Configure a replication relationship

ONTAP 9

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Configure a replication relationship

Create a replication job schedule

Whether you are replicating data from Element to ONTAP or from ONTAP to Element, you need to configure a job schedule, specify a policy, and create and initialize the relationship. You can use a default or custom policy.

You can use the `job schedule cron create` command to create a replication job schedule. The job schedule determines when SnapMirror automatically updates the data protection relationship to which the schedule is assigned.

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.

Step

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 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 replication policy

Create a custom replication policy

You can use a default or custom policy when you create a replication relationship. For a custom unified replication policy, you must define one or more *rules* that determine which Snapshot copies are transferred during initialization and update.

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 Snapshot copies.

About this task

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
mirror-vault	Unified replication

Step

1. Create a custom replication policy:

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

   For complete command syntax, see the man page.

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

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

After you finish

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

Use the `snapmirror policy show` command to verify that the SnapMirror policy was created. For complete command syntax, see the man page.

Define a rule for a policy

For custom policies with the "mirror-vault" policy type, you must define at least one rule that determines which Snapshot copies are transferred during initialization and update.

You can also define rules for default policies with the “mirror-vault” policy type.

About this task

Every policy with the “mirror-vault” policy type must have a rule that specifies which Snapshot copies to replicate. The rule “bi-monthly”, for example, indicates that only Snapshot copies assigned the SnapMirror label “bi-monthly” should be replicated. You assign the SnapMirror label when you configure Element Snapshot copies.

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	A Snapshot copy created by SnapMirror is transferred on initialization and update.
daily	mirror-vault	New Snapshot copies on the source with the SnapMirror label “daily” are transferred on initialization and update.
weekly	mirror-vault	New Snapshot copies on the source with the SnapMirror label “weekly” are transferred on initialization and update.
monthly	mirror-vault	New Snapshot copies on the source with the SnapMirror label “monthly” are transferred on initialization and update.

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 Snapshot copies 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 Snapshot copies 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`*

   For complete command syntax, see the man page.

   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
```

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

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

Create a replication relationship

Create a relationship from an Element source to an ONTAP destination

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 a data protection relationship from an Element source to an ONTAP destination, or from an ONTAP source to an Element destination.

You can use SnapMirror to replicate Snapshot copies of an Element volume to an ONTAP destination system. In the event of a disaster at the Element site, you can serve data to clients from the ONTAP system, then reactivate the Element source volume when service is restored.

Before you begin

- The Element node containing the volume to be replicated must have been made accessible to ONTAP.
- The Element volume must have been enabled for SnapMirror replication.
- If you are using the “mirror-vault” policy type, a SnapMirror label must have been configured for the Element Snapshot copies to be replicated.

> You can perform this task in the Element software web UI only. For more information, see the Element documentation.

About this task

You must specify the Element source path in the form *hostip:*/lun/*name*, where “lun” is the actual string “lun” and `name` is the name of the Element volume.

An Element volume is roughly equivalent to an ONTAP LUN. SnapMirror creates a LUN with the name of the Element volume when a data protection relationship between Element software and ONTAP is initialized. SnapMirror replicates data to an existing LUN if the LUN meets the requirements for replicating from Element software to ONTAP.

Replication rules are as follows:

- An ONTAP volume can contain data from one Element volume only.
- You cannot replicate data from an ONTAP volume to multiple Element volumes.

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

Step

1. From the destination cluster, create a replication relationship from an Element source to an ONTAP destination:

   `snapmirror create -source-path` *`hostip:`*`/lun/name -destination-path` *`SVM:volume`*
   `|`*`cluster://SVM/volume`* `-type XDP -schedule schedule -policy` *`policy`*

   For complete command syntax, see the man page.

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

   ```
   cluster_dst::> snapmirror create -source-path 10.0.0.11:/lun/0005
   -destination-path svm_backup:volA_dst -type XDP -schedule my_daily
   -policy MirrorLatest
   ```

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

   ```
   cluster_dst:> snapmirror create -source-path 10.0.0.11:/lun/0005
   -destination-path svm_backup:volA_dst -type XDP -schedule my_daily
   -policy MirrorAndVault
   ```

   The following example creates a unified replication relationship using the `Unified7year` policy:

   ```
   cluster_dst::> snapmirror create -source-path 10.0.0.11:/lun/0005
   -destination-path svm_backup:volA_dst -type XDP -schedule my_daily
   -policy Unified7year
   ```

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

```
cluster_dst::> snapmirror create -source-path 10.0.0.11:/lun/0005
-destination-path svm_backup:volA_dst -type XDP -schedule my_daily
-policy my_unified
```

After you finish

Use the `snapmirror show` command to verify that the SnapMirror relationship was created. For complete command syntax, see the man page.

Create a relationship from an ONTAP source to an Element destination

Beginning with ONTAP 9.4, you can use SnapMirror to replicate Snapshot copies of a LUN created on an ONTAP source back to an Element destination. You might be using the LUN to migrate data from ONTAP to Element software.

Before you begin

- The Element destination node must have been made accessible to ONTAP.
- The Element volume must have been enabled for SnapMirror replication.

About this task

You must specify the Element destination path in the form *`hostip:`*`/lun/`*`name`*, where “lun” is the actual string “lun” and `name` is the name of the Element volume.

Replication rules are as follows:

- The replication relationship must have a policy of type “async-mirror”.

  You can use a default or custom policy.

- Only iSCSI LUNs are supported.
- You cannot replicate more than one LUN from an ONTAP volume to an Element volume.
- You cannot replicate a LUN from an ONTAP volume to multiple Element volumes.

Step

1. Create a replication relationship from an ONTAP source to an Element destination:

   `snapmirror create -source-path` *`SVM:volume|cluster://SVM/volume`* `-destination -path` *`hostip:`*`/lun/`*`name -type XDP -schedule schedule -policy` *`policy`*

   For complete command syntax, see the man page.

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

   ```
   cluster_dst::> snapmirror create -source-path svm_1:volA_dst
   -destination-path 10.0.0.11:/lun/0005 -type XDP -schedule my_daily
   -policy MirrorLatest
   ```

The following example creates a SnapMirror DR relationship using the custom `my_mirror` policy:

```
cluster_dst::> snapmirror create -source-path svm_1:volA_dst
-destination-path 10.0.0.11:/lun/0005 -type XDP -schedule my_daily
-policy my_mirror
```

After you finish

Use the `snapmirror show` command to verify that the SnapMirror relationship was created. For complete command syntax, see the man page.

Initialize a replication relationship

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

Before you begin

- The Element node containing the volume to be replicated must have been made accessible to ONTAP.
- The Element volume must have been enabled for SnapMirror replication.
- If you are using the “mirror-vault” policy type, a SnapMirror label must have been configured for the Element Snapshot copies to be replicated.

About this task

You must specify the Element source path in the form *`hostip:`*`/lun/`*`name`*, where “lun” is the actual string “lun” and *`name`* is the name of the Element volume.

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

If initialization of a relationship from an ONTAP source to an Element destination fails for any reason, it will continue to fail even after you have corrected the problem (an invalid LUN name, for example). The workaround is as follows:

1. Delete the relationship.
2. Delete the Element destination volume.
3. Create a new Element destination volume.
4. Create and initialize a new relationship from the ONTAP source to the Element destination volume.

Step

1. Initialize a replication relationship:

   `snapmirror initialize -source-path` *`hostip:`*`/lun/`*`name`* `-destination-path` *`SVM:volume|cluster://SVM/volume`*

   For complete command syntax, see the man page.

The following example initializes the relationship between the source volume `0005` at IP address 10.0.0.11 and the destination volume `volA_dst` on `svm_backup`:

```
cluster_dst::> snapmirror initialize -source-path 10.0.0.11:/lun/0005
-destination-path svm_backup:volA_dst
```

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