



Disaster recovery using SnapMirror

Element Software

NetApp
October 01, 2024

Table of Contents

- Disaster recovery using SnapMirror 1
 - Perform a failover from an Element cluster 1
 - Perform a failback to Element 1
 - Perform a transfer or one-time migration from ONTAP to Element 5

Disaster recovery using SnapMirror

In the event of a problem with a volume or cluster running NetApp Element software, use the SnapMirror functionality to break the relationship and failover to the destination volume.



If the original cluster has completely failed or is non-existent, contact NetApp Support for further assistance.

Perform a failover from an Element cluster

You can perform a failover from the Element cluster to make the destination volume read/write and accessible to hosts on the destination side. Before you perform a failover from the Element cluster, you must break the SnapMirror relationship.

Use the NetApp Element UI to perform the failover. If the Element UI is not available, you can also use ONTAP System Manager or ONTAP CLI to issue the break relationship command.

What you'll need

- A SnapMirror relationship exists and has at least one valid snapshot on the destination volume.
- You have a need to failover to the destination volume due to unplanned outage or planned event at the primary site.

Steps

1. In the Element UI, click **Data Protection > SnapMirror Relationships**.
2. Find the relationship with the source volume that you want to failover.
3. Click the **Actions** icon.
4. Click **Break**.
5. Confirm the action.

The volume on the destination cluster now has read-write access and can be mounted to the application hosts to resume production workloads. All SnapMirror replication is halted as a result of this action. The relationship shows a state of broken-off.

Perform a failback to Element

When the issue on the primary side has been mitigated, you must resynchronize the original source volume and fail back to NetApp Element software. The steps you perform vary depending on whether the original source volume still exists or whether you need to failback to a newly created volume.

Find more information

- [Perform a failback when source volume still exists](#)
- [Perform a failback when source volume no longer exists](#)

- [SnapMirror failback scenarios](#)

SnapMirror failback scenarios

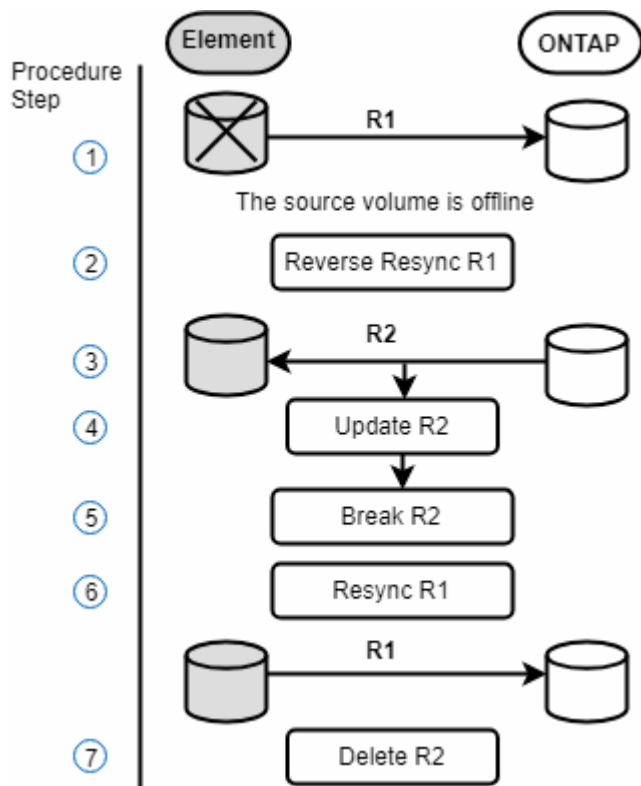
The SnapMirror disaster recovery functionality is illustrated in two failback scenarios. These assume the original relationship has been failed over (broken).

The steps from the corresponding procedures are added for reference.

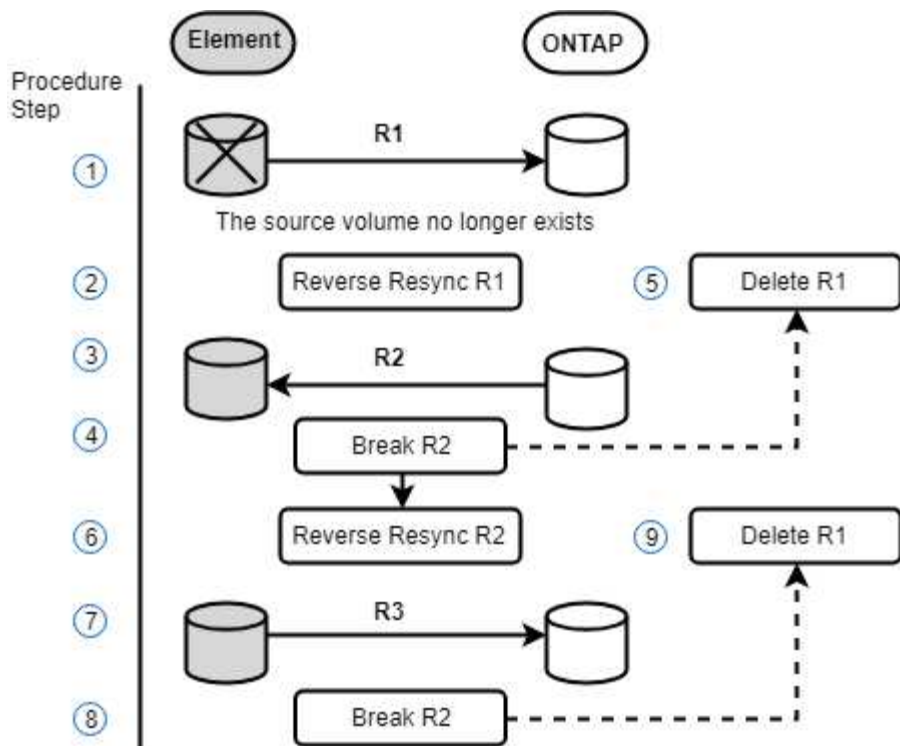


In the examples here, R1 = the original relationship in which the cluster running NetApp Element software is the original source volume (Element) and ONTAP is the original destination volume (ONTAP). R2 and R3 represent the inverse relationships created through the reverse resync operation.

The following image shows the failback scenario when the source volume still exists:



The following image shows the failback scenario when the source volume no longer exists:



Find more information

- [Perform a failback when source volume still exists](#)
- [Perform a failback when source volume no longer exists](#)

Perform a failback when source volume still exists

You can resynchronize the original source volume and fail back using the NetApp Element UI. This procedure applies to scenarios where the original source volume still exists.

1. In the Element UI, find the relationship that you broke to perform the failover.
2. Click the Actions icon and click **Reverse Resync**.
3. Confirm the action.



The Reverse Resync operation creates a new relationship in which the roles of the original source and destination volumes are reversed (this results in two relationships as the original relationship persists). Any new data from the original destination volume is transferred to the original source volume as part of the reverse resync operation. You can continue to access and write data to the active volume on the destination side, but you will need to disconnect all hosts to the source volume and perform a SnapMirror update before redirecting back to the original primary.

4. Click the Actions icon of the inverse relationship that you just created and click **Update**.

Now that you have completed the reverse resync and ensured that there are no active sessions connected to the volume on the destination side and that the latest data is on the original primary volume, you can perform the following steps to complete the failback and reactivate the original primary volume:

5. Click the Actions icon of the inverse relationship and click **Break**.
6. Click the Actions icon of the original relationship and click **Resync**.



The original primary volume can now be mounted to resume production workloads on the original primary volume. The original SnapMirror replication resumes based on the policy and schedule configured for the relationship.

7. After you confirm that the original relationship status is “snapmirrored”, click the Actions icon of the inverse relationship and click **Delete**.

Find more information

[SnapMirror failback scenarios](#)

Perform a failback when source volume no longer exists

You can resynchronize the original source volume and fail back using the NetApp Element UI. This section applies to scenarios in which the original source volume has been lost but the original cluster is still intact. For instructions about how to restore to a new cluster, see the documentation on the NetApp Support Site.

What you'll need

- You have a broken-off replication relationship between Element and ONTAP volumes.
- The Element volume is irretrievably lost.
- The original volume name shows as NOT FOUND.

Steps

1. In the Element UI, find the relationship that you broke to perform the failover.

Best Practice: Make note of the SnapMirror policy and schedule details of the original broken-off relationship. This information will be required when recreating the relationship.

2. Click the **Actions** icon and click **Reverse Resync**.
3. Confirm the action.



The Reverse Resync operation creates a new relationship in which the roles of the original source volume and the destination volume are reversed (this results in two relationships as the original relationship persists). Because the original volume no longer exists, the system creates a new Element volume with the same volume name and volume size as the original source volume. The new volume is assigned a default QoS policy called sm-recovery and is associated with a default account called sm-recovery. You will want to manually edit the account and QoS policy for all volumes that are created by SnapMirror to replace the original source volumes that were destroyed.

Data from the latest snapshot is transferred to the new volume as part of the reverse resync operation. You can continue to access and write data to the active volume on the destination side, but you will need to disconnect all hosts to the active volume and perform a SnapMirror update before reinstating the original primary relationship in a later step. After you complete the reverse resync and ensure that there are no active sessions connected to the volume on the destination side and that the latest data is on the original primary volume, continue with the following steps to complete the failback and reactivate the original

primary volume:

4. Click the **Actions** icon of the inverse relationship that was created during the Reverse Resync operation and click **Break**.
5. Click the **Actions** icon of the original relationship, in which the source volume does not exist, and click **Delete**.
6. Click the **Actions** icon of the inverse relationship, which you broke in step 4, and click **Reverse Resync**.
7. This reverses the source and destination and results in a relationship with the same volume source and volume destination as the original relationship.
8. Click the **Actions** icon and **Edit** to update this relationship with the original QoS policy and schedule settings you took note of.
9. Now it is safe to delete the inverse relationship that you reverse resynced in step 6.

Find more information

[SnapMirror failback scenarios](#)

Perform a transfer or one-time migration from ONTAP to Element

Typically, when you use SnapMirror for disaster recovery from a SolidFire storage cluster running NetApp Element software to ONTAP software, Element is the source and ONTAP the destination. However, in some cases the ONTAP storage system can serve as the source and Element as the destination.

- Two scenarios exist:
 - No previous disaster recovery relationship exists. Follow all the steps in this procedure.
 - Previous disaster recovery relationship does exist, but not between the volumes being used for this mitigation. In this case, follow only steps 3 and 4 below.

What you'll need

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

You must specify the Element destination path in the form `hostip:/lun/<id_number>`, where `lun` is the actual string "lun" and `id_number` is the ID of the Element volume.

Steps

1. Using ONTAP, create the relationship with the Element cluster:

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

2. Verify that the SnapMirror relationship was created by using the ONTAP `snapmirror show` command.

See information about creating a replication relationship in the ONTAP documentation and for complete command syntax, see the ONTAP man page.

3. Using the `ElementCreateVolume` API, create the target volume and set the target volume access mode to SnapMirror:

Create an Element volume using the Element API

```
{
  "method": "CreateVolume",
  "params": {
    "name": "SMTargetVolumeTest2",
    "accountID": 1,
    "totalSize": 100000000000,
    "enable512e": true,
    "attributes": {},
    "qosPolicyID": 1,
    "enableSnapMirrorReplication": true,
    "access": "snapMirrorTarget"
  },
  "id": 1
}
```

4. Initialize the replication relationship using the ONTAP `snapmirror initialize` command:

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


Copyright information

Copyright © 2024 NetApp, Inc. All Rights Reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

LIMITED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (b)(3) of the Rights in Technical Data -Noncommercial Items at DFARS 252.227-7013 (FEB 2014) and FAR 52.227-19 (DEC 2007).

Data contained herein pertains to a commercial product and/or commercial service (as defined in FAR 2.101) and is proprietary to NetApp, Inc. All NetApp technical data and computer software provided under this Agreement is commercial in nature and developed solely at private expense. The U.S. Government has a non-exclusive, non-transferrable, nonsublicensable, worldwide, limited irrevocable license to use the Data only in connection with and in support of the U.S. Government contract under which the Data was delivered. Except as provided herein, the Data may not be used, disclosed, reproduced, modified, performed, or displayed without the prior written approval of NetApp, Inc. United States Government license rights for the Department of Defense are limited to those rights identified in DFARS clause 252.227-7015(b) (FEB 2014).

Trademark information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.