



**Hewlett Packard**  
Enterprise

# XP7 Auto LUN User Guide

## **Abstract**

This document describes and provides instructions for using Auto LUN to migrate volumes on the XP7 Storage systems.

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# 1 Overview of Auto LUN

This is an overview of Auto LUN.

## Overview of Auto LUN

Auto LUN is used to optimize your data storage by balancing resource utilization and resolving bottlenecks of system activity on the storage system. If heavy input/output (I/O) activity occurs on a specific data drive or disk processor, the host might suffer from slower response times. To avoid this situation, Auto LUN lets you migrate high-usage volumes to a low-usage data drive or a fast data drive.

Migrating volumes with Auto LUN is completely non-disruptive as the data being migrated can remain online to all hosts for read and write operations throughout the entire migration process.

The system administrator specifies the source volume and the target volume, and then executes the migration plan.

## Limitations of Auto LUN

You should keep in mind that Auto LUN operations can improve performance in one area while decreasing performance in another. Consider the following scenario:

- Parity Group A has an average usage value of 20%
- Parity Group B has an average usage value of 90%

Through Auto LUN, it is estimated that if one volume from Parity Group B is migrated to Parity Group A, the usage values of both parity groups become 55%. In this scenario, the I/O response time for *Parity Group B* will most likely decrease, while the I/O response time for Parity Group A will most likely increase. Overall, the throughput may increase or decrease.

Auto LUN must only be performed when you can expect a large improvement in storage system performance. Auto LUN operations may not provide significant improvement for cases in which parity group or volume usage varies only slightly, or for cases in which the overall MP or DRR usages is relatively high.

When an error condition exists in the XP7 storage system, resource usage can increase or become unbalanced. Do not use data collected during an error condition as the basis for planning Auto LUN operations.

## Source and target volumes

The Auto LUN source volume is the volume whose data will be migrated, and this data is migrated to the Auto LUN target volume. Theoretically, the source and target volumes can be located anywhere in the storage system, however, there are some restrictions for selecting source and target volumes in migration. See [“Requirements” \(page 8\)](#) for more information on requirements and restrictions when selecting source and target volumes.

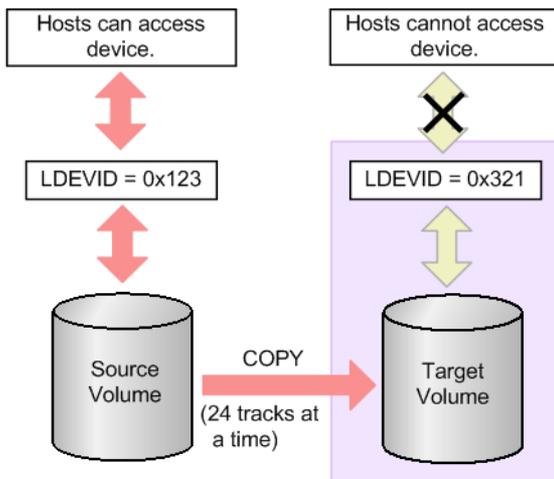
## Volume migration

In a volume migration operation, the data on the source volume is copied to a target volume. Once all data is copied to the target volume, host access is transferred to the target volume to complete the migration. During the migration, the source volume remains available for read and write operations.

The volume migration copy operation copies the content of the source volume to the target volume cylinder by cylinder (24 tracks at a time, not including the diagnostic and unassigned alternate tracks). If the source volume is updated by write operations during the copy operation, the updates will be recorded on the cylinder map of a volume. If there are differential data created by the update, the differential data are copied from the source volume to the target volume. This process

is repeated until all differential data on the source volume is copied. The following figure illustrates the data flow during a migration operation.

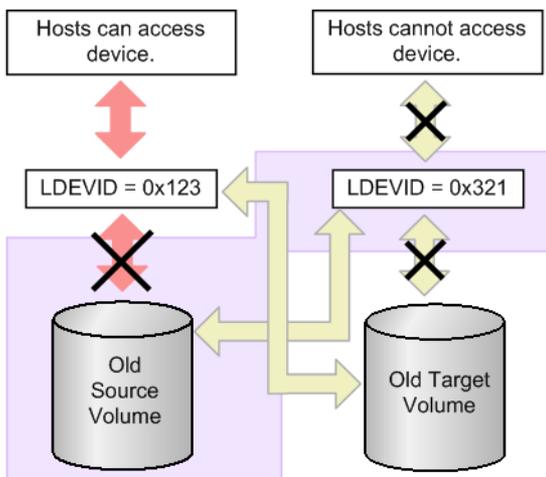
**Figure 1 Data flow during an Auto LUN operation**



There is an upper limit to the number of times a copy operation is executed, and the limit depends on the capacity of the source volume. The limit increases as the capacity of the source volume increases. When differential data still exists after copy operations are repeated to the upper limit, the migration fails. Before attempting the migration again, the workload between the host and the storage system must be adequately reduced, preferably to a value below 50 IOPS (input/output operations per second).

Once the volumes are fully synchronized (that is, there is no differential data on the source volume), the XP7 storage system completes the migration by swapping the Reserve attribute (from target volume to source volume) and redirecting host access to the target volume. The status of the target volume becomes normal. Auto LUN performs all migration operations synchronously (that is, one migration at a time). The following figure illustrates the state of the volumes after a migration operation.

**Figure 2 Data flow after an Auto LUN operation**



Immediately after the source volume and target volume are swapped (that is, the migration is complete), the RAID level before the migration might be displayed. If this occurs, try to resolve the issue by updating the display of the window.

## When to use volume migration

In the following scenarios, you must perform a migration plan:

- To analyze processor and access path usage
- To migrate external volumes
- To migrate Thin Provisioning or Thin Provisioning MF virtual volumes
- To run RAID Manager commands on open-system and mainframe volumes from an open-system host

To perform volume migration by RAID Manager, Auto LUN must be installed on the storage system.

## 2 Requirements

This chapter provides information about Auto LUN requirements.

### System requirements

To perform Auto LUN operations using Remote Web Console or RAID Manager, you need:

- An XP7 Storage system
- A Remote Web Console computer
- Performance Monitor
- Auto LUN

To perform Auto LUN operations using Hewlett Packard Enterprise XP7 Command View Advanced Edition (XP7 CVAE), you need:

- An XP7 Storage system
- A Remote Web Console computer
- Auto LUN V2

If you install only Auto LUN V2, you cannot perform Auto LUN operation with Remote Web Console and RAID Manager.

### Source and target volume general requirements

The source and target volume must satisfy the following conditions:

- Managed by the same storage system, even if the volumes are the external volumes.
- Have the same emulation type. If the emulation type is not OPEN-V, both the source and target volumes must be custom-sized (CV) volumes or normal volumes.
- The source and target volumes have the same capacity in blocks for open system, and in cylinders for mainframe.

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**NOTE:** For open system, confirm the size of source and target volumes by specifying **block** for **Capacity Unit** with **Option** in the **Logical Device** window. For mainframe, confirm the size of source and target volumes by specifying **Cyl** for **Capacity Unit** with **Option** in the **Logical Device** window.

If you display the size of volumes in bytes, for example **GB**, by specifying **block** or **Cyl** for **Capacity Unit**, the slight difference of capacity between the source and target volumes may not be indicated.

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- Must have the same setting in the T10 PI attribute.
- The LDEV IDs (LDKC:CU:LDEV) must have values between 00:00:00 and 00:FE:FF
- Must be specified by LDEV ID, not VOLSER or TID/LUN.
- Do not set Cache Residency on the migrating volume.
- When you encrypt a source volume by using DKA Encryption, encrypt a target volume, too. If you do not encrypt a target volume, data in the target volume is not encrypted. In this case, the confidentiality of target volume is not guaranteed.

### Volumes assigned to resource groups

When you use Resource Partition, you can create migration plans including volumes that belong to resource groups as source volumes and target volumes. You may be unable to create migration plans depending on the use of Resource Partition.

**Table 1 Information about whether you can create migration plans when using Resource Partition**

Resource groups where source volumes belong	Resource groups where target volumes belong	
	are assigned to user groups where you belong	are not assigned to user groups where you belong
are assigned to user groups where you belong	Yes	No
are not assigned to user groups where you belong	No	No
<b>Legend</b> Yes: You can create migration plans. No: You cannot create migration plans.		

**△ CAUTION:** When you use a mainframe system, you can access only one resource group from a host. It is recommended that you must specify volumes that are assigned to the resource group that can be accessed from the host as source volumes and target volumes.

For details about Resource Partition, see *XP7 Provisioning for Open Systems user guide* or *XP7 Provisioning for Mainframe Systems user guide*.

## Supported and prohibited source and target volumes

The following list includes volumes and volume types that cannot be used as source or target volumes for Auto LUN:

- Volumes being used by the host as command devices
- IBM 3390 Concurrent Copy volumes
- Volumes undergoing a Quick Format operation
- Volumes and virtual volumes constituting Fast Snap pairs
- Pool volumes used by Fast Snap
- External volumes of which Data Direct Mapping attribute is enabled.
- Volumes belonging to the capacity expansion-enabled parity groups.

The following table lists the volumes and volume types that can and cannot be considered as candidates for source and/or target volumes for an Auto LUN operation. The table is categorized by program product.

**Table 2 Candidates for source and target volumes by program product**

Program Product	Volume Type/Status	Source Volume Candidate?	Target Volume Candidate?
Thin Provisioning	THP V-VOL	Yes Note that the maximum capacity of THP V-VOL which can be used as the source volume is the same size of the maximum capacity of THP V-VOL.*	Yes, but the target volume may not be associated with the same Thin Provisioning pool as the source volume. Note that the maximum capacity of THP V-VOL which can be used as the target volume is the same size of the

**Table 2 Candidates for source and target volumes by program product (continued)**

Program Product	Volume Type/Status	Source Volume Candidate?	Target Volume Candidate?
			maximum capacity of THP V-VOL.*
	Pool volume	No	No
Thin Provisioning MF	THP V-VOL	Yes, but you cannot specify the volume whose emulation type is 3390-V or 6588-A as the source volume. Note that the maximum capacity of THP V-VOL which can be used as the source volume is the same size of the maximum capacity of THP V-VOL.*	Yes, but the target volume may not be associated with the same Thin Provisioning MF pool as the source volume. You cannot specify the volume whose emulation type is 3390-V or 6588-A as the target volume. Note that the maximum capacity of THP V-VOL which can be used as the target volume is the same size of the maximum capacity of THP V-VOL.*
	Pool volume	No	No
Continuous Access Synchronous	A volume in PSUS, PSUE, or PAIR status	Yes	No
	Deleted pair volumes from a storage system in a primary site	Yes, if volumes are in SMPL status	No
	Deleted secondary volume from a storage system in a primary site	Yes, if volume is in SMPL status	No
	Deleted primary volume from a storage system in a secondary site	Yes, if volume is in SMPL status	No
Continuous Access Synchronous MF	A volume in suspended, simplex, or duplex status	Yes	No
	An external primary volume	Yes, if volume is in suspended status	No
	An external secondary volume	Yes, if volume is in simplex status	No
Continuous Access Journal and Continuous Access Journal MF	A data volume pair	Yes. Note that the target volume must be in the same CLPR.	No
	A journal volume	No	No
Continuous Access Journal	A primary volume in any status	Yes. Note that the target volume must be in the same CLPR.	No
	A secondary volume in PSUS status	Yes. Note that the target volume must be in the same CLPR.	No
	A volume in COPY or PAIR status	No	No

**Table 2 Candidates for source and target volumes by program product (continued)**

Program Product	Volume Type/Status	Source Volume Candidate?	Target Volume Candidate?
Continuous Access Journal MF	A primary volume in any status	Yes. Note that the target volume must be in the same CLPR.	No
	A secondary volume in suspend status	Yes. Note that the target volume must be in the same CLPR.	No
	A volume in Pending Duplex or Duplex status	No	No
Compatible XRC	A normal volume	No	No
Compatible FlashCopy and Compatible FlashCopy SE	Source volume	Yes	No
	Target volume	No	No
Business Copy and Business Copy MF	BC pair volumes	Yes	No
	A primary volume in a BC pair where the primary volume to secondary volume ratio is 1:1 or 1:2	Yes	No
	A primary volume in a BC pair where the primary volume to secondary volume ratio is 1:3	No	No
	A secondary volume in a BC pair where the primary volume to secondary volume ratio is 1:1, 1:2, or 1:3	Yes	No
	A primary volume in an L1 cascaded BC pair where the primary volume to secondary volume ratio is 1:1 or 1:2	Yes	No
	A primary volume in an L1 cascaded BC pair where the primary volume to secondary volume ratio is 1:3	No	No
	A primary volume in an L2 cascaded BC pair where the primary volume to secondary volume ratio is 1:1	Yes	No
	A primary volume in an L2 cascaded BC pair where the primary volume to secondary volume ratio is 1:2	No	No
	A secondary volume in an L1 cascaded BC pair where the primary volume to secondary volume ratio is 1:1, 1:2, or 1:3	Yes	No
	A secondary volume in an L2 cascaded BC pair where the primary volume to secondary volume ratio is 1:1 or 1:2	No	No
Business Copy	A volume in COPY(SP)/COPY or PSUS(SP)/PSUS status	No	No
Business Copy MF	A volume in SP-Pend/TRANS or V-Split/SUSPVS status	No	No
Cache Residency and Cache Residency MF	A volume with data stored in cache	No	No

**Table 2 Candidates for source and target volumes by program product (continued)**

Program Product	Volume Type/Status	Source Volume Candidate?	Target Volume Candidate?
RAID Manager	A volume undergoing an Auto LUN operation via RAID Manager	No	No
	A volume that LU path is not set to	Yes	No
Volume Retention	A volume having the Read Only or Protect attribute turned on	No	No
Data Retention	A volume having the Read Only or Protect attribute turned on	No	No
	A volume disabled to be used as a secondary volume	No	No
Remote Web Console	A volume that LU path is set to	Yes	No
High Availability	A primary volume, a secondary volume or the volume that has the reserve attribute	No	No
	A quorum disk volume	No	No
*For the maximum capacity of the Thin Provisioning virtual volume, see the <i>XP7 Provisioning for Open Systems user guide</i> . For the maximum capacity of Thin Provisioning MF virtual volume, see the <i>XP7 Provisioning for Mainframe Systems user guide</i> .			

If you create the Auto LUN pair during the processing of reclaiming the zero data (including reclaiming the zero data by the WriteSame/Unmap command or rebalancing), the processing of reclaiming the zero data will be suspended.

If you create the Auto LUN pair during the processing of the Unmap command issued when the system option mode 905 is on, the pair creation may fail. If this occur, please retry the pair creation after a while. If the problem persists despite retrying, turn off the system option mode 905, and then retry the pair creation.

## Auto LUN with Thin Provisioning or Thin Provisioning MF virtual volumes

You can perform a migration plan on a Thin Provisioning or Thin Provisioning MF virtual volume or an external volume. However, you cannot examine the estimated usage rate after the migration because the usage rate of the virtual volume or the external volume cannot be collected.

The following table summarizes the internal volume and Thin Provisioning or Thin Provisioning MF virtual volume (THP V-VOL) combinations under which a volume migration plan can be created.

**Table 3 Permissible Internal and THP V-VOL combinations**

Source Volume	Internal Volume as Target Volume	THP V-VOL in Normal State as Target Volume
Internal Volume	A migration plan can be created.	A migration plan can be created*.
THP V-VOL in Normal state	A migration plan can be created*.	A migration plan can be created*. A warning message appears if there is a possibility that the data size may exceed the pool threshold after migration.
THP V-VOL in Blocked state due to full capacity	A migration plan can be created*.	A migration plan can be created*. A warning message appears if there is a possibility that the data size may

**Table 3 Permissible Internal and THP V-VOL combinations** (continued)

Source Volume	Internal Volume as Target Volume	THP V-VOL in Normal State as Target Volume
		exceed the pool threshold after migration.
<p>*If operations change the configuration of the storage system after the initial volume migration, any subsequent volume migration must be executed at an interval which is calculated by the following formula:  <math>(Pool\_Capacity \times 3 \text{ (seconds)}) + 40 \text{ (minutes)}</math></p>		

The migration plan might not be executed if the storage system is experiencing a heavy workload. When you specify a Thin Provisioning or Thin Provisioning MF virtual volume or an internal volume which is used for the Continuous Access Synchronous pair as a source volume, see the [Table 5 \(page 14\)](#) table for specifying a target volume. The Continuous Access Synchronous or Continuous Access Synchronous MF pair combination of an internal volume as a primary volume and a Thin Provisioning or Thin Provisioning MF virtual volume as a secondary volume is not recommended.

If the capacity of a Thin Provisioning or Thin Provisioning MF virtual volume is increasing, this volume cannot be specified as the source or target volume in an Auto LUN plan. It will also be impossible to reserve or remove the reserve attribute for a virtual volume whose capacity is increasing. You must ensure that the capacity of a Thin Provisioning or Thin Provisioning MF virtual volume is not increasing if you plan on using that virtual volume in an Auto LUN plan.

When you create an Auto LUN pair using a virtual volume of Thin Provisioning whose capacity is larger than 4,194,304MB (8,589,934,592 blocks), the differential data is managed by the pool which is related to the source volume and target volume of the Auto LUN pair. In this case, the pool capacity for the differential management data (maximum 4 pages) is required for every 4,123,168,604,160 bytes of the capacity of the volume. The pool capacity for the differential management data depends on the configuration of the software.

When you downgrade the microcode to the version which does not support the creation of pair using a virtual volume of Auto LUN whose capacity is larger than 4,194,304MB, you must release the differential data (page) which is managed by the pool. The release procedures are as follows:

1. Delete all pairs using a virtual volume whose pages will be released.
2. Make the system option mode 755 OFF.

You can reclaim the zero data pages after the system option mode 755 is off.

3. Recover the blocked pool.
4. Release the page of the virtual volume.

When you release the page, use **Reclaiming Zero Data Page** window of Remote Web Console or `raidcom modify ldev` command of RAID Manager.

When you create an Auto LUN pair using a virtual volume of Thin Provisioning MF whose capacity is larger than 262,668 Cyl, the differential data is managed by the pool which is related to the source volume and target volume of the Auto LUN pair. In this case, the pool capacity for the differential management data is 1 page required for every 4,096 Cyl of the capacity of the volume.

In this manual, Thin Provisioning indicates Thin Provisioning, Smart Tiers, and Real Time Smart Tier. Thin Provisioning MF indicates Thin Provisioning MF, Smart Tiers MF, and Real Time Smart Tier for Mainframe.

## Auto LUN with Continuous Access Synchronous MF and Continuous Access Journal MF

When the selected source volume is a primary volume or a secondary volume of a Continuous Access Synchronous MF or Continuous Access Journal MF pair consisting of internal volumes

and/or Thin Provisioning MF virtual volumes, there are some target volume candidates that must not be considered. The following table lists the possible Internal/THP V-VOL - Continuous Access Synchronous MF/Continuous Access Journal MF pair combinations, and tells which type of volume must not be considered as a target volume based on the Continuous Access Synchronous MF/Continuous Access Journal MF pair combination and the selected source volume.

**Table 4 Poor target volume candidates for Cnt Ac-S MF/Cnt Ac-J MF pair combinations**

Cnt Ac-S MF or Cnt Ac-J MF Pair	Source Volume Candidate	Poor Target Volume Candidate
Internal primary volume, Internal secondary volume	Internal primary volume	None
	Internal secondary volume	THP V-VOL
Internal secondary volume, THP V-VOL secondary volume	Internal primary volume	Internal volume
	THP V-VOL secondary volume	THP V-VOL
THP V-VOL primary volume, Internal secondary volume	THP V-VOL primary volume	None
	Internal secondary volume	None
THP V-VOL primary volume, THP V-VOL secondary volume	THP V-VOL primary volume	Internal volume
	THP V-VOL secondary volume	None

**△ CAUTION:**

- If you do the Continuous Access Synchronous MF operation so that the Continuous Access Synchronous MF pair status becomes other than Suspended when Auto LUN and Continuous Access Synchronous MF share a volume, the Auto LUN process stops.
- If you do the Continuous Access Journal MF operation so that the Continuous Access Journal MF pair status becomes other than Suspended when Auto LUN and Continuous Access Journal MF share a volume, the Auto LUN process stops.

## Auto LUN with Continuous Access Synchronous and Continuous Access Journal

When the selected source volume is a primary volume or a secondary volume of a Continuous Access Synchronous or Continuous Access Journal pair consisting of internal volumes and/or Thin Provisioning virtual volumes, there are some target volume candidates that must not be considered. The following table lists the possible Internal/THP V-VOL - Continuous Access Synchronous/Continuous Access Journal pair combinations, and tells which type of volume must not be considered as a target volume based on the Continuous Access Synchronous/Continuous Access Journal pair combination and the selected source volume.

**Table 5 Poor target volume candidates for Cnt Ac-S/Cnt Ac-J pair combinations**

Continuous Access Synchronous or Continuous Access Journal Pair	Source Volume Candidate	Poor Target Volume Candidate
Internal primary volume, Internal secondary volume	Internal primary volume	None
	Internal secondary volume	THP V-VOL
Internal primary volume, THP V-VOL secondary volume	Internal primary volume	Internal volume
	THP V-VOL secondary volume	THP V-VOL
THP V-VOL primary volume, Internal secondary volume	THP V-VOL primary volume	None
	Internal secondary volume	None

**Table 5 Poor target volume candidates for Cnt Ac-S/Cnt Ac-J pair combinations (continued)**

Continuous Access Synchronous or Continuous Access Journal Pair	Source Volume Candidate	Poor Target Volume Candidate
THP V-VOL primary volume, THP V-VOL secondary volume	THP V-VOL primary volume	Internal volume
	THP V-VOL secondary volume	None

**△ CAUTION:**

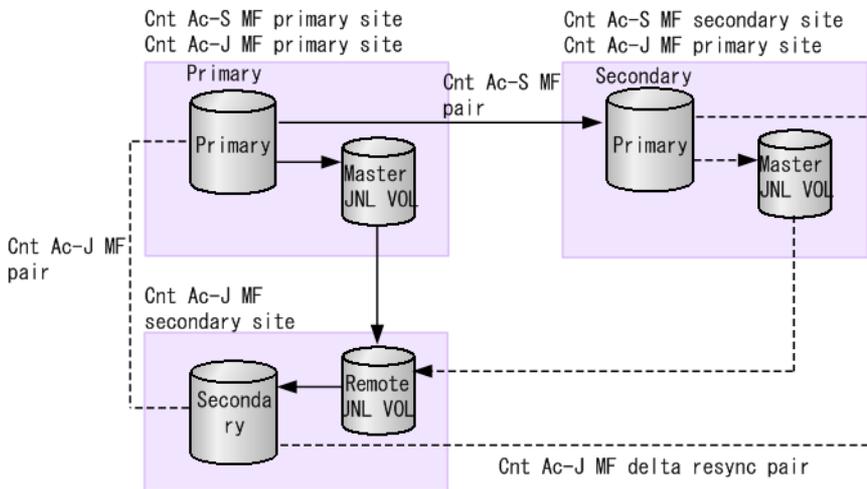
- If you do the Continuous Access Synchronous operation so that the Continuous Access Synchronous pair status becomes other than PSUS when Auto LUN and Continuous Access Synchronous share a volume, the Auto LUN process stops.
- If you do the Continuous Access Journal operation so that the Continuous Access Journal pair status becomes other than PSUS when Auto LUN and Continuous Access Journal share a volume, the Auto LUN process stops.

## Auto LUN and Continuous Access Journal MF

You cannot select a volume in Pending Duplex or Duplex status as a source volume.

If you create a Continuous Access Journal MF pair for a delta resync operation in a 3DC multi-target configuration, the primary volume or the secondary volume of the delta resync pair can be used as a source volume. To use the primary or secondary volume as a source volume, you must ensure that the status of each pair in the 3 DC multi-target configuration is as shown in [Table 6 \(page 16\)](#) and [Table 7 \(page 16\)](#).

**Figure 3 3DC multi-target configuration**



(Legend)  
 Cnt Ac-S MF: Continuous Access Synchronous for Mainframe  
 Cnt Ac-J MF: Continuous Access Journal for Mainframe  
 JNLVOL: journal volume  
 Primary: primary volume  
 Secondary: secondary volume

**Table 6 Pair status when primary volume of Continuous Access Journal MF delta resync pair is as a source volume**

Pair Name	Status
Continuous Access Synchronous MF pair	SUSPEND or DUPLEX
Continuous Access Journal MF pair	Any pair status can be acceptable
Continuous Access Journal MF pair for delta resync operation	Hold or Hlde

**Table 7 Pair status when secondary volume of Continuous Access Journal MF delta resync pair is a source volume**

Pair Name	Status
Continuous Access Synchronous MF pair	Any pair status can be acceptable
Continuous Access Journal MF pair	SUSPEND
Continuous Access Journal MF pair for delta resync operation	Hold or Hlde

Also, the source and target volumes must belong to the same CLPR.

**△ CAUTION:**

- If you do the Continuous Access Journal MF operation so that the Continuous Access Journal MF pair status becomes other than Suspended when Auto LUN and Continuous Access Journal MF share a volume, the Auto LUN process stops.
- In a 3DC multi-target configuration and a 3DC cascade configuration with three Continuous Access Journal MF sites, you cannot specify the volume which two Continuous Access Journal MF pairs share to use for Auto LUN. You cannot use Auto LUN volumes as the volume which two Continuous Access Journal MF pairs share.

## Auto LUN with Business Copy MF or Business Copy

You can use the Business Copy MF pair volumes or the Business Copy pair volumes as the Auto LUN source volume excluding the volumes having some pair statuses or the configurations. For more information, see [“Supported and prohibited source and target volumes” \(page 9\)](#).

**△ CAUTION:**

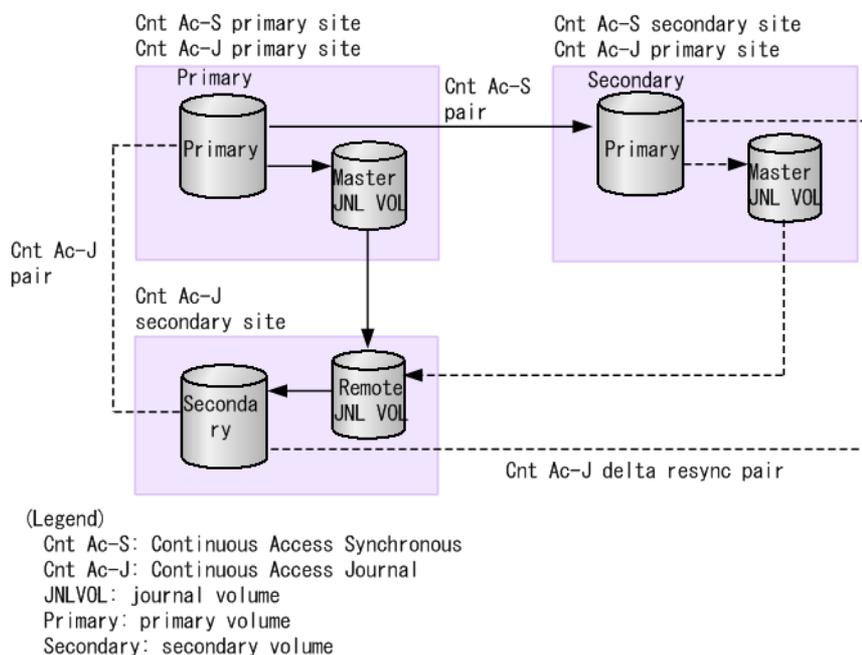
- If you do the Business Copy operation so that the Business Copy pair status becomes COPY (SP) or PSUS(SP) when Auto LUN and Business Copy share a volume, the Auto LUN process stops.
- If you do the Business Copy MF operation so that the Business Copy MF pair status becomes other than SP-Pend or V-Split when Auto LUN and Business Copy MF share a volume, the Auto LUN process stops.

## Auto LUN and Continuous Access Journal

You cannot select a volume in COPY or PAIR status as a source volume.

In a 3DC multi-target configuration with Continuous Access Journal and Continuous Access Synchronous, if you create a Continuous Access Journal pair for a delta resync operation, the primary volume or the secondary volume of the delta resync pair can be used as a source volume. To use the primary or secondary volume as a source volume, you must ensure that the status of each pair in the 3 DC multi-target configuration is as shown in [Table 8 \(page 17\)](#) and [Table 9 \(page 17\)](#).

**Figure 4 3DC multi-target configuration**



**Table 8 Pair status when primary volume of Continuous Access Journal delta resync pair is a source volume**

Pair Name	Status
Continuous Access Synchronous pair	PSUS or PAIR
Continuous Access Journal pair	Any pair status can be acceptable
Continuous Access Journal pair for delta resync operation	HOLD or HLDE

**Table 9 Pair status when secondary volume of Continuous Access Journal delta resync pair is a source volume**

Pair Name	Status
Continuous Access Synchronous pair	Any pair status can be acceptable
Continuous Access Journal pair	PSUS
Continuous Access Journal pair for delta resync operation	HOLD or HLDE

Also, the source and target volumes must belong to the same CLPR.

**△ CAUTION:**

- If you do the Continuous Access Journal operation so that the Continuous Access Journal pair status becomes other than PSUS when Auto LUN and Continuous Access Journal share a volume, the Auto LUN process stops.
- In a 3DC multi-target configuration and a 3DC cascade configuration with three Continuous Access Journal sites, you cannot specify the volume which two Continuous Access Journal pairs share to use for Auto LUN. You cannot use Auto LUN volumes as the volume which two Continuous Access Journal pairs share.

## Volumes having access attribute of Data Retention

You can select a volume having an attribute setting of Data Retention as a source volume. However, depending on the access attribute of the target volume, you may not be able to perform

Auto LUN operations. For information about whether or not you can perform the volume migration operation to the volume having the access attribute of Data Retention, see [Table 10 \(page 18\)](#).

**Table 10 Access attributes and permissible Auto LUN operations**

Access attributes of source volume	Access attributes of target volume	Operations from Remote Web Console		Operations from RAID Manager	
		Performing Auto LUN operation	Stopping Auto LUN operation	paircreate	pairsplit-S
Read/Write, Read Only, Protect, and S-VOL Disable	Read/Write	permissible	permissible	permissible	permissible
	Read Only	not permissible	permissible	not permissible	permissible
	Protect	not permissible	permissible	not permissible	permissible
	S-VOL Disable	not permissible	permissible	not permissible	permissible

**NOTE:** A source volume exchanges the role with a target volume by the Auto LUN operation. However, the access attribute of the source volume and the target volume does not exchange.

Depending on the status of the Auto LUN plan, you may not be able to set the access attribute with Data Retention to the source volume or the target volume of Auto LUN. For information about whether or not you can set the access attribute to the Auto LUN pair, see [Table 11 \(page 18\)](#).

**Table 11 Permissible access attributes for source volume and target volume of Auto LUN**

Volume specified with Auto LUN			Access attributes			
Pair status		Volume	Read/Write	Read Only	Protect	S-VOL Disable
Pair created by Remote Web Console	Migrating	Source	permissible	not permissible	not permissible	not permissible
		Target	permissible	not permissible	not permissible	not permissible
Pair created by RAID Manager	COPY	Source	permissible	not permissible	not permissible	not permissible
		Target	permissible	not permissible	not permissible	not permissible
	PSUS	Source	permissible	not permissible	not permissible	not permissible
		Target	permissible	not permissible	not permissible	not permissible
	PSUE	Source	permissible	not permissible	not permissible	not permissible
		Target	permissible	not permissible	not permissible	not permissible

You can set only Read/Write as the access attribute to the reserved volume of Auto LUN. You cannot set the Read Only, Protect, and S-VOL Disable attributes.

## Volumes having access attribute of Volume Retention

You can select a volume setting an access attribute by using Volume Retention as a source volume. However, depending on the access attribute of the target volume, you may not be able to perform the Auto LUN operations. For the information about whether or not you can perform the volume migration operation to the volume having the access attribute of Volume Retention, see [Table 12 \(page 19\)](#).

**Table 12 Access attributes and permissible Auto LUN operations**

Access attributes of source volume	Access attributes of target volume	Operations from Remote Web Console		Operations from RAID Manager	
		Performing Auto LUN operation	Stopping Auto LUN operation	paircreate	pairsplit-S
Read/Write, Read Only, and Protect	Read/Write	permissible	permissible	permissible	permissible
	Read Only	not permissible	permissible	not permissible	permissible
	Protect	not permissible	permissible	not permissible	permissible

**NOTE:** A source volume exchanges the role with a target volume by the Auto LUN operation. However, the access attribute of the source volume and the target volume does not exchange.

You can set the access attribute to the source volume or the target volume of Auto LUN with Volume Retention. However, if the emulation type of volume is 3390-A, and you set the Read Only attribute or the Protect attribute to the source volume or the target volume, the migration operation may stop or the failure may occur.

You can set all access attributes that you can set by using Volume Retention to the reserved volume of Auto LUN. The access attributes that you can set by using Volume Retention are Read/Write, Read Only, and Protect.

## Compatible XRC pair volumes

You cannot create migration plans by using the Compatible XRC pair volumes as the source volume or the target volume. You can create the Compatible XRC pairs by specifying the Auto LUN volumes after creating the migration plan, but the Auto LUN process stops.

## Concurrent Copy (CC) pair volumes

You cannot create migration plans by using the Concurrent Copy (CC) pair volumes as the source volume or the target volume. You can create the Concurrent Copy pairs by specifying the Auto LUN volumes after creating the migration plan, but the Auto LUN process stops.

## 3 Auto LUN planning

This chapter provides information about Auto LUN planning.

### Migration plans

To migrate volumes, you must create migration plans. A migration plan is required for each volume that you want to migrate, and each plan includes a source volume and target volume.

#### Execute multiple migration plans continuously

- When you create migration plans, the volume configuration may change for every migration plan execution.
- Up to eight migration plans can be applied each time you click **Apply** in the **Migration Plan** window. If you want more than eight migration plans, you must click **Apply** multiple times.
- You can apply the next migration plan during the migration plan execution.
- The number of migration plans that can be executed concurrently might be restricted based on emulation types and sizes of the migrated volumes, and on the resources being used by other programs.

### Estimating differential tables

Differential tables are resources shared by Auto LUN, Business Copy, Business Copy MF, and Compatible FlashCopy. Because an Auto LUN source volume still accepts I/O write operation during an Auto LUN operation, differential tables are used to track and copy the differential data to the target volume, which ultimately becomes the migrated volume. The subsequent topics provide formulas for estimating the amount of differential and pair tables that you will need per migration plan.

### Calculating the required amount of differential tables for a mainframe volume

When you migrate mainframe volumes, you must determine the total number of required differential tables and pair tables per migration plan. Use the following equation to calculate the required amount of differential tables. Figures are rounded up to the nearest whole number. If you use a volume whose size exceeds 223 GB (262,668 Cyl), the following equation is not necessary because you do not need the differential table.

**Total number of the differential tables per migration plan** =  $(X + Y) \times 15 \div Z$

The variables are explained below:

- X: The number of volume cylinders to be migrated. If the volume is divided by the Virtual LVI function, this value is the number of cylinders in the divided volume.
- Y: The number of control cylinders.
- Z: The number of slots that can be managed by a differential table.

### Control cylinders by mainframe emulation type

Before you can calculate the required amount of differential tables per migration plan, you must know the number of control cylinders contained by the mainframe volume. The following table shows the number of control cylinders based on the emulation type.

**Table 13 Number of control cylinders based on emulation type**

Emulation Type	Number of Control Cylinders
3390-3, 3390-3A, 3390-3B, 3390-3C	21
3390-9, 3390-9A, 3390-9B, 3390-9C	25
3390-L, 3390-LA, 3390-LB	23
3390-A, 3390-M, 3390-MA, 3390-MB, 3390-MC, 6588-A	53
3390-LC	23

### 3390-3 emulation type example

For this example, the emulation type of the mainframe volume is 3390-3. Recall the formula for calculating the required amount of differential tables per migration plan:

$(X \text{ (number of volume cylinders)} + Y \text{ (number of control cylinders)}) \times 15 \div Z \text{ (number of slots that can be managed by a differential table)}$

The number of volume cylinders for the 3390-3 emulation type is 3,390. The number of control cylinders for the 3390-3 emulation type is 21 (see the preceding table). The number of slots that can be managed by a differential table is 20,448. The formula is calculated below:

$$(3,339 + 21) \times 15 \div (20,448) = 2.464788732$$

When you round up 2.464788732 to the nearest whole number, it becomes 3. Therefore, the total number of required differential tables for each migration plan is 3 when the emulation type is 3390-3.

One pair table can be used for 36 differential tables. Therefore, the number of pair tables for one migration plan is 1 when the emulation type is 3390-3. Two pair tables are used if the emulation type is 3390-M and the number of volume cylinders is default number.

## Calculating the required amount of differential tables for an open-system volume

When you migrate open-system volumes, you must determine the total number of required differential tables and pair tables per migration plan. The equation to calculate the required amount of differential tables will vary based on the emulation type. Figures are rounded up to the nearest whole number.

### Control cylinders by open emulation type

Before you can calculate the required amount of differential tables per migration plan, you must know the number of control cylinders contained by the open-system 3,019,898,880 volume. The following table shows the number of control cylinders based on the emulation type.

**Table 14 Number of control cylinders and capacity based on emulation type**

Emulation Type	Control Cylinders (Capacity)
OPEN-3	8 (5,760 KB)
OPEN-8, OPEN-9	27 (19,440 KB)
OPEN-E	19 (13,680 KB)
OPEN-L	7 (5,040 KB)
OPEN-V	0 (0 KB)

## Differential tables calculation for an OPEN-V volume

The following equation is used to calculate the required amount of differential tables for an OPEN-V volume. If you use the THP V-VOL whose size exceeds 4 TB, the following equation is not necessary because you do not need the differential table.

**Total number of differential tables per migration plan** =  $(X \div 256) \div Z$

The variables are explained below:

- X: The capacity of the volume to be migrated (in kilobytes). If the volume is divided by the Virtual LVI function, this value is the capacity of the divided volume.
- Z: The number of the slots that can be managed by a differential table.

The capacity of an OPEN-V volume is 3,019,898,880 kilobytes, and the number of slots that can be managed by a differential table is 20,448. The formula is calculated below:

$$(3,019,898,880 \div 256) \div 20,448 = 576.9014085$$

When you round up 576.9014085 to the nearest whole number, it becomes 577. Therefore, the total number of required differential tables for each migration plan is 577 when the emulation type is OPEN-V.

One pair table can be used for 36 differential tables. Therefore the number of pair tables for one migration plan is 17 when the emulation type is OPEN-V.

## Differential tables calculation for other open emulation types

The following equation is used to calculate the required amount of differential tables for OPEN-3, OPEN-8, OPEN-9, OPEN-E, and OPEN-L volumes. If you use the THP V-VOL whose size exceeds 4 TB, the following equation is not necessary because you do not need the differential table.

**Total number of the differential tables per migration plan** =  $(X \div 48 + Y \times 15) \div Z$

The variables are explained below:

- X: The capacity of the volume to be migrated (in kilobytes). If the volume is divided by the Virtual LVI function, this value is the capacity of the divided volume. The Virtual LVI function is not available for OPEN-L volumes.
- Y: The number of control cylinders.
- Z: The number of the slots that can be managed by a differential table.

If the emulation type of a volume is OPEN-3, the capacity is 2,403,360 (in kilobytes) and the number of control cylinders is 8. Both of these figures are provided in the preceding table. The number of slots that can be managed by a differential table is 20,448. The formula is calculated below:

$$(2,403,360 \div 48 + 8 \times 15) \div 20,448 = 2.454518779$$

When you round up 2.454518779 to the nearest whole number, it becomes 3. Therefore, the total number of required differential tables for each migration plan is 3 when the emulation type is OPEN-3.

One pair table can be used for 36 differential tables. Therefore the total number of the pair tables for one migration plan is 1 when the emulation type is OPEN-3.

## Running concurrent migration plans

To implement a migration plan, the differential tables and the pair tables are necessary as resources. The differential tables and the pair tables are the resources shared by Auto LUN, Business Copy and Business Copy MF. The number of differential tables and pair tables used in one storage system differs depending on whether the dedicated shared memories are added. Concurrent migration plans cannot be implemented at a time if the number of system volumes

in the storage system is more than half of the total number of system volumes. If you want to add the dedicated shared memories, call the Hewlett Packard Enterprise Support Center.

**Table 15 The number of differential tables, pair tables and system volumes per additional shared memory type**

Additional shared memory for Auto LUN	the number of differential tables	the number of pair tables	the number of system volumes
Base (no additional shared memory)	57,600	8,192	16,384
Extension	419,200	32,768	65,536

The emulation type and capacity of each volume to be migrated.

The number of differential tables and pair tables needed to migrate one volume differs based on the emulation type and size of the volume. For the number of differential tables and pair tables needed for migrating a mainframe volume, see [“Calculating the required amount of differential tables for a mainframe volume” \(page 20\)](#). For the number of differential tables needed for migrating an open-system volume, see [“Calculating the required amount of differential tables for an open-system volume” \(page 21\)](#).

## Estimating the number of concurrent migration plans

The following conditional expression can be used to estimate the maximum number of migration plans that can be executed concurrently:

$$\Sigma(\alpha) \leq (\beta) \text{ and } \Sigma(\gamma) \leq (\delta)$$

The variables are explained below:

- $\Sigma(\alpha)$ : total number of differential tables needed for migrating all volumes.
- $(\beta)$ : total number of differential tables available in the storage system.
- $\Sigma(\gamma)$ : total number of pair tables needed for migrating all volumes.
- $(\delta)$ : total number of pair tables available in the storage system.

As calculated in [“Differential tables calculation for an OPEN-V volume” \(page 22\)](#), the number of differential tables required for each migration plan for an OPEN-3 volume is 3, and the number of required pair tables for each migration plan is 1. If you want to create 20 migration plans of OPEN-3 volumes, 60 differential and 20 pair tables are required. These numbers are plugged into the original equation:

$$[(3 \times 20) = 60] \leq 26,176 \text{ and } [(1 \times 20) = 20] \leq 8,192$$

Because this expression is true, you can create all 20 migration plans for the OPEN-3 volumes.

In the preceding calculation, it is assumed that only Auto LUN is running. However, as mentioned earlier, differential tables are resources that are also shared by Business Copy, Business Copy MF, and Compatible FlashCopy. The total number of pair tables used by Business Copy, Business Copy MF, Compatible FlashCopy and Auto LUN must be within the value of  $(\beta)$  and  $(\delta)$ . For details on how to calculate the number of differential tables and pair tables used by the programs other than Auto LUN, see the manuals of the corresponding products.

# 4 Auto LUN operations

This chapter contains operations performed in the Auto LUN window.

## Migrating a volume

A volume can be migrated through the **Migration Plan** window.

### Prerequisites

- You must have the Storage Administrator (Provisioning) role to perform this task.
- The user has permission to access the source and target volume.
- The volumes meet all requirements as source and target volume candidates.
- OPEN-V volumes other than the Thin Provisioning or Thin Provisioning MF virtual volumes might not be displayed as target volumes.

### Procedure 1 To migrate a volume:

1. Open the **Migrate Volumes** window in one of the following methods.

When you use Command View Advanced Edition:

- Expand the **Storage System** tree in the **Resource** tab. Right-click **Volume** under the local storage system, and then select **System GUI**. Click **Other Tasks > Migration Volumes** in the **LDEV** tab.

When you use Remote Web Console:

- Select **Logical Devices** from the **Storage Systems** tree. Click **More Actions > Migrate Volumes** in the **LDEVs** tab.
- Click **Actions > Logical Device > Migration > Migrate Volumes**.

2. In the **Selected Source Volume** table, click **Select**.
3. In the window, select the radio button of the migration volumes.
4. Click **OK**.

The selected volume is displayed in **Selected Source Volume** table.

5. From **Available Target Volume** table, select the radio button of the target volume.
6. Click **Add**.

The information for the created migration plan is displayed in **Selected Migration Plan** table.

7. Click **Finish**.
8. In the Confirmation window, enter the **Task Name**.

9. Click **Apply**.

If **Go to tasks window for status** is checked when you click **Apply**, the task window appears.

**CAUTION:** If any of the following operations is performed on an Auto LUN source volume during migration, the volume migration process stops:

- Compatible XRC operation
- CC operation
- Continuous Access Synchronous MF or Continuous Access Synchronous operation that changes the volume status to something other than suspended
- Business Copy MF operation that changes the volume status to SP-Pend/TRANS or V-Split/SUSPVS
- Business Copy operation that changes the volume status to COPY(SP)/COPY or PSUS(SP)/PSUS.
- Continuous Access Journal MF or Continuous Access Journal operation

## Related information

[“Volume Migration wizard” \(page 42\)](#)

## Viewing a migration plan

There may be an occasion when you want to view a migration plan.

### Prerequisite

- You must have the Storage Administrator (View only) role to perform this task.

### To view migration plans:

Open the **Migration Plan** window in one of the following methods.

When you use Command View Advanced Edition:

- Expand the **Storage System** tree in the **Resource** tab. Right-click **Volume** under the local storage system, and then select **System GUI**. Click **Volume Migration > View Migration Plans**.

When you use Remote Web Console:

- Select **Logical Devices** from the **Storage Systems** tree. Click **Volume Migration > View Migration Plans** in the summary.
- Click **Actions > Logical Device > Migration > View Migration Plans**.

## Related information

[“Volume Migration wizard” \(page 42\)](#)

## Deleting a migration plan

There may be an occasion when you want to delete a migration plan. You can delete up to eight migration plans in one deleting operation. If you want to delete nine plans or more, repeat the following procedure until all migration plans are deleted.

## Prerequisite

- You must have the Storage Administrator (Provisioning) role to perform this task.

### Procedure 2 To delete a migration plan:

1. Open the **Migration Plan** window in one of the following methods.

When you use Command View Advanced Edition:

- Expand the **Storage System** tree in the **Resource** tab. Right-click **Volume** under the local storage system, and then select **System GUI**. Click **Volume Migration > View Migration Plans** in the summary.

When you use Remote Web Console:

- Select **Logical Devices** from the **Storage Systems** tree. Click **Volume Migration > View Migration Plans** in the summary.
- Click **Actions > Logical Device > Migration > View Migration Plans**.

2. In the **Migration Plans** window, select the check box of the migration plan that you want to delete.
3. Click **Delete Migration Plans** button.
4. Click **OK**.

---

**NOTE:** If you delete a migration plan that is being processed, the data in the target volume cannot be guaranteed. A migration plan that was created by another program cannot be deleted through Remote Web Console.

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## Related information

[“Delete Migration Plans window” \(page 57\)](#)

## Viewing the migration history logs

The History window displays logs of migration operations.

---

**NOTE:** If you use 1000 or more volumes concurrently, the operation history might not be recorded completely.

---

## Prerequisite

- You must have the Storage Administrator (View only) role to perform this task.

### To view migration logs:

Open the **History** window in one of the following methods.

When you use Command View Advanced Edition:

- Expand the **Storage System** tree in the **Resource** tab. Right-click **Volume** under the local storage system, and then select **System GUI**. Click **Volume Migration > View History** in the summary.

When you use Remote Web Console:

- Select **Logical Devices** from the **Storage Systems** tree. Click **Volume Migration > View History** in the summary.
- Click **Actions > Logical Device > Migration > View History**.

## Related information

[“History window” \(page 59\)](#).

# Delete all history logs

The History window displays logs of migration operations. All history logs can be deleted at one time.

## Prerequisite

- You must have the Storage Administrator (Provisioning) role to perform this task.

### Procedure 3 To delete all history logs:

1. Click **Actions > Logical Device > Migration > Delete All Histories**.
2. Enter the Task name in the **Delete All Histories** window.
3. Click **Apply**.

### Procedure 4 or:

1. Open the **Migration Plan** window in one of the following methods.

When you use Command View Advanced Edition:

- Expand the **Storage System** tree in the **Resource** tab. Right-click **Volume** under the local storage system, and then select **System GUI**. Click **Volume Migration > View History** in the summary.

When you use Remote Web Console:

- Select **Logical Devices** from the **Storage Systems** tree. Click **Volume Migration > View History** in the summary.
  - Click **Actions > Logical Device > Migration > View History**.
2. Click **Delete All Histories** button in the **History** window.
  3. Click **OK**.

## Related information

[“Delete All Histories window” \(page 60\)](#)

[“History window” \(page 59\)](#)

# 5 Auto LUN monitoring

This chapter contains the system messages that appear in Auto LUN history logs.

## Migration History messages

The following table contains the messages that appear in Migration History logs.

**Table 16 Migration history log messages**

Message	Description
Migration Started	The migration operation started.
Migration Completed	The migration operation completed successfully.
Migration Canceled by User	The migration operation was canceled by the user.
Migration Failed	The migration operation failed.
Migration Canceled by Controller <sup>1</sup>	The migration operation was canceled by Auto LUN (e.g., volume usage rate exceeded specified maximum).
Migration Canceled by Controller (BC/SS/BC MF <sup>2</sup> ) Migration Canceled by Controller (Cnt Ac-S/Cnt Ac-S MF <sup>3</sup> ) Migration Canceled by Controller (Cnt Ac-J/Cnt Ac-J MF <sup>4</sup> ) Migration Canceled by Controller (XRC <sup>5</sup> ) Migration Canceled by Controller (Concurrent Copy)	Because each program product started processing, the migration operation was canceled by Auto LUN.
<b>Notes:</b> 1. This message may be displayed under one of the following statuses. <ul style="list-style-type: none"><li>• The workload from the host to the source volume is heavy.</li><li>• The maintenance activities for the storage system is in progress.</li><li>• The storage system judges that the volume cannot be migrated by some reasons in the system.</li></ul> 2. It indicates Business Copy/Business Copy MF. 3. It indicates Continuous Access Synchronous/Continuous Access Synchronous MF. 4. It indicates Continuous Access Journal/Continuous Access Journal MF. 5. It indicates Compatible XRC.	

## Copy Threshold option

The Copy Threshold option can be configured to temporarily stop Auto LUN operations when activity on the storage system becomes heavy. The use of this option is not recommended for hosts that frequently update volumes which are likely to be migrated because of the increased possibility of failure during migration.

For information about setting the Copy Threshold option, call the Hewlett Packard Enterprise technical support.

The Copy Threshold option also stops migration operations associated with the following products:

- Business Copy
- Business Copy MF
- Compatible FlashCopy
- Fast Snap

---

**NOTE:** Copy operations that are stopped by the Copy Threshold option will resume once the load on the storage system becomes light.

---

## Effects of Auto LUN on other program products

When differential data is being copied, longer copying time can be expected for the following program products:

- Auto LUN
- Business Copy
- Business Copy MF
- Compatible FlashCopy

The following table shows the amount of additional copy time expected for the affected program products. The increase in copy time may be as much as doubled and depends on the number of pairs set to the program product.

**Table 17 Estimated delay in copy time for Auto LUN and other program products**

Capacity of Migrated Volume (MB)	Estimated delay in copying speed (in minutes)
0 - 1,000	4
1,001 - 5,000	18
5,001 - 10,000	37
10,001 - 50,000	186
50,001 - 100,000	372
100,001 - 500,000	1,860
500,001 - 1,000,000	3,720
1,000,001 - 2,150,400	9,667

The above estimates are calculated based on the assumption that the workload for update I/Os for the migrated volume is 50 IOPS for one volume.

## Best practices

Do not perform Auto LUN operations during storage system maintenance activities (such as, installation, replacement, removal of cache or drives, configuration changes, or replacement of the microcode).

- △ CAUTION:** If a volume migration operation of Auto LUN is in progress and the SVP is in Modify mode, the Auto LUN process might not complete and the volume might remain being migrated. In this case, make sure that the SVP is in View mode.

Before turning off the power on the storage system, confirm that all Auto LUN operations are complete. If you turn off the power of the storage system during Auto LUN operations, and power is later restored, Auto LUN operations resume, but there is a risk that data may be lost from the shared memory. If this happens, Auto LUN begins recopying all data, both the differential data not yet migrated as well as the data previously copied to the target volume before the power interruption.

# 6 Troubleshooting

This chapter gives troubleshooting information on Auto LUN.

## Troubleshooting Auto LUN

An error message appears on the Remote Web Console web client when error conditions occur during Auto LUN operations.

If you need to contact Hewlett Packard Enterprise Technical Support, make sure to provide as much information about the problem as possible, including the error codes. For information on other error codes displayed on the Remote Web Console web client, see the XP7 Remote Web Console Messages.

Taking a long time to the volume migration completion may be caused by a bottleneck. To prevent the occurrence of the bottleneck, do the following actions.

**Table 18 Causes of bottleneck and actions for countermeasure**

Cause	Action
The Host I/O Performance option of Business Copy is enabled.	Disable the Host I/O Performance option of Business Copy. <sup>1</sup>
The Host I/O Performance option of Business Copy MF is enabled.	Disable the Host I/O Performance option of Business Copy MF. <sup>2</sup>
Performance of the data drive or the external storage of the target volume is lower than one of the source volume.	Review the configuration.
The MP blade to which the source volume and the target volume are allocated includes a processor of which the MP usage rate exceeds 80 %. <sup>3</sup>	Review the configuration.
An error occurs in the data drive or the external storage of the target volume.	Remove the error in the data drive or the external storage of the target volume.
An error occurs in the data drive or the external storage of the source volume.	Remove the error in the data drive or the external storage of the source volume.
<b>Notes:</b>	
1. For information about the procedure of disabling the host I/O performance option of Business Copy, see <i>XP7 Business Copy user guide</i> .	
2. For information about the procedure of disabling the host I/O performance option of Business Copy MF, see <i>XP7 Business Copy for Mainframe Systems user guide</i> .	
3. For information about how to check the MP usage rate, see <i>XP7 Performance for Open and Mainframe Systems user guide</i> .	

# 7 Support and other resources

## Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:  
[www.hpe.com/assistance](http://www.hpe.com/assistance)
- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:  
[www.hpe.com/support/hpesc](http://www.hpe.com/support/hpesc)

### Information to collect

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

## Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.
  - To download product updates, go to either of the following:
    - Hewlett Packard Enterprise Support Center **Get connected with updates** page:  
[www.hpe.com/support/e-updates](http://www.hpe.com/support/e-updates)
    - Software Depot website:  
[www.hpe.com/support/softwaredepot](http://www.hpe.com/support/softwaredepot)
  - To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page:  
[www.hpe.com/support/AccessToSupportMaterials](http://www.hpe.com/support/AccessToSupportMaterials)
- 
- ① **IMPORTANT:** Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HP Passport set up with relevant entitlements.
- 

## Related information

The following documents and websites provide related information:

- *XP7 RAID Manager User Guide*
- *XP7 for Compatible FlashCopy Mirroring User Guide*

- *XP7 Performance for Open and Mainframe Systems User Guide*
- *XP7 Provisioning for Open Systems User Guide*
- *XP7 Provisioning for Mainframe Systems User Guide,*
- *XP7 Business Copy for Mainframe Systems User Guide*
- *XP7 Business Copy User Guide*
- *XP7 Remote Web Console Messages*
- *XP7 Remote Web Console User Guide*
- *XP7 Continuous Access Synchronous for Mainframe Systems User Guide*
- *XP7 Continuous Access Synchronous User Guide*
- *XP7 Continuous Access Journal for Mainframe Systems User Guide*
- *XP7 Continuous Access Journal User Guide*
- *XP7 Cache Partition User Guide*

You can find these documents at:

- Hewlett Packard Enterprise Support Center website (Manuals page):  
[www.hpe.com/support/manuals](http://www.hpe.com/support/manuals)

Click **Storage > Disk Storage System > XP Storage**, and then select your Storage System.

- Hewlett Packard Enterprise Information Library website:  
[www.hpe.com/info/enterprise/docs](http://www.hpe.com/info/enterprise/docs)

Under Products and Solutions, click **HP XP Storage**. Then, click **XP7 Storage** under HP XP Storage.

## Websites

Website	Link
Hewlett Packard Enterprise Information Library	<a href="http://www.hpe.com/info/enterprise/docs"><u>www.hpe.com/info/enterprise/docs</u></a>
Hewlett Packard Enterprise Support Center	<a href="http://www.hpe.com/support/hpesc"><u>www.hpe.com/support/hpesc</u></a>
Contact Hewlett Packard Enterprise Worldwide	<a href="http://www.hpe.com/assistance"><u>www.hpe.com/assistance</u></a>
Subscription Service/Support Alerts	<a href="http://www.hpe.com/support/e-updates"><u>www.hpe.com/support/e-updates</u></a>
Software Depot	<a href="http://www.hpe.com/support/softwaredepot"><u>www.hpe.com/support/softwaredepot</u></a>
Insight Remote Support	<a href="http://www.hpe.com/info/insightremotesupport/docs"><u>www.hpe.com/info/insightremotesupport/docs</u></a>
Serviceguard Solutions for HP-UX	<a href="http://www.hpe.com/info/hpux-serviceguard-docs"><u>www.hpe.com/info/hpux-serviceguard-docs</u></a>
Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix	<a href="http://www.hpe.com/storage/spock"><u>www.hpe.com/storage/spock</u></a>
Storage white papers and analyst reports	<a href="http://www.hpe.com/storage/whitepapers"><u>www.hpe.com/storage/whitepapers</u></a>

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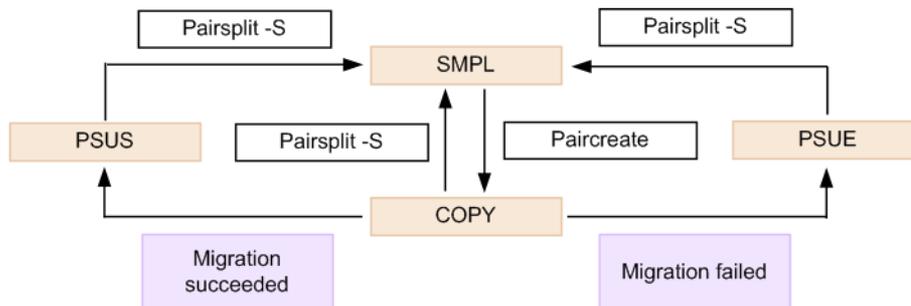
# A Using RAID Manager for Auto LUN

Use RAID Manager from an open-system host to perform migration operations on open-system and mainframe volumes.

## Auto LUN and RAID Manager commands

The following figure illustrates the different states of Auto LUN pairs when using RAID Manager commands.

**Figure 5 Auto LUN Pairs and RAID Manager Commands**



The status of a pair can be checked by using the `pairdisplay` RAID Manager command.

## Migrating volumes with RAID Manager

In this example, *group1* represents the group name in the RAID Manager configuration definition file, and *pair1* represents the name of the volume whose pair is the target volume of the operation.

### Procedure 5 To perform a migration using RAID Manager commands:

1. Start RAID Manager.
2. Type the following command for a SMPL pair to start volume migration:  

```
paircreate -g group1 -d pair1 -m cc -v1
```

When volume migration starts, the status of the pair changes to COPY.
3. Type the following command to check the status of the pair:  

```
pairdisplay -g group1 -d pair1 -fcex
```

When volume migration completes, the status of the pair changes to PSUS. If volume migration fails, the status of the pair changes to PSUE.
4. Type the following command to change the pair status back to SMPL:  

```
pairsplit -S -g group1 -d pair1
```

If the migration fails (the status of the pair becomes PSUE), repeat step 2 and 3. If you are unable to change the pair status back to SMPL, contact the service engineer.

## Interoperability of Auto LUN and RAID Manager

When you perform an Auto LUN plan by using RAID Manager commands, note the following:

- A migration plan being executed by Auto LUN cannot be canceled using RAID Manager.
- A migration plan created by Auto LUN cannot be displayed using RAID Manager.
- Click **File > Refresh All** on the menu bar of the Remote Web Console main window to check RAID Manager settings in Remote Web Console.
- While the microcode is being downgraded or upgraded, users must not perform any operations that the resulting microcode would not support.

- If you delete an Auto LUN plan, the volume status changes from SMPL(PD) to SMPL. You can check the status of the volume by viewing the list at the bottom of the window and confirming the existence of the migration plan.  
You can check the status of a volume by using the `pairdisplay` command, but you cannot distinguish between the SMPL and SMPL(PD) status.
- When you delete an Auto LUN plan, you must wait until the status of the volume changes from SMPL(PD) to SMPL (usually about 10 seconds) before executing another Auto LUN operation through RAID Manager.
- When you attempt to migrate a volume or cancel a migration plan through RAID Manager, you might encounter an "EX\_CMDRJE" exception and the command might be refused depending on the condition in the DKC.

## Troubleshooting when using RAID Manager

When you execute or cancel an Auto LUN plan through RAID Manager, you might identify the cause of the error by referring to the log displayed on the RAID Manager window or in the RAID Manager operation log file.

The RAID Manager operation log file is stored in:

`/HORCM/log*/curlog/horcmlog_HOST/horcm.log`

Where:

- \* is the instance number.
- HOST is the host name.

The following figure shows an example of error log message in the RAID Manager window.

**Figure 6 Example of a Log Displayed on The RAID Manager Window**

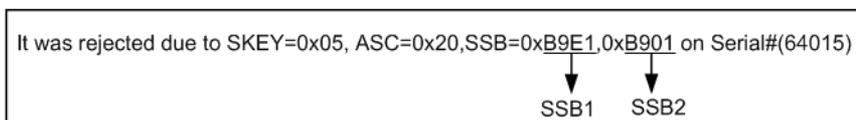


Table 19 (page 35) shows the RAID Manager error messages related to executed or canceled migration plans.

**Table 19 RAID Manager errors related to migration plans**

Error Code (SSB2)	Message	Required Action
2008	The setting of the T10 PI attribute does not match between the migration source volume and the migration target volume.	The volume cannot be migrated. Check the configuration definition file.
2027	The cache mode does not match between the migration source volume and the migration target volume.	The volume cannot be migrated. Check the configuration definition file.
2039	The migration source volume is the Quorum disk.	The volume cannot be migrated. Check the configuration definition file.
203A	The migration target volume is the Quorum disk.	The volume cannot be migrated. Check the configuration definition file.
203E	In the migration source volume, the serial number and the model of the virtual storage machine or the virtual LDEV ID has been changed.	After the configuration change has finished, try again.
203F	In the migration target volume, the serial number and the model of the virtual storage machine or the virtual LDEV ID has been changed.	After the configuration change has finished, try again.

**Table 19 RAID Manager errors related to migration plans** *(continued)*

<b>Error Code (SSB2)</b>	<b>Message</b>	<b>Required Action</b>
204A	The current microcode version does not support the capacity of the migration source volume.	Specify a volume whose capacity is supported.
204B	The current microcode version does not support the capacity of the migration target volume.	Specify a volume whose capacity is supported.
204C	The migration source volume corresponds to either of the following causes: <ol style="list-style-type: none"> <li>1. The volume is primary or secondary volume of High Availability.</li> <li>2. The volume has the reserve attribute of High Availability.</li> </ol>	The volume cannot be migrated. Check the configuration definition file.
204D	The migration target volume corresponds to either of the following causes: <ol style="list-style-type: none"> <li>1. The volume is primary or secondary volume of High Availability.</li> <li>2. The volume has the reserve attribute of High Availability.</li> </ol>	The volume cannot be migrated. Check the configuration definition file.
2050	The migration target volume is being used with Volume Retention.	Release the volume from Volume Retention, and then migrate the volume.
2051	The migration target volume is being used with Data Retention.	Release the volume from Data Retention, and then migrate the volume.
2055	The migration target volume is being used with Continuous Access Journal.	Release the volume from Continuous Access Journal, and then migrate the volume.
2056	The migration source volume is being used with Continuous Access Journal.	Release the volume from Continuous Access Journal, and then migrate the volume.
2058	The migration target volume and the migration source volume belong to the same parity group.	The volume cannot be migrated. Check the configuration definition file.
205C	The migration target volume is being used with Continuous Access Journal.	Release the volume from Continuous Access Journal, and then migrate the volume.
2075	The migration source volume corresponds to the following cause: The volume is secondary volume of the Fast Snap pair, or V-VOL of Fast Snap.	The volume cannot be migrated. Check the configuration definition file.
2076	The migration target volume corresponds to either of the following causes: <ol style="list-style-type: none"> <li>1. The volume is primary volume of the Fast Snap pair.</li> <li>2. The volume is secondary volume of the Fast Snap pair, or V-VOL of Fast Snap.</li> </ol>	Perform the following actions for each cause: <ol style="list-style-type: none"> <li>1. Release the Fast Snap pair, and then migrate the volume.</li> <li>2. None. This migration plan cannot be executed.</li> </ol>
2078	The migration source volume is the pool-VOL of Fast Snap.	Release the pool-VOL setting of Fast Snap from the volume, and then migrate the volume.
2079	The migration target volume is the pool-VOL of Fast Snap.	Release the pool-VOL setting of Fast Snap from the volume, and then migrate the volume.
207F	The volume has migrated by Auto LUN, and the end processing is now in progress.	Wait for a while, and then confirm that the Auto LUN processing has been completed.
2089	The migration source volume is undergoing quick formatting.	Wait for the quick formatting to complete and then migrate the volume.

**Table 19 RAID Manager errors related to migration plans (continued)**

<b>Error Code (SSB2)</b>	<b>Message</b>	<b>Required Action</b>
208A	The migration target volume is undergoing quick formatting.	Wait for the quick formatting to complete and then migrate the volume.
208f	The migration source volume or the migration target volume is a Mainframe Fibre Data Migration volume.	The volume cannot be migrated. Check the configuration definition file.
2090	The migration target volume is a THP V-VOL which is not associated with a pool.	Associate a THP V-VOL with a pool, and then migrate the volume.
2091	The migration source volume is a THP V-VOL which is not associated with a pool.	Associate a THP V-VOL with a pool, and then migrate the volume.
2093	The migration source volume is primary volume of the Fast Snap pair.	The volume cannot be migrated. Check the configuration definition file.
2095	The migration target volume and the migration source volume are THP V-VOLs that are associated with the same pool.	The volume cannot be migrated. Check the configuration definition file.
2096	The migration source volume is used by Continuous Access Synchronous or Continuous Access Journal. The migration target volume is a THP V-VOL.	Release the pair containing the migration source volume, and then migrate the volume.
20A5	The migration source volume is a THP V-VOL whose capacity is increasing.	Wait until the capacity increase is completed. Then, you must specify a target volume which has the same capacity as the volume whose capacity is increased and migrate the volume.
20A6	The migration target volume is a THP V-VOL whose capacity is increasing.	Wait until the capacity increase is completed. Then, you must specify a source volume which has the same capacity as the volume whose capacity is increased and migrate the volume.
20AC	The command ended abnormally because you specified either of the following for the migration source volume. <ul style="list-style-type: none"> <li>External volume for which the Data Direct Mapping attribute is enabled</li> <li>Volume belonging to the capacity expansion-enabled parity groups</li> </ul> These volumes can only be used as the pool volume.	The volume cannot be migrated. Check the configuration definition file.
20AD	The migration source volume is a THP V-VOL. The volume is processing the Unmap command issued when the system option mode 905 is on.	Please retry the pair creation after a while. If the problem persists despite retrying, turn off the system option mode 905, and then retry the pair creation.
20AE	The migration target volume is a THP V-VOL. The volume is processing the Unmap command issued when the system option mode 905 is on.	Please retry the pair creation after a while. If the problem persists despite retrying, turn off the system option mode 905, and then retry the pair creation.
20AF	The command ended abnormally because you specified either of the following for the migration source volume. <ul style="list-style-type: none"> <li>External volume for which the Data Direct Mapping attribute is enabled</li> <li>Volume belonging to the capacity expansion-enabled parity groups</li> </ul>	The volume cannot be migrated. Check the configuration definition file.

**Table 19 RAID Manager errors related to migration plans (continued)**

<b>Error Code (SSB2)</b>	<b>Message</b>	<b>Required Action</b>
	These volumes can only be used as the pool volume.	
20BA	The volume specified as a migration source volume has no LU path.	Set an LU path to the volume and then migrate the volume.
20BB	The volume specified as a migration target volume has no LU path.	Set an LU path to the volume and then migrate the volume.
20C0	The emulation type of the migration source volume is 3390-V.	The volume cannot be migrated. Check the configuration definition file.
20C1	The emulation type of the migration target volume is 3390-V.	The volume cannot be migrated. Check the configuration definition file.
20C5	The power supply is switched off.	Perform the operation again after the power supply turning on.
20C6	The emulation type of the migration source volume is 6588-A.	The volume cannot be migrated. Check the configuration definition file.
20C7	The emulation type of the migration target volume is 6588-A.	The volume cannot be migrated. Check the configuration definition file.
20CC	The emulation type of the migration source volume is 3390-A, and one of the following applies: <ul style="list-style-type: none"> <li>• Mainframe Fibre CHAs are not installed.</li> <li>• All Mainframe Fibre CHAs are being blocked.</li> </ul>	If Mainframe Fibre CHAs are not installed, install them. If all Mainframe Fibre CHAs are being blocked, restore them.
20CD	The emulation type of the migration target volume is 3390-A, and one of the following applies: <ul style="list-style-type: none"> <li>• Mainframe Fibre CHAs are not installed.</li> <li>• All Mainframe Fibre CHAs are being blocked.</li> </ul>	If Mainframe Fibre CHAs are not installed, install them. If all Mainframe Fibre CHAs are being blocked, restore them.
20D3	The migration source volume is a THP V-VOL whose THP pool is being initialized.	Perform the operation again after the initialization of the THP pool has finished.
20D4	The migration target volume is a THP V-VOL whose THP pool is being initialized.	Perform the operation again after the initialization of the THP pool has finished.
20D9	The migration source volume is a TSE-VOL.	The volume cannot be migrated. Check the configuration definition file.
20DA	The migration target volume is a TSE-VOL.	The volume cannot be migrated. Check the configuration definition file.
20E1	The settings for online data migration of the source volume is incorrect.	Perform the operation again after checking the configuration definition file.
20E2	The migration target volume is an external volume mapped for online data migration.	The volume cannot be migrated. Check the configuration definition file.
20F2	If the serial number of the virtual storage machine is set to the primary and secondary volume, the serial number set in the primary volume matches the serial number set in the secondary volume. However, the serial numbers of the physical storage systems and the virtual storage machines do not match.	The volume cannot be migrated. Check the configuration definition file.
20F9	The pair cannot be operated because the specified migration source volume is the	The volume cannot be migrated. Check the configuration definition file.

**Table 19 RAID Manager errors related to migration plans** *(continued)*

<b>Error Code (SSB2)</b>	<b>Message</b>	<b>Required Action</b>
	secondary volume of the Business Copy pair whose primary volume is in the process of the online data migration.	
22FA	The migration source volume is the source or target volume of Compatible FlashCopy.	Release the Compatible FlashCopy pair, and then migrate the volume.
22FB	The migration target volume is the primary or secondary volume of Compatible FlashCopy.	Release the Compatible FlashCopy pair, and then migrate the volume.
2301	Auto LUN is not installed on the storage system.	Install Auto LUN, and then migrate the volume.
2302	The shared memory which is necessary to use Auto LUN is not installed or the initial setting is not completed.	Check the configuration information of your storage system.
2306	The LBA size does not match between the migration target volume and the migration source volume.	The volume cannot be migrated. Check the configuration definition file.
2309	The maximum number of pairs which can be set in the storage system is exceeded.	Reduce the number of pairs set in the storage system, and then migrate the volume.
2312	The migration target volume is online with the host.	Make the migration target volume off-line from the host, and then migrate the volume.
2322	The migration source volume is set as the leaf volume of Business Copy	Release the Business Copy pair, and then migrate the volume.
2328	The migration target volume is set as the secondary volume of Business Copy.	Release the Business Copy pair, and then migrate the volume.
232F	The migration source volume is already specified as the target volume of Auto LUN.	Release the volume from Auto LUN, and then migrate the volume.
2331	The number of slots does not match between the migration target volume and the migration source volume.	The volume cannot be migrated. Check the configuration definition file.
2332	You cannot add pair settings any more to the volume specified as the migration source.	Reduce the number of pair settings of the specified volume, and then migrate the volume.
2333	The volume specified by the migration cancellation is not a migration source volume	None. The specified volume is not a source volume.
2336	The emulation type does not match between the migration target volume and the migration source volume.	The volume cannot be migrated. Check the configuration definition file.
2337	The migration source volume is a leaf volume of Business Copy.	Release the Business Copy pair, and then migrate the volume.
233B	The migration target volume is a primary volume of Business Copy.	Release the Business Copy pair, and then migrate the volume.
233C	The migration target volume is a secondary volume of Business Copy.	Release the Business Copy pair, and then migrate the volume.
2342	The migration target volume is already specified as the target volume of Auto LUN.	Release the volume from Auto LUN, and then migrate the volume.
2343	The migration target volume is set as the primary volume of Business Copy.	Release the Business Copy pair, and then migrate the volume.
2344	The volume specified by the migration cancellation is not a migration target volume	None. The specified volume is not a target volume.

**Table 19 RAID Manager errors related to migration plans (continued)**

<b>Error Code (SSB2)</b>	<b>Message</b>	<b>Required Action</b>
2346	The migration target volume is a primary volume of Continuous Access Synchronous.	Release the Continuous Access Synchronous pair, and then migrate the volume.
2347	The migration target volume is a secondary volume of Continuous Access Synchronous.	Release the Continuous Access Synchronous pair, and then migrate the volume.
234B	The migration target volume is already specified as the source volume of Auto LUN.	Release the volume from Auto LUN, and then migrate the volume.
2350	The migration source volume is not paired with the migration target volume.	None. This migration plan cannot be deleted or canceled.
2351	The migration source volume and the migration target volume are set to the same volume.	None. This migration plan cannot be executed, deleted, or cancelled.
2355	The setting of VLL is different between the migration target volume and the migration source volume.	The volume cannot be migrated. Check the configuration definition file.
2362	The migration source volume is a primary volume of Compatible XRC.	Release the Compatible XRC pair, and then migrate the volume.
2363	The migration target volume is a primary volume of Compatible XRC.	Release the Compatible XRC pair, and then migrate the volume.
2365	The migration source volume is a primary volume of IBM Concurrent Copy (CC).	Release the IBM Concurrent Copy pair, and then migrate the volume.
2366	The migration target volume is a primary volume of IBM Concurrent Copy.	Release the IBM Concurrent Copy pair, and then migrate the volume.
2368	The volume specified as the migration source volume is being used as the primary volume of the Continuous Access Synchronous pair. The pair is in the COPY status.	Change the Continuous Access Synchronous pair status from COPY to PAIR or PSUS, or delete the Continuous Access Synchronous pair, and then migrate the volume.
2369	The volume specified as the migration source volume is being used as the secondary volume of the Continuous Access Synchronous pair. The pair is in the COPY status.	Change the Continuous Access Synchronous pair status from COPY to PAIR or PSUS, or delete the Continuous Access Synchronous pair, and then migrate the volume.
236A	The migration source volume is the primary volume of a Business Copy or Business Copy MF pair which is in the COPY status.	Migrate the volume after the Business Copy or Business Copy MF pair is changed to PSUS status.
236B	The migration source volume is the secondary volume of a Business Copy or Business Copy MF pair which is in the COPY status.	Migrate the volume after the Business Copy or Business Copy MF pair is changed to PSUS status.
2370	The migration source volume is not installed.	The volume cannot be migrated. Check the configuration definition file.
2371	The migration source volume is blocked.	Recover the blocked volume, and then migrate the volume.
2372	The migration source volume is being formatted or being shredded.	Migrate the volume after formatting or shredding is completed.
2373	The migration source volume is a command device.	The volume cannot be migrated. Check the configuration definition file.
237C	The migration source volume is an external volume specified as a primary volume of Continuous Access Synchronous.	Release the Continuous Access Synchronous pair, and then migrate the volume.

**Table 19 RAID Manager errors related to migration plans** *(continued)*

<b>Error Code (SSB2)</b>	<b>Message</b>	<b>Required Action</b>
2380	The migration target volume is not installed.	The volume cannot be migrated. Check the configuration definition file.
2381	The migration target volume is blocked.	Recover the blocked volume, and then migrate the volume.
2382	The migration target volume is being formatted or being shredded.	Migrate the volume after formatting or shredding is completed.
2383	The migration target volume is a command device.	The volume cannot be migrated. Check the configuration definition file.
2389	Cache Residency is set on the migration source volume.	Release the setting of Cache Residency, and then migrate the volume.
238A	Cache Residency is set on the migration target volume.	Release the setting of Cache Residency, and then migrate the volume.
9100	The command cannot be executed because the user authentication is not performed.	Perform the user authentication.
B911	The pair operation command was rejected because the specified volume is not implemented.	Make sure that the specified volume is implemented.
B912	The pair operation command was rejected because the specified secondary volume is not implemented.	Make sure that the specified secondary volume is implemented.
B913	The pair operation command was rejected because the mirror ID is invalid.	Specify the mirror ID from 0 to 2.

# B Auto LUN GUI reference

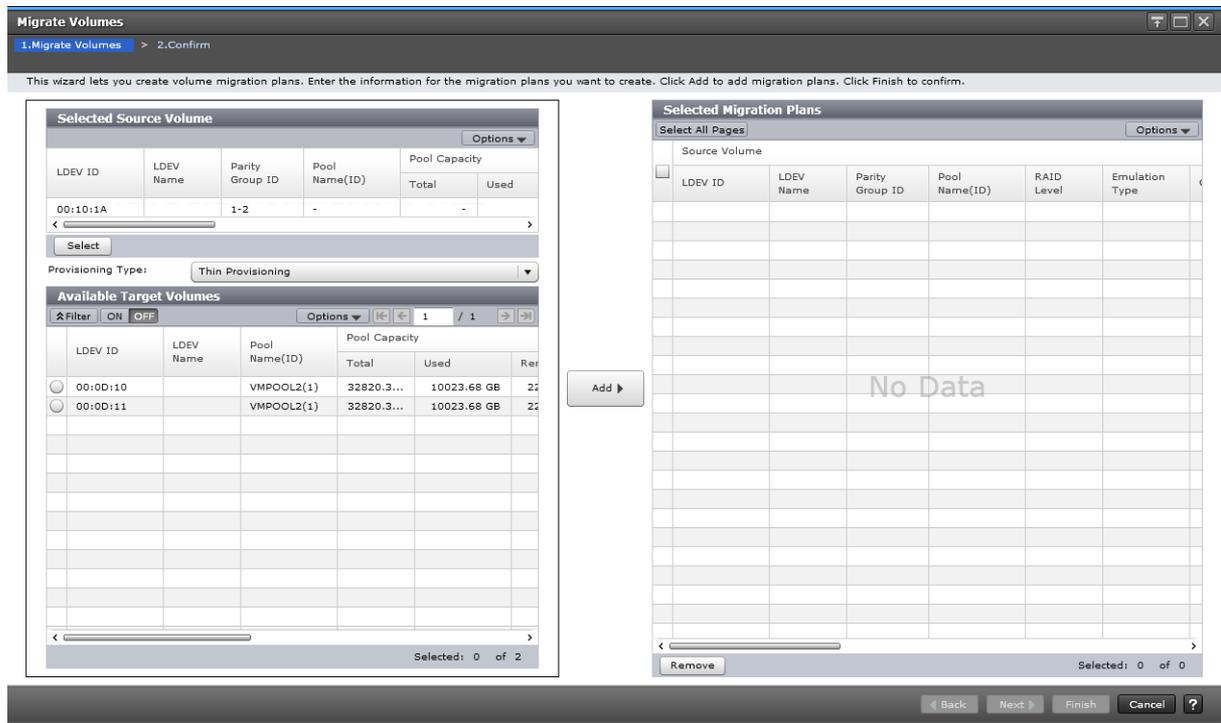
The GUI elements of Auto LUN windows are summarized.

## Volume Migration wizard

Related links:

[“Migrating a volume” \(page 24\)](#)

## Migrate Volumes window



### Selected Source Volume table

Item	Description
LDEV ID	Selected LDEV's identifier
LDEV Name	Selected LDEV's name
Parity Group ID	ID for the parity group. They are hyphenated numbers. A number before the hyphen shows the frame number and a number after the hyphen shows the group number.
Pool Name (ID)	Pool name and ID number.
Pool Capacity	The pool capacity. If the source volume is not THP V-VOL, a hyphen (-) is displayed. <ul style="list-style-type: none"><li>• <b>Total:</b> The total pool capacity.</li><li>• <b>Used:</b> The sum of the amount of the pool capacity for allocated pages and the reserved capacity for pages.</li><li>• <b>Remaining:</b> The pool free space.</li></ul> As for the pool using pool volumes belonging to the capacity expansion-enabled parity groups, the pool free space may be smaller than the capacity which is displayed.

Item	Description
Physical Pool Capacity	<p>For a pool containing pool volumes that support Capacity Expansion, this item displays the capacity assured for writing. If the Capacity Expansion is not supported, a hyphen (-) is displayed.</p> <ul style="list-style-type: none"> <li>• <b>Total:</b> Displays the total pool capacity which is assured of writing.</li> <li>• <b>Used:</b> Displays the used capacity of the pool. The used capacity is the capacity which deducts the free capacity which is assured of writing from the total pool capacity which is assured of writing. For the pool consisted from pool volumes belonging to the capacity expansion-enabled parity groups, the compressed data capacity is included in the used capacity.</li> <li>• <b>Remaining:</b> Displays the remaining pool capacity which is assured of writing.</li> </ul>
RAID Level	The RAID level of the source volume.
Emulation Type	The emulation type of the source volume.
Attribute	<p>The attribute of the source volume.</p> <ul style="list-style-type: none"> <li>• <b>SLU:</b> The volume has an SLU attribute.</li> <li>• <b>Data Direct Mapping:</b> The volume of which Data Direct Mapping attribute is enabled.</li> <li>• <b>-:</b> The volume has no attribute.</li> </ul>
Capacity	<p>The source volume's capacity.</p> <ul style="list-style-type: none"> <li>• <b>Total:</b> The total source volume capacity.</li> <li>• <b>Mapped:</b> The amount of page capacity of which user data and control information for the source volume are stored. If the source volume is not THP V-VOL, a hyphen (-) is displayed.</li> <li>• <b>Used:</b> The sum of the amount of the allocated page capacity for the source volume and the reserved capacity for pages. If the source volume is not THP V-VOL, a hyphen (-) is displayed. If you refer to the used capacity during I/O or copy processing by Auto LUN or the replication program products, for example Business Copy and Continuous Access Journal, even if the Full allocation is enabled on the virtual volume, the displayed used capacity may be different from the actual capacity because there is a gap between the times of information gathering about the mapped capacity and the reserved page capacity.</li> </ul>
Full Allocation	<p>The information on the status of Full Allocation for the source volume.</p> <ul style="list-style-type: none"> <li>• <b>Enabled:</b> The Full Allocation for the source volume is enabled.</li> <li>• <b>Disabled:</b> The Full Allocation for the source volume is disabled.</li> </ul> <p>If LDEV is an internal volume, an external volume or a migration volume, a hyphen (-) is displayed.</p>
Provisioning Type	<p>Provisioning type of the LDEV:</p> <ul style="list-style-type: none"> <li>• <b>Basic:</b> Internal volume</li> <li>• <b>External:</b> External volume</li> <li>• <b>THP:</b> THP volume</li> <li>• <b>External MF:</b> External mainframe volume</li> </ul>
Drive Type/RPM	Displays the data drive type and RPM of the pool.
CLPR	Indicates the ID number and name of the CLPR corresponding to the parity group.

Item	Description
Encryption	<p>Information about the encryption set to the source volume:</p> <ul style="list-style-type: none"> <li>• <b>Enabled:</b> The encryption for the parity group to which the LDEV as the source volume belongs is enabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is enabled.</li> <li>• <b>Disabled:</b> The encryption for the parity group to which the LDEV as the source volume belongs is disabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is disabled.</li> <li>• <b>Mixed:</b> The pool volumes whose encryption is enabled or disabled are mixed in the pool to which the LDEV belongs.</li> </ul> <p><i>Note:</i> When the value is <b>Mixed</b>, the encryption of data is not guaranteed. If you want to manage the encryption of data, use the LDEV of which <b>Encryption</b> is <b>Enabled</b> or <b>Disabled</b>.</p> <ul style="list-style-type: none"> <li>• <b>- (hyphen):</b> The LDEV is an external volume or a migration volume.</li> </ul> <p>In case of the virtual volume of Thin Provisioning or Thin Provisioning MF, the pool to which the LDEV belongs is an external volume or blocked.</p>
Select	When clicked, the <b>Select Source Volume</b> window displays.

## Provisioning Type

Provisioning type of the LDEV, which can be set as the target volume:

- Basic: Internal volume
- External: External volume
- Thin Provisioning: THP volume
- External MF: External mainframe volume

## Available Target Volumes table

Item	Description
LDEV ID	Selected LDEV's identifier
LDEV Name	Selected LDEV's name. This field is blank if the LDEV name is not set.
Pool Name (ID)	Pool name and ID number.
Pool Capacity	<p>The pool capacity. If the target volume is not THP V-VOL, a hyphen (-) is displayed.</p> <ul style="list-style-type: none"> <li>• <b>Total:</b> The total pool capacity.</li> <li>• <b>Used:</b> The sum of the amount of the pool capacity for allocated pages and the reserved capacity for pages.</li> <li>• <b>Remaining:</b> The pool free space.</li> </ul> <p>As for the pool using pool volumes belonging to the capacity expansion-enabled parity groups, the pool free space may be smaller than the capacity which is displayed.</p>
Physical Pool Capacity	<p>For a pool containing pool volumes that support Capacity Expansion, this item displays the capacity assured for writing. If the Capacity Expansion is not supported, a hyphen (-) is displayed.</p> <ul style="list-style-type: none"> <li>• <b>Total:</b> Displays the total pool capacity which is assured of writing.</li> <li>• <b>Used:</b> Displays the used capacity of the pool. The used capacity is the capacity which deducts the free capacity which is assured of writing from the total pool capacity which is assured of writing. For the pool consisted from</li> </ul>

Item	Description
	<p>pool volumes belonging to the capacity expansion-enabled parity groups, the compressed data capacity is included in the used capacity.</p> <ul style="list-style-type: none"> <li>• <b>Remaining:</b> Displays the remaining pool capacity which is assured of writing.</li> </ul>
Pool Threshold (%)	<p>The pool threshold:</p> <ul style="list-style-type: none"> <li>• <b>Warning:</b> Warning threshold</li> <li>• <b>Depletion:</b> Depletion threshold</li> </ul>
RAID Level	The RAID level of the available target volume.
Emulation Type	The emulation type of the available target volume.
Attribute	<p>The attribute of the target volume.</p> <ul style="list-style-type: none"> <li>• <b>SLU:</b> The volume has an SLU attribute.</li> <li>• <b>Data Direct Mapping:</b> The volume of which Data Direct Mapping attribute is enabled.</li> <li>• <b>-:</b> The volume has no attribute.</li> </ul>
Capacity	<p>The available target volume's capacity.</p> <ul style="list-style-type: none"> <li>• <b>Total:</b> The total target volume capacity.</li> <li>• <b>Used:</b> The sum of the amount of the allocated page capacity for the target volume and the reserved capacity for pages. If the target volume is not THP V-VOL, a hyphen (-) is displayed.</li> </ul>
Full Allocation	<p>The information on the status of Full Allocation for the target volume.</p> <ul style="list-style-type: none"> <li>• <b>Enabled:</b> The Full Allocation for the target volume is enabled.</li> <li>• <b>Disabled:</b> The Full Allocation for the target volume is disabled.</li> </ul> <p>If LDEV is an internal volume, an external volume or a migration volume, a hyphen (-) is displayed.</p>
Drive Type/RPM	Displays the data drive type and RPM of the pool.
CLPR	Indicates the ID number and name of the CLPR corresponding to the parity group.
Encryption	<p>Information about the encryption set to the target volume:</p> <ul style="list-style-type: none"> <li>• <b>Enabled:</b> The encryption for the parity group to which the LDEV as the target volume belongs is enabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is enabled.</li> <li>• <b>Disabled:</b> The encryption for the parity group to which the LDEV as the target volume belongs is disabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is disabled.</li> <li>• <b>Mixed:</b> The pool volumes whose encryption is enabled or disabled are mixed in the pool to which the LDEV belongs.</li> </ul> <p><i>Note:</i> When the value is <b>Mixed</b>, the encryption of data is not guaranteed. If you want to manage the encryption of data, use the LDEV of which <b>Encryption is Enabled or Disabled</b>.</p> <ul style="list-style-type: none"> <li>• <b>- (hyphen):</b> The LDEV is an external volume or a migration volume.</li> </ul> <p>In case of the virtual volume of Thin Provisioning or Thin Provisioning MF, the pool to which the LDEV belongs is an external volume or blocked.</p>
T10 PI	<p>Displays the information about the T10 PI attribute of the volume.</p> <ul style="list-style-type: none"> <li>• <b>Enabled–</b> The T10 PI attribute of the volume is enabled.</li> <li>• <b>Disabled–</b> The T10 PI attribute of the volume is disabled.</li> </ul>

## Add button

Adds the volume migration plans to the **Selected Migration Plans** table.

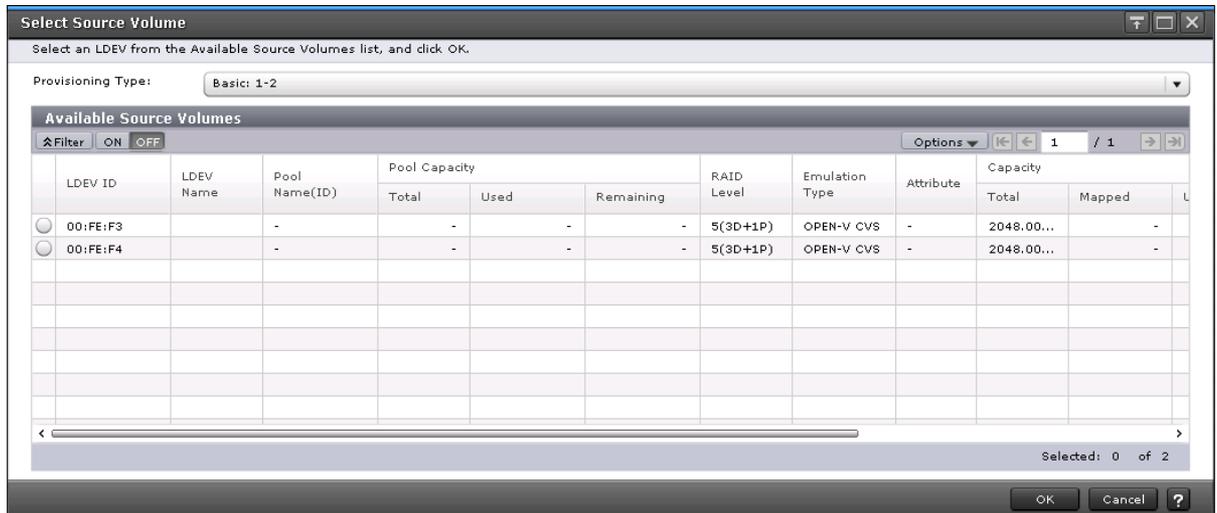
## Selected Migration Plans table

Item	Description
Source Volume	<ul style="list-style-type: none"> <li>• <b>LDEV ID:</b> Source volume's LDEV identifier</li> <li>• <b>LDEV Name:</b> Selected LDEV's name. This field is blank if the LDEV name is not set.</li> <li>• <b>Parity Group ID:</b> Indicates the source volume's parity group ID. The number before the hyphen is the frame number and the number after the hyphen is the group number.</li> <li>• <b>Pool Name (ID):</b> Source volume's pool name and ID number</li> <li>• <b>RAID Level:</b> The RAID level of the source volume</li> <li>• <b>Emulation Type:</b> The emulation type of the source volume</li> <li>• <b>Capacity:</b> The source volume's capacity</li> <li>• <b>Provisioning Type:</b> Provisioning type of the source volume: <ul style="list-style-type: none"> <li>◦ <b>Basic:</b> Internal volume</li> <li>◦ <b>External:</b> External volume</li> <li>◦ <b>THP:</b> THP volume</li> <li>◦ <b>External MF:</b> External mainframe volume</li> </ul> </li> <li>• <b>Attribute:</b> The attribute of the source volume. <ul style="list-style-type: none"> <li>◦ <b>SLU:</b> The volume has an SLU attribute.</li> <li>◦ <b>Data Direct Mapping:</b> The volume of which Data Direct Mapping attribute is enabled.</li> <li>◦ <b>-:</b> The volume has no attribute.</li> </ul> </li> <li>• <b>Drive Type/RPM:</b> Displays the data drive type and RPM of the source volume.</li> <li>• <b>CLPR:</b> Indicates the ID number and name of the CLPR corresponding to the source volume's parity group.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Encryption:</b> Information about the encryption set to the source volume is displayed. <ul style="list-style-type: none"> <li>◦ <b>Enabled:</b> The encryption for the parity group to which the LDEV as the source volume belongs is enabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is enabled.</li> <li>◦ <b>Disabled:</b> The encryption for the parity group to which the LDEV as the source volume belongs is disabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is disabled.</li> <li>◦ <b>Mixed:</b> The pool volumes whose encryption is enabled or disabled are mixed in the pool to which the LDEV belongs. <i>Note:</i> When the value is <b>Mixed</b>, the encryption of data is not guaranteed. If you want to manage the encryption of data, use the LDEV of which <b>Encryption</b> is <b>Enabled</b> or <b>Disabled</b>.</li> <li>◦ <b>-(hyphen):</b> The LDEV is an external volume or a migration volume. In case of the virtual volume of Thin Provisioning or Thin Provisioning MF, the pool to which the LDEV belongs is an external volume or blocked.</li> </ul> </li> <li>• <b>T10 PI:</b> Displays the information about the T10 PI attribute of the volume. <ul style="list-style-type: none"> <li>◦ <b>Enabled–</b> The T10 PI attribute of the volume is enabled.</li> <li>◦ <b>Disabled–</b> The T10 PI attribute of the volume is disabled.</li> </ul> </li> </ul>

Item	Description
	<ul style="list-style-type: none"> <li>◦</li> </ul>
Target Volume	<ul style="list-style-type: none"> <li>• <b>LDEV ID:</b> Target volume's LDEV identifier</li> <li>• <b>LDEV Name:</b> Selected LDEV's name. This field is blank if the LDEV name is not set.</li> <li>• <b>Parity Group ID:</b> Indicates the target volume's parity group ID. The number before the hyphen is the frame number and the number after the hyphen is the group number.</li> <li>• <b>Pool Name (ID):</b> Target volume's pool name and ID number</li> <li>• <b>RAID Level:</b> The RAID level of the target volume</li> <li>• <b>Emulation Type:</b> The emulation type of the target volume</li> <li>• <b>Capacity:</b> The target volume's capacity</li> <li>• <b>Provisioning Type:</b> Provisioning type of the target volume: <ul style="list-style-type: none"> <li>◦ <b>Basic:</b> Internal volume</li> <li>◦ <b>External:</b> External volume</li> <li>◦ <b>THP:</b> THP volume</li> <li>◦ <b>External MF:</b> External mainframe volume</li> </ul> </li> <li>• <b>Attribute:</b> The attribute of the target volume. <ul style="list-style-type: none"> <li>◦ <b>SLU:</b> The volume has an SLU attribute.</li> <li>◦ <b>Data Direct Mapping:</b> The volume of which Data Direct Mapping attribute is enabled.</li> <li>◦ <b>-:</b> The volume has no attribute.</li> </ul> </li> <li>• <b>Drive Type/RPM:</b> Displays the data drive type and RPM of the target volume.</li> <li>• <b>CLPR:</b> Indicates the ID number and name of the CLPR corresponding to the target volume's parity group.</li> <li>• <b>Encryption:</b> Information about the encryption set to the target volume is displayed. <ul style="list-style-type: none"> <li>◦ <b>Enabled:</b> The encryption for the parity group to which the LDEV as the target volume belongs is enabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is enabled.</li> <li>◦ <b>Disabled:</b> The encryption for the parity group to which the LDEV as the target volume belongs is disabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is disabled.</li> <li>◦ <b>Mixed:</b> The pool volumes whose encryption is enabled or disabled are mixed in the pool to which the LDEV belongs. <i>Note:</i> When the value is <b>Mixed</b>, the encryption of data is not guaranteed. If you want to manage the encryption of data, use the LDEV of which <b>Encryption</b> is <b>Enabled</b> or <b>Disabled</b>.</li> <li>◦ <b>- (hyphen):</b> The LDEV is an external volume or a migration volume. In case of the virtual volume of Thin Provisioning or Thin Provisioning MF, the pool to which the LDEV belongs is an external volume or blocked.</li> </ul> </li> <li>• <b>T10 PI:</b> Displays the information about the T10 PI attribute of the volume. <ul style="list-style-type: none"> <li>◦ <b>Enabled–</b> The T10 PI attribute of the volume is enabled.</li> <li>◦ <b>Disabled–</b> The T10 PI attribute of the volume is disabled.</li> </ul> </li> </ul>

Item	Description
Remove	When clicked, removes the migration plan from the table.

## Select Source Volume window



### Provisioning Type

Types of LDEV which can be selected as the source volume.

- **Basic:** Internal volume
- **External:** External volume
- **Thin Provisioning:** THP volume
- **External MF:** External mainframe volume

### Available Source Volumes table

Item	Description
LDEV ID	Source volume's LDEV identifier
LDEV Name	Selected LDEV's name. This field is blank if the LDEV name is not set.
Pool Name (ID)	Source volume's pool name and ID number
Pool Capacity	Displays the information of the pool, in which the source volume is installed. If the source volume is not THP V-VOL, a hyphen (-) is displayed. <ul style="list-style-type: none"> <li>• <b>Total:</b> The total pool capacity.</li> <li>• <b>Used:</b> The sum of the amount of the pool capacity for allocated pages and the reserved capacity for pages.</li> <li>• <b>Remaining:</b> The pool free space.</li> </ul>
RAID Level	The RAID level of the source volume
Emulation Type	The emulation type of the source volume
Attribute	The attribute of the source volume. <ul style="list-style-type: none"> <li>• <b>SLU:</b> The volume has an SLU attribute.</li> <li>• <b>Data Direct Mapping:</b> The volume of which Data Direct Mapping attribute is enabled.</li> <li>• <b>-:</b> The volume has no attribute.</li> </ul>

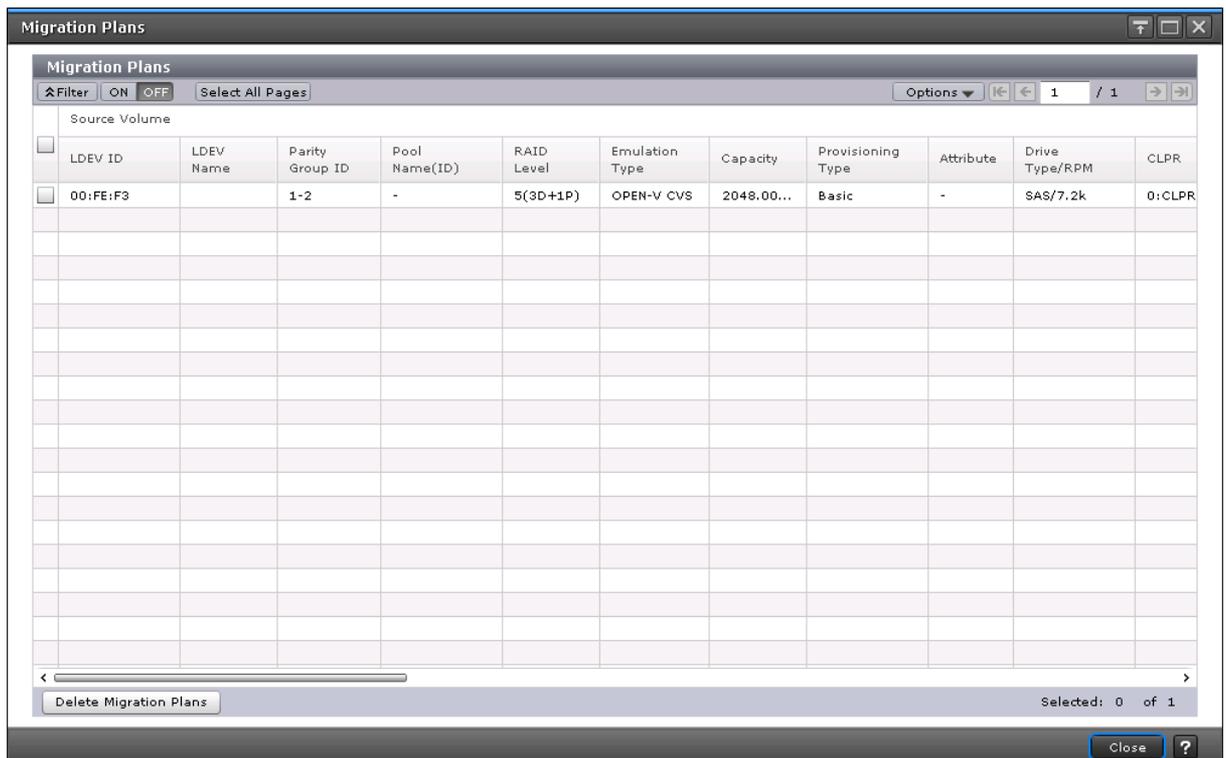
Item	Description
Capacity	<p>The source volume's capacity</p> <ul style="list-style-type: none"> <li>• <b>Total:</b> The total source volume capacity.</li> <li>• <b>Mapped:</b> The amount of page capacity of which user data and control information for the source volume are stored. If the source volume is not THP V-VOL, a hyphen (-) is displayed.</li> <li>• <b>Used:</b> The sum of the amount of the allocated page capacity for the source volume and the reserved capacity for pages. If the source volume is not THP V-VOL, a hyphen (-) is displayed. If you refer to the used capacity during I/O or copy processing by Auto LUN or the replication program products, for example Business Copy and Continuous Access Journal, even if the Full allocation is enabled on the virtual volume, the displayed used capacity may be different from the actual capacity because there is a gap between the times of information gathering about the mapped capacity and the reserved page capacity.</li> </ul>
Full Allocation	<p>The information on the status of Full Allocation for the source volume.</p> <ul style="list-style-type: none"> <li>• <b>Enabled:</b> The Full Allocation for the source volume is enabled.</li> <li>• <b>Disabled:</b> The Full Allocation for the source volume is disabled.</li> </ul> <p>If LDEV is an internal volume, an external volume or a migration volume, a hyphen (-) is displayed.</p>
Drive Type/RPM	Displays the data drive type and RPM of the source volume.
CLPR	Indicates the ID number and name of the CLPR corresponding to the source volume's parity group.
Encryption	<p>Information about the encryption set to the source volume:</p> <ul style="list-style-type: none"> <li>• <b>Enabled:</b> The encryption for the parity group to which the LDEV as the source volume belongs is enabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is enabled.</li> <li>• <b>Disabled:</b> The encryption for the parity group to which the LDEV as the source volume belongs is disabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is disabled.</li> <li>• <b>Mixed:</b> The pool volumes whose encryption is enabled or disabled are mixed in the pool to which the LDEV belongs.</li> </ul> <p><i>Note:</i> When the value is <b>Mixed</b>, the encryption of data is not guaranteed. If you want to manage the encryption of data, use the LDEV of which <b>Encryption</b> is <b>Enabled</b> or <b>Disabled</b>.</p> <ul style="list-style-type: none"> <li>• <b>- (hyphen):</b> The LDEV is an external volume or a migration volume.</li> </ul> <p>In case of the virtual volume of Thin Provisioning or Thin Provisioning MF, the pool to which the LDEV belongs is an external volume or blocked.</p>
T10 PI	<p>Displays the information about the T10 PI attribute of the volume.</p> <ul style="list-style-type: none"> <li>• Enabled– The T10 PI attribute of the volume is enabled.</li> <li>• Disabled– The T10 PI attribute of the volume is disabled.</li> </ul>



Item	Description
	<ul style="list-style-type: none"> <li>• <b>Encryption:</b> Information about Encryption set to the source volume is displayed. <ul style="list-style-type: none"> <li>◦ <b>Enabled:</b> The encryption for the parity group to which the LDEV as the source volume belongs is enabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is enabled.</li> <li>◦ <b>Disabled:</b> The encryption for the parity group to which the LDEV as the source volume belongs is disabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is disabled.</li> <li>◦ <b>Mixed:</b> The pool volumes whose encryption is enabled or disabled are mixed in the pool to which the LDEV belongs. <i>Note:</i> When the value is <b>Mixed</b>, the encryption of data is not guaranteed. If you want to manage the encryption of data, use the LDEV of which <b>Encryption</b> is <b>Enabled</b> or <b>Disabled</b>.</li> <li>◦ <b>- (hyphen):</b> The LDEV is an external volume or a migration volume. In case of the virtual volume of Thin Provisioning or Thin Provisioning MF, the pool to which the LDEV belongs is an external volume or blocked.</li> </ul> </li> <li>• <b>T10 PI:</b> Displays the information about the T10 PI attribute of the volume. <ul style="list-style-type: none"> <li>◦ Enabled– The T10 PI attribute of the volume is enabled.</li> <li>◦ Disabled– The T10 PI attribute of the volume is disabled.</li> </ul> </li> </ul>
Target Volume	<ul style="list-style-type: none"> <li>• <b>LDEV ID:</b> Target volume's LDEV identifier</li> <li>• <b>LDEV Name:</b> Selected LDEV's name. This field is blank if the LDEV name is not set.</li> <li>• <b>Parity Group ID:</b> Indicates the target volume's parity group ID. The number before the hyphen is the frame number and the number after the hyphen is the group number.</li> <li>• <b>Pool Name (ID):</b> Target volume's pool name and ID number</li> <li>• <b>RAID Level:</b> The RAID level of the target volume</li> <li>• <b>Emulation Type:</b> The emulation type of the target volume</li> <li>• <b>Capacity:</b> The target volume's capacity</li> <li>• <b>Provisioning Type:</b> Provisioning type of the target volume: <ul style="list-style-type: none"> <li>◦ <b>Basic:</b> Internal volume</li> <li>◦ <b>External:</b> External volume</li> <li>◦ <b>THP:</b> THP volume</li> <li>◦ <b>External MF:</b> External mainframe volume</li> </ul> </li> <li>• <b>Attribute:</b> The attribute of the target volume. <ul style="list-style-type: none"> <li>◦ <b>SLU:</b> The volume has an SLU attribute.</li> <li>◦ <b>Data Direct Mapping:</b> The volume of which Data Direct Mapping attribute is enabled.</li> <li>◦ <b>-:</b> The volume has no attribute.</li> </ul> </li> <li>• <b>Drive Type/RPM:</b> Displays the data drive type and RPM of the target volume.</li> <li>• <b>CLPR:</b> Indicates the ID number and name of the CLPR corresponding to the target volume's parity group.</li> <li>• <b>Encryption:</b> Information about the encryption set to the target volume is displayed.</li> </ul>

Item	Description
	<ul style="list-style-type: none"> <li>◦ <b>Enabled:</b> The encryption for the parity group to which the LDEV as the target volume belongs is enabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is enabled.</li> <li>◦ <b>Disabled:</b> The encryption for the parity group to which the LDEV as the target volume belongs is disabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is disabled.</li> <li>◦ <b>Mixed:</b> The pool volumes whose encryption is enabled or disabled are mixed in the pool to which the LDEV belongs. <i>Note:</i> When the value is <b>Mixed</b>, the encryption of data is not guaranteed. If you want to manage the encryption of data, use the LDEV of which <b>Encryption is Enabled or Disabled</b>.</li> <li>◦ <b>-(hyphen):</b> The LDEV is an external volume or a migration volume. In case of the virtual volume of Thin Provisioning or Thin Provisioning MF, the pool to which the LDEV belongs is an external volume or blocked.</li> <li>• <b>T10 PI:</b> Displays the information about the T10 PI attribute of the volume. <ul style="list-style-type: none"> <li>◦ Enabled– The T10 PI attribute of the volume is enabled.</li> <li>◦ Disabled– The T10 PI attribute of the volume is disabled.</li> </ul> </li> </ul>

## Migration Plans window



## Migration Plans table

Item	Description
Source Volume	<ul style="list-style-type: none"> <li>• <b>LDEV ID:</b> Source volume's LDEV identifier</li> <li>• <b>LDEV Name:</b> Selected LDEV's name. This field is blank if the LDEV name is not set.</li> <li>• <b>Parity Group ID:</b> Indicates the source volume's parity group ID. The number before the hyphen is the frame number and the number after the hyphen is the group number.</li> <li>• <b>Pool Name (ID):</b> Source volume's pool name and ID number</li> <li>• <b>RAID Level:</b> The RAID level of the source volume</li> <li>• <b>Emulation Type:</b> The emulation type of the source volume</li> <li>• <b>Capacity:</b> The source volume's capacity</li> <li>• <b>Provisioning Type:</b> Provisioning type of the source volume: <ul style="list-style-type: none"> <li>◦ <b>Basic:</b> Internal volume</li> <li>◦ <b>External:</b> External volume</li> <li>◦ <b>THP:</b> THP volume</li> <li>◦ <b>External MF:</b> External mainframe volume</li> </ul> </li> <li>• <b>Attribute:</b> The attribute of the source volume. <ul style="list-style-type: none"> <li>◦ <b>SLU:</b> The volume has an SLU attribute.</li> <li>◦ <b>Data Direct Mapping:</b> The volume of which Data Direct Mapping attribute is enabled.</li> <li>◦ <b>-:</b> The volume has no attribute.</li> </ul> </li> <li>• <b>Drive Type/RPM:</b> Displays the data drive type and RPM of the source volume.</li> <li>• <b>CLPR:</b> Indicates the ID number and name of the CLPR corresponding to the source volume's parity group.</li> <li>• <b>Encryption:</b> Information about the encryption set to the source volume is displayed. <ul style="list-style-type: none"> <li>◦ <b>Enabled:</b> The encryption for the parity group to which the LDEV as the source volume belongs is enabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is enabled.</li> <li>◦ <b>Disabled:</b> The encryption for the parity group to which the LDEV as the source volume belongs is disabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is disabled.</li> <li>◦ <b>Mixed:</b> The pool volumes whose encryption is enabled or disabled are mixed in the pool to which the LDEV belongs. <i>Note:</i> When the value is <b>Mixed</b>, the encryption of data is not guaranteed. If you want to manage the encryption of data, use the LDEV of which <b>Encryption</b> is <b>Enabled</b> or <b>Disabled</b>.</li> <li>◦ <b>-(hyphen):</b> The LDEV is an external volume or a migration volume. In case of the virtual volume of Thin Provisioning or Thin Provisioning MF, the pool to which the LDEV belongs is an external volume or blocked.</li> </ul> </li> <li>• <b>T10 PI:</b> Displays the information about the T10 PI attribute of the volume. <ul style="list-style-type: none"> <li>◦ <b>Enabled–</b> The T10 PI attribute of the volume is enabled.</li> <li>◦ <b>Disabled–</b> The T10 PI attribute of the volume is disabled.</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Virtual Storage Machine:</b> Displays the virtual storage machine of the source volume.</li> </ul>

Item	Description
	<ul style="list-style-type: none"> <li>• <b>Virtual LDEV ID:</b> Displays the virtual LDEV ID of the source volume.</li> <li>• <b>Virtual Device Name:</b> Displays the virtual device name of the source volume.</li> <li>• <b>Virtual SSID:</b> Displays the virtual SSID of the source volume.</li> </ul>
Migration Type	<ul style="list-style-type: none"> <li>• <b>Normal:</b> The migration type is normal.</li> <li>• <b>Online Data Migration:</b> The data is migrated by Online Migration.</li> </ul>
Status	<p>Displays the status of the migration plan.</p> <ul style="list-style-type: none"> <li>• <b>run:</b> Running</li> <li>• <b>suspend:</b> Suspended</li> <li>• <b>split:</b> Completed</li> </ul>
Progress Rate (%)	<p>Displays the progress rate for the migration plan. If the error occurs when <b>Apply</b> is clicked, displays the error message. For error codes and corrective actions, see the XP7 Remote Web Console Messages.</p>

Item	Description
Target Volume	<ul style="list-style-type: none"> <li>• <b>LDEV ID:</b> Target volume's LDEV identifier</li> <li>• <b>LDEV Name:</b> Selected LDEV's name. This field is blank if the LDEV name is not set.</li> <li>• <b>Parity Group ID:</b> Indicates the target volume's parity group ID. The number before the hyphen is the frame number and the number after the hyphen is the group number.</li> <li>• <b>Pool Name (ID):</b> Target volume's pool name and ID number</li> <li>• <b>RAID Level:</b> The RAID level of the target volume</li> <li>• <b>Emulation Type:</b> The emulation type of the target volume</li> <li>• <b>Capacity:</b> The target volume's capacity</li> <li>• <b>Provisioning Type:</b> Provisioning type of the target volume: <ul style="list-style-type: none"> <li>◦ <b>Basic:</b> Internal volume</li> <li>◦ <b>External:</b> External volume</li> <li>◦ <b>THP:</b> THP volume</li> <li>◦ <b>External MF:</b> External mainframe volume</li> </ul> </li> <li>• <b>Attribute:</b> The attribute of the target volume. <ul style="list-style-type: none"> <li>◦ <b>SLU:</b> The volume has an SLU attribute.</li> <li>◦ <b>Data Direct Mapping:</b> The volume of which Data Direct Mapping attribute is enabled.</li> <li>◦ <b>-:</b> The volume has no attribute.</li> </ul> </li> <li>• <b>Drive Type/RPM:</b> Displays the data drive type and RPM of the target volume.</li> <li>• <b>CLPR:</b> Indicates the ID number and name of the CLPR corresponding to the target volume's parity group.</li> <li>• <b>Encryption:</b> Information about Encryption set to the target volume is displayed. <ul style="list-style-type: none"> <li>◦ <b>Enabled:</b> The encryption for the parity group to which the LDEV as the target volume belongs is enabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is enabled.</li> <li>◦ <b>Disabled:</b> The encryption for the parity group to which the LDEV as the target volume belongs is disabled. Otherwise, the LDEV is THP V-VOL which is allocated to the pool volume of the pool whose encryption is disabled.</li> <li>◦ <b>Mixed:</b> The pool volumes whose encryption is enabled or disabled are mixed in the pool to which the LDEV belongs. <i>Note:</i> When the value is <b>Mixed</b>, the encryption of data is not guaranteed. If you want to manage the encryption of data, use the LDEV of which <b>Encryption</b> is <b>Enabled</b> or <b>Disabled</b>.</li> <li>◦ <b>- (hyphen):</b> The LDEV is an external volume or a migration volume. In case of the virtual volume of Thin Provisioning or Thin Provisioning MF, the pool to which the LDEV belongs is an external volume or blocked.</li> </ul> </li> <li>• <b>T10 PI:</b> Displays the information about the T10 PI attribute of the volume. <ul style="list-style-type: none"> <li>◦ <b>Enabled–</b> The T10 PI attribute of the volume is enabled.</li> <li>◦ <b>Disabled–</b> The T10 PI attribute of the volume is disabled.</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Virtual Storage Machine:</b> Displays the virtual storage machine of the target volume.</li> <li>• <b>Virtual LDEV ID:</b> Displays the virtual LDEV ID of the target volume.</li> <li>• <b>Virtual Device Name:</b> Displays the virtual device name of the target volume.</li> </ul>



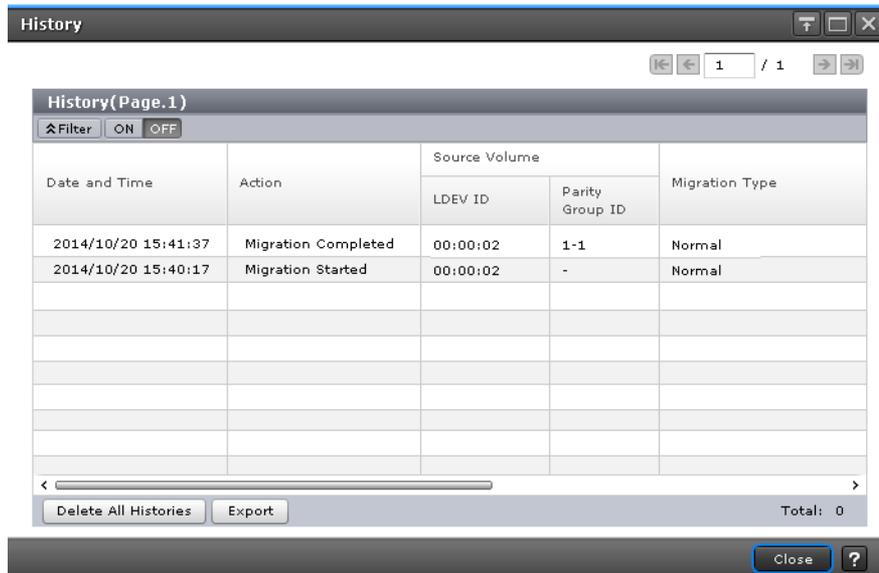
## Selected Migration Plans table

Item	Description
Source Volume	<ul style="list-style-type: none"> <li>• <b>LDEV ID:</b> Source volume's LDEV identifier</li> <li>• <b>LDEV Name:</b> Selected LDEV's name. This field is blank if the LDEV name is not set.</li> <li>• <b>Parity Group ID:</b> Indicates the source volume's parity group ID. The number before the hyphen is the frame number and the number after the hyphen is the group number.</li> <li>• <b>Pool Name (ID):</b> Source volume's pool name and ID number</li> <li>• <b>RAID Level:</b> The RAID level of the source volume</li> <li>• <b>Emulation Type:</b> The emulation type of the source volume</li> <li>• <b>Capacity:</b> The source volume's capacity</li> <li>• <b>Provisioning Type:</b> Provisioning type of the source volume: <ul style="list-style-type: none"> <li>◦ <b>Basic:</b> Internal volume</li> <li>◦ <b>External:</b> External volume</li> <li>◦ <b>THP:</b> THP volume</li> <li>◦ <b>External MF:</b> External mainframe volume</li> </ul> </li> <li>• <b>Drive Type/RPM:</b> Displays the data drive type and RPM of the source volume.</li> <li>• <b>CLPR:</b> Indicates the ID number and name of the CLPR corresponding to the source volume's parity group.</li> </ul>
Migration Type	<ul style="list-style-type: none"> <li>• <b>Normal:</b> The migration type is normal.</li> <li>• <b>Online Data Migration:</b> The data is migrated by Online Migration.</li> </ul>
Target Volume	<ul style="list-style-type: none"> <li>• <b>LDEV ID:</b> Target volume's LDEV identifier</li> <li>• <b>LDEV Name:</b> Selected LDEV's name. This field is blank if the LDEV name is not set.</li> <li>• <b>Parity Group ID:</b> Indicates the target volume's parity group ID. The number before the hyphen is the frame number and the number after the hyphen is the group number.</li> <li>• <b>Pool Name (ID):</b> Target volume's pool name and ID number</li> <li>• <b>RAID Level:</b> The RAID level of the target volume</li> <li>• <b>Emulation Type:</b> The emulation type of the target volume</li> <li>• <b>Capacity:</b> The target volume's capacity</li> <li>• <b>Provisioning Type:</b> Provisioning type of the target volume: <ul style="list-style-type: none"> <li>◦ <b>Basic:</b> Internal volume</li> <li>◦ <b>External:</b> External volume</li> <li>◦ <b>THP:</b> THP volume</li> <li>◦ <b>External MF:</b> External mainframe volume</li> </ul> </li> <li>• <b>Drive Type/RPM:</b> Displays the data drive type and RPM of the target volume.</li> <li>• <b>CLPR:</b> Indicates the ID number and name of the CLPR corresponding to the target volume's parity group.</li> </ul>

## Related information

[“Deleting a migration plan” \(page 25\)](#)

## History window



## History (Page number) table

Item	Description
Date and Time	Operation date and time
Action	The name of the operation
Source Volume	<ul style="list-style-type: none"><li>• <b>LDEV ID:</b> Source volume's LDEV identifier</li><li>• <b>Parity Group ID:</b> Indicates the source volume's parity group ID. The number before the hyphen is the frame number and the number after the hyphen is the group number.</li></ul>
Migration Type	<ul style="list-style-type: none"><li>• <b>Normal:</b> The migration type is normal.</li><li>• <b>Online Data Migration:</b> The data is migrated by Online Migration.</li></ul>
Target Volume	<ul style="list-style-type: none"><li>• <b>LDEV ID:</b> Target volume's LDEV identifier</li><li>• <b>Parity Group ID:</b> Indicates the target volume's parity group ID. The number before the hyphen is the frame number and the number after the hyphen is the group number.</li></ul>
Owner	<ul style="list-style-type: none"><li>• <b>Remote Web Console:</b> Indicates that this is the target volume which is reserved by Remote Web Console.</li><li>• <b>RAID Manager:</b> Indicates that this is the target volume which is reserved by RAID Manager. You cannot delete such a migration plan with the <b>Delete Migration Plans</b> button.</li><li>• <b>Tiered Storage Manager:</b> Indicates that this is the target volume which is reserved by Tiered Storage Manager. You cannot delete such a migration plan with the <b>Delete Migration Plans</b> button.</li></ul>
Delete All Histories	When clicked, deletes all histories information.
Export	When clicked, outputs the history information.

## Related information

[“Viewing the migration history logs” \(page 26\)](#)

## Delete All Histories window

**Delete All Histories**

**1. Confirm**

This wizard lets you delete all histories. Are you sure you want to continue?

Task Name:  (Max. 32 Characters)

Go to tasks window for status   Back   Next   Apply   Cancel  

## Related information

[“Delete all history logs” \(page 27\)](#)

# C Warranty and regulatory information

For important safety, environmental, and regulatory information, see *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products*, available at [www.hpe.com/support/Safety-Compliance-EnterpriseProducts](http://www.hpe.com/support/Safety-Compliance-EnterpriseProducts).

## Warranty information

HPE ProLiant and x86 Servers and Options

[www.hpe.com/support/ProLiantServers-Warranties](http://www.hpe.com/support/ProLiantServers-Warranties)

HPE Enterprise Servers

[www.hpe.com/support/EnterpriseServers-Warranties](http://www.hpe.com/support/EnterpriseServers-Warranties)

HPE Storage Products

[www.hpe.com/support/Storage-Warranties](http://www.hpe.com/support/Storage-Warranties)

HPE Networking Products

[www.hpe.com/support/Networking-Warranties](http://www.hpe.com/support/Networking-Warranties)

## Regulatory information

Belarus Kazakhstan Russia marking



Manufacturer and Local Representative Information

**Manufacturer information:**

- Hewlett Packard Enterprise Company, 3000 Hanover Street, Palo Alto, CA 94304 U.S.

**Local representative information Russian:**

- **Russia:**

ООО «Хьюлетт Паккард Энтерпрайз», Российская Федерация, 125171, г. Москва, Ленинградское шоссе, 16А, стр.3, Телефон/факс: +7 495 797 35 00

- **Belarus:**

ИООО «Хьюлетт-Паккард Бел», Республика Беларусь, 220030, г. Минск, ул. Интернациональная, 36-1, Телефон/факс: +375 17 392 28 20

- **Kazakhstan:**

ТОО «Хьюлетт-Паккард (К)», Республика Казахстан, 050040, г. Алматы, Бостандыкский район, проспект Аль-Фараби, 77/7, Телефон/факс: + 7 727 355 35 52

### Local representative information Kazakh:

- **Russia:**

ЖШС "Хьюлетт Паккард Энтерпрайз", Ресей Федерациясы, 125171,  
Мәскеу, Ленинград тас жолы, 16А блок 3, Телефон/факс: +7 495 797 35 00

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«HEWLETT-PACKARD Bel» ЖШС, Беларусь Республикасы, 220030, Минск қ.,  
Интернациональная көшесі, 36/1, Телефон/факс: +375 17 392 28 20

- **Kazakhstan:**

ЖШС «Хьюлетт-Паккард (К)», Қазақстан Республикасы, 050040, Алматы қ.,  
Бостандық ауданы, Әл-Фараби даңғылы, 77/7, Телефон/факс: +7 727 355 35 52

### Manufacturing date:

The manufacturing date is defined by the serial number.

CCSYWWZZZZ (serial number format for this product)

Valid date formats include:

- YWW, where Y indicates the year counting from within each new decade, with 2000 as the starting point; for example, 238: 2 for 2002 and 38 for the week of September 9. In addition, 2010 is indicated by 0, 2011 by 1, 2012 by 2, 2013 by 3, and so forth.
- YYWW, where YY indicates the year, using a base year of 2000; for example, 0238: 02 for 2002 and 38 for the week of September 9.

## Turkey RoHS material content declaration

*Türkiye Cumhuriyeti: EEE Yönetmeliğine Uygundur*

## Ukraine RoHS material content declaration

*Обладнання відповідає вимогам Технічного регламенту щодо обмеження використання деяких небезпечних речовин в електричному та електронному обладнанні, затвердженого постановою Кабінету Міністрів України від 3 грудня 2008 № 1057*

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