Data protection for FlexGroup volumes

ONTAP 9

NetApp
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Table of Contents

Data protection for FlexGroup volumes .......................................................... 1
  Data protection workflow for FlexGroup volumes .......................................... 1
  Create a SnapMirror relationship for FlexGroup volumes ............................... 2
  Create a SnapVault relationship for FlexGroup volumes ............................... 5
  Create a unified data protection relationship for FlexGroup volumes ................ 8
  Create an SVM disaster recovery relationship for FlexGroup volumes ............... 11
Transition an existing FlexGroup SnapMirror relationship to SVM DR .................. 13
Convert a FlexVol volume to a FlexGroup volume within an SVM-DR relationship .... 15
Considerations for creating SnapMirror cascade and fanout relationships for FlexGroups .... 16
Considerations for creating a SnapVault backup relationship and a unified data protection relationship for FlexGroup volumes .............................................. 17
Monitor SnapMirror data transfers for FlexGroup volumes ............................... 18
Data protection for FlexGroup volumes

Data protection workflow for FlexGroup volumes

You can create SnapMirror disaster recovery (DR) relationships for FlexGroup volumes. Beginning with ONTAP 9.3, you can also backup and restore FlexGroup volumes by using SnapVault technology, and you can create a unified data protection relationship that uses the same destination for backup and DR.

The data protection workflow consists of verifying the cluster and SVM peer relationships, creating a destination volume, creating a job schedule, specifying a policy, creating a data protection relationship, and initializing the relationship.

About this task
The SnapMirror relationship type is always XDP for FlexGroup volumes. The type of data protection that is provided by a SnapMirror relationship is determined by the replication policy that you use. You can use either
the default policy or a custom policy of the required type for the replication relationship that you want to create. The following table shows the default policy types and supported custom policy types for different types of data protection relationships.

<table>
<thead>
<tr>
<th>Relationship type</th>
<th>Default Policy</th>
<th>Custom policy type</th>
</tr>
</thead>
<tbody>
<tr>
<td>SnapMirror DR</td>
<td>MirrorAllSnapshots</td>
<td>async-mirror</td>
</tr>
<tr>
<td>SnapVault backup</td>
<td>XDPDefault</td>
<td>vault</td>
</tr>
<tr>
<td>Unified data protection</td>
<td>MirrorAndVault</td>
<td>mirror-vault</td>
</tr>
</tbody>
</table>

The MirrorLatest policy is not supported with FlexGroup volumes.

Create a SnapMirror relationship for FlexGroup volumes

You can create a SnapMirror relationship between the source FlexGroup volume and the destination FlexGroup volume on a peered SVM for replicating data for disaster recovery. You can use the mirror copies of the FlexGroup volume to recover data when a disaster occurs.

What you’ll need
You must have created the cluster peering relationship and SVM peering relationship.

Cluster and SVM peering

About this task

• You can create both intercluster SnapMirror relationships and intracluster SnapMirror relationships for FlexGroup volumes.

• Beginning with ONTAP 9.3, you can expand FlexGroup volumes that are in a SnapMirror relationship.

If you are using a version of ONTAP earlier than ONTAP 9.3, you must not expand FlexGroup volumes after a SnapMirror relationship is established; however, you can increase the capacity of FlexGroup volumes after establishing a SnapMirror relationship. If you expand the source FlexGroup volume after breaking the SnapMirror relationship in releases earlier than ONTAP 9.3, you must perform a baseline transfer to the destination FlexGroup volume.

Steps

1. Create a destination FlexGroup volume of type DP that has the same number of constituents as that of the source FlexGroup volume:

   a. From the source cluster, determine the number of constituents in the source FlexGroup volume:

   ```bash
   volume show -volume volume_name* -is-constituent true
   ```
b. From the destination cluster, create a destination FlexGroup volume of type DP with the same number of constituents as that of the source FlexGroup volume.

```
cluster2:--> volume create -vserver vsd -aggr-list aggr1,aggr2 -aggr-list-multiplier 8 -size 400TB -type DP dstFG
```

Warning: The FlexGroup volume "dstFG" will be created with the following number of constituents of size 25TB: 16.
Do you want to continue? {y|n}: y

[Job 766] Job succeeded: Successful

c. From the destination cluster, verify the number of constituents in the destination FlexGroup volume:

```
volume show -volume volume_name* -is-constituent true
```
2. 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 the `-month`, `-dayofweek`, and `-hour` options, you can specify all to run the job every month, every day of the week, and every hour, respectively.

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

   ```bash
   cluster1::> job schedule cron create -name my_weekly -dayofweek "Saturday" -hour 3 -minute 0
   ```

3. Create a custom policy of type `async-mirror` for the SnapMirror relationship:
   `snapmirror policy create -vserver SVM -policy snapmirror_policy -type async-mirror`

   If you do not create a custom policy, you should specify the `MirrorAllSnapshots` policy for SnapMirror relationships.

4. From the destination cluster, create a SnapMirror relationship between the source FlexGroup volume and the destination FlexGroup volume:
   `snapmirror create -source-path src_svm:src_flexgroup -destination-path dest_svm:dest_flexgroup -type XDP -policy snapmirror_policy -schedule sched_name`

   SnapMirror relationships for FlexGroup volumes must be of type XDP.
If you specify a throttle value for the SnapMirror relationship for the FlexGroup volume, each constituent uses the same throttle value. The throttle value is not divided among the constituents.

You cannot use SnapMirror labels of Snapshot copies for FlexGroup volumes.

In ONTAP 9.4 and earlier, if the policy is not specified with the `snapmirror create` command, the `MirrorAllSnapshots` policy is used by default. In ONTAP 9.5, if the policy is not specified with the `snapmirror create` command, the `MirrorAndVault` policy is used by default.

```
cluster2::> snapmirror create -source-path vss:srcFG -destination-path vsd:dstFG -type XDP -policy MirrorAllSnapshots -schedule hourly
Operation succeeded: snapmirror create for the relationship with destination "vsd:dstFG".
```

5. From the destination cluster, initialize the SnapMirror relationship by performing a baseline transfer:
   `snapmirror initialize -destination-path dest_svm:dest_flexgroup`

After the baseline transfer is completed, the destination FlexGroup volume is updated periodically based on the schedule of the SnapMirror relationship.

```
cluster2::> snapmirror initialize -destination-path vsd:dstFG
Operation is queued: snapmirror initialize of destination "vsd:dstFG".
```

If you have created any SnapMirror relationship between FlexGroup volumes with the source cluster running ONTAP 9.3 and the destination cluster running ONTAP 9.2 or earlier, and if you create any qtrees in the source FlexGroup volume, the SnapMirror updates fail. To recover from this situation, you must delete all of the non-default qtrees in the FlexGroup volume, disable the qtree functionality on the FlexGroup volume, and then delete all of the Snapshot copies that are enabled with the qtree functionality. You must also perform these steps before reverting from ONTAP 9.3 to an earlier version of ONTAP, if you have the qtree functionality enabled on the FlexGroup volumes. Disable qtree functionality in FlexGroup volumes before reverting.

**After you finish**

You should set up the destination SVM for data access by setting up required configurations such as LIFs and export policies.

**Create a SnapVault relationship for FlexGroup volumes**

You can configure a SnapVault relationship and assign a SnapVault policy to the relationship to create a SnapVault backup.

**What you'll need**

You must be aware of the considerations for creating a SnapVault relationship for FlexGroup volumes.

**Steps**
1. Create a destination FlexGroup volume of type DP that has the same number of constituents as that of the source FlexGroup volume:

   a. From the source cluster, determine the number of constituents in the source FlexGroup volume:

   ```bash
   cluster1::> volume show -volume volume_name* -is-constituent true
   ```

   ```
   Vserver   Volume       Aggregate    State      Type       Size
   -------------- -------------- --------- --------- ---- ----------
   Available Used%  ----------------- ---------- ---- ----------
   vss           src          -            online     RW         400TB
   172.86GB  56%  vss           src__0001    Aggr_cmode   online     RW         25GB
   10.86TB  56%  vss           src__0002    aggr1        online     RW         25TB
   10.86TB  56%  vss           src__0003    Aggr_cmode   online     RW         25TB
   10.72TB  57%  vss           src__0004    aggr1        online     RW         25TB
   10.73TB  57%  vss           src__0005    Aggr_cmode   online     RW         25TB
   10.67TB  57%  vss           src__0006    aggr1        online     RW         25TB
   10.64TB  57%  vss           src__0007    Aggr_cmode   online     RW         25TB
   10.63TB  57%
   ...
   ```

   b. From the destination cluster, create a destination FlexGroup volume of type DP with the same number of constituents as that of the source FlexGroup volume.

   ```bash
   cluster2::> volume create -vserver vsd -aggr-list aggr1,aggr2 -aggr-list-multiplier 8 -size 400TB -type DP dst
   ```

   Warning: The FlexGroup volume "dst" will be created with the following number of constituents of size 25TB: 16.
   Do you want to continue? {y|n}: y

   [Job 766] Job succeeded: Successful

   c. From the destination cluster, verify the number of constituents in the destination FlexGroup volume:

   ```bash
   volume show -volume volume_name* -is-constituent true
   ```
2. **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.

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

```
cluster1::> job schedule cron create -name my_weekly -dayofweek "Saturday" -hour 3 -minute 0
```

3. **Create a SnapVault policy, and then define a rule for the SnapVault policy**:

   a. **Create a custom policy of type vault for the SnapVault relationship**: `snapmirror policy create -vserver svm_name -policy policy_name -type vault`

   b. **Define a rule for the SnapVault policy that determines which Snapshot copies are transferred during initialization and update operations**: `snapmirror policy add-rule -vserver svm_name -policy policy_for_rule - snapmirror-label snapmirror-label -keep retention_count -schedule schedule`

   If you do not create a custom policy, you should specify the XDPDefault policy for SnapVault relationships.

In ONTAP 9.4 and earlier, if the policy is not specified with the `snapmirror create` command, the `MirrorAllSnapshots` policy is used by default. In ONTAP 9.5, if the policy is not specified with the `snapmirror create` command, the `MirrorAndVault` policy is used by default.

```
cluster2::> snapmirror create -source-path vss:srcFG -destination-path vsd:dstFG -type XDP -schedule Daily -policy XDPDefault
```

5. From the destination cluster, initialize the SnapVault relationship by performing a baseline transfer: `snapmirror initialize -destination-path dest_svm:dest_flexgroup`

```
cluster2::> snapmirror initialize -destination-path vsd:dst
Operation is queued: snapmirror initialize of destination "vsd:dst".
```

## Create a unified data protection relationship for FlexGroup volumes

Beginning with ONTAP 9.3, you can create and configure SnapMirror unified data protection relationships to configure disaster recovery and archiving on the same destination volume.

### What you’ll need

You must be aware of the considerations for creating unified data protection relationships for FlexGroup volumes.

### Considerations for creating a SnapVault backup relationship and a unified data protection relationship for FlexGroup volumes

### Steps

1. Create a destination FlexGroup volume of type DP that has the same number of constituents as that of the source FlexGroup volume:

   a. From the source cluster, determine the number of constituents in the source FlexGroup volume:

   ```
   volume show -volume volume_name* -is-constituent true
   ```
b. From the destination cluster, create a destination FlexGroup volume of type DP with the same number of constituents as that of the source FlexGroup volume.

```
cluster2::> volume create -vserver vsd -aggr-list aggr1,aggr2 -aggr-list-multiplier 8 -size 400TB -type DP dstFG

Warning: The FlexGroup volume "dstFG" will be created with the following number of constituents of size 25TB: 16.
Do you want to continue? {y|n}: y
[Job 766] Job succeeded: Successful
```

c. From the destination cluster, verify the number of constituents in the destination FlexGroup volume:
```
volume show -volume volume_name* -is-constituent true
```
cluster2::> volume show -volume dstFG* -is-constituent true

<table>
<thead>
<tr>
<th>Vserver</th>
<th>Volume</th>
<th>Aggregate</th>
<th>State</th>
<th>Type</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Available</td>
<td>Used%</td>
<td>---------</td>
</tr>
<tr>
<td>---------</td>
<td>--------------</td>
<td>--------------</td>
<td>------------</td>
<td>------------</td>
<td>---------</td>
</tr>
<tr>
<td>vsd</td>
<td>dstFG</td>
<td>-</td>
<td>online</td>
<td>RW</td>
<td>400TB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>172.86GB</td>
<td>56%</td>
<td></td>
</tr>
<tr>
<td>vsd</td>
<td>dstFG__0001</td>
<td>Aggr_cmode</td>
<td>online</td>
<td>RW</td>
<td>25GB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10.86TB</td>
<td>56%</td>
<td></td>
</tr>
<tr>
<td>vsd</td>
<td>dstFG__0002</td>
<td>aggr1</td>
<td>online</td>
<td>RW</td>
<td>25TB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10.86TB</td>
<td>56%</td>
<td></td>
</tr>
<tr>
<td>vsd</td>
<td>dstFG__0003</td>
<td>Aggr_cmode</td>
<td>online</td>
<td>RW</td>
<td>25TB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10.72TB</td>
<td>57%</td>
<td></td>
</tr>
<tr>
<td>vsd</td>
<td>dstFG__0004</td>
<td>aggr1</td>
<td>online</td>
<td>RW</td>
<td>25TB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10.73TB</td>
<td>57%</td>
<td></td>
</tr>
<tr>
<td>vsd</td>
<td>dstFG__0005</td>
<td>Aggr_cmode</td>
<td>online</td>
<td>RW</td>
<td>25TB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10.67TB</td>
<td>57%</td>
<td></td>
</tr>
<tr>
<td>vsd</td>
<td>dstFG__0006</td>
<td>aggr1</td>
<td>online</td>
<td>RW</td>
<td>25TB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10.64TB</td>
<td>57%</td>
<td></td>
</tr>
<tr>
<td>vsd</td>
<td>dstFG__0007</td>
<td>Aggr_cmode</td>
<td>online</td>
<td>RW</td>
<td>25TB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10.63TB</td>
<td>57%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>...</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Create a job schedule:

```bash
cluster1::> job schedule cron create -name job_name -month month 
            -dayofweek day_of_week -day day_of_month -hour hour -minute minute
```

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

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

```bash
cluster1::> job schedule cron create -name my_weekly -dayofweek "Saturday" 
            -hour 3 -minute 0
```

3. Create a custom policy of type `mirror-vault`, and then define a rule for the mirror and vault policy:

   a. Create a custom policy of type `mirror-vault` for the unified data protection relationship:

   ```bash
   snapmirror policy create -vserver svm_name -policy policy_name -type mirror-vault
   ```

   b. Define a rule for the mirror and vault policy that determines which Snapshot copies are transferred during initialization and update operations:

   ```bash
   snapmirror policy add-rule -vserver svm_name 
                          -policy policy_for_rule - snapmirror-label snapmirror-label 
                          -keep retention_count -schedule schedule
   ```

   If you do not specify a custom policy, the `MirrorAndVault` policy is used for unified data protection relationships.
4. Create a unified data protection relationship:
```
snapmirror create -source-path src_svm:src_flexgroup -destination-path dest_svm:dest_flexgroup -type XDP -schedule schedule_name -policy MirrorAndVault
```

In ONTAP 9.4 and earlier, if the policy is not specified with the `snapmirror create` command, the MirrorAllSnapshots policy is used by default. In ONTAP 9.5, if the policy is not specified with the `snapmirror create` command, the MirrorAndVault policy is used by default.

```
cluster2::> snapmirror create -source-path vss:srcFG -destination-path vsd:dstFG -type XDP -schedule Daily -policy MirrorAndVault
```

5. From the destination cluster, initialize the unified data protection relationship by performing a baseline transfer:
```
snapmirror initialize -destination-path dest_svm:dest_flexgroup
```

```
cluster2::> snapmirror initialize -destination-path vsd:dstFG
Operation is queued: snapmirror initialize of destination "vsd:dstFG".
```

Create an SVM disaster recovery relationship for FlexGroup volumes

Beginning with ONTAP 9.9.1, you can create SVM disaster recovery (SVM DR) relationships using FlexGroup volumes. An SVM DR relationship provides redundancy and the ability to recover FlexGroups in the event of a disaster by synchronizing and replicating the SVM configuration and its data. A SnapMirror license is required for SVM DR.

Before you begin
You should be aware of the conditions when you cannot create a FlexGroup SVM DR relationship.

- A FlexClone FlexGroup configuration exists
- A FlexGroup volume contains a FabricPool configuration
- The FlexGroup volume is part of a fanout or cascading relationship

About this task
- All nodes in both clusters must be running the same ONTAP version as the node on which SVM DR support was added (ONTAP 9.9.1 or later).
- The SVM DR relationship between the primary and secondary sites should be healthy and should have enough space on both the primary and secondary SVMs to support the FlexGroup volumes.

For information about creating an SVM DR relationship, see Manage SnapMirror SVM replication.

Steps
1. Create an SVM DR relationship, or use an existing relationship.

   Replicate an entire SVM configuration
2. Create a FlexGroup volume on the primary site with the required number of constituents.

Creating a FlexGroup volume.

Wait until FlexGroup and all of its constituents are created before proceeding.

3. To replicate the FlexGroup volume, update the SVM at the secondary site: `snapmirror update -destination-path destination_svm_name: -source-path source_svm_name:`. You can also check if a scheduled SnapMirror update already exists by entering `snapmirror show -fields schedule`

4. From the secondary site, verify that the SnapMirror relationship is healthy: `snapmirror show`

```
cluster2::> snapmirror show

Progress
Source Destination Mirror Relationship Total
Last Path Type Path State Status Progress Healthy
Updated
-------- ---- ------------ ------- -------------- --------- -------
---------- ---- ------------ ------- -------------- --------- -------
---------- ---- ------------ ------- -------------- --------- -------
---------- ---- ------------ ------- -------------- --------- -------
---------- ---- ------------ ------- -------------- --------- -------

vsl:       XDP  vsl_dst:   Snapmirrored
           Idle          true   -
```

5. From the secondary site, verify that the new FlexGroup volume and its constituents exist: `snapmirror show -expand`
```
cluster2::> snapmirror show -expand

Progress
Source            Destination Mirror  Relationship   Total
Last
Path        Type  Path        State   Status         Progress  Healthy
Updated
----------- ---- ------------ ------- -------------- --------- -------
----------
vs1:        XDP  vs1_dst:     Snapmirrored
            Idle           -         true    -
vs1:fg_src  XDP  vs1_dst:fg_src
            Snapmirrored
            Idle           -         true    -
vs1:fg_src__0001  XDP  vs1_dst:fg_src__0001
            Snapmirrored
            Idle           -         true    -
vs1:fg_src__0002  XDP  vs1_dst:fg_src__0002
            Snapmirrored
            Idle           -         true    -
vs1:fg_src__0003  XDP  vs1_dst:fg_src__0003
            Snapmirrored
            Idle           -         true    -
vs1:fg_src__0004  XDP  vs1_dst:fg_src__0004
            Snapmirrored
            Idle           -         true    -
6 entries were displayed.
```

**Transition an existing FlexGroup SnapMirror relationship to SVM DR**

You can create a FlexGroup SVM DR relationship by transitioning an existing FlexGroup volume SnapMirror relationship.

**What you’ll need**
- The FlexGroup volume SnapMirror relationship is in a healthy state.
- The source and destination FlexGroup volumes have the same name.

**Steps**
1. From the SnapMirror destination, resynchronize the FlexGroup level SnapMirror relationship: `snapmirror`
resync

2. Create the FlexGroup SVM DR SnapMirror relationship. Use the same SnapMirror policy which is configured on the FlexGroup volume SnapMirror relationships:

   `snapmirror create -destination -path dest_svm: -source-path src_svm: -identity-preserve true -policy MirrorAllSnapshots`

You must use the `-identity-preserve true` option of the `snapmirror create` command when you create your replication relationship.

1. Verify the relationship is broken off:

   `snapmirror show -destination-path dest_svm: -source-path src_svm:`

   ```plaintext
   Progress
   Source Destination Mirror Relationship Total
   Last Path Type Path State Status Progress Healthy
   Updated --------- ---- ------------ ------- -------------- --------- -------
   ---------
   fg_vs:        XDP  fg_vs1_renamed:     Broken-off
                 Idle           -         true   -
   ```

2. Stop the destination SVM:

   `vserver stop -vserver vs_name`

   ```plaintext
   vserver stop -vserver fg_vs_renamed
   [Job 245] Job is queued: Vserver Stop fg_vs_renamed.
   [Job 245] Done
   ```

3. Resynchronize the SVM SnapMirror relationship:

   `snapmirror resync -destination-path dest_svm: -source-path src_svm:`

   ```plaintext
   snapmirror resync -destination-path fg_vs_renamed: -source-path fg_vs:
   Warning: This Vserver has volumes which are the destination of FlexVol or FlexGroup SnapMirror relationships. A resync on the Vserver SnapMirror relationship will cause disruptions in data access
   ```

4. Verify that the SVM DR level SnapMirror relationship reaches a healthy idle state:

   `snapmirror show -expand`

5. Verify that the FlexGroup SnapMirror relationship is in a healthy state:

   `snapmirror show`
Convert a FlexVol volume to a FlexGroup volume within an SVM-DR relationship

Beginning with ONTAP 9.10.1, you can convert a FlexVol volume to a FlexGroup volume on an SVM-DR source.

What you’ll need

• The FlexVol volume that is being converted must be online.
• The operations and configurations on the FlexVol volume must be compatible with the conversion process.

An error message is generated if the FlexVol volume has any incompatibility, and the volume conversion is cancelled. You can take corrective actions and retry the conversion. For more details, see Considerations for converting FlexVol volumes to FlexGroup volumes

Steps

1. From the destination, update the SVM-DR relationship:

   `snapmirror update -destination-path destination_svm_name: -source-path source_svm_name:

2. Ensure that the SVM-DR relationship is in a SnapMirrored state and is not broken-off:

   `snapmirror show

3. From the destination SVM, verify that the FlexVol volume is ready for conversion:

   `volume conversion start -vserver svm_name -volume vol_name -check-only true

4. From the destination, disable transfers on the SVM-DR relationship:

   `snapmirror quiesce -destination-path dest_svm:

5. Start the conversion:

   `volume conversion start -vserver svm_name -volume vol_name

6. Verify that the conversion is successful:

   `volume show vol_name -fields -volume-style-extended,state

   
   | vserver | volume     state    volume-style-extended |
   |---------|---------|------|-----------------------|
   | vs0     | my_volume online flexgroup             |

7. From the destination cluster, resume transfers for the relationship:

   `snapmirror resume -destination-path dest_svm:
8. From the destination cluster, perform an update to propagate the conversion to the destination:

   snapmirror update -destination-path dest_svm:

9. Ensure that the SVM-DR relationship is in a SnapMirrored state and is not broken off:

   snapmirror show

10. Ensure the conversion occurred on the destination:

   volume show vol_name -fields -volume-style-extended,state

<table>
<thead>
<tr>
<th>vserver</th>
<th>volume</th>
<th>state</th>
<th>volume-style-extended</th>
</tr>
</thead>
<tbody>
<tr>
<td>vs0_dst</td>
<td>my_volume</td>
<td>online</td>
<td>flexgroup</td>
</tr>
</tbody>
</table>

Considerations for creating SnapMirror cascade and fanout relationships for FlexGroups

There are support considerations and limitations you should keep in mind when creating SnapMirror cascade and fanout relationships for FlexGroup volumes.

Considerations for creating cascading relationships

- Each relationship can be either an inter cluster or intra cluster relationship.
- All asynchronous policy types, including async-mirror, mirror-vault, and vault, are supported for both relationships.
- Only "MirrorAllSnapshots," not "MirrorLatest" async-mirror policies are supported.
- Concurrent updates of cascaded XDP relationships is supported.
- Supports removing A to B and B to C and resync A to C or resync C to A
- A and B FlexGroup volumes also support fanout when all nodes are running ONTAP 9.9.1 or later.
- Restore operations from B or C FlexGroup volumes are supported.
- Transfers on FlexGroup relationships are not support while the destination is the source of a restore relationship.
- The destination of a FlexGroup restore cannot be the destination of any other FlexGroup relationship.
- FlexGroup file restore operations have the same restrictions as regular FlexGroup restore operations.
- All nodes in the cluster where the B and C FlexGroup volumes reside must be running ONTAP 9.9.1 or later.
- All expand and auto expand functionality is supported.
- In a cascade configuration such as A to B to C, if A to B and B to C have different numbers of constituent SnapMirror relationships, then an abort operation from the source is not supported for the B to C SnapMirror relationship.
• System Manager does not support cascading relationships in ONTAP 9.9.1.

• When converting an A to B to C set of FlexVol relationship to a FlexGroup relationship, you must convert the B to C hop first.

• All FlexGroup cascade configurations for relationships with policy types supported by REST are also supported by REST APIs in cascading FlexGroup configurations.

• As with FlexVol relationships, FlexGroup cascading is not supported by the snapmirror protect command.

**Considerations for creating fanout relationships**

• Two or more FlexGroup fanout relationships are supported; for example, A to B, A to C, with a maximum of 8 fanout legs.

• Each relationship can be either intercluster or intracluster.

• Concurrent updates are supported for the two relationships.

• All expand and auto expand functionality is supported.

• If the fanout legs of the relationship have different numbers of constituent SnapMirror relationships, then an abort operation from the source is not supported for the A to B and A to C relationships.

• All nodes in the cluster where the source and destination FlexGroups reside must be running ONTAP 9.9.1 or later.

• All asynchronous policy types currently supported for FlexGroup SnapMirror are supported in fanout relationships.

• You can perform restore operations from B to C FlexGroups.

• All fanout configurations with policy types supported by rest are also supported for REST APIs in FlexGroup fanout configurations.

**Considerations for creating a SnapVault backup relationship and a unified data protection relationship for FlexGroup volumes**

You must be aware of the considerations for creating a SnapVault backup relationship and unified data protection relationship for FlexGroup volumes.

• You can resynchronize a SnapVault backup relationship and a unified data protection relationship by using the `-preserve` option that enables you to preserve Snapshot copies on the destination volume that are newer than the latest common Snapshot copy.

• Long-term retention is not supported with FlexGroup volumes.

  Long-term retention enables creating Snapshot copies directly on the destination volume without requiring to store the Snapshot copies on the source volume.

• The `snapshot` command `expiry-time` option is not supported for FlexGroup volumes.

• Storage efficiency cannot be configured on the destination FlexGroup volume of a SnapVault backup relationship and unified data protection relationship.

• You cannot rename Snapshot copies of a SnapVault backup relationship and unified data protection relationship for FlexGroup volumes.
• A FlexGroup volume can be the source volume of only one backup relationship or restore relationship.

A FlexGroup volume cannot be the source of two SnapVault relationships, two restore relationships, or a SnapVault backup relationship and a restore relationship.

• If you delete a Snapshot copy on the source FlexGroup volume and re-create a Snapshot copy with the same name, the next update transfer to the destination FlexGroup volume fails if the destination volume has a Snapshot copy of the same name.

This is because Snapshot copies cannot be renamed for FlexGroup volumes.

Monitor SnapMirror data transfers for FlexGroup volumes

You should periodically monitor the status of the FlexGroup volume SnapMirror relationships to verify that the destination FlexGroup volume is updated periodically as per the specified schedule.

About this task
You must perform this task from the destination cluster.

Steps
1. View the SnapMirror relationship status of all FlexGroup volume relationships: snapmirror show -relationship-group-type flexgroup

```
cluster2::> snapmirror show -relationship-group-type flexgroup
```

<table>
<thead>
<tr>
<th>Progress</th>
<th>Source</th>
<th>Destination</th>
<th>Mirror</th>
<th>Relationship</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last</td>
<td>Path</td>
<td>Type</td>
<td>Path</td>
<td>State</td>
<td>Status</td>
</tr>
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<td>Updated</td>
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</tr>
<tr>
<td>vss:s</td>
<td>XDP</td>
<td>vsd:d</td>
<td>Snapmirrored</td>
<td>Idle</td>
<td>-</td>
</tr>
<tr>
<td>vss:s2</td>
<td>XDP</td>
<td>vsd:d2</td>
<td>Uninitialized</td>
<td>Idle</td>
<td>-</td>
</tr>
<tr>
<td>2 entries were displayed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. View the SnapMirror relationship status for each constituent in the FlexGroup volume: snapmirror show -expand
cluster2::> snapmirror show -expand

Progress
Source Destination Mirror Relationship Total
Last Path Type Path State Status Progress Healthy
Updated ----------- ---- ------------ ------- -------------- --------- -------

--------
vss:s XDP vsd:d Snapmirrored
       Idle - true -
vss:s__0001 XDP vsd:d__0001 Snapmirrored
       Idle - true -
vss:s__0002 XDP vsd:d__0002 Snapmirrored
       Idle - true -
vss:s__0003 XDP vsd:d__0003 Snapmirrored
       Idle - true -
vss:s__0004 XDP vsd:d__0004 Snapmirrored
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vss:s__0005 XDP vsd:d__0005 Snapmirrored
       Idle - true -
vss:s__0006 XDP vsd:d__0006 Snapmirrored
       Idle - true -
vss:s__0007 XDP vsd:d__0007 Snapmirrored
       Idle - true -
vss:s__0008 XDP vsd:d__0008 Snapmirrored
       Idle - true -
...

3. If the SnapMirror transfer fails, identify the FlexGroup volume constituent for which the transfer failed and the reason for the error: `snapmirror show -fields last-transfer-error -expand`
After rectifying the issue, you must rerun the SnapMirror operation.