

# Manage data protection operations for FlexGroup volumes

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# Manage data protection operations for FlexGroup volumes

## Disaster recovery for FlexGroup volumes

## Disaster recovery workflow for FlexGroup volumes

When a disaster strikes on the source FlexGroup volume, you should activate the destination FlexGroup volume and redirect client access. Depending on whether the source FlexGroup volume can be recovered, you should either reactivate the source FlexGroup volume or reverse the SnapMirror relationship.



#### About this task

Client access to the destination FlexGroup volume is blocked for a brief period when some SnapMirror operations, such as SnapMirror break and resynchronization, are running. If the SnapMirror operation fails, it is possible that some of the constituents remain in this state and access to the FlexGroup volume is denied. In such cases, you must retry the SnapMirror operation.

## Activate the destination FlexGroup volume

When the source FlexGroup volume is unable to serve data due to events such as data corruption, accidental deletion or an offline state, you must activate the destination FlexGroup volume to provide data access until you recover the data on the source FlexGroup volume. Activation involves stopping future SnapMirror data transfers and

## breaking the SnapMirror relationship.

## About this task

You must perform this task from the destination cluster.

## **Steps**

1. Disable future transfers for the FlexGroup volume SnapMirror relationship: snapmirror quiesce dest\_svm:dest\_flexgroup

```
cluster2::> snapmirror quiesce -destination-path vsd:dst
```

2. Break the FlexGroup volume SnapMirror relationship: snapmirror break dest\_svm:dest\_flexgroup

```
cluster2::> snapmirror break -destination-path vsd:dst
```

3. View the status of the SnapMirror relationship: snapmirror show -expand

cluster2::> snapmirror show -expand									
Progress Source Last		Destination N	Mirror	Relationship	Total				
		Path S		Status	Progress	Healthy			
vss:s	XDP	vsd:dst	Broke	n-off					
				Idle	-	true	-		
vss:s0001	XDP	vsd:dst0001	Broke						
vss.s 0002	XDD	vsd:dst 0002	Brokei	Idle	_	true	_		
V33:30002	21.01	v5a.a5c0002	DIORCI	Idle	_	true	_		
vss:s0003	XDP	vsd:dst0003	Broke	n-off					
				Idle	-	true	-		
vss:s0004	XDP	vsd:dst0004	Broke						
weete 0005	AUD	vsd:dst 0005	Broke	Idle	_	true	-		
v33 <b>.</b> 30003	ADI	vsa:asc0005	DIORCI	Idle	_	true	_		
vss:s0006	XDP	vsd:dst0006	Broke	n-off					
				Idle	-	true	-		
vss:s0007	XDP	vsd:dst0007	Broke						
0000	VDD		Desplay	Idle	-	true	-		
vss:s0008	XDP	vsd:dst0008	Broke	n-oii Idle	_	true	_		
				1410		CLUC			

The SnapMirror relationship status of each constituent is  ${\tt Broken-off}.$ 

4. Verify that the destination FlexGroup volume is read/write: volume show -vserver svm\_name

Vserver Availabl	Volume e Used%	Aggregate	State	Type	Size
vsd	dst	-	online	**RW**	2GB
1.54GB	22%				
vsd	d2	-	online	DP	2GB
1.55GB	22%				
vsd	root_vs0	aggr1	online	RW	100MB
94.02MB	5%				

5. Redirect clients to the destination FlexGroup volume.

## Reactivate the original source FlexGroup volume after disaster

When the source FlexGroup volume becomes available, you can resynchronize the original source and original destination FlexGroup volumes. Any new data on the destination FlexGroup volume is lost.

#### About this task

Any active quota rules on the destination volume are deactivated and the quota rules are deleted before resynchronization is performed.

You can use the volume quota policy rule create and volume quota modify commands to create and reactivate quota rules after the resynchronization operation is complete.

## Steps

- 1. From the destination cluster, resynchronize the FlexGroup volume SnapMirror relationship: snapmirror resync -destination-path dst\_svm:dest\_flexgroup
- 2. View the status of the SnapMirror relationship: snapmirror show -expand

cluster2::>	snapr	mirror show -ex	pand				
Progress Source Last		Destination M	irror	Relationship	Total		
	Type	Path S	tate	Status	Progress	Healthy	
vss:s	XDP	vsd:dst	Snapm	irrored Idle	_	true	_
vss:s0001	XDP	vsd:dst0001	Snapm	irrored			
0000	VDD		Q	Idle	-	true	-
vss:s0002	XDP	vsd:dst0002	Snapm	irrored Idle	_	true	_
vss:s 0003	XDP	vsd:dst 0003	Snapm	irrored		cruc	
<del></del>		<del></del>		Idle	-	true	-
vss:s0004	XDP	vsd:dst0004	Snapm	irrored			
WGG • G 0005	VDD	vsd:dst 0005	Snanm	Idle irrored	-	true	-
VSS:S00003	ADP	vsa:ast0005	SITAPIII	Idle	_	true	_
vss:s0006	XDP	vsd:dst0006	Snapm	irrored			
				Idle	-	true	-
vss:s0007	XDP	vsd:dst0007	Snapm	irrored			
7788.8 NNN9	מחע	vsd:dst 0008	Snanm	Idle irrored	_	true	-
v35.50000	VDE	vsu.ust0000	Strapill	Idle	_	true	_

The SnapMirror relationship status of each constituent is Snapmirrored.

## Reverse a SnapMirror relationship between FlexGroup volumes during disaster recovery

When a disaster disables the source FlexGroup volume of a SnapMirror relationship, you can use the destination FlexGroup volume to serve data while you repair or replace the source FlexGroup volume. After the source FlexGroup volume is online, you can make the original source FlexGroup volume a read-only destination and reverse the SnapMirror relationship.

## About this task

Any active quota rules on the destination volume are deactivated and the quota rules are deleted before resynchronization is performed.

You can use the volume quota policy rule create and volume quota modify commands to create

and reactivate quota rules after the resynchronization operation is complete.

## **Steps**

1. On the original destination FlexGroup volume, remove the data protection mirror relationship between the source FlexGroup volume and the destination FlexGroup volume: snapmirror delete -destination -path svm name:volume name

```
cluster2::> snapmirror delete -destination-path vsd:dst
```

2. On the original source FlexGroup volume, remove the relationship information from the source FlexGroup volume: snapmirror release -destination-path svm\_name:volume\_name -relationship -info-only

After deleting a SnapMirror relationship, you must remove the relationship information from the source FlexGroup volume before attempting a resynchronization operation.

```
cluster1::> snapmirror release -destination-path vsd:dst -relationship
-info-only true
```

3. On the new destination FlexGroup volume, create the mirror relationship: snapmirror create -source-path src\_svm\_name:volume\_name -destination-path dst svm name:volume name -type XDP -policy MirrorAllSnapshots

```
cluster1::> snapmirror create -source-path vsd:dst -destination-path
vss:src -type XDP -policy MirrorAllSnapshots
```

4. On the new destination FlexGroup volume, resynchronize the source FlexGroup: snapmirror resync -source-path svm\_name:volume\_name

```
cluster1::> snapmirror resync -source-path vsd:dst
```

5. Monitor the SnapMirror transfers: snapmirror show -expand

cluster2::> snapm	irror show -expa	nd						
_								
Progress Source Destination Mirror Relationship Total								
Source Last	Destination Mir	ror Relationship	Total					
	Path Sta	te Status	Progress	Healthy				
Updated		ec beacub	11091000	nearchy				
vsd:dst XDP	vss:src	Snapmirrored						
		Idle	_	true	-			
vss:dst0001 XDP	vss:src0001	Snapmirrored						
		Idle	_	true	-			
vsd:dst0002 XDP	vss:src0002	<del>-</del>						
1 1	0000	Idle	_	true	-			
vsd:dst0003 XDP	vss:src0003			<b>.</b>				
vsd:dst 0004 XDP	7755.570 0001	Idle Snapmirrored	_	true	_			
VSQ.QSC0004 ADF	V55.5IC0004	Idle	_	true	_			
vsd:dst 0005 XDP	vss:src 0005			CIUC				
		Idle	_	true	_			
vsd:dst 0006 XDP	vss:src 0006	Snapmirrored						
<del></del>	<del></del>	Idle	_	true	-			
vsd:dst0007 XDP	vss:src0007	Snapmirrored						
		Idle	-	true	-			
vsd:dst0008 XDP	vss:src0008	<del>-</del>						
		Idle	-	true	-			
• • •								

The SnapMirror relationship status of each constituent shows as Snapmirrored that indicates that the resynchronization was successful.

## Expand FlexGroup volumes in a SnapMirror relationship

## **Expand FlexGroup volumes in a SnapMirror relationship**

Beginning with ONTAP 9.3, you can expand the source FlexGroup volume and destination FlexGroup volume that are in a SnapMirror relationship by adding new constituents to the volumes. You can expand the destination volumes either manually or automatically.

#### About this task

• After expansion, the number of constituents in the source FlexGroup volume and destination FlexGroup volume of a SnapMirror relationship must match.

If the number of constituents in the volumes does not match, the SnapMirror transfers fail.

- You should not perform any SnapMirror operation when the expansion process is in progress.
- If a disaster strikes before the expansion process is complete, you must break the SnapMirror relationship and wait until the operation succeeds.



You should break the SnapMirror relationship when the expansion process is in progress only in the case of a disaster. In the case of a disaster, the break operation can take some time to complete. You should wait for the break operation to get completed successfully before performing a resync operation. If the break operation fails, you must retry the break operation. If the break operation fails, some of the new constituents might remain in the destination FlexGroup volume after the break operation. It is best to delete these constituents manually before proceeding further.

## Expand the source FlexGroup volume of a SnapMirror relationship

Beginning with ONTAP 9.3, you can expand the source FlexGroup volume of a SnapMirror relationship by adding new constituents to the source volume. You can expand the source volume in the same way that you expand a regular FlexGroup volume (read-write volume).

## **Steps**

1. Expand the source FlexGroup volume: volume expand -vserver vserver\_name -volume fg\_src -aggr-list aggregate name,... [-aggr-list-multiplier constituents per aggr]

```
cluster1::> volume expand -volume src_fg -aggr-list aggr1 -aggr-list -multiplier 2 -vserver vs_src

Warning: The following number of constituents of size 50GB will be added to FlexGroup "src_fg": 2.

Expanding the FlexGroup will cause the state of all Snapshot copies to be set to "partial".

Partial Snapshot copies cannot be restored.

Do you want to continue? {y|n}: Y

[Job 146] Job succeeded: Successful
```

The state of all of the Snapshot copies that are taken before the volume is expanded changes to partial.

## Expand the destination FlexGroup volume of a SnapMirror relationship

You can expand the destination FlexGroup volume and reestablish the SnapMirror relationship either automatically or manually. By default, the SnapMirror relationship is set for automatic expansion, and the destination FlexGroup volume expands automatically if the source volume expands.

## What you'll need

- The source FlexGroup volume must have been expanded.
- The SnapMirror relationship must be in the SnapMirrored state.

The SnapMirror relationship must not be broken or deleted.

#### About this task

 When the destination FlexGroup volume is created, the volume is set up for automatic expansion by default.

You can modify the destination FlexGroup volume for manual expansion, if required.



The best practice is to expand the destination FlexGroup volume automatically.

- All SnapMirror operations fail until both the source FlexGroup volume and destination FlexGroup volume have expanded and have the same number of constituents.
- If you expand the destination FlexGroup volume after the SnapMirror relationship is broken or deleted, you cannot resync the original relationship again.

If you intend to reuse the destination FlexGroup volume, you must not expand the volume after deleting the SnapMirror relationship.

#### Choices

- Perform an update transfer to expand the destination FlexGroup volume automatically:
  - a. Perform a SnapMirror update transfer: snapmirror update -destination-path svm:vol name
  - b. Verify that the status of the SnapMirror relationship is in the SnapMirrored state: snapmirror show

Based on the size and availability of aggregates, the aggregates are automatically selected, and new constituents that match the constituents of the source FlexGroup volume are added to the destination FlexGroup volume. After expansion, a resynchronization operation is automatically triggered.

- Expand the destination FlexGroup volume manually:
  - a. If the SnapMirror relationship is in the auto-expand mode, set the SnapMirror relationship to the manual expand mode: snapmirror modify -destination-path svm:vol\_name -is-auto-expand -enabled false

```
cluster2::> snapmirror modify -destination-path vs_dst:dst_fg -is
-auto-expand-enabled false
Operation succeeded: snapmirror modify for the relationship with
destination "vs_dst:dst_fg".
```

b. Quiesce the SnapMirror relationship: snapmirror quiesce -destination-path svm:vol name

```
cluster2::> snapmirror quiesce -destination-path vs_dst:dst_fg
Operation succeeded: snapmirror quiesce for destination
"vs_dst:dst_fg".
```

c. Expand the destination FlexGroup volume: volume expand -vserver vserver\_name -volume fg\_name -aggr-list aggregate name,... [-aggr-list-multiplier constituents\_per\_aggr]

```
cluster2::> volume expand -volume dst_fg -aggr-list aggr1 -aggr-list
-multiplier 2 -vserver vs_dst

Warning: The following number of constituents of size 50GB will be
added to FlexGroup "dst_fg": 2.
Do you want to continue? {y|n}: y
[Job 68] Job succeeded: Successful
```

d. Resynchronize the SnapMirror relationship: snapmirror resync -destination-path svm:vol name

```
cluster2::> snapmirror resync -destination-path vs_dst:dst_fg
Operation is queued: snapmirror resync to destination
"vs_dst:dst_fg".
```

e. Verify that the status of the SnapMirror relationship is SnapMirrored: snapmirror show

# Perform a SnapMirror single file restore from a FlexGroup volume

Beginning with ONTAP 9.8, you can restore a single file from a FlexGroup SnapMirror vault or from a UDP destination.

#### About this task

- You can restore from a FlexGroup volume of any geometry to FlexGroup volume of any geometry
- · Only one file per restore operation is supported
- You can restore to either the original source FlexGroup volume or to a new FlexGroup volume
- · Remote fenced file lookup is not supported.

Single file restore fails if the source file is fenced.

- · You can restart or clean up an aborted single file restore
- You should clean up a failed single file restore transfer by using the clean-up-failure option of the snapmirror restore command
- Expansion of FlexGroup volumes is supported when a FlexGroup single file restore is in progress or in an aborted state

#### Steps

 Restore a file from a FlexGroup volume:snapmirror restore -destination-path destination\_path -source-path source\_path -file-list /f1 -throttle throttle -source-snapshot snapshot

The following is an example of a FlexGroup volume single file restore operation.

```
vserverA::> snapmirror restore -destination-path vs0:fg2 -source-path
vs0:fgd -file-list /f1 -throttle 5 -source-snapshot snapmirror.81072ce1-
```

```
d57b-11e9-94c0-005056a7e422 2159190496.2019-09-19 062631
[Job 135] Job is queued: snapmirror restore from source "vs0:fgd" for
the snapshot snapmirror.81072ce1-d57b-11e9-94c0-
005056a7e422 2159190496.2019-09-19 062631.
vserverA::> snapmirror show
Source Destination Mirror Relationship
Total Last
Path Type Path State Status Progress
Healthy Updated
-----
vs0:v1d RST vs0:v2
                        - Transferring Idle 83.12KB
true 09/19 11:38:42
vserverA::*> snapmirror show vs0:fg2
Source Path: vs0:fgd
Source Cluster: -
Source Vserver: vs0
Source Volume: fgd
Destination Path: vs0:fg2
Destination Cluster: -
Destination Vserver: vs0
Destination Volume: fg2
Relationship Type: RST
Relationship Group Type: none
Managing Vserver: vs0
SnapMirror Schedule: -
SnapMirror Policy Type: -
SnapMirror Policy: -
Tries Limit: -
Throttle (KB/sec): unlimited
Current Transfer Throttle (KB/sec): 2
Mirror State: -
Relationship Status: Transferring
File Restore File Count: 1
File Restore File List: f1
Transfer Snapshot: snapmirror.81072ce1-d57b-11e9-94c0-
005056a7e422 2159190496.2019-09-19 062631
Snapshot Progress: 2.87MB
Total Progress: 2.87MB
Network Compression Ratio: 1:1
Snapshot Checkpoint: 2.97KB
Newest Snapshot: -
Newest Snapshot Timestamp: -
```

```
Exported Snapshot: -
Exported Snapshot Timestamp: -
Healthy: true
Physical Replica: -
Relationship ID: e6081667-dacb-11e9-94c0-005056a7e422
Source Vserver UUID: 81072ce1-d57b-11e9-94c0-005056a7e422
Destination Vserver UUID: 81072ce1-d57b-11e9-94c0-005056a7e422
Current Operation ID: 138f12e6-dacc-11e9-94c0-005056a7e422
Transfer Type: cg file restore
Transfer Error: -
Last Transfer Type: -
Last Transfer Error: -
Last Transfer Error Codes: -
Last Transfer Size: -
Last Transfer Network Compression Ratio: -
Last Transfer Duration: -
Last Transfer From: -
Last Transfer End Timestamp: -
Unhealthy Reason: -
Progress Last Updated: 09/19 07:07:36
Relationship Capability: 8.2 and above
Lag Time: -
Current Transfer Priority: normal
SMTape Operation: -
Constituent Relationship: false
Destination Volume Node Name: vserverA
Identity Preserve Vserver DR: -
Number of Successful Updates: 0
Number of Failed Updates: 0
Number of Successful Resyncs: 0
Number of Failed Resyncs: 0
Number of Successful Breaks: 0
Number of Failed Breaks: 0
Total Transfer Bytes: 0
Total Transfer Time in Seconds: 0
Source Volume MSIDs Preserved: -
OpMask: fffffffffffffff
Is Auto Expand Enabled: -
Source Endpoint UUID: -
Destination Endpoint UUID: -
Is Catalog Enabled: false
```

## Restore a FlexGroup volume from a SnapVault backup

You can perform a full-volume restore operation of FlexGroup volumes from a Snapshot

copy in the SnapVault secondary volume. You can restore the FlexGroup volume either to the original source volume or to a new FlexGroup volume.

## Before you begin

You must be aware of certain considerations when you restore from SnapVault backups for FlexGroup volumes.

- Only baseline restore is supported with partial Snapshot copies from a SnapVault backup.
   The number of constituents in the destination volume must match the number of constituents in the source volume when the Snapshot copy was taken.
- If a restore operation fails, no other operations are allowed until the restore operation is complete.

  You can either retry the restore operation or run the restore operation with the cleanup parameter.
- 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 relationship and a restore relationship.
- SnapVault backup and restore operations cannot run in parallel.
   When either a baseline restore operation or an incremental restore operation is in progress, you should quiesce the backup operations.
- You must abort a restore operation of a partial Snapshot copy from the destination FlexGroup volume. You cannot abort the restore operation of a partial Snapshot copy from the source volume.
- If you abort a restore operation, you must restart the restore operation with the same Snapshot copy that was used for the previous restore operation.

#### About this task

Any active quota rules on the destination FlexGroup volume are deactivated before the restore is performed.

You can use the volume quota modify command to reactivate quota rules after the restore operation is complete.

#### Steps

1. Restore the FlexGroup volume: snapmirror restore -source-path src\_svm:src\_flexgroup -destination-path dest\_svm:dest\_flexgroup -snapshot snapshot\_name snapshot\_name is the Snapshot copy that is to be restored from the source volume to the destination volume. If the Snapshot copy is not specified, the destination volume is restored from the latest Snapshot copy.

```
vserverA::> snapmirror restore -source-path vserverB:dstFG -destination -path vserverA:newFG -snapshot daily.2016-07-15_0010 Warning: This is a disruptive operation and the volume vserverA:newFG will be read-only until the operation completes Do you want to continue? \{y|n\}: y
```

## Disable SVM protection on a FlexGroup volume

When the SVM DR flag is set to protected on a FlexGroup volume, you can set the flag to unprotected to disable SVM DR protection on a FlexGroup volume.

## What you'll need

- The SVM DR relationship between the primary and secondary is healthy.
- SVM DR protection parameter is set to protected.

## **Steps**

1. Disable protection by using the volume modify command to change the vserver-dr-protection parameter for the FlexGroup volume to unprotected.

```
cluster2::> volume modify -vserver vs1 -volume fg_src -vserver-dr
-protection unprotected
[Job 5384] Job is queued: Modify fg_src.
[Job 5384] Steps completed: 4 of 4.
cluster2::>
```

- 2. Update the SVM at the secondary site: snapmirror update -destination-path destination svm name: -source-path Source svm name:
- 3. Verify that the SnapMirror relationship is healthy: snapmirror show
- 4. Verify that the FlexGroup SnapMirror relationship has been removed: snapmirror show -expand

## **Enable SVM protection on a FlexGroup volume**

When the SVM DR protection flag is set to unprotected on a FlexGroup volume, you can set the flag to protected to enable SVM DR protection.

## What you'll need

- The SVM DR relationship between the primary and secondary is healthy.
- SVM DR protection parameter is set to unprotected.

## **Steps**

1. Enable protection by using the volume modify to change the vserver-dr-protection parameter for the FlexGroup volume to protected.

```
cluster2::> volume modify -vserver vs1 -volume fg_src -vserver-dr
-protection protected
[Job 5384] Job is queued: Modify fg_src.
[Job 5384] Steps completed: 4 of 4.
cluster2::>
```

2. Update the SVM at the secondary site: snapmirror update -destination-path destination\_svm\_name -source-path source\_svm\_name

```
snapmirror update -destination-path vs1_dst: -source-path vs1:
```

3. 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
----vs1: XDP vs1\_dst: Snapmirrored
Idle - true -

4. Verify that the FlexGroup SnapMirror relationship is healthy: snapmirror show -expand

cluster2::>	snapı	mirror show -	expand				
Progress Source Last		Destination	Mirror	Relationship	Total		
Path Updated	Type	Path	State	Status	Progress	Healthy	
vs1:	XDP	vs1_dst:	Snapmir	rored Idle	_	true	_
vs1:fg_src	XDP	vs1_dst:fg_s					
			Snapmir	rored Idle	-	true	-
vs1:fg_src_	_0001 XDP	vs1_dst:fg_s	rc0001				
			Snapmir				
vs1:fg_src_	_0002			Idle	-	true	_
	XDP	vs1_dst:fg_s	rc0002 Snapmir				
vs1:fg src	0003			Idle	_	true	-
vs1.19_51C_	XDP	vs1_dst:fg_s					
			Snapmir	rored Idle	-	true	-
vs1:fg_src_	_	1 1	0004				
	XDP	vs1_dst:fg_s	rc0004 Snapmir	rored			
6 entries w	ere d	i splaved		Idle	_	true	-
O CHELLES M	CIG U.	roprayea.					

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