Pair volumes

Element Software

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Pair volumes

After you have established a connection between clusters in a cluster pair, you can pair a volume on one cluster with a volume on the other cluster in the pair. When a volume pairing relationship is established, you must identify which volume is the replication target.

You can pair two volumes for real-time replication that are stored on different storage clusters in a connected cluster pair. After you pair two clusters, you can configure active volumes on one cluster to be continuously replicated to a second cluster, providing continuous data protection (CDP). You can also assign either volume to be the source or target of the replication.

Volume pairings are always one-to-one. After a volume is part of a pairing with a volume on another cluster, you cannot pair it again with any other volume.

What you'll need

- You have established a connection between clusters in a cluster pair.
- You have cluster administrator privileges to one or both clusters being paired.

Steps

1. Create a target volume with read or write access
2. Pair volumes using a volume ID or pairing key
3. Assign a replication source and target to paired volumes

Create a target volume with read or write access

The replication process involves two endpoints: the source and the target volume. When you create the target volume, the volume is automatically set to read/write mode to accept the data during the replication.

1. Select **Management** > **Volumes**.
2. Click **Create Volume**.
3. In the Create a New Volume dialog box, enter the Volume Name.
4. Enter the total size of the volume, select a block size for the volume, and select the account that should have access to the volume.
5. Click **Create Volume**.
6. In the Active window, click the Actions icon for the volume.
7. Click **Edit**.
8. Change the account access level to Replication Target.
9. Click **Save Changes**.

Pair volumes using a volume ID or pairing key

The pairing process involves pairing two volumes by using either a volume ID or a pairing key.

1. Pair volumes by selecting one of the following methods:
   - Using a volume ID: Use this method if you have cluster administrator access to both clusters on which volumes are to be paired. This method uses the volume ID of the volume on the remote cluster to initiate a connection.
   - Using a pairing Key: Use this method if you have cluster administrator access to only the source cluster. This method generates a pairing key that can be used on the remote cluster to complete the volume pair.

     The volume pairing key contains an encrypted version of the volume information and might contain sensitive information. Only share this key in a secure manner.

Find more information

- Pair volumes using a volume ID
- Pair volumes using a pairing key

Pair volumes using a volume ID

You can pair a volume with another volume on a remote cluster if you have cluster administrator credentials for the remote cluster.

What you'll need

- Ensure that the clusters containing the volumes are paired.
- Create a new volume on the remote cluster.

  You can assign a replication source and target after the pairing process. A replication source or target can be either volume in a volume pair. You should create a target volume that contains no data and has the exact characteristics of the source volume, such as size, block size setting for the volumes (either 512e or 4k), and QoS configuration. If you assign an existing volume as the replication target, the data on that volume will be overwritten. The target volume can be greater or equal in size to the source volume, but it cannot be smaller.

- Know the target Volume ID.

Steps

1. Select **Management** > **Volumes**.
2. Click the **Actions** icon for the volume you want to pair.
3. Click **Pair**.
4. In the **Pair Volume** dialog box, select **Start Pairing**.
5. Select **I Do** to indicate that you have access to the remote cluster.
6. Select a **Replication Mode** from the list:
   - **Real-time (Asynchronous)**: Writes are acknowledged to the client after they are committed on the source cluster.
   - **Real-time (Synchronous)**: Writes are acknowledged to the client after they are committed on both the source and target clusters.
   - **Snapshots Only**: Only snapshots created on the source cluster are replicated. Active writes from the

source volume are not replicated.

7. Select a remote cluster from the list.
8. Choose a remote volume ID.
9. Click **Start Pairing**.

   The system opens a web browser tab that connects to the Element UI of the remote cluster. You might be required to log on to the remote cluster with cluster administrator credentials.

10. In the Element UI of the remote cluster, select **Complete Pairing**.
11. Confirm the details in **Confirm Volume Pairing**.
12. Click **Complete Pairing**.

    After you confirm the pairing, the two clusters begin the process of connecting the volumes for pairing. During the pairing process, you can see messages in the **Volume Status** column of the **Volume Pairs** window. The volume pair displays `PausedMisconfigured` until the volume pair source and target are assigned.

    After you successfully complete the pairing, you should refresh the Volumes table to remove the **Pair** option from the **Actions** list for the paired volume. If you do not refresh the table, the **Pair** option remains available for selection. If you select the **Pair** option again, a new tab opens and because the volume is already paired, the system reports a `StartVolumePairing Failed: xVolumeAlreadyPaired` error message in the **Pair Volume** window of the Element UI page.

Find more information

- Volume pairing messages
- Volume pairing warnings
- Assign a replication source and target to paired volumes

Pair volumes using a pairing key

If you do not have cluster admin credentials for a remote cluster, you can pair a volume with another volume on a remote cluster using a pairing key.

What you'll need

- Ensure that the clusters containing the volumes are paired.
- Ensure that there is a volume on the remote cluster to use for the pairing.

> ⓘ You can assign a replication source and target after the pairing process. A replication source or target can be either volume in a volume pair. You should create a target volume that contains no data and has the exact characteristics of the source volume, such as size, block size setting for the volumes (either 512e or 4k), and QoS configuration. If you assign an existing volume as the replication target, the data on that volume will be overwritten. The target volume can be greater or equal in size to the source volume, but it cannot be smaller.

Steps

1. Select **Management** > **Volumes**.
2. Click **Actions** icon for the volume you want to pair.

3. Click **Pair**.
4. In the **Pair Volume** dialog box, select **Start Pairing**.
5. Select **I Do Not** to indicate that you do not have access to the remote cluster.
6. Select a **Replication Mode** from the list:
   - **Real-time (Asynchronous)**: Writes are acknowledged to the client after they are committed on the source cluster.
   - **Real-time (Synchronous)**: Writes are acknowledged to the client after they are committed on both the source and target clusters.
   - **Snapshots Only**: Only snapshots created on the source cluster are replicated. Active writes from the source volume are not replicated.
7. Click **Generate Key**.

   > This action generates a text key for pairing and creates an unconfigured volume pair on the local cluster. If you do not complete the procedure, you will need to manually delete the volume pair.

8. Copy the pairing key to your computer's clipboard.
9. Make the pairing key accessible to the cluster admin at the remote cluster site.

   > The volume pairing key should be treated in a secure manner and not used in a way that would allow accidental or unsecured access.

   > Do not modify any of the characters in the pairing key. The key becomes invalid if it is modified.

10. In the remote cluster Element UI, select **Management** > **Volumes**.
11. Click the Actions icon for the volume you want to pair.
12. Click **Pair**.
13. In the **Pair Volume** dialog box, select **Complete Pairing**.
14. Paste the pairing key from the other cluster into the **Pairing Key** box.
15. Click **Complete Pairing**.

    After you confirm the pairing, the two clusters begin the process of connecting the volumes for pairing. During the pairing process, you can see messages in the **Volume Status** column of the **Volume Pairs** window. The volume pair displays `PausedMisconfigured` until the volume pair source and target are assigned.

    After you successfully complete the pairing, you should refresh the Volumes table to remove the **Pair** option from the **Actions** list for the paired volume. If you do not refresh the table, the **Pair** option remains available for selection. If you select the **Pair** option again, a new tab opens and because the volume is already paired, the system reports a `StartVolumePairing Failed: xVolumeAlreadyPaired` error message in the **Pair Volume** window of the Element UI page.

Find more information

- Volume pairing messages

- Volume pairing warnings
- Assign a replication source and target to paired volumes

Assign a replication source and target to paired volumes

After volumes are paired, you must assign a source volume and its replication target volume. A replication source or target can be either volume in a volume pair. You can also use this procedure to redirect data sent to a source volume to a remote target volume should the source volume become unavailable.

What you'll need

You have access to the clusters containing the source and target volumes.

Steps

1. Prepare the source volume:
   a. From the cluster that contains the volume you want to assign as source, select **Management** > **Volumes**.
   b. Click the **Actions** icon for the volume you want to assign as source and click **Edit**.
   c. In the **Access** drop-down list, select **Read/Write**.

      > If you are reversing source and target assignment, this action will cause the volume pair to display the following message until a new replication target is assigned: `PausedMisconfigured`

      Changing access pauses volume replication and causes the transmission of data to cease. Be sure that you have coordinated these changes at both sites.
   d. Click **Save Changes**.
2. Prepare the target volume:
   a. From the cluster that contains the volume you want to assign as target, select **Management** > **Volumes**.
   b. Click the Actions icon for the volume you want to assign as target and click **Edit**.
   c. In the **Access** drop-down list, select **Replication Target**.

      > If you assign an existing volume as the replication target, the data on that volume will be overwritten. You should use a new target volume that contains no data and has the exact characteristics of the source volume, such as size, 512e setting, and QoS configuration. The target volume can be greater or equal in size to the source volume, but it cannot be smaller.
   d. Click **Save Changes**.

Find more information

- Pair volumes using a volume ID
- Pair volumes using a pairing key