

**Hitachi TagmaStore<sup>®</sup>  
Universal Storage Platform and  
Hitachi TagmaStore<sup>®</sup>  
Network Storage Controller  
Compatible Replication for IBM<sup>®</sup> XRC  
User's Guide**



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- Xr50d09a
- Xr50d08b

## Changes Made by RSD (Xr50d09b)

The following changes are made in this revision and are highlighted in yellow:

- Added the description of an emulation type supported by XRC Replication (see section 3.1 and 3.2.1).

## Changes Made by RSD (Xr50d09a)

The following changes are made in this revision and are highlighted in blue:

- Updated the microcode version to **50-09-0X** (see the **Microcode Level** section).
- Added the features supported by XRC Replication (see section 3.2.1).

## Referenced Documents

- *Storage Navigator™ User's Guide*
- *Storage Navigator™ Error Codes*



# Preface

This user's guide describes and provides instructions for performing Compatible Replication for IBM® XRC operations on the Hitachi TagmaStore® Universal Storage Platform and Hitachi TagmaStore Network Storage Controller.

**Note:** In this user's guide, *Hitachi TagmaStore Universal Storage Platform* and *Hitachi TagmaStore Network Storage Controller* are collectively referred to as "TagmaStore USP", unless otherwise noted.

**Note:** In this user's guide, *Hitachi TagmaStore Network Storage Controller* is referred to as "TagmaStore NSC", unless otherwise noted.

**Note:** In this manual, you might find "Hitachi TagmaStore Universal Storage Platform and Hitachi TagmaStore Network Storage Controller" omitted from document titles. For example, *Hitachi TagmaStore Universal Storage Platform and Hitachi TagmaStore Network Storage Controller Storage Navigator™ User's Guide* is shortened to *Storage Navigator™ User's Guide*.

This user's guide assumes that:

- the user has a background in data processing and understands direct-access storage device (DASD) subsystems and their basic functions,
- the user has read and understands both the *Hitachi TagmaStore Universal Storage Platform User and Reference Guide* (MK-XXXXXXX) and the *TagmaStore Universal Storage Platform - Storage Navigator™ User's Guide* (MK-XXXXXXX), and
- the user is familiar with the operating system and web browser software on the system hosting the Hitachi TagmaStore Universal Storage Platform Storage Navigator and Compatible Replication for IBM® XRC software.  
For details on the applicable operation systems and web browser software, please refer to the *Storage Navigator™ User's Guide*.

**Note:** The use of Compatible Replication for IBM® XRC software, and all other Hitachi products is governed by the terms of your license agreement(s) with Hitachi.

**Note:** There are different types of users for TagmaStore USP: storage administrators and storage partition administrators. The functions described in this manual are not for the storage partition administrators. For details on the user types, please refer to the *Storage Navigator™ User's Guide*.

**Note:** This document uses the following conventions:

- 1 KB (kilobyte) is 1,024 bytes.
- 1 MB (megabyte) is 1,024 KB.
- 1 GB (gigabyte) is 1,024 MB.
- 1 TB (terabyte) is 1,024 GB.
- 1 block is 512 bytes.

**Note:** The Compatible Replication for IBM® XRC screens shown in this document were captured on a Windows® system with the Internet Explorer web browser. The screens may display differently on other operating systems and browsers. Please refer to the *Storage Navigator™ User's Guide* for further information on UNIX™ operating systems and browsers.

## **Microcode Level**

This document revision applies to TagmaStore USP microcode version 50-09-0X-XX/XX and higher.



# Contents

<b>Chapter 1 Overview of Hitachi Copy Solutions</b>	<b>1</b>
1.1 Compatible Replication for IBM® XRC (XRC Replication)	1
1.2 Other copy features in TagmaStore Universal Storage Platform	1
1.2.1 TrueCopy for z/OS®	1
1.2.2 ShadowImage for z/OS®	2
1.2.3 Compatible Mirroring for IBM® FlashCopy®	2
<b>Chapter 2 Overview of XRC Replication Operations</b>	<b>3</b>
2.1 Function Overview	3
2.1.1 Sessions	3
2.1.2 TSO commands	4
2.2 Configuration	4
<b>Chapter 3 Requirements and Restrictions</b>	<b>7</b>
3.1 System Requirements	7
3.2 Requirements and Restrictions for Using XRC Replication	8
3.2.1 Supported Functions	8
3.2.2 The Number of Sessions	8
3.2.3 Considerations for Performance	9
3.2.4 Notes and Cautions	9
3.3 Using XRC Replication in Conjunction with Other Copy Solutions	14
3.3.1 Using Two XRC Replication Pairs in Conjunction	15
3.3.2 Using XRC Replication in Conjunction with TrueCopy for z/OS®	15
3.3.3 Using XRC Replication in Conjunction with ShadowImage for z/OS®	16
3.3.4 Using XRC Replication in Conjunction with FlashCopy® Mirror	18
<b>Chapter 4 Preparing for XRC Replication Operations</b>	<b>21</b>
4.1 System Configuration	21
4.2 Installing the XRC Replication Software	21
4.3 Starting XRC Replication	21
<b>Chapter 5 XRC Replication Panels</b>	<b>23</b>
5.1 The XRC Option Panel	23
5.2 The Change Option Panel	25
<b>Chapter 6 Performing XRC Replication Operations</b>	<b>31</b>
6.1 Setting XRC Replication Options	31
6.2 Changing Settings in the Preset List	33
6.3 Deleting Settings from the Preset List	34
<b>Chapter 7 Troubleshooting</b>	<b>35</b>
7.1 Troubleshooting	35
7.2 Calling the Hitachi Support Center	35

Acronyms and Abbreviations.....	37
Index	39

## List of Figures

Figure 2.1	Overview of XRC Replication Operations .....	3
Figure 2.2	Channel Extender Connection Configuration for XRC Replication .....	5
Figure 3.1	Double XRC Replications.....	15
Figure 3.2	Configuration in which a Volume is Functioning as XRC Replication P-VOL and TC-zOS M-VOL .....	16
Figure 3.3	Configuration in which a Volume is Functioning as XRC Replication S-VOL and TC-zOS M-VOL .....	16
Figure 3.4	Configuration in which a Volume is Functioning as XRC Replication P-VOL and SI-zOS S-VOL.....	17
Figure 3.5	Configuration in which a Volume is Functioning as XRC Replication S-VOL and SI-zOS S-VOL.....	17
Figure 3.6	Configuration in which One Volume is Used as XRC Replication P-VOL/SI-zOS S-VOL and Another Volume is Used as XRC Replication S-VOL/SI-zOS S-VOL.....	18
Figure 3.7	Configuration in Which a Volume is Functioning as XRC Replication P-VOL and FlashCopy <sup>®</sup> Mirror S-VOL.....	18
Figure 3.8	Configuration in Which a Volume is Functioning as XRC Replication S-VOL and FlashCopy <sup>®</sup> Mirror S-VOL.....	19
Figure 3.9	Configuration in Which One Volume is Used as XRC Replication P-VOL/FlashCopy <sup>®</sup> Mirror S-VOL and Another Volume is Used as XRC Replication S-VOL and FlashCopy <sup>®</sup> Mirror S-VOL.....	19
Figure 5.1	XRC Option Panel .....	23
Figure 5.2	Change Option Panel .....	25
Figure 5.3	Controlling the Amount of Write Data (1).....	27
Figure 5.4	Controlling the Amount of Write Data (2).....	28
Figure 6.1	Confirmation Panel to be Displayed When the "The same setting is applied" Check Box is Selected.....	32
Figure 6.2	Confirmation Panel Indicating that a Pair will be Suspended .....	32
Figure 6.3	Confirmation Panel Asking You Whether to Apply Settings to the Subsystem ..	32
Figure 6.4	Panel Indicating that the Operation is Finished.....	32
Figure 6.5	Confirmation Panel Indicating that a Setting will be Deleted from the Preset List.....	34

## List of Tables

Table 3.1	Features Supported by XRC Replication .....	8
Table 3.2	Number of XRC Replication Sessions .....	9
Table 3.3	Number of Sessions Per Logical Volume .....	9
Table 3.4	Combinations of ESCON and FICON Paths .....	10
Table 3.5	XRC Replication in Conventional Models and TagmaStore USP.....	10
Table 3.6	Behavior of the TagmaStore USP Subsystem When the Block Option of XRC Replication is Set to "Volume Level" .....	11
Table 3.7	Behavior of the TagmaStore USP Subsystem When the Block Option of XRC Replication is Set to "Cache Level".....	12
Table 3.8	Volume Sharing between XRC Replication and Other Copy Functions .....	14



# Chapter 1 Overview of Hitachi Copy Solutions

## 1.1 Compatible Replication for IBM® XRC (XRC Replication)

Compatible Replication for IBM® XRC (henceforth referred to as "XRC Replication") in the TagmaStore® USP subsystem is an asynchronous remote copy feature used for data backup in the event of a disaster.

XRC Replication is used in mainframe systems and functionally compatible with IBM Extended Remote Copy (XRC), an IBM host software feature. XRC Replication is provided as a program product. XRC Replication is compatible with System Data Mover (SDM) in DFSMS (Data Facility Storage Management Subsystem), which is common to the XRC environment. XRC Replication operations are performed in the same manner as XRC operations, by issuing XRC TSO commands from the host system to the TagmaStore USP subsystem.

XRC Replication temporarily stores the data written by the host at the primary site to the cache as a sidefile. Upon request of the host at the secondary site, XRC Replication asynchronously transfers the sidefile for data backup to the secondary site.

Since XRC Replication is an asynchronous remote copy feature, response time to the primary site does not depend on the distance between the primary and secondary sites. You are able to use the communication lines at the primary and secondary sites to have a long distance connection between these sites. By using a common time stamp provided by the Sysplex timer, you are able to guarantee that data is written at the secondary site in the same order as it is written at the primary site.

In XRC Replication operations, a group of logical volumes is processed as one session. The order of writes at the secondary site is guaranteed in each session. You can register 4,096 sessions in one disk subsystem, and XRC Replication enables you to have a large-scale remote copy system, which involves multiple hosts.

The XRC Replication program product must be installed in the disk subsystem at the primary site. For the installation procedure, please refer to *Hitachi TagmaStore Universal Storage Platform Storage Navigator™ User's Guide*.

## 1.2 Other copy features in TagmaStore Universal Storage Platform

TagmaStore Universal Storage Platform supports the following copy features that can be used in combination with XRC Replication in mainframe systems.

### 1.2.1 TrueCopy for z/OS®

Hitachi TrueCopy for z/OS® (TC-zOS) enables you to create copies of logical volumes in two different subsystems at remote locations. You can manage data in mainframe systems by using the TC-zOS remote console software or by using TSO and/or ICKDSF commands.

TC-zOS has synchronous (TC-zOS Sync) and asynchronous (TC-zOS Async) copy modes. TC-zOS Synchronous can be used for volume-based real-time data backup. TC-zOS Asynchronous enables you to back up data asynchronously with the host write operation, so that the response time to the host will not be increased. TC-zOS Synchronous can be used in conjunction with XRC Replication to support disaster recovery systems in three data center (3DC) configuration. See section 3.3.2 for further information on combining XRC Replication with TC-zOS Synchronous operations.

This user's guide does not cover TC-zOS operations. For information and instructions on performing TC-zOS operations, please refer to the *TagmaStore USP TrueCopy for z/OS® User's Guide*, or contact your Hitachi account team.

## 1.2.2 ShadowImage for z/OS®

ShadowImage for z/OS (SI- zOS) enables you to set up and maintain multiple copies of logical volumes within the same Hitachi TagmaStore USP subsystem. You can manage data in mainframe systems by using the ShadowImage for z/OS® software or by using TSO and/or ICKDSF commands.

The RAID-protected ShadowImage duplicate volumes are created within the same Hitachi TagmaStore USP subsystem at hardware speeds. SI-zOS can be used in conjunction with XRC Replication to maintain multiple copies of critical data at your primary and/or secondary sites. See section 3.3.3 for further information on combining XRC Replication and SI for z/OS operations.

This user's guide does not cover SI-zOS operations. For information and instructions on performing SI-zOS operations, please refer to the *TagmaStore USP ShadowImage for z/OS® User's Guide*, or contact your Hitachi account team.

## 1.2.3 Compatible Mirroring for IBM® FlashCopy®

Compatible Mirroring for IBM® FlashCopy® (henceforth referred to as "FlashCopy® Mirror") enables you to set up and maintain multiple copies of logical volumes within the same Hitachi TagmaStore USP subsystem. The FlashCopy® Mirror operations can be performed in the Hitachi TagmaStore USP subsystem by using the TSO and/or DFSMSdss commands from the host.

If you use FlashCopy® Mirror in conjunction with XRC Replication, you will be able to maintain multiple copies of critical data at your primary and/or secondary sites. For details of combination of XRC Replication and FlashCopy® Mirror operations, see section 3.3.4.

This user's guide does not cover FlashCopy® Mirror operations. For information and instructions on performing FlashCopy® Mirror operations, please refer to the *TagmaStore USP ShadowImage for z/OS® User's Guide*, or contact your Hitachi account team.

## Chapter 2 Overview of XRC Replication Operations

### 2.1 Function Overview

In XRC Replication operations, the data written from the primary host at the primary site is written to the primary volume via cache memory at the primary disk subsystem. At the same time, it is stored on the cache memory as a sidefile temporarily. System Data Mover (SDM), which is a host software, at the secondary site reads the sidefile data from the primary disk subsystem at the primary site asynchronously via communication lines. SDM then writes the data to the secondary volume in the secondary disk subsystem in the same order as it was written at the primary site.

SDM manages pair definitions of the primary and secondary disk subsystems, or pair definitions of the primary and secondary volumes.

Figure 2.1 shows the overview of XRC Replication operations.

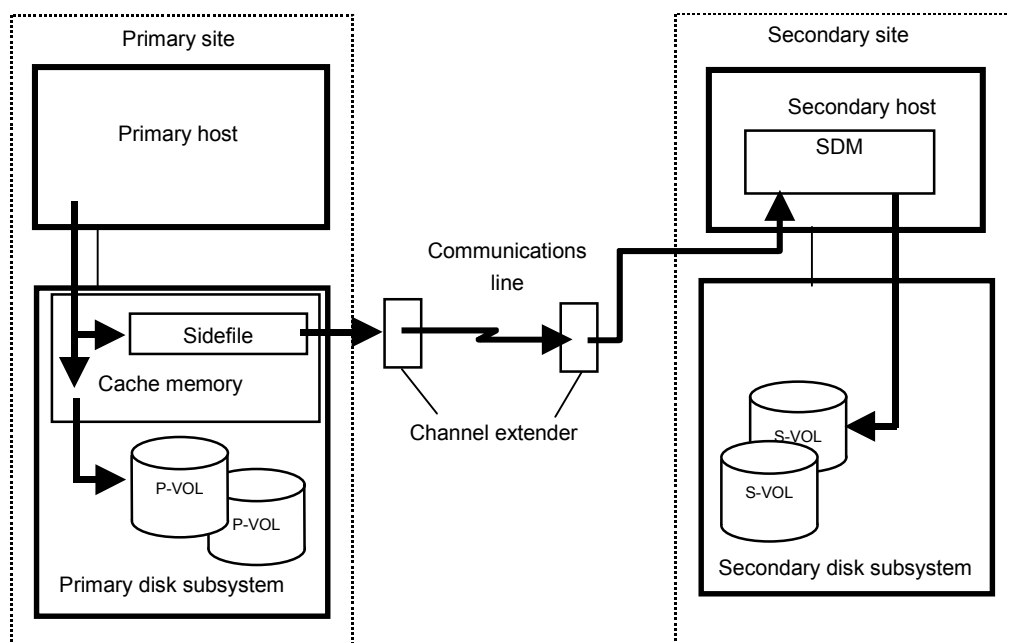


Figure 2.1 Overview of XRC Replication Operations

#### 2.1.1 Sessions

In XRC Replication operations, a group of primary volumes is processed as one session. Data is written to the secondary volumes in each session in the same order as it was written at the primary site. In the event of a failure, all logical volume pairs in the same session will be suspended while the write order is maintained.

A session is further divided into internal sessions called “storage control sessions” (SC sessions). SDM reads the data written to the disk subsystem at the primary site in order of time stamp in each SC session. SDM checks the time stamp of each SC session, and determines in what order the data should be written to the secondary volumes. Data is written to the secondary volumes in units of session in the same order as it was written at the primary site, not in units of SC session.

SDM manages definitions of sessions and SC sessions. They are assigned session IDs and defined in units of logical volume in the disk subsystem.

### 2.1.2 TSO commands

The following settings concerning XRC Replication operations are defined by the TSO commands issued to the disk subsystem from the host system.

- Start and end of the session
- Integration and withdrawal from the session
- Creation of utility volumes
- Creation and deletion of pair volumes
- Suspending of pairs
- Resuming suspended pairs
- Display of session status
- Display of utility volume status
- Display of pair status
- Recovery at the secondary site

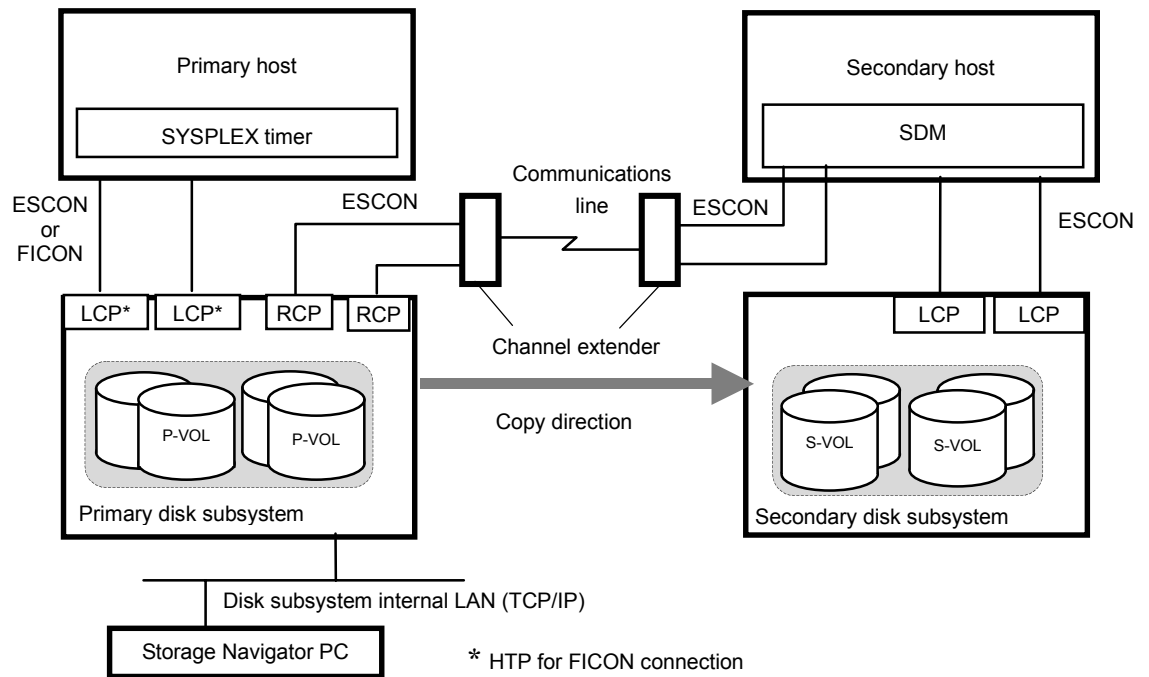
**Note:** For details of the TSO commands in XRC Replication, see *DFSMS Advanced Copy Services* (Document number: SC35-0428-02) published by IBM.

## 2.2 Configuration

XRC Replication operations require hosts and TagmaStore USP subsystems at both primary and secondary sites, and also a communications path between the subsystem at the primary site and the host at the secondary site. If the system at the primary site consists of several hosts, a SYSPLEX timer is required in the primary host to provide a common time reference for the I/O time-stamping function. The secondary host requires SDM, which is a host software, for remote copy operations. The XRC Replication program product needs to be installed in the primary disk subsystem. The primary site requires a Storage Navigator PC for setting options of the XRC Replication program product.

Figure 2.2 shows the connection configuration of channel extenders for XRC Replication.





**Figure 2.2 Channel Extender Connection Configuration for XRC Replication**



## Chapter 3 Requirements and Restrictions

### 3.1 System Requirements

XRC Replication operations require hosts and Hitachi TagmaStore USP subsystems at both primary and secondary sites, a communications path between the primary subsystem and the secondary host, a Storage Navigator PC, and the XRC Replication program product. The XRC Replication system requirements are:

- **Primary host**

If the system in the primary site consists of several hosts, a SYSPLEX timer is required in the primary host to provide a common time reference for the I/O time-stamping function.

- **Secondary host**

The secondary host requires System Data Mover (SDM), which is a host software, for remote copy operations.

- **Primary disk subsystem**

The XRC Replication program product needs to be installed in the Hitachi TagmaStore USP subsystem.

**Note:** When the DKC emulation type is 3990-6 or 3990-6E, you are able to use XRC Replication even if the program product is not installed. In such a case, however, XRC Replication supports only the XRC2 feature (For details, see section 3.2.1). When the DKC emulation type is 2105 or 2107, the XRC Replication program product needs to be installed.

- **Secondary disk subsystem**

The TagmaStore USP subsystem is required.

**Note:** The XRC Replication program product does not have to be installed in the secondary disk subsystem.

- **Communication path connection**

- If ESCON is used for connection, the maximum possible distance between the primary disk subsystem and the secondary host is 3 km.
- If the director is used for connection, the maximum possible distance between the primary disk subsystem and the secondary host is 20 km.
- If the director and repeater are used for connection, the maximum possible distance between the primary disk subsystem and the secondary host is 40 km.
- If the channel extender is used for connection, no restriction is applied to the distance between the primary disk subsystem and the secondary host.

**Note:** The following channel extender is supported.

Channel extender: CNT Ultranet Storage Director (ATM, IP connections)

Line type: ATM lines (Up to 135 Mbps), IP lines (500 Mbps)

- **Storage Navigator PC**

You must have a Storage Navigator PC at the primary site. To use the TagmaStore USP Storage Navigator Java applet programs including XRC Replication, you must have a WWW browser. A license key code is also required for using the XRC Replication program product. For details on how to install and use a Storage Navigator PC, please refer to *Hitachi TagmaStore Universal Storage Platform Storage Navigator™ User's Guide*.

## 3.2 Requirements and Restrictions for Using XRC Replication

### 3.2.1 Supported Functions

Table 3.1 shows the features supported by XRC Replication and whether they are supported in IBM XRC functions (XRC2 and XRC3).

**Table 3.1 Features Supported by XRC Replication**

Feature	Description	XRC2	XRC3
DEV blocking	Sidefile threshold tuning feature for each logical volume	Supported	Supported
Unplanned outage	Differential copy feature for unplanned outage achieved by the differential bit management in the disk subsystem	Not supported	Supported
CNT MULTI path	Alternate path retry feature for CNT USD* <sup>1</sup> connections	Not supported	Supported
Fix utility	Fix or Float of Utility DEV setting feature	Not supported	Supported * <sup>2</sup>
Suspend on Long Busy	Suspend setting feature which does not report SCP from SDM	Not supported	Supported * <sup>3</sup>
Write Pacing	Function to set arbitrary Sleep Time from SDM when the amount of write data is controlled.	Not supported	Supported * <sup>4</sup>

\*<sup>1</sup> CNT extender (Ultranet Storage Director).

\*<sup>2</sup> Only Fix of Utility DEV is supported (Float is not supported).

\*<sup>3</sup> Operates when Level 2 Suspend is set to Disabled in the option of XRC Replication. Level 2 Suspend operation will be processed preferentially, when Level 2 Suspend is set to Enable.

\*<sup>4</sup> Operates when Block Option is set to Volume Level in the option of XRC Replication. Write Pacing will not operate when Block Option is set to Cache Level.

**Note:** When the DKC emulation type is 3990-6 or 3990-6E, only the XRC2 function is supported. When the DKC emulation type is 2105 or 2107, XRC2 or XRC3 is supported.

### 3.2.2 The Number of Sessions

Table 3.2 shows the number of sessions in XRC Replication.

**Table 3.2 Number of XRC Replication Sessions**

Unit	Number of sessions
Per disk subsystem	4,096
Per CU	64
Per logical volume	1

The number of Concurrent Copy (CC) and XRC Replication sessions per logical volume depends on the combination of CC and XRC (XRC2 and XRC3). Table 3.3 shows the number of sessions per logical volume.

**Table 3.3 Number of Sessions Per Logical Volume**

Session type	DKU emulation type	
	3390-1, 3390-2, 3390-3, 3390-3R, 3390-9, 3390-L, 3390-M	
	Number of CC sessions	Number of XRC Replication sessions
CC only	16	-
CC and XRC2	15	1
CC and XRC3	15	1

### 3.2.3 Considerations for Performance

Please note the following when performing XRC Replication operations.

- We recommend that you have one ESCON path for one SC session.
- Take the block sizes into consideration when configuring the SC sessions (Do not issue too many write I/Os with large block to one SC session).
- The performance of XRC Replication is affected by the performance of SDM. Please tune the SDM in order to achieve the desired performance.  
For SDM tuning, please refer to RedBooks *Implementing ESS Copy Services on S/390* published by IBM, or contact IBM.

### 3.2.4 Notes and Cautions

This section describes notes and cautions regarding XRC Replication.

**Caution:** XRC Replication operations, as well as TCzA operations, utilize additional cache to store the sidefile queue of asynchronous recordsets.

If you are maintaining XRC Replication pairs and TCzA pairs, please consider asynchronous remote copy workloads, and then make sure that your Hitachi TagmaStore USP subsystems have adequate cache installed and available.

**Caution:** If the ANTX5123W console message is displayed during the RESUME operation for XRC Replication pairs, the operation might be unsuccessful. In this case, you must perform the XDELP AIR operation to delete the pairs, and then perform the XADDP AIR operation to create the pairs again.

**Caution:** If the ANTA5107E (RC=9014, REAS=604 or REAS=608) console message is displayed during the XADDP AIR operation, the XRC Replication program product may not be installed. Check whether the XRC Replication program product is installed. If the XRC Replication program product is not installed, please install it.

**Note:** If XRC Replication is used with FICON™ host interface, you must be careful about the path combination with serial channel (ESCON). Table 3.4 lists possible combinations of paths between the primary host and the primary disk subsystem and paths between the primary disk subsystem and the secondary host. Refer to Table 3.4 when you use FICON.

**Table 3.4 Combinations of ESCON and FICON Paths**

Paths between primary host and primary disk subsystem	Paths between primary disk subsystem and secondary host	Support
ESCON	ESCON	Supported
ESCON	FICON	Supported
FICON*1	ESCON	Not recommended
FICON*1	FICON	Supported

*Note\*1:* Since FICON achieves faster transfer speed than ESCON, you need to consider the difference in performance between FICON and ESCON paths. If FICON is used for the connection between the primary host and the primary disk subsystem, we do not recommend that you use ESCON for connecting the primary disk subsystem and the secondary host. In this case, use FICON instead.

**Note:** Table 3.5 shows the operation modes of XRC Replication in conventional models and the corresponding option settings in the TagmaStore USP subsystems.

**Table 3.5 XRC Replication in Conventional Models and TagmaStore USP**

Operation Modes of XRC Replication in Conventional Model							Option Settings of XRC Replication in TagmaStore USP Subsystem
45	61	85	86	97	98	118	
Off	Off	—	—	—	—	—	<ul style="list-style-type: none"> <li>Block Option: Cache Level</li> <li>Donot Block (Volume Level): Disable</li> <li>Level 1 Sleep: Enable</li> </ul>
Off	On	—	—	—	—	—	<ul style="list-style-type: none"> <li>Block Option: Cache Level</li> <li>Donot Block (Volume Level): Enable</li> <li>Level 1 Sleep: Enable *1</li> </ul>
On	Off	—	—	—	—	—	<ul style="list-style-type: none"> <li>Block Option: Cache Level</li> <li>Donot Block (Volume Level): Disable</li> <li>Level 1 Sleep: Disable</li> </ul>

Operation Modes of XRC Replication in Conventional Model							Option Settings of XRC Replication in TagmaStore USP Subsystem
45	61	85	86	97	98	118	
On	On	—	—	—	—	—	<ul style="list-style-type: none"> <li>Block Option: Volume Level</li> <li>Donot Block (Volume Level): Enable</li> <li>Level 1 Sleep: Disable</li> </ul>
—	—	Off	Off	—	—	—	Level 2 Threshold: 50%
—	—	Off	On	—	—	—	Level 2 Threshold: 60%
—	—	On	Off	—	—	—	Level 2 Threshold: 40%
—	—	On	On	—	—	—	Level 2 Threshold: 70%
—	—	—	—	Off	—	—	Sleep Time: 100 ms
—	—	—	—	On	—	—	Sleep Time: 10 ms
—	—	—	—	—	Off	—	Level 2 Suspend: Disable
—	—	—	—	—	On	—	Level 2 Suspend: Enable
—	—	—	—	—	—	Off	Level 1 SIM: Disable
—	—	—	—	—	—	On	Level 1 SIM: Enable

\*1 Level 1 Sleep is performed on a logical volume in which a threshold specified by SDM is enabled (Block option). Level 1 Sleep is not performed on the volume for which Donot Block (Volume Level) is specified.

**Note:** The behavior of the TagmaStore USP subsystem, which is affected by option settings in the Change Option panel (Figure 5.2), will also be affected by whether the *DonotBlock* parameter of the *Xaddpair* command of SDM is specified. For details, see Table 3.6 and Table 3.7.

**Table 3.6 Behavior of the TagmaStore USP Subsystem When the Block Option of XRC Replication is Set to "Volume Level"**

Option Settings in XRC Replication		Behavior of the TagmaStore USP Subsystem	
Options	Settings	If "DonotBlock" is Specified by SDM	If "DonotBlock" is Not Specified by SDM (i.e., If "Block" is Specified)
Donot Block (Volume Level)	Enable	The subsystem does not control the amount of data to be written to the specified logical volume.	According to the amount of used sidefile capacity, the subsystem performs "Sleep" - "Wait" command retry when the threshold specified by SDM is exceeded.
	Disable *1	-	-
Level 1 Sleep	Enable *1	-	-
	Disable	The subsystem does not perform "Sleep" - "Wait" command retry.	According to the amount of used sidefile capacity, the subsystem performs "Sleep" - "Wait" command retry when the threshold specified by SDM is exceeded.

Option Settings in XRC Replication		Behavior of the TagmaStore USP Subsystem	
Level 1 SIM	Enable	The subsystem does not report an SIM to the host when the sidefile exceeds the sleep wait threshold.	The subsystem reports an SIM to the host when the sidefile exceeds the sleep wait threshold.
	Disable	The subsystem does not report an SIM to the host when the sidefile exceeds the sleep wait threshold.	The subsystem does not report an SIM to the host when the sidefile exceeds the sleep wait threshold.
Level 2 Suspend	Enable *1	-	-
	Disable	Even when the amount of used sidefile capacity exceeds the level-2 threshold, level-2 suspension does not occur and the subsystem does not report SCP-SCI to the host.	Even when the amount of used sidefile capacity exceeds the level-2 threshold, level-2 suspension does not occur and the subsystem does not report SCP-SCI to the host.

\*1 This setting is impossible when the block option of XRC Replication is set to **Volume Level**.

**Table 3.7 Behavior of the TagmaStore USP Subsystem When the Block Option of XRC Replication is Set to "Cache Level"**

Option Settings in XRC Replication		Behavior of the TagmaStore USP Subsystem	
Options	Settings	If DonotBlock is Specified by SDM	If DonotBlock is Not Specified by SDM (i.e., If Block is Specified by SDM)
Donot Block (Volume Level)	Enable	The subsystem does not control the amount of data to be written to the specified logical volume.	The subsystem controls the amount of data to be written. To control the amount, the subsystem uses the threshold specified by the <b>Level 2 Threshold</b> drop-down list.
	Disable	The subsystem controls the amount of data to be written. To control the amount, the subsystem uses the threshold specified by the <b>Level 2 Threshold</b> drop-down list.	The subsystem controls the amount of data to be written. To control the amount, the subsystem uses the threshold specified by the <b>Level 2 Threshold</b> drop-down list.
Level 1 Sleep	Enable	If <b>Donot Block (Volume Level)</b> is disabled, the subsystem performs "Sleep" - "Wait" command retry.  If <b>Donot Block (Volume Level)</b> is enabled, the subsystem does not perform "Sleep" - "Wait" command retry.	The subsystem performs "Sleep" - "Wait" command retry.
	Disable	The subsystem does not perform "Sleep" - "Wait" command retry.	The subsystem does not perform "Sleep" - "Wait" command retry.



Option Settings in XRC Replication		Behavior of the TagmaStore USP Subsystem	
Options	Settings	If DonotBlock is Specified by SDM	If DonotBlock is Not Specified by SDM (i.e., If Block is Specified by SDM)
Level 1 SIM	Enable	<p>If <b>Donot Block (Volume Level)</b> is enabled and <b>Level 1 Sleep</b> is enabled, the subsystem reports an SIM to the host when the amount of used sidefile capacity exceeds the threshold.</p> <p>If <b>Donot Block (Volume Level)</b> is enabled but <b>Level 1 Sleep</b> is disabled, the subsystem does not report an SIM to the host.</p> <p>If <b>Donot Block (Volume Level)</b> is disabled, the subsystem reports an SIM to the host when the amount of used sidefile capacity exceeds the threshold.</p>	<p>If <b>Donot Block (Volume Level)</b> is disabled, the subsystem reports an SIM to the host when the amount of used sidefile capacity exceeds the threshold.</p> <p>If <b>Donot Block (Volume Level)</b> is enabled, the subsystem does not report an SIM to the host.</p>
	Disable	The subsystem does not report an SIM to the host when the amount of used sidefile capacity exceeds the sleep wait threshold.	The subsystem does not report an SIM to the host when the amount of used sidefile capacity exceeds the sleep wait threshold.
Level 2 Suspend	Enable	<p>If <b>Donot Block (Volume Level)</b> is enabled, level-2 suspension does not occur when the amount of used sidefile capacity exceeds the level-2 threshold. Also, the subsystem does not report SCP-SCI to the host.</p> <p>If <b>Donot Block (Volume Level)</b> is disabled, level-2 suspension occurs when the amount of used sidefile capacity exceeds the level-2 threshold.</p>	Level-2 suspension occurs when the amount of used sidefile capacity exceeds the level-2 threshold.
	Disable	<p>If <b>Donot Block (Volume Level)</b> is enabled, level-2 suspension does not occur when the amount of used sidefile capacity exceeds the level-2 threshold. Also, the subsystem does not report SCP-SCI to the host.</p> <p>If <b>Donot Block (Volume Level)</b> is disabled, level-2 suspension does not occur when the amount of used sidefile capacity exceeds the level-2 threshold. The subsystem reports SCP-SCI to the host.</p>	When the amount of used sidefile capacity exceeds the level-2 threshold, level-2 suspension does not occur. The subsystem reports SCP-SCI to the host.

**Caution:** If you want to use XRC Replication and more than one CLPR (cache logical partition), it is recommended that you use SC sessions in the same CLPR.

XRC Replication options can be set to each CLPR. If an SC session extends over more than one CLPR, the subsystem operates depending on the XRC Replication option setting for each CLPR. For example, if more than one session exists in one CLPR and then the amount of used sidefile capacity in the CLPR reaches *level-2* (if the **Level 2 Suspend** option of XRC Replication is enabled) or *level-3*, the session that occupies the largest capacity in the sidefile in the cache will be suspended.

**Caution:** When using a drive in which its DKU emulation type is 3390-M as a P-VOL or an S-VOL, patch the System Data Mover (SDM), which is a host software of the secondary site, with the following PTF (Program Temporary Fixes).

[PTF] UA18053: SUPPORT XRC VOLUME SIZE UP TO 65520 CYL
--

Drives in which its DKU emulation type is 3390-M cannot be used as a P-VOL or an S-VOL in XRC Replication operations if the PTF is not patched to the SDM.

**Caution:** The SC session of the disk subsystem will be terminated automatically when offline replacement of a microprogram which requires PS OFF and PS ON, or PS ON after the battery has discharged (volatile PS ON) is performed while XRC Replication is operating. The session of the SDM side of the secondary site will be suspended by the termination, however the RESUME operation may fail.

Therefore, please perform the following operation

- When performing an offline microprogram replacement, delete all XRC Replication pairs by XDELPAIR command before PS OFF, and then create all pairs again by XADDPAIR command after PS ON.
- When performing volatile PS ON, delete all XRC Replication pairs by XDELPAIR command immediately after PS ON, and then create all pairs again by XADDPAIR command.

**Caution:** Please do not execute resume operation for XRC Replication pairs in the following condition, when the side file of the XRC Replication pairs still exists in the cache because it may cause a timeout error.

- When pair volumes are suspended by XSUSPEND TSO command.
- When pair volumes are suspended by failure of some sort.

When executing resume operation for XRC Replication pairs under the above condition, check that the side file of the XRC Replication pairs do not exist in the cache, before executing the operation.

### 3.3 Using XRC Replication in Conjunction with Other Copy Solutions

XRC Replication supports concurrent operations with other copy functions. Table 3.8 shows whether XRC Replication can share volumes with other copy functions or not.

**Table 3.8 Volume Sharing between XRC Replication and Other Copy Functions**

	XRC Replication P-VOL	XRC Replication S-VOL	TC-zOS M-VOL	TC-zOS R-VOL	SI-zOS M-VOL	SI-zOS R-VOL	FlashCopy® Mirror M-VOL	FlashCopy® Mirror R-VOL
XRC Replication P-VOL	—	Yes *1	Yes *2	No	Yes*3	No	Yes	No
XRC Replication S-VOL	Yes *1	—	Yes	No	Yes	No	Yes	No

\*<sup>1</sup> An S-VOL of XRC Replication cannot be used as an XRC Replication P-VOL within the same XRC session, but it can be used as an XRC Replication P-VOL in another XRC session.

\*<sup>2</sup> It cannot be used as a TC-zOS Async M-VOL at the same time.

\*<sup>3</sup> When the XRC Replication P-VOL and the SI-zOS M-VOL are the same volume, you cannot use the Reverse Copy and Quick Restore commands of SI-zOS.

### 3.3.1 Using Two XRC Replication Pairs in Conjunction

By using two XRC Replication pairs in conjunction, you can maintain three copies of data between secondary sites for disaster recovery purposes.

Figure 3.1 shows the configuration in which two XRC Replication operations are performed. In this configuration, data is copied from the primary site to the first secondary site using XRC Replication, and then it is copied from the first secondary site to the second one using XRC Replication.

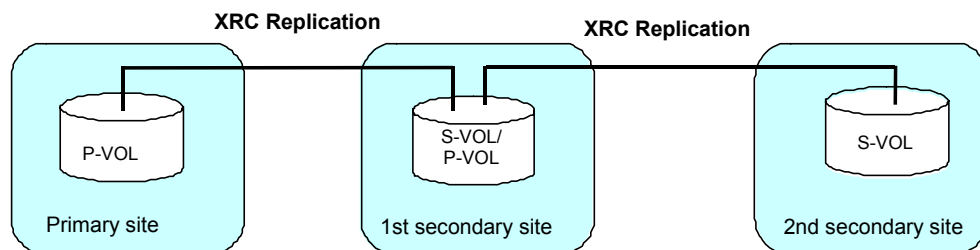


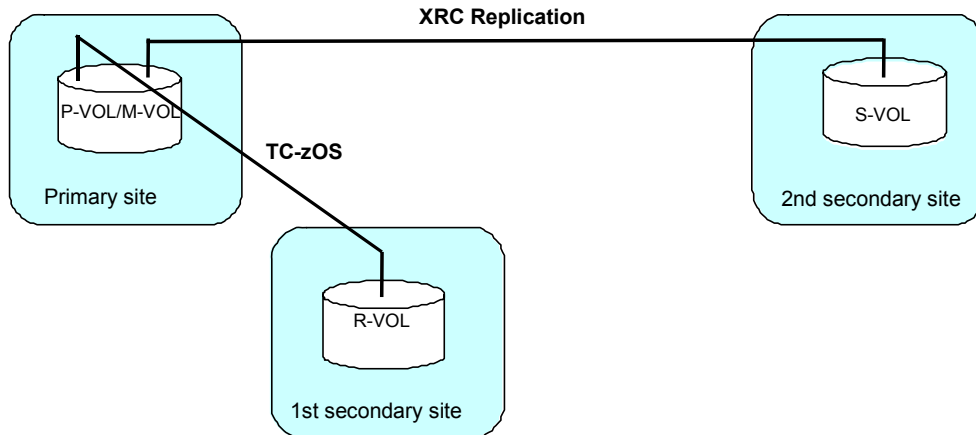
Figure 3.1 Double XRC Replications

### 3.3.2 Using XRC Replication in Conjunction with TrueCopy for z/OS®

XRC Replication can be used in conjunction with TrueCopy for z/OS® (TC-zOS) to maintain three copies of critical data at your primary and/or secondary sites for disaster recovery purposes.

- **Configuration in which a volume is functioning as XRC Replication P-VOL and TC-zOS M-VOL**

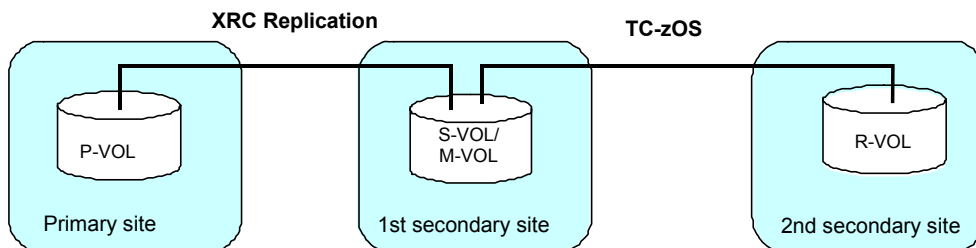
Figure 3.2 shows the configuration in which a volume is functioning as both an XRC Replication P-VOL and a TC-zOS M-VOL. In this configuration, data is copied from the primary site to the first secondary site using TC-zOS, and it is copied from the primary site to the second secondary site using XRC Replication.



**Figure 3.2** Configuration in which a Volume is Functioning as XRC Replication P-VOL and TC-zOS M-VOL

- **Configuration in which a volume is functioning as XRC Replication S-VOL and TC-zOS M-VOL**

Figure 3.3 shows a configuration in which a volume is functioning as both an XRC Replication S-VOL and a TC-zOS M-VOL. In this configuration, data is copied from the primary site to the first secondary site using XRC Replication, and it is copied from the first secondary site to the second secondary site using TC-zOS.



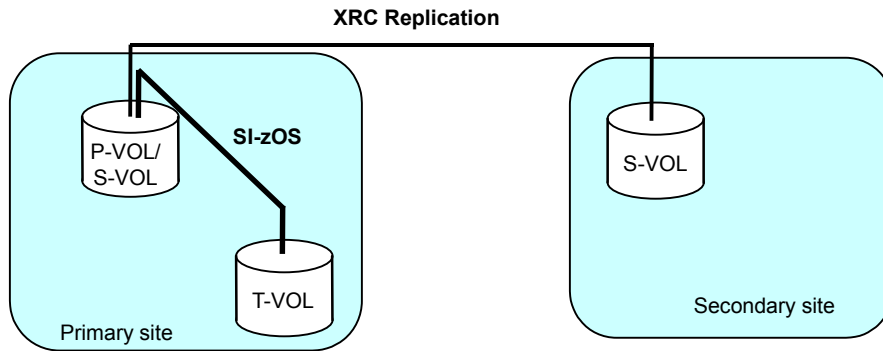
**Figure 3.3** Configuration in which a Volume is Functioning as XRC Replication S-VOL and TC-zOS M-VOL

### 3.3.3 Using XRC Replication in Conjunction with ShadowImage for z/OS®

XRC Replication can be used in conjunction with ShadowImage for z/OS (SI-zOS) to maintain data in the secondary site and the primary site for disaster recovery and data migration purposes.

- **Configuration in which a volume is functioning as XRC Replication P-VOL and SI-zOS S-VOL**

Figure 3.4 shows the configuration in which a volume is functioning as both an XRC Replication P-VOL and a SI-zOS S-VOL. In this configuration, data is copied within the primary site using SI-zOS, and it is copied from the primary site to the secondary site using XRC Replication.

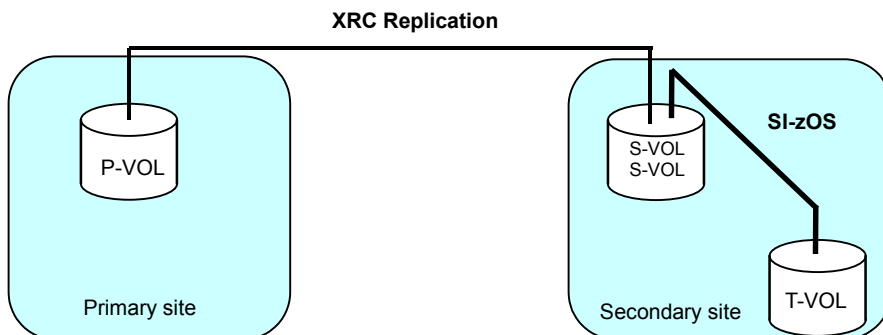


**Note:** "S-VOL" is source volume for SI-zOS, and is secondary volume for XRC Replication.

**Figure 3.4** Configuration in which a Volume is Functioning as XRC Replication P-VOL and SI-zOS S-VOL

- Configuration in which a volume is functioning as XRC Replication S-VOL and SI-zOS S-VOL

Figure 3.5 shows the configuration in which a volume is functioning as both an XRC Replication S-VOL (secondary volume) and a SI-zOS S-VOL (source volume). In this configuration, data is copied from the primary site to the secondary site using XRC Replication, and then it is copied within the secondary site using SI-zOS.

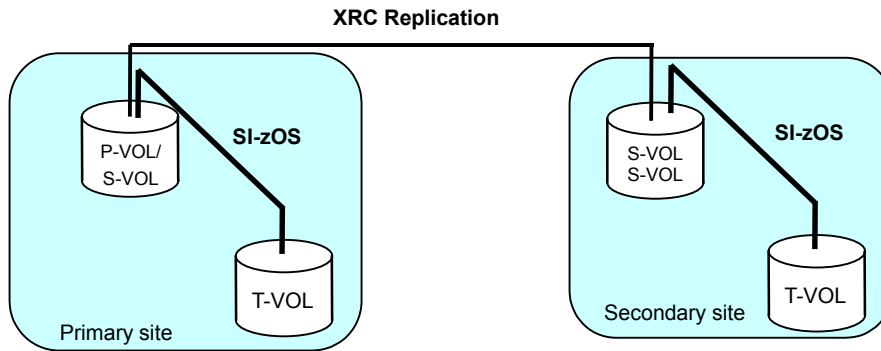


**Note:** "S-VOL" is secondary volume for XRC Replication, and is source volume for SI-zOS,.

**Figure 3.5** Configuration in which a Volume is Functioning as XRC Replication S-VOL and SI-zOS S-VOL

- Configuration in which one volume is functioning as XRC Replication P-VOL and SI-zOS S-VOL, and another volume is functioning as XRC Replication S-VOL and SI-zOS S-VOL

Figure 3.6 shows the configuration in which one volume is functioning as both an XRC Replication P-VOL and a SI-zOS S-VOL (source volume) and another volume is functioning as both an XRC Replication S-VOL (secondary volume) and a SI-zOS S-VOL (source volume). In this configuration, data is copied within the primary site using SI-zOS, and it is copied from the primary site to the secondary site using XRC Replication, and after that it is copied within the secondary site using SI-zOS.



**Note:** "S-VOL" is source volume for SI-zOS, and is secondary volume for XRC Replication.

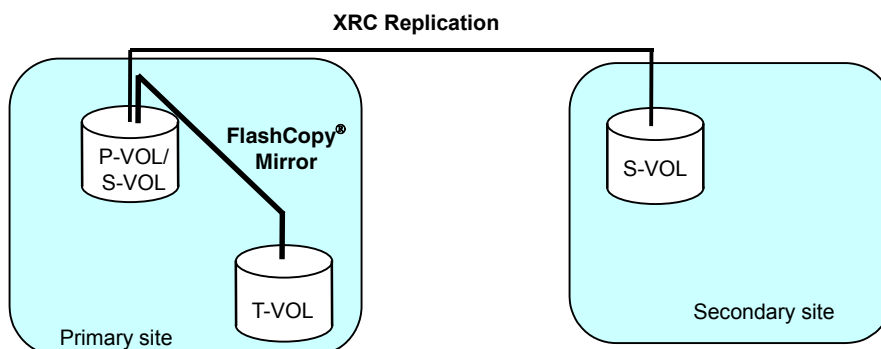
**Figure 3.6** Configuration in which One Volume is Used as XRC Replication P-VOL/SI-zOS S-VOL and Another Volume is Used as XRC Replication S-VOL/SI-zOS S-VOL

### 3.3.4 Using XRC Replication in Conjunction with FlashCopy® Mirror

XRC Replication can be used in conjunction with FlashCopy® Mirror to maintain data in the secondary site and the primary site for disaster recovery and data migration purposes.

- Configuration in which a volume is functioning as XRC Replication P-VOL and FlashCopy® Mirror S-VOL

Figure 3.7 shows the configuration in which a volume is functioning as both an XRC Replication P-VOL and a FlashCopy® Mirror S-VOL. In this configuration, data is copied within the primary site using FlashCopy® Mirror, and it is copied from the primary site to the secondary site using XRC Replication.

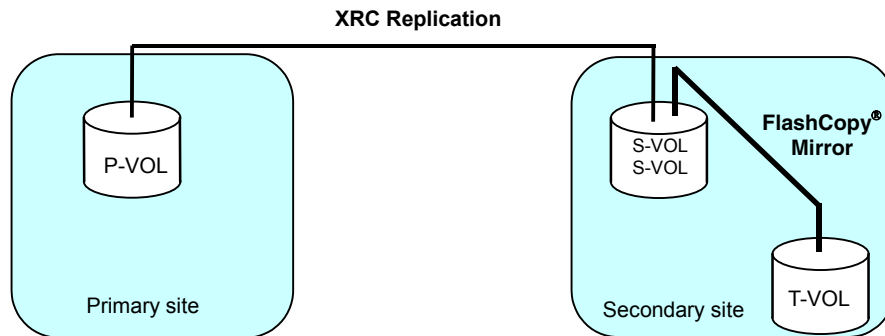


**Note:** "S-VOL" is source volume for FlashCopy® Mirror, and is secondary volume for XRC Replication.

**Figure 3.7** Configuration in Which a Volume is Functioning as XRC Replication P-VOL and FlashCopy® Mirror S-VOL

- Configuration in which a volume is functioning as XRC Replication S-VOL and FlashCopy® Mirror S-VOL

Figure 3.8 shows the configuration in which a volume is functioning as both an XRC Replication S-VOL (secondary volume) and a FlashCopy® Mirror S-VOL (source volume). In this configuration, data is copied from the primary site to the secondary site using XRC Replication, and it is copied within the secondary site using FlashCopy® Mirror.

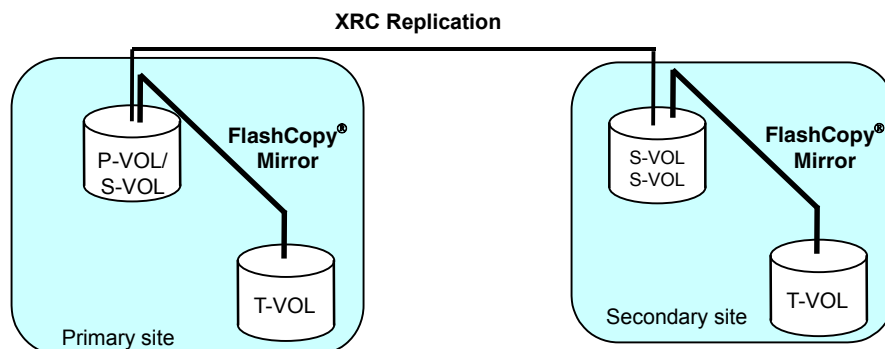


**Note:** "S-VOL" is *secondary volume* for XRC Replication, and is *source volume* for FlashCopy® Mirror.

**Figure 3.8 Configuration in Which a Volume is Functioning as XRC Replication S-VOL and FlashCopy® Mirror S-VOL**

- Configuration in which one volume is functioning as XRC Replication P-VOL and FlashCopy® Mirror S-VOL, and another volume is functioning as XRC Replication S-VOL and FlashCopy® Mirror S-VOL

Figure 3.9 shows the configuration in which one volume is functioning as both an XRC Replication P-VOL and a FlashCopy® Mirror S-VOL, and another volume is functioning as both an XRC Replication S-VOL and a FlashCopy® Mirror S-VOL. In this configuration, data is copied within the primary site using FlashCopy® Mirror, and then it is copied within the secondary site using FlashCopy® Mirror.



**Note:** "S-VOL" is *source volume* for FlashCopy® Mirror, and is *secondary volume* for XRC Replication.

**Figure 3.9 Configuration in Which One Volume is Used as XRC Replication P-VOL/FlashCopy® Mirror S-VOL and Another Volume is Used as XRC Replication S-VOL and FlashCopy® Mirror S-VOL**





# Chapter 4 Preparing for XRC Replication Operations

## 4.1 System Configuration

To perform XRC Replication operations, you need the Hitachi TagmaStore USP disk subsystem, Storage Navigator computers, and the XRC Replication program product.

## 4.2 Installing the XRC Replication Software


The XRC Replication program product must be installed on the TagmaStore USP disk subsystem in the primary site.

For detailed information about how to install XRC Replication, please refer to *Hitachi TagmaStore Universal Storage Platform Storage Navigator™ User's Guide*.

## 4.3 Starting XRC Replication


When you use your Storage Navigator computer and log in to the TagmaStore USP disk subsystem, the Storage Navigator main panel appears. To use XRC Replication, you must use the Storage Navigator main panel to open the XRC Option panel.

To open the XRC Option panel:

1. Enter the URL of the primary SVP into the WWW browser to access the primary SVP.
2. From the Storage Device List panel, select the TagmaStore USP disk subsystem that you want to log in.
3. Enter the user ID and the password and then select **OK**. The Storage Navigator main panel appears.
4. In the Storage Navigator main panel, select the **Mainframe Connection** button () and then select the **XRC** tab.

**Note:** When you display the Storage Navigator main panel for the first time, the panel is in View mode. To perform XRC Replication operations, you must ensure that the panel is in Modify mode. For detailed information about how to change the mode to Modify, please refer to *Hitachi TagmaStore Universal Storage Platform Storage Navigator™ User's Guide*.

**Note:** For detailed information about how to install and use Storage Navigator PCs and Storage Navigator, please refer to *Hitachi TagmaStore Universal Storage Platform Storage Navigator™ User's Guide*.

To end XRC Replication operations, select the **Close** button (.



## Chapter 5 XRC Replication Panels

This section explains panels for performing XRC Replication operations.

When you open the XRC Option panel (see Figure 5.1), the XRC Replication option list is displayed.

### 5.1 The XRC Option Panel

After you start XRC Replication, the XRC Option panel appears (see Figure 5.1):

CLPR	LV2 THD	Block Option	Donot Block(Vol LV)	LV1 Sleep	Sleep Time	LV1 SIM	LV2 Suspend
00:CLPR00	50%	Cache	Disable	Enable	100ms	Disable	Disable
01:CLPR01	50%	Cache	Disable	Enable	100ms	Disable	Disable
02:CLPR02	50%	Cache	Disable	Enable	100ms	Disable	Disable

CLPR	LV2 THD	Block Option	Donot Block(Vol LV)	LV1 Sleep	Sleep Time	LV1 SIM	LV2 Suspend
------	---------	--------------	---------------------	-----------	------------	---------	-------------

Preset : 0/3

Apply Cancel

Figure 5.1 XRC Option Panel

The XRC Option panel displays the following items and enables you to make settings:

- XRC Replication option list (at the upper portion in the panel):
  - CLPR:  
Displays the CLPR number.
  - LV2 THD:  
Displays the threshold specified in **Level 2 Threshold** in the Change Option panel (see Figure 5.2).
  - Block Option:

Displays the setting that is made in **Block Option** in the Change Option panel (see Figure 5.2).

- **Donot Block (Vol LV):**

Displays the setting that is made in **Donot Block(Volume Level)** in the Change Option panel (see Figure 5.2).

- **LV1 Sleep:**

Displays the setting that is made in **Level 1 Sleep** in the Change Option panel (see Figure 5.2).

- **Sleep Time:**

Displays the time specified in **Sleep Time** in the Change Option panel (see Figure 5.2).

- **LV1 SIM:**

Displays the setting that is made in **Level 1 SIM** in the Change Option panel (see Figure 5.2).

- **LV2 Suspend:**

Displays the setting that is made in **Level 2 Suspend** in the Change Option panel (see Figure 5.2).

- **Preset list:**

Displays settings made in the Change Option panel (see Figure 5.2). The settings displayed in the **Preset** list are not applied to the subsystem. After you click the **Apply** button in the XRC Option panel (see Figure 5.1), the settings in the **Preset** list will be applied to the subsystem. For detailed information about the **Preset** list, see section 5.2.

- **Apply:**

Applies settings in the **Preset** list to the subsystem. After the settings are applied successfully, the **Preset** list will be cleared.

- **Cancel:**

Cancels all settings in the **Preset** list.

## 5.2 The Change Option Panel

The Change Option panel (see Figure 5.2) appears when you select and right-click a setting in the XRC Replication option list in the XRC Option panel, and then select **Change Option** from the pop-up menu.

Figure 5.2 gives an example of the Change Option panel:

The screenshot shows a dialog box titled "Change Option". At the top, there is a "CLPR" label followed by a dropdown menu showing "00:CLPR00" and a checkbox labeled "The same setting is applied." which is currently unchecked. Below this, there are several rows of settings, each with a label on the left and two radio button options on the right. The settings are: "Level 2 Threshold" with a value of "30%", "Block Option" with "Volume Level" selected, "Donot Block(Volume Level)" with "Disable" selected, "Level 1 Sleep" with "Enable" selected, "Sleep Time" with "100ms" selected, "Level 1 SIM" with "Disable" selected, and "Level 2 Suspend" with "Disable" selected. At the bottom of the dialog are three buttons: "OK", "Cancel", and "Default".

Setting	Option 1	Option 2
Level 2 Threshold	30%	
Block Option	<input checked="" type="radio"/> Volume Level	<input type="radio"/> Cache Level
Donot Block(Volume Level)	<input type="radio"/> Enable	<input checked="" type="radio"/> Disable
Level 1 Sleep	<input checked="" type="radio"/> Enable	<input type="radio"/> Disable
Sleep Time	<input type="radio"/> 10ms	<input checked="" type="radio"/> 100ms
Level 1 SIM	<input type="radio"/> Enable	<input checked="" type="radio"/> Disable
Level 2 Suspend	<input type="radio"/> Enable	<input checked="" type="radio"/> Disable

Figure 5.2 Change Option Panel

The Change Option panel enables you to make settings on the following options:

- **CLPR drop-down list:**
  - Allows you to select the number of the CLPR for which you want to specify options.
  - **The same setting is applied** check box:
    - If this check box is selected, options will be set to all the selected CLPRs. If this check box is cleared, options will be set only to the CLPR selected in the drop-down list.
- **Level 2 Threshold drop-down list:**

Allows you to select the threshold for the sidefile for reporting SCP-SCI. This threshold is called *the SCP-SCI reporting threshold* or *the level-2 threshold*. SCP is an acronym for State Change Pending. SCI is an acronym for State Change Interrupt. The level-2 threshold must be within the range of 30 to 70 percent and must be a multiple of 10 percent (i.e., 30, 40, 50, 60, or 70 percent). The default is 50 percent.

**Caution:** The level-2 threshold is set to the area in which the SCP-SCI reporting threshold for TrueCopy Asynchronous, TrueCopy for z/OS Asynchronous, or Concurrent Copy. Keep in mind that the level-2 threshold for XRC Replication and the SCP-SCI reporting threshold for TrueCopy Asynchronous, TrueCopy for z/OS Asynchronous, or Concurrent Copy affect each other.

**Note:** To calculate the level-1 threshold, subtract 10 percent from the level-2 threshold. To calculate the level-3 threshold, add 10 percent to the level-2 threshold.

#### ■ **Block Option:**

Allows you to set IBM-compatibility mode for the device blocking function, or to control the amount of write data according to sidefile capacity:

##### – **Volume Level** radio button:

Sets IBM-compatibility mode for the device blocking function. Write I/Os to logical volumes will be put in a wait status by “Sleep” -”Wait” command retry if the amount of write data exceeds the threshold for the number of recordsets per logical volume; the threshold is specified by SDM, and the default threshold is 0x500.

**Note:** If the **Volume Level** radio button is selected, **Donot Block (Volume Level)** is set to **Enable**. Also, **Level 1 Sleep** and **Level 2 Suspend** are set to **Disable**.

##### – **Cache Level** radio button:

Depending on the sidefile capacity, the subsystem will perform one of the following three levels of control of the amount of write data (see Figure 5.3):

**Note:** If the **Cache Level** radio button is selected, “Sleep” -”Wait” command retry will not be performed according to the threshold for the number of recordsets per logical volume; the threshold is specified by SDM.

- |         |   |
|---------|---|
| Level 1 | <p>This level of control will be performed when the sidefile capacity is equal to or larger than the level-1 threshold, and is smaller than the level-2 threshold.</p> <p>If <b>Level 1 Sleep</b> is set to <b>Enable</b>, write I/Os to logical volumes will be put in a wait status by command retry when the sleep wait threshold (i.e., level-1 threshold) is exceeded.</p> <p>If <b>Level 1 Sleep</b> is set to <b>Disable</b>, write I/Os to logical volumes will not be put in a wait status.</p>  |
| Level 2 | <p>This level of control will be performed when the sidefile capacity is equal to or larger than the level-2 threshold, and is smaller than the level-3 threshold.</p> <p>If <b>Level 2 Suspend</b> is set to <b>Disable</b>, write I/Os to logical volumes will be put in a wait status by SCP-SCI reporting when the SCP-SCI reporting threshold (i.e., level-2 threshold) is exceeded.</p> <p>If <b>Level 2 Suspend</b> is set to <b>Enable</b>, the subsystem will not report SCP-SCI to hosts. Sidefile puncture will occur, and the target session will be suspended.</p> |
| Level 3 | <p>This level of control will be performed when the sidefile capacity is equal to or larger than the level-3 threshold.</p> <p>Sidefile puncture will occur. The session for the sidefile containing the maximum capacity in the cache in the CLPR will be suspended.</p>   |

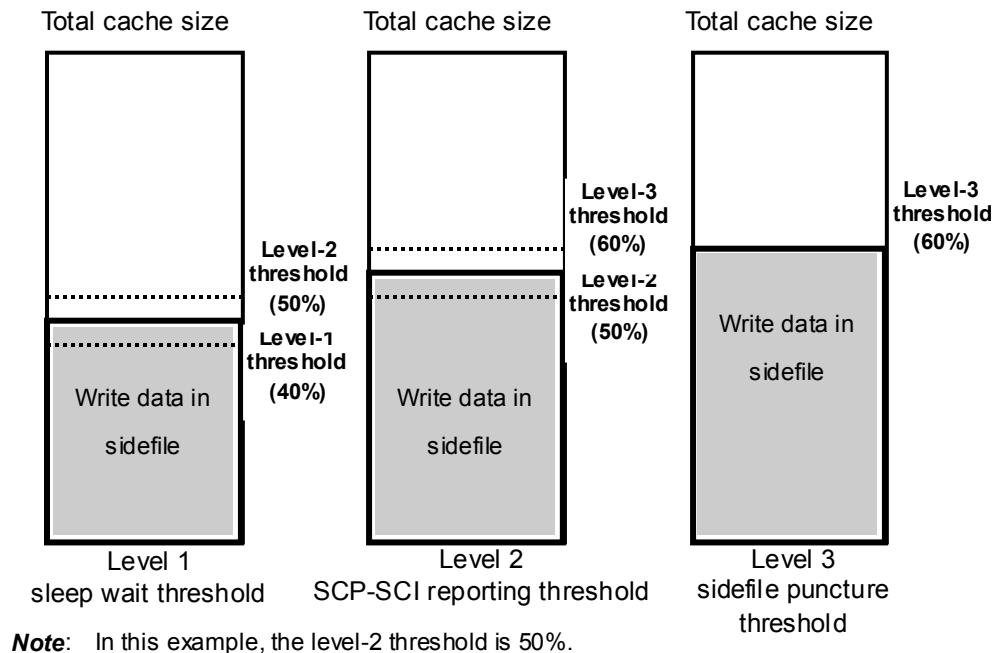


Figure 5.3 Controlling the Amount of Write Data (1)

■ **Donot Block (Volume Level):**

Allows you to specify whether the subsystem should control the amount of data to be written to the specified logical volume:

– **Enable** radio button:

The subsystem will not control the amount of data to be written to the specified logical volume. Therefore, write I/Os from hosts will not be put in a wait status.

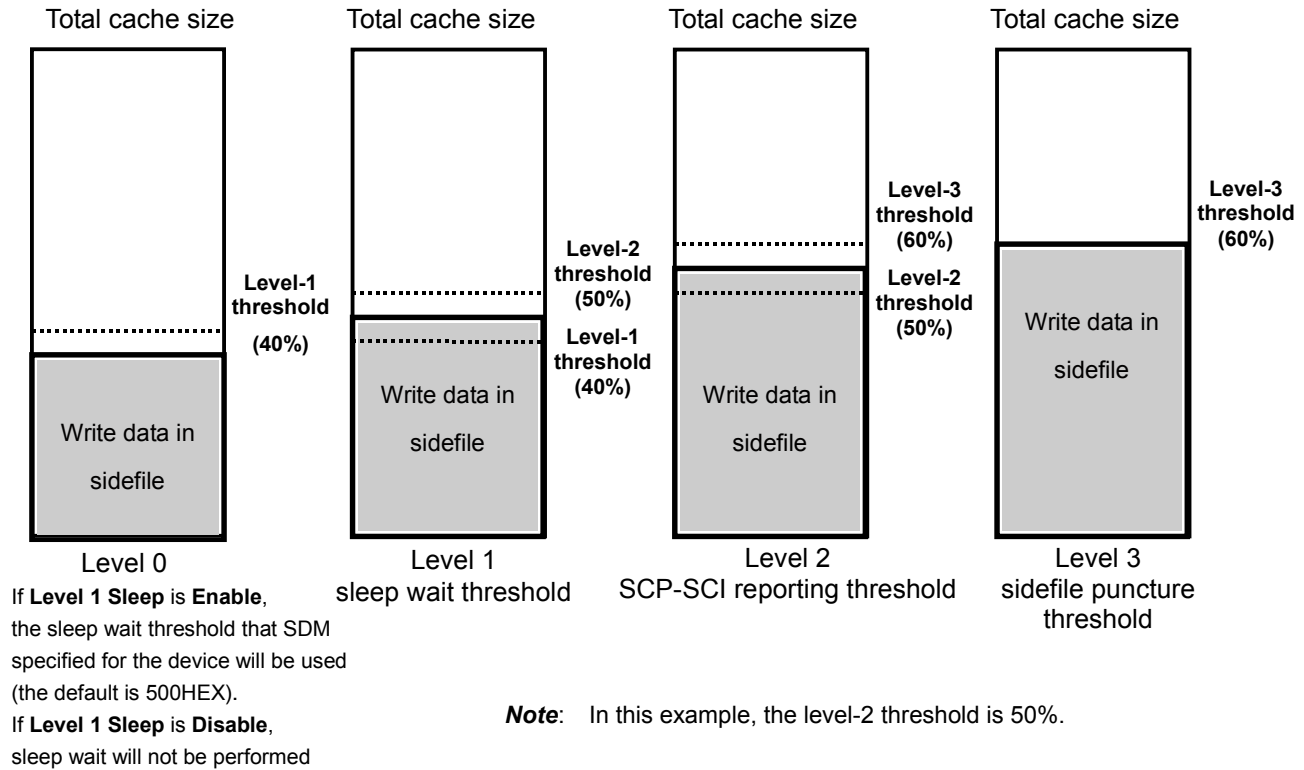
**Note:** Donot Block (Volume Level) is always set to **Enable** when Block Option is set to Volume Level.

– **Disable** radio button:

Depending on the sidefile capacity, the subsystem will perform one of the following four levels of control of the amount of write data (see Figure 5.4):

- Level 0 This level of control will be performed when the sidefile capacity is smaller than the level-1 threshold.  
If **Level 1 Sleep** is set to **Enable**, write I/Os to logical volumes will be put in a wait status according to the threshold for the number of recordsets per logical volume; the threshold is specified by SDM, and the default threshold is 0x500.  
If **Level 1 Sleep** is set to **Disable**, write I/Os to logical volumes will not be put in a wait status.
- Level 1 This level of control will be performed when the sidefile capacity is equal to or larger than the level-1 threshold, and is smaller than the level-2 threshold.  
Write I/Os to logical volumes will be put in a wait status by command retry when the sleep wait threshold (i.e., level-1 threshold) is exceeded.
- Level 2 This level of control will be performed when the sidefile capacity is equal to or larger than the level-2 threshold, and is smaller than the level-3 threshold.  
Write I/Os to logical volumes will be put in a wait status by SCP-SCI reporting when the SCP-SCI reporting threshold (i.e., level-2 threshold) is exceeded.

Level 3 This level of control will be performed when the sidefile capacity is equal to or larger than the level-3 threshold.  
Sidefile puncture will occur.



**Figure 5.4 Controlling the Amount of Write Data (2)**

■ **Level 1 Sleep:**

Allows you to specify whether the subsystem should perform “Sleep” -”Wait” command retry when the sidefile threshold exceeds the sleep wait threshold (i.e., the level-1 threshold).

– **Enable** radio button:

The subsystem will perform “Sleep” -”Wait” command retry.

– **Disable** radio button:

The subsystem will not perform “Sleep” -”Wait” command retry.

**Note:** Level 1 Sleep is always set to **Disable** when **Block Option** is set to **Volume Level**.

■ **Sleep Time:**

Allows you to specify the sleep wait time for “Sleep” -”Wait” command retry.

– **10ms:**

The subsystem will wait 10 milliseconds.

– **100ms:**



The subsystem will wait 100 milliseconds.

- **Level 1 SIM:**

Allows you to specify whether the subsystem should report a SIM (service information message) to the host when the sidefile threshold exceeds the sleep wait threshold (i.e., the level-1 threshold).

- **Enable** radio button:

A SIM indicating that the sidefile exceeds the sleep wait threshold will be reported to the host.

- **Disable** radio button:

A SIM will not be reported to the host even when the sidefile exceeds the sleep wait threshold.

- **Level 2 Suspend:**

Allows you to specify whether the subsystem should report SCP-SCI to the host when the sidefile threshold exceeds the SCP-SCI reporting threshold (i.e., the level-2 threshold).

- **Enable** radio button:

The subsystem will not report SCP-SCI to the host. Sidefile puncture will occur, and the target session will be suspended.

- **Disable** radio button:

The subsystem will report SCP-SCI to the host. After the host receives SCP from the subsystem, the host will be unable to issue write I/Os until the host receives SCI.

**Note:** Level 2 Suspend is always set to **Disable** when **Block Option** is set to **Volume Level**.

- **OK button:**

Confirms the XRC Replication option settings and closes the Change Option panel (see Figure 5.2). The option settings will be displayed in the **Preset** list of the XRC Option panel (see Figure 5.1). The option settings will be displayed in blue, bold and italics in the XRC Replication option list.

- **Cancel button:**

Cancels the XRC Replication option settings.

- **Default button:**

Changes the XRC Replication option settings to the default status.



## Chapter 6 Performing XRC Replication Operations

This chapter explains how to perform XRC Replication operations.

The XRC Replication operations are:

- Setting XRC Replication options (see section 6.1)
- Changing settings in the **Preset** list (see section 6.2)
- Deleting settings from the **Preset** list (see section 6.3)

### 6.1 Setting XRC Replication Options

To set XRC Replication options:

1. From the XRC Replication option list in the XRC Option panel (see Figure 5.1), select and right-click the CLPR on which you want to make option settings. A pop-up menu appears.

**Note:** You can select one or more CLPRs.

2. From the pop-up menu, select **Change Option**.

The Change Option panel appears (see Figure 5.2).

3. In the Change Option panel (see Figure 5.2), set XRC Replication options.

**Note:** If you select the **The same setting is applied** check box, the option settings will be used for all the selected CLPRs. If you select the check box, a confirmation panel appears and informs you that the option settings will be applied to all the selected CLPRs (see Figure 6.1). To continue the operation, select **OK**.

4. When you finish setting XRC Replication options, select **OK**.

The Change Option panel closes (see Figure 5.2). The option settings are displayed in the **Preset** list of the XRC Option panel (see Figure 5.1). The option settings are displayed in blue, bold and italics in the XRC Replication option list.

5. Select **Apply**.

Depending on your settings, a confirmation panel may appear and inform you that a pair will be suspended (see Figure 6.2).

6. To continue the operation, select **OK**.

A confirmation panel appears and asks you whether you want to apply the option settings to the subsystem (see Figure 6.3).

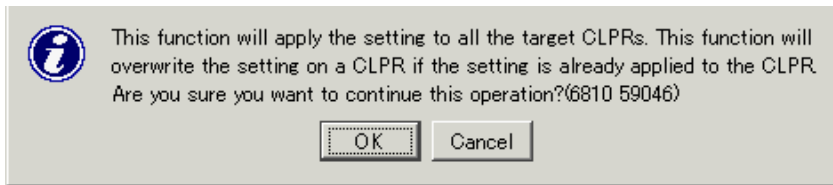
7. To apply the settings, select **OK**.

The settings are applied to the subsystem, and then a panel appears and informs you that the operation is finished (see Figure 6.4).

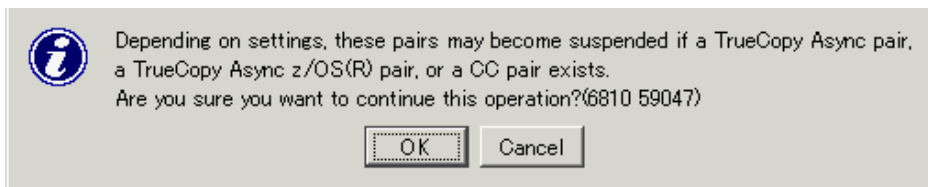
8. Select **OK**.

The settings are reflected in the XRC Replication option list in the XRC Option panel.

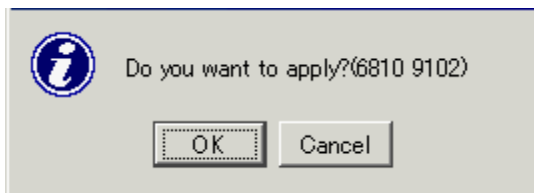
The operation for setting XRC Replication options is finished.



**Figure 6.1 Confirmation Panel to be Displayed When the "The same setting is applied" Check Box is Selected**



**Figure 6.2 Confirmation Panel Indicating that a Pair will be Suspended**



**Figure 6.3 Confirmation Panel Asking You Whether to Apply Settings to the Subsystem**



**Figure 6.4 Panel Indicating that the Operation is Finished**

## 6.2 Changing Settings in the Preset List

To change a setting in the **Preset** list in the XRC Option panel:

1. From the **Preset** list in the XRC Option panel (see Figure 5.1), select and right-click the CLPR on which you want to change option settings. A pop-up menu appears.
2. From the pop-up menu, select **Modify**.  
The Change Option panel appears (see Figure 5.2).
3. In the Change Option panel (see Figure 5.2), change XRC Replication options.
4. When you finish setting XRC Replication options, select **OK**.

The Change Option panel closes (see Figure 5.2). The resulting option setting is displayed in the **Preset** list of the XRC Option panel (see Figure 5.1).

The operation for changing a setting in the **Preset** list is finished.

### 6.3 Deleting Settings from the Preset List

To delete a setting from the **Preset** list in the XRC Option panel:

1. From the **Preset** list in the XRC Option panel (see Figure 5.1), select and right-click the CLPR on which you want to delete option settings. A pop-up menu appears.
2. From the pop-up menu, select **Delete**.

A confirmation panel appears and informs you that the setting will be deleted from the **Preset** list (see Figure 6.5).

3. To delete the setting, select **OK**.

The selected CLPR is deleted from the **Preset** list. The setting that has been displayed in blue, bold and italics is displayed in original status (i.e., not blue, not bold, and not italics).

The operation for deleting a setting from the **Preset** list is finished.

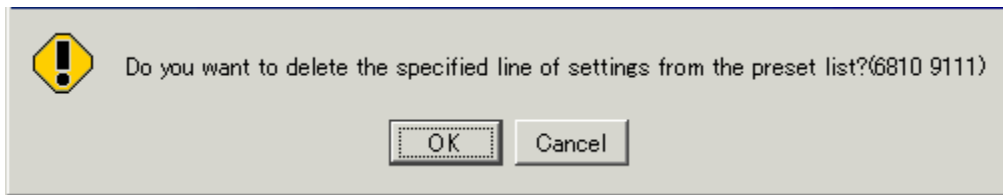


Figure 6.5 Confirmation Panel Indicating that a Setting will be Deleted from the Preset List

# Chapter 7 Troubleshooting

## 7.1 Troubleshooting

For detailed information about how to remove errors during XRC Replication operations, please refer to the manual *Storage Navigator Error Codes*.

**Note:** For detailed information about how to remove Storage Navigator errors, please refer to the manual *Storage Navigator User's Guide*.

## 7.2 Calling the Hitachi Support Center

- If you need to call the Hitachi Technical Support Center, be sure to provide as much information about the problem as possible. Include the circumstances surrounding the error or failure, the TagmaStore USP Storage Navigator configuration information saved in the floppy diskette(s) by the **FD Dump Tool**, the exact content of any messages displayed on the Storage Navigator PC, and the severity levels and reference codes of the DKC and DKU on the Status panel of the Storage Navigator main panel.





# Acronyms and Abbreviations

async	asynchronous
CCI	Command Control Interface
DASD	direct access storage device
HDS	Hitachi Data Systems Corporation
XRC	Replication Compatible Replication for IBM® XRC
I/O	input/output
IBM®	International Business Machines Corporation
LAN	local-area network
LDEV	logical device
LED	light-emitting diode
ms	milliseconds
MVS	Multiple Virtual Storage
PC	personal computer system
PPRC	Peer-to-Peer Remote Copy
P-VOL	primary volume
RAID	redundant array of independent disks
RAID-1/5	specific RAID architectures
R-VOL	remote volume
SCI	state-change-interrupt
SCP	state-change-pending
SI	ShadowImage
SIz	ShadowImage for z/OS®
SIM	service information message
SVP	service processor
S-VOL	secondary volume
TC	TrueCopy
TCz	TrueCopy for z/OS®
TCzA	TCz Asynchronous
TCA	TrueCopy Asynchronous
XRC	Extended Remote Copy



# Index

## C

calling the Hitachi Support Center, 35

## I

installation  
    requirements, 7

## S

ShadowImage, 2

## T

troubleshooting, 35