

Use the `snapmirror show` command to verify that the SnapMirror relationship was created.

Learn more about `snapmirror show` in the ONTAP command reference.

Related information

- Create and delete SnapMirror failover test volumes.

Other ways to do this in ONTAP

To perform these tasks with…	See this content…
System Manager Classic (available with ONTAP 9.7 and earlier)	Volume backup using SnapVault overview

Related information

- snapmirror create

Initialize an ONTAP SnapMirror replication relationship

For all relationship types, initialization performs a *baseline transfer*: it makes a snapshot of the source volume, then transfers that copy and all the data blocks it references to the destination volume. Otherwise, the contents of the transfer depend on the policy.

Before you begin

The source and destination clusters and SVMs must be peered.

Cluster and SVM peering

About this task

Initialization can be time-consuming. You might want to run the baseline transfer in off-peak hours.

Beginning with ONTAP 9.5, SnapMirror synchronous relationships are supported.

You should be aware that if a filesystem is rebooted for any reason, such as a node reboot, takeover/giveback, or panic, then initialization will not automatically resume and must be restarted manually.

Step

1. Initialize a replication relationship:

   ```
   snapmirror initialize -source-path <SVM:volume>|<cluster://SVM/volume>, …
   -destination-path <SVM:volume>|<cluster://SVM/volume>, …
   ```

You must run this command from the destination SVM or the destination cluster.

The following example initializes the relationship between the source volume `volA` on `svm1` and the destination volume `volA_dst` on `svm_backup`:

```
cluster_dst::> snapmirror initialize -source-path svm1:volA -destination
-path svm_backup:volA_dst
```

Learn more about `snapmirror initialize` in the ONTAP command reference.

Ensure a common snapshot in an ONTAP mirror-vault deployment

You can use the `snapmirror snapshot-owner create` command to preserve a labeled snapshot on the secondary in a mirror-vault deployment. Doing so ensures that a common snapshot exists for the update of the vault relationship.

About this task

If you use a combination mirror-vault fan-out or cascade deployment, you should keep in mind that updates will fail if a common snapshot does not exist on the source and destination volumes.

This is never an issue for the mirror relationship in a mirror-vault fan-out or cascade deployment, since SnapMirror always creates a snapshot of the source volume before it performs the update.

It might be an issue for the vault relationship, however, because SnapMirror does not create a snapshot of the source volume when it updates a vault relationship. You need to use the `snapmirror snapshot-owner create` to ensure that there is at least one common snapshot on both the source and destination of the vault relationship. Learn more about data protection fan-out and cascade deployments.

Steps

1. On the source volume, assign an owner to the labeled snapshot you want to preserve:

   ```
   snapmirror snapshot-owner create -vserver <SVM> -volume <volume> -snapshot
   <snapshot> -owner <owner>
   ```

   The following example assigns `ApplicationA` as the owner of the `snap1` snapshot:

   ```
   clust1::> snapmirror snapshot-owner create -vserver vs1 -volume vol1
   -snapshot snap1 -owner ApplicationA
   ```

   Learn more about `snapmirror snapshot-owner create` in the ONTAP command reference.

2. Update the mirror relationship, as described in Updating a replication relationship manually.

   Alternatively, you can wait for the scheduled update of the mirror relationship.

3. Transfer the labeled snapshot to the vault destination:

   ```
   snapmirror update -source-path <SVM:volume>|<cluster://SVM/volume>, …
   ```

`-destination-path <SVM:volume>|<cluster://SVM/volume>, … -source-snapshot snapshot`

The following example transfers the `snap1` snapshot

```
clust1::> snapmirror update -vserver vs1 -volume vol1
-source-snapshot snap1
```

The labeled snapshot will be preserved when the vault relationship is updated.

Learn more about `snapmirror update` in the ONTAP command reference.

4. On the source volume, remove the owner from the labeled snapshot:

   `snapmirror snapshot-owner delete -vserver` *`SVM`* `-volume` *`volume`* `-snapshot` *`snapshot`* `-owner` *`owner`*

   The following examples removes `ApplicationA` as the owner of the `snap1` snapshot:

   ```
   clust1::> snapmirror snapshot-owner delete -vserver vs1 -volume vol1
   -snapshot snap1 -owner ApplicationA
   ```

   Learn more about `snapmirror snapshot-owner delete` in the ONTAP command reference.

Example: Configure an ONTAP SnapMirror vault-vault cascade

An example will show in concrete terms how you can configure replication relationships one step at a time. You can use the vault-vault cascade deployment configured in the example to retain more than 251 snapshots labeled `my-weekly`.

Before you begin

The source and destination clusters and SVMs must be peered.

About this task

The example assumes the following:

- You have configured snapshots on the source cluster with the SnapMirror labels `my-daily`, `my-weekly`, and `my-monthly`.
- You have configured destination volumes named `volA` on the secondary and tertiary destination clusters.
- You have configured replication job schedules named `my_snapvault` on the secondary and tertiary destination clusters.

The example shows how to create replication relationships based on two custom policies:

- The `snapvault_secondary` policy retains 7 daily, 52 weekly, and 180 monthly snapshots on the secondary destination cluster.
- The `snapvault_tertiary policy` retains 250 weekly snapshots on the tertiary destination cluster.

Steps

1. On the secondary destination cluster, create the `snapvault_secondary` policy:

   ```
   cluster_secondary::> snapmirror policy create -policy snapvault_secondary
   -type vault -comment "Policy on secondary for vault to vault cascade" -vserver
   svm_secondary
   ```

2. On the secondary destination cluster, define the `my-daily` rule for the policy:

   ```
   cluster_secondary::> snapmirror policy add-rule -policy snapvault_secondary
   -snapmirror-label my-daily -keep 7 -vserver svm_secondary
   ```

3. On the secondary destination cluster, define the `my-weekly` rule for the policy:

   ```
   cluster_secondary::> snapmirror policy add-rule -policy snapvault_secondary
   -snapmirror-label my-weekly -keep 52 -vserver svm_secondary
   ```

4. On the secondary destination cluster, define the `my-monthly` rule for the policy:

   ```
   cluster_secondary::> snapmirror policy add-rule -policy snapvault_secondary
   -snapmirror-label my-monthly -keep 180 -vserver svm_secondary
   ```

5. On the secondary destination cluster, verify the policy:

   ```
   cluster_secondary::> snapmirror policy show snapvault_secondary -instance
   ```

```
                     Vserver: svm_secondary
      SnapMirror Policy Name: snapvault_secondary
      SnapMirror Policy Type: vault
                Policy Owner: cluster-admin
                 Tries Limit: 8
           Transfer Priority: normal
   Ignore accesstime Enabled: false
     Transfer Restartability: always
 Network Compression Enabled: false
             Create Snapshot: false
                     Comment: Policy on secondary for vault to vault
cascade
       Total Number of Rules: 3
                  Total Keep: 239
                       Rules: SnapMirror Label     Keep  Preserve Warn
Schedule Prefix
                              ----------------     ----  -------- ----
-------- ------
                              my-daily                7  false       0 -
-
                              my-weekly              52  false       0 -
-
                              my-monthly            180  false       0 -
-
```

6. On the secondary destination cluster, create the relationship with the source cluster:

```
cluster_secondary::> snapmirror create -source-path svm_primary:volA
-destination-path svm_secondary:volA -type XDP -schedule my_snapvault -policy
snapvault_secondary
```

7. On the secondary destination cluster, initialize the relationship with the source cluster:

```
cluster_secondary::> snapmirror initialize -source-path svm_primary:volA
-destination-path svm_secondary:volA
```

8. On the tertiary destination cluster, create the `snapvault_tertiary` policy:

```
cluster_tertiary::> snapmirror policy create -policy snapvault_tertiary -type
vault -comment "Policy on tertiary for vault to vault cascade" -vserver
svm_tertiary
```

9. On the tertiary destination cluster, define the `my-weekly` rule for the policy:

```
cluster_tertiary::> snapmirror policy add-rule -policy snapvault_tertiary
-snapmirror-label my-weekly -keep 250 -vserver svm_tertiary
```

10. On the tertiary destination cluster, verify the policy:

```
cluster_tertiary::> snapmirror policy show snapvault_tertiary -instance
```

```
                     Vserver: svm_tertiary
      SnapMirror Policy Name: snapvault_tertiary
      SnapMirror Policy Type: vault
                Policy Owner: cluster-admin
                 Tries Limit: 8
           Transfer Priority: normal
   Ignore accesstime Enabled: false
     Transfer Restartability: always
 Network Compression Enabled: false
             Create Snapshot: false
                     Comment: Policy on tertiary for vault to vault
cascade
       Total Number of Rules: 1
                  Total Keep: 250
                       Rules: SnapMirror Label     Keep  Preserve Warn
Schedule Prefix
                              ----------------     ----  -------- ----
-------- ------
                              my-weekly             250  false       0 -
-
```

11. On the tertiary destination cluster, create the relationship with the secondary cluster:

```
cluster_tertiary::> snapmirror create -source-path svm_secondary:volA
-destination-path svm_tertiary:volA -type XDP -schedule my_snapvault -policy
snapvault_tertiary
```

12. On the tertiary destination cluster, initialize the relationship with the secondary cluster:

```
cluster_tertiary::> snapmirror initialize -source-path svm_secondary:volA
-destination-path svm_tertiary:volA
```

Related information

- snapmirror create
- snapmirror initialize
- snapmirror policy add-rule
- snapmirror policy create
- snapmirror policy show

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