UR pair operations

You perform different tasks on UR pairs in day to day operations as a Storage Administrator.

Pair operations

You must have Storage Administrator (Remote Copy) role to perform Universal Replicator pair operations. The pair operations are:

- Checking the pair status
- Creating a UR pair
- Splitting a UR pair
- Splitting a mirror
- Creating point-in-time copies
- Resynchronizing a UR pair
- Resynchronizing a mirror
- Deleting a UR pair
- Managing pairs in a GAD 3DC delta resync environment (VSP G1x00 and VSP F1500)

Caution (VSP G1x00 and VSP F1500) When you perform pair operations between the primary and secondary sites or between the intermediate and secondary sites in a 3DC cascade configuration in which three UR sites are combined, make sure that the pair operations are not performed in other sites. If the pair operations are duplicated, either one of the pair operations might fail. When performing pair operations between other sites, make sure the pair status transition to the required status is completed before performing pair operations in another site.
Creating a UR pair

When you create a pair, the pair relationship between the volumes is established, and the initial copy operation is performed. The P-VOL remains available to the host for I/O operations during the initial copy operation.

To perform this task in CCI, use the paircreate command.

Before you begin

- You can create a pair only from the primary storage system.
- The S-VOL must be offline to all hosts.
- The primary and secondary storage systems must already be configured, and the remote paths must already be defined.
- The P-VOL capacity and S-VOL capacity must be the same (same number of blocks). To view the capacity in blocks, click Options Capacity Unit block in the Logical Devices window. If the capacity is displayed in GB or TB, a slight difference in P-VOL and S-VOL capacity might not be displayed.
- Journal volumes must be registered to the journals that are associated with pairs.
- Review the information on S-VOL volume numbers in the bullet on creating multiple pairs in .
- If you are creating a UR delta resync pair, see
- Make sure that Performance Monitor is stopped.

The following additional information might be useful to you before beginning the procedure:

- You will select the volumes to be paired by port, host group ID or iSCSI target ID, and LUN ID. Make sure to have this information available.
- You will assign master and restore journals to the P-VOL and S-VOL during the operation.
- You will assign a mirror ID to the pair. This identifies the pair within the journal. A mirror refers to the pair within the journal.
- If the mirror ID you will assign to the new pair contains an existing pair or pairs, the new pair’s volumes must belong to the same primary and secondary storage systems defined in the mirror.
- (VSP G1x00 and VSP F1500) In a 3DC multi-target configuration in which three UR sites are combined, you cannot create a UR pair with the second mirror if the first UR P-VOL is in the COPY status.
- (VSP G1x00 and VSP F1500) In a 3DC cascade configuration in which three UR sites are combined, you cannot create a UR pair between the intermediate and secondary sites if the UR S-VOL between the primary and intermediate sites is in the COPY status.

Procedure

1. In the Explorer pane, expand the Storage Systems tree.
2. Expand the target storage system tree, expand Replication, and click Remote Replication.
3. In the UR Pairs tab, click Create UR Pairs.
4. In the Create UR Pairs window, for Copy Type, select Universal Replicator.
5. For Remote Storage System, select the secondary storage system’s Model/Serial Number and Path Group ID.
   - If the mirror contains an existing pair, the same Model/Serial Number as the existing pair’s must be selected.
   - If the secondary storage system is USP V/VM, only 0 can be selected for Path Group ID.

6. In the Primary Volume Selection box, for Use Existing Volumes of UR Pairs, select whether to use the volume used by the UR pair. (VSP G1x00 and VSP F1500) If you are creating 3DC multi-target pair by three UR sites or cascade configuration pair, select Yes. If you are not, select No.

7. In the Primary Volume Selection box, in LU Selection, select the Port ID and Host Group Name or iSCSI Target Alias to display the volumes from which you want to select the P-VOL.

8. In the Available Primary Volumes table, select the volume that will be the P-VOL.
   - When you are using a virtual storage machine with, Available Primary Volumes displays physical LDEV information, not virtual.
   - Nondisruptive migration volumes are not displayed in Available Primary Volumes.
   - Data volumes in different virtual storage machines cannot be registered in the same journal.

9. In the Secondary Volume Selection box, for Base Secondary Volume, select the S-VOL’s Port ID, Host Group ID/iSCSI Target ID, and LUN ID.
   - For USP V/VM and VSP, LUN IDs are displayed in hexadecimal numbers. For VSP G1000, VSP G1500, and VSP F1500, LUN IDs display in decimal or hexadecimal numbers. If you have selected the decimal notation, when assigning an S-VOL in a USP V/VM or VSP storage system, make sure to convert the hexadecimal LUN ID number to decimal.

10. For Selection Type, select the method for assigning S-VOLs when multiple primary volumes are selected, Interval or Relative Primary Volume. See "Before you begin" for more information.

11. For Mirror Selection, specify the following:
    1. For Master Journal, select a number from the list of registered journal IDs. The list excludes already-assigned master and restore journal IDs.
       - If you selected Yes for Use Existing Volumes of UR Pairs in the Primary Volume Selection box, Depends on Selected P-Vols is selected for Master Journal.
    2. For Mirror ID, assign an identifier number for the mirror.
    3. For Restore Journal, select a number from the list of registered journal IDs. All journal IDs display (000-0FF).
    4. For CTG ID, select a consistency group from the list of those registered in the storage system. An asterisk indicates the CTG is assigned to a pair in the Select Pairs table.

12. Click Options to define the following optional settings:
    1. For Initial Copy Type, you can specify whether to copy data from P-VOL to S-VOL during the operation.
       - Entire creates the pair and copies data to the S-VOL. (Default)
- None creates the pair but data is not copied to the S-VOL. This requires that data in the P-VOL and S-VOL are already identical.

- Delta creates the delta resync pair but data is not copied to the S-VOL.

2. For Initial Copy Priority, you can specify the scheduling order for this initial copy operation. Range is 1 to 256 (default = 32). If a time out error occurs, the copy operation may not be executed in the order that you set with Initial Copy Priority. The time out error may be caused by the CU configuration or a remote copy path error. Review the error, release the pair with the error, and then retry the Paircreate operation.

3. In the Error Level list, you can select one of the following system responses if a failure occurs during this operation:
   - Mirror, to split all pairs in the failed pair’s mirror. Mirror is the default.
   - LU, to split only the pair that failed.

13. When ready, click Add. This moves the new pair to the Selected Pairs table. (To remove a pair from the table, select the pair and click Remove).

14. Click Finish.

15. In the Confirm window, review the settings, enter a task name, and then click Apply.

Results
Based on the initial copy option you selected, you can verify that the pair status is correct in the Remote Replication window. The following table specifies the pair status required to successfully complete the operation.

<table>
<thead>
<tr>
<th>Initial Copy Option</th>
<th>Pair Status Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire or None</td>
<td>COPY or PAIR</td>
</tr>
<tr>
<td>Delta</td>
<td>HOLD, HOLDING</td>
</tr>
</tbody>
</table>

You can also monitor the progress of the operation by clicking File > Refresh in the menu bar. This updates the information in the list.

Checking the pair status

Every UR operation requires that the pairs have a specific status. You should always check the pair status before performing any UR operation.

Before you begin

- The pair status requirements are listed in the prerequisite information for each procedure (in "Before you begin").
To review the definitions of the pair statuses, see Pair status definitions.

Procedure

1. In the Explorer pane, expand the Storage Systems tree.

2. Expand the target storage system tree, expand Replication, and click Remote Replication.

3. Select the UR Pairs tab, and then locate the desired pair in the list. The pair status is displayed in the Status column. Click File Refresh as needed to display the most current pair status information in the Remote Replication window.

4. To view detailed pair properties, select the pair, and then click More Actions View Pair Properties.

### Splitting a UR pair

When you split a pair, write-data is no longer sent to the S-VOL and the pair is no longer synchronized. Splitting a pair or mirror gives you a point-in-time copy of the P-VOL.

The following information might be useful before beginning the procedure:

- Performing the pair split when I/O load is low reduces impact on performance. Operations on multiple pairs in the same consistency group with different statuses may result in suspension during periods of heavy write I/O.

- If you split pairs in PAIR status and other than PAIR status in the same mirror, an unexpected suspension could occur during the operation under heavy I/O load conditions. You can estimate whether the I/O load is heavy or not from frequency of host I/Os. This operation should be performed under light I/O load conditions.

- During normal operations, the secondary storage system rejects write operations to an S-VOL. If desired, you can enable write operations to the S-VOL while the pair is split by enabling the S-VOL write option. When this option is enabled, the secondary storage system sends the S-VOL track bitmap to the primary storage system during pair resync to ensure proper resynchronization of the pair. The S-VOL write option (Secondary Volume Write) is described in the pair-split procedure.

To perform this task in CCI, use the pairsplit command.

Before you begin

- This operation can be performed from the primary or secondary storage system.

- Pair status must be COPY or PAIR.

- To split multiple pairs at the same time, the pairs must belong to the same mirror. This ensures sequence consistency among S-VOLS in the mirror.

- Pairs in a CCI consistency group consisting of multiple primary and secondary storage systems can only be split in the mirror.

Procedure

1. In the Explorer pane, expand the Storage Systems tree.
2. Expand the target storage system tree, expand Replication, and click Remote Replication.

3. In the UR Pairs tab, select the pairs to be split and click Split Pairs.

4. In the Split Pairs window, review the pairs to be split in the Selected Pairs table. To remove a pair from the table, select the pair and click Cancel.

5. For Secondary Volume Write, specify whether data can be written to the S-VOL while it is split. Available only when performing the split operation from the pair’s primary storage system.
   - Enable: The host can write data to the S-VOL.
   - Disable: The host cannot write data to the S-VOL.

   Note (VSP G1x00 and VSP F1500) In a 3DC configuration in which three UR sites are combined, host I/O write requests to the split pair’s S-VOL might be rejected when the delta resync pair shares the split S-VOL, even if you split a pair with the Secondary Volume Write option enabled.

6. Click Finish.

7. In the Confirm window, review the settings, enter a task name, and then click Apply.

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**Splitting a mirror**

A mirror normally has multiple pairs with the same master and restore journals groups. When you split a mirror, you split all the pairs in the mirror. As with a normal pair split, data copying is suspended between primary and secondary journals.

To perform this task in CCI, use the pairsplit command.

**Before you begin**

- A mirror can be split from the primary or secondary storage system.
- Pair status must be Active.

**Procedure**

1. In the Explorer pane, expand the Storage Systems tree.

2. Expand the target storage system tree, expand Replication, and click Remote Replication.

3. On the Mirrors tab, select the mirrors to be split and click Split Mirrors.

4. In the Split Mirrors window, review the mirrors that you selected in the Selected Mirrors table. To remove a mirror, select it and click Cancel.

5. For Secondary Volume Write, specify whether data can be written to S-VOLs in the mirror while it is split.
   - Enable: The host can write data to S-VOLs in the mirror. Available only when the selected mirror’s Attribute is
Master. If Restore, Disable is used automatically.
- Disable: The host cannot write data to S-VOLs in the mirror.

6. For Split Mode, specify whether data is written to S-VOLs in the mirror before the split operation runs.
- Flush: Copies all update data from to S-VOLs in the mirror before the split.
- Purge: Prevents update data from being copied to S-VOLs in the mirror before the split. Uncopied data is copied to the S-VOL when the pair is resynchronized.

7. Click Finish.

8. In the Confirm window, review the settings, enter a task name, and then click Apply.

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**Creating point-in-time copies**

Universal Replicator allows you to make Point-in-Time (PiT) copies of volumes in the same journal. Point-in-Time describes a copy of data made when you made it.

To perform this task in CCI, use the pairsplit command.

**Before you begin**
- Review the prerequisite information (in "Before you begin") in Splitting a mirror.

**Procedure**

1. Stop all write I/Os from hosts to P-VOLs in the journal.
2. Split the mirror. Make sure to specify Flush for Split Mode.
3. When the status of all pairs in the journal changes to PSUS, the operation is completed. Resume write I/O to the P-VOLs.

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**Resynchronizing a UR pair**

Resynchronizing a pair updates the S-VOL with differential data that accumulated since the pair was split. After the pair is resynchronized, the S-VOL is again updated from the journals.

To perform this task in CCI, use the pairresync command.

**Before you begin**
- This operation is performed from the primary storage system only.
- The pair status must be PSUS or PSUE.
If pair status is HOLD, HOLDING, or HLDE, use the resynchronizing mirrors operation (see [Resynchronizing a mirror](#)).

- (VSP G1x00 and VSP F1500) In a 3DC multi-target configuration with three UR sites, you cannot resynchronize the other mirror's UR pair when one mirror's UR P-VOL is in the COPY status.
- (VSP G1x00 and VSP F1500) In a 3DC cascade configuration with three UR sites, you cannot resynchronize the UR pair between the primary and intermediate sites when the UR pair between the intermediate and secondary sites is in the COPY status, as illustrated in the following figure.

![Diagram of 3DC configuration](https://example.com/diagram.png)

- (VSP G1x00 and VSP F1500) In a 3DC cascade configuration with three UR sites, the pair between the intermediate and secondary sites will be split automatically when you resync the UR pair between the primary and intermediate sites, if the UR pair between the intermediate and secondary sites is in the PAIR status.
- Pairs suspended by the system (PSUE status) can be resynchronized only after the error causing the suspension has been corrected.

The following additional information might be useful before beginning the procedure:

- Performing the operation on a pair in HLDE status changes the status to HOLD.
- The primary storage system does not resynchronize a pair that is suspended due to an error until the cause of error is resolved.
- If P-VOL status is Failure and S-VOL status is unpaired, the pair cannot be recovered by resynchronizing. It must be deleted and created again.
- Resynchronizing pairs when I/O load is low reduces impact on performance. Operations on multiple pairs in the same mirror with different statuses may result in suspension during periods of heavy write I/O.
- If you resynchronize pairs in PAIR status and other than PAIR status in the same mirror, an unexpected suspension could occur during the operation under heavy I/O load conditions. You can estimate whether the I/O load is heavy or not from frequency of host I/Os. This operation should be performed under light I/O load conditions.

Procedure

1. In the Explorer pane, expand the Storage Systems tree.
2. Expand the target storage system tree, expand Replication, and click Remote Replication.
3. In the UR Pairs tab, select the pairs to be resynchronized and click Resync Pairs.
4. In the Resync Pairs window, review the pairs in the Selected Pairs table. You can remove a pair from the table by...
selecting it and clicking Cancel.

5. For Copy Priority list, specify the scheduling order for resynchronizing selected pairs, between 1 and 256.

6. For Error Level, specify the system response if a failure occurs during this operation.
   - Mirror: Splits all pairs in the failed pair’s mirror.
   - LU: Splits only the specified pair or pairs that failed.

7. Click Finish.

8. In the Confirm window, review the settings, enter a task name, and then click Apply.

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**Resynchronizing a mirror**

When you resynchronize a mirror, all the pairs with the mirror ID are resynchronized and update data copy to the S-VOL is resumed.

When you use UR with TC and a mirror to which the delta resync pair belongs is resynchronized, the delta resync operation is performed. When you use UR with GAD, resynchronizing the mirror is not necessary for performing delta resync.

To perform this task in CCI, execute the pairresync command by specifying a group.

**Before you begin**

- Perform this task only from the primary storage system.
- Mirror status must be Stopped, Hold, Holding, or Hold(Failure).
- Device Manager - Storage Navigator does not support multiple primary and secondary storage systems in a UR system. In this case, use CCI to restore a mirror.
- Use CCI to restore a mirror that is in a CCI consistency group containing multiple journals.
- Resynchronizing a mirror when I/O load is low reduces impact on performance.
- If performing the delta resync operation, make sure to review Performing the delta resync operation.

**Procedure**

1. In the Explorer pane, expand the Storage Systems tree.

2. Expand the target storage system tree, expand Replication, and click Remote Replication.

3. On the Mirrors tab, select the mirrors to be resynchronized, delta resynchronized, or changed from Hold(Failure) to Hold status, and then click Resync Mirrors.

4. In the Resync Mirrors window, review the mirrors in the Selected Mirrors table. You can remove a mirror from the table by selecting it and clicking Cancel.
5. Click Finish.

6. In the Confirm window, review the settings, enter a task name, and then click Apply.

Deleting a UR pair

When you delete a pair, the UR relationship between the P-VOL and S-VOL is released. Only the relationship is affected, the data volumes and their data remain.

To perform this task in CCI, use the pairsplit -S command.

Before you begin

- You must have the Storage Administrator (Remote Copy) role.
- This operation can be performed from the primary or secondary storage system.
- When S-VOLs are physically attached to the same host as P-VOLs, take the S-VOLs offline before releasing the pair. Doing this avoids confusion and possible error when the host is restarted.
- Pairs must be in Suspend status when their journal is in a CCI consistency group consisting of multiple primary and secondary storage systems. If all pairs in the journal are not in Suspend status, you can delete the desired pairs individually, or select Mirror in the Range field, which deletes all pairs in the pair’s mirror.

The following additional information might be useful to you before beginning the procedure:

- When a pair deletion is initiated, differential data is transferred from the S-VOL, the pair relationship is ended, and the volumes’ status becomes unpaired.
- Pairs should be in PAIR status to ensure data consistency between volumes. However, a pair can be deleted in any status except Suspending or Deleting.
- (VSP G1x00 and VSP F1500) If you delete a UR pair between the intermediate and secondary sites in a 3DC cascade configuration in which three UR sites are combined, change the status of the mirror between the primary and the intermediate sites to Stopped, or change the status of the pair you want to delete to Suspending.
- If the operation fails, the P-VOL nevertheless becomes unpaired, but transfer of differential data to the S-VOL is terminated.
- If you plan to delete all pairs in the journal and then create another pair, be sure to wait at least one minute after deleting the pairs before creating the new pair.
- Perform pair deletion when write I/O load is low to reduce impact on performance. Operations on pairs with different status in the same mirror may result in suspension during periods of heavy write I/O.
- If you delete pairs in PAIR status and other than PAIR status in the same mirror, an unexpected suspension could occur during the operation under heavy I/O load conditions. You can estimate whether the I/O load is heavy or not from frequency of host I/Os. This operation should be performed under light I/O load conditions.
- In a delta resync configuration with TC, if you release the TC pair, the UR delta resync pair is released as well. If you release the UR pair, the UR delta resync S-VOL is released.
- In a delta resync configuration with GAD, release the pairs in the order of UR pair first, UR delta resync pair second, and then finally the GAD pair.

Procedure
1. In the Explorer pane, expand the Storage Systems tree.

2. Expand the target storage system tree, expand Replication, and click Remote Replication.

3. In the UR Pairs tab, select the pairs to be deleted and click More Actions Delete Pairs.

4. In the Delete Pairs dialog box, review the pairs in the Selected Pairs table. To remove a pair from the table, select the pair and click Cancel.

5. For Delete Mode, Normal is used for UR.
   CautionNote the following:
   ◦ Forced deletion in the primary storage system results in data that was not yet sent to the secondary storage system being deleted.
   ◦ Forced deletion in the secondary storage system results in data that was not yet restored being deleted.
   ◦ If pair status has not changed to SMPL five minutes after you forcibly delete the pair, delete it again.
   ◦ Make sure not to re-create the pair in the first five minutes after forcibly deleting it using the same journals (mirrors), even if pair status is SMPL and journal status is Initial: in this case pair creation could fail and the pair might suspend.
   ◦ A time-out error can occur at the time of a forced deletion if I/O is sent to another pair in the same journal and the pair’s status is PAIR or COPY.

6. Click Finish.

7. In the Confirm window, review the settings, enter a task name, and then click Apply.

---

**Deleting a mirror**

When you delete a mirror, data copying between master and restore journals ends. After deleting the mirror, pairs in the mirror are also deleted.

To perform this task in CCI, execute the pairsplit command with the -S option by specifying a group.

**Before you begin**

- This operation can be performed from the primary or secondary storage system.
- (VSP G1x00 and VSP F1500) When you delete a mirror between the intermediate and secondary sites in a 3DC cascade configuration in which three UR sites are combined, change the status of the mirror between the primary and the intermediate sites to Stopped, or change the status of the mirror between the intermediate and secondary sites to Suspend.
- If a journal includes two mirrors in a configuration which TrueCopy and Universal Replicator are shared:
  ◦ If you specify a mirror in Hold, Holding, or Hold(Failure) status, only the UR pairs of the specified mirror are deleted.
  ◦ If you specify a mirror that is not in Hold, Holding, or Hold(Failure) status, UR pairs of both mirrors (including the mirror that you did not specify) are deleted.
Procedure

1. In the Explorer pane, expand the Storage Systems tree.

2. Expand the target storage system tree, expand Replication, and click Remote Replication.

3. On the Mirrors tab, select the mirrors to be deleted, and then click More Actions Delete Mirrors.

4. In the Delete Mirrors dialog box, review the mirrors in the Selected Mirrors table.

5. For Delete Mode, specify one of the following:
   - Normal: Mirrors are deleted only if the primary storage system can change the mirror status to Initial.
   - Force: Mirrors are forcibly deleted even when the primary storage system cannot communicate with the secondary storage system.

6. Click Finish.

7. In the Confirm window, review the settings, enter a task name, and then click Apply.

Next steps

Note

If the journal (mirror) status is not Initial, even though you deleted pairs forcibly and five minutes have passed, perform the operation again to delete all pairs registered to the mirror.

Do not create pairs with the same journal for at least five minutes, even if the journal status was Initial; otherwise pair creation could fail and the pair would be suspended.

Managing pairs in a GAD 3DC delta resync environment (VSP G1x00 and VSP F1500)

This topic describes GAD and UR pair operations in a GAD 3DC delta resync (GAD+UR) environment.

Executing delta resync

When you specify an S-VOL and suspend (swap suspend) a GAD pair, the GAD S-VOL pair status changes from PAIR to SSWS. After the pair status changes to SSWS, the UR delta resync pair changes to a UR pair, and the copying from the GAD S-VOL to the UR S-VOL starts. This change in the copy source of the UR pair is the delta resync operation.

For details about storage system support (models, microcode) for GAD+UR operations, see the Global-Active Device User Guide.
Before you begin

- Pair status and mirror status must be as follows:

<table>
<thead>
<tr>
<th>Pair type</th>
<th>Pair status</th>
<th>Mirror status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P-VOL</td>
<td>S-VOL</td>
</tr>
<tr>
<td>GAD pair</td>
<td>PAIR</td>
<td>PAIR</td>
</tr>
<tr>
<td>UR pair</td>
<td>PAIR</td>
<td>PAIR</td>
</tr>
<tr>
<td>UR delta resync pair</td>
<td>PSUS*</td>
<td>SSUS*</td>
</tr>
</tbody>
</table>

* If you use Device Manager - Storage Navigator to suspend (swap suspend) the pair, make sure the status of the UR delta resync pair is HOLD.

- All the differential data of the UR pairs is stored in the primary site's journal.
- Data must be able to be transferred between the UR P-VOL and S-VOL.
- The number of S-VOLs in the UR pairs is the same as that in the UR delta resync pairs.
• There is no failure in the remote path between the secondary site of GAD and the secondary site of UR.
• After creating the UR pair, you must keep updating I/O from the server to the GAD pair's P-VOL or S-VOL for about two minutes.

Command example

! pairsplit -g oraHA -RS -IH1

Notes on delta resync

• When a UR pair has not been suspended and resynchronized for a long time, the data in the restore journal might exceed 70% of capacity. If this happens, old journal data is automatically deleted. In this case, the P-VOL and S-VOL are not synchronized completely by just copying the data, and delta resync will fail. In case of delta resync failure, resynchronize the UR pair.
• Journal data might be deleted in the following cases, even if the data in the restore journal does not exceed 70% of capacity:
  ◦ When you update the P-VOL after resynchronizing the GAD pair.
  ◦ When you update the P-VOL after resynchronizing the UR pair between the primary site and UR secondary site.
  ◦ When retry-processing occurs because of a delay of the P-VOL update.
  ◦ When the update of a GAD S-VOL is delayed.
• If the pair status of the UR delta resync pair does not change after the delta resync operation, the prerequisites for delta resync might not be satisfied. Review the prerequisites for the pair status of the GAD pair, UR pair, and UR delta resync pair.

In case of delta resync failure

If delta resync fails, the UR delta resync pair changes to a UR pair. The status of each pair changes as follows:

Legend:
- P-VOL pair status/S-VOL pair status
- Copy direction
In case of delta resync failure, confirm the following two conditions:

- The system requirements for the GAD+UR configuration are met.
- The system has no failure causes.

If you resynchronize the UR pair after delta resync failure, the initial copy is performed for the GAD pair's S-VOL data to the UR pair's S-VOL.

Note: In a GAD+UR configuration, the data is not copied automatically even if you specify Entire Copy for Delta Resync Failure in the Edit Mirror Options window.

**Resynchronizing GAD pairs in a GAD 3DC delta resync environment**

To resynchronize a GAD pair by specifying the S-VOL (swap resync), the conditions specified below must be met.

For details about storage system support (models, microcode) for GAD operations, see the *Global-Active Device User Guide*.

**Before you begin**

- Pair status must be as follows:

<table>
<thead>
<tr>
<th>Pair type</th>
<th>Pair status</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-VOL</td>
<td>S-VOL</td>
</tr>
<tr>
<td>GAD pair</td>
<td>PSUS</td>
</tr>
<tr>
<td></td>
<td>SSWS</td>
</tr>
<tr>
<td>UR pair</td>
<td>PSUE or PAIR</td>
</tr>
<tr>
<td></td>
<td>PSUE or PAIR</td>
</tr>
<tr>
<td>UR delta resync pair</td>
<td>No condition</td>
</tr>
<tr>
<td></td>
<td>No condition</td>
</tr>
</tbody>
</table>

- The UR pair whose volume shared by GAD S-VOL after swap resync must be a UR delta resync pair.

**Command example**

```
pairresync -g oraHA -swaps -IH1
```

**Deleting GAD pairs in a GAD 3DC delta resync environment**

For details about storage system support (models, microcode) for GAD+UR operations, see the *Global-Active Device User Guide*.

**Before you begin**
If you need to delete a GAD pair forcibly, first delete the UR pair and the UR delta resync pair, and then delete the GAD pair forcibly.

Procedure

1. Delete the UR pair.
   Note: If you accidentally delete the UR delta resync pair in this step before deleting the UR pair, the UR pair might be suspended by failures.

2. Delete the UR delta resync pair.

3. Suspend the GAD pair.

4. Delete the GAD pair.