Hitachi Virtual Storage Platform 5000 Series

SVOS RF 9.4

Hitachi Compatible XRC User Guide

This document describes and provides instructions for using Hitachi Compatible XRC software on Hitachi Virtual Storage Platform 5000 series storage systems.

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Contents

Preface

This document describes and provides instructions for using the provisioning software to configure and perform operations on Hitachi Virtual Storage Platform 5000 series storage systems.

Please read this document carefully to understand how to use these products, and maintain a copy for your reference.

Intended audience

This document is intended for system administrators, Hitachi Vantara representatives, and authorized service providers who install, configure, and operate Hitachi Virtual Storage Platform 5000 series storage systems.

Readers of this document should be familiar with the following:

- Data processing and RAID storage systems and their basic functions.
- The Hitachi Virtual Storage Platform 5000 series storage system and the *Product Overview*.
- The Hitachi Device Manager - Storage Navigator software, and the *System Administrator Guide*.
- The storage systems that connect to the Hitachi Virtual Storage Platform 5000 series as external storage.
- The concepts and functionality of storage provisioning operations in the use of Hitachi Dynamic Provisioning, Hitachi Dynamic Tiering software, Hitachi LUN Manager, and Hitachi Data Retention Utility.

Product version

This document revision applies to the following product versions:

- VSP 5000 series: firmware 90-04-0*x* or later
- SVOS 9.4 or later

Release notes

Read the release notes before installing and using this product. They may contain requirements or restrictions that are not fully described in this document or updates or corrections to this document. Release notes are available on Hitachi Vantara Support Connect: https://knowledge.hitachivantara.com/Documents.

Changes made in this revision

- Added information and specifications for VSP 5000 series.
- Added notes on sidefile capacity.
- Changed the term "MP blade" to "MP unit".

Related documents

The documents below are referenced in this document or contain more information about the features described in this document.

Hitachi Virtual Storage Platform 5000 series documents:

- *Product Overview*, MK-98RD9008
- *Hardware Guide*, MK-98RD9013
- *Provisioning Guide for Mainframe Systems*, MK-98RD9025
- *Provisioning Guide for Open Systems*, MK-98RD9015
- *System Administrator Guide*, MK-98RD9009
- *Hitachi TrueCopy® User Guide*, MK-98RD9022
- *Hitachi ShadowImage® User Guide*, MK-98RD9021
- *Hitachi Compatible FlashCopy/FlashCopy SE User Guide*, MK-98RD9028
- *Hitachi Universal Replicator for Mainframe User Guide*, MK-98RD9031
- *Hitachi Device Manager - Storage Navigator Messages*, MK-98RD9012

For a list of all documents for the Hitachi Virtual Storage Platform 5000 series storage system, see the *Product Overview*.

Document conventions

This document uses the following typographic conventions:

Convention	Description
Bold	▪ Indicates text in a window, including window titles, menus, menu options, buttons, fields, and labels. Example: Click **OK**. ▪ Indicates emphasized words in list items.
Italic	▪ Indicates a document title or emphasized words in text. ▪ Indicates a variable, which is a placeholder for actual text provided by the user or for output by the system. Example: `pairdisplay -g group` (For exceptions to this convention for variables, see the entry for angle brackets.)
`Monospace`	Indicates text that is displayed on screen or entered by the user. Example: `pairdisplay -g oradb`
< > angle brackets	Indicates variables in the following scenarios: ▪ Variables are not clearly separated from the surrounding text or from other variables. Example: `Status-<report-name><file-version>.csv` ▪ Variables in headings.
[ ] square brackets	Indicates optional values. Example: [a | b] indicates that you can choose a, b, or nothing.
{ } braces	Indicates required or expected values. Example: { a | b } indicates that you must choose either a or b.
| vertical bar	Indicates that you have a choice between two or more options or arguments. Examples: [a | b] indicates that you can choose a, b, or nothing. { a | b } indicates that you must choose either a or b.

This document uses the following icons to draw attention to information:

Icon	Label	Description
	Note	Calls attention to important or additional information.

Icon	Label	Description
	Tip	Provides helpful information, guidelines, or suggestions for performing tasks more effectively.
	Caution	Warns the user of adverse conditions and/or consequences (for example, disruptive operations, data loss, or a system crash).
	WARNING	Warns the user of a hazardous situation which, if not avoided, could result in death or serious injury.

Conventions for storage capacity values

Physical storage capacity values (for example, disk drive capacity) are calculated based on the following values:

Physical capacity unit	Value
1 kilobyte (KB)	1,000 (10^3) bytes
1 megabyte (MB)	1,000 KB or $1{,}000^2$ bytes
1 gigabyte (GB)	1,000 MB or $1{,}000^3$ bytes
1 terabyte (TB)	1,000 GB or $1{,}000^4$ bytes
1 petabyte (PB)	1,000 TB or $1{,}000^5$ bytes
1 exabyte (EB)	1,000 PB or $1{,}000^6$ bytes

Logical capacity values (for example, logical device capacity, cache memory capacity) are calculated based on the following values:

Logical capacity unit	Value
1 block	512 bytes
1 cylinder	Mainframe: 870 KB Open-systems: ▪ OPEN-V: 960 KB ▪ Others: 720 KB
1 KB	1,024 (2^{10}) bytes

Logical capacity unit	Value
1 MB	1,024 KB or $1,024^2$ bytes
1 GB	1,024 MB or $1,024^3$ bytes
1 TB	1,024 GB or $1,024^4$ bytes
1 PB	1,024 TB or $1,024^5$ bytes
1 EB	1,024 PB or $1,024^6$ bytes

Accessing product documentation

Product user documentation is available on Hitachi Vantara Support Connect: https://knowledge.hitachivantara.com/Documents. Check this site for the most current documentation, including important updates that may have been made after the release of the product.

Getting help

Hitachi Vantara Support Connect is the destination for technical support of products and solutions sold by Hitachi Vantara. To contact technical support, log on to Hitachi Vantara Support Connect for contact information: https://support.hitachivantara.com/en_us/contact-us.html.

Hitachi Vantara Community is a global online community for Hitachi Vantara customers, partners, independent software vendors, employees, and prospects. It is the destination to get answers, discover insights, and make connections. **Join the conversation today!** Go to community.hitachivantara.com, register, and complete your profile.

Comments

Please send us your comments on this document to doc.comments@hitachivantara.com. Include the document title and number, including the revision level (for example, -07), and refer to specific sections and paragraphs whenever possible. All comments become the property of Hitachi Vantara LLC.

Thank you!

Chapter 1: Overview of Hitachi Compatible Replication for IBM® XRC

This topic provides an overview of the Hitachi Compatible Replication for IBM® XRC (Compatible XRC) feature and configuration.

Introducing Compatible XRC

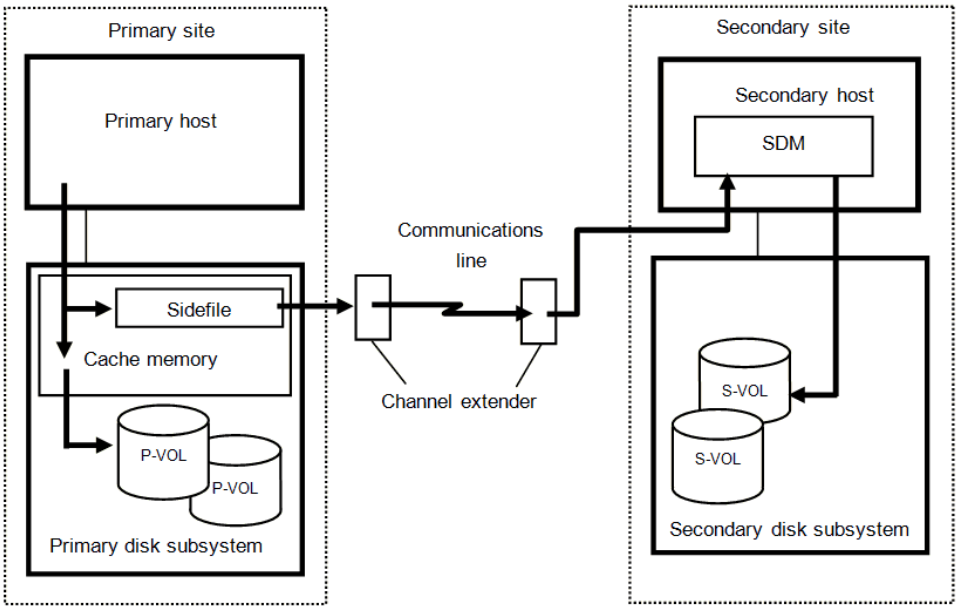
The Hitachi Compatible Replication for IBM® XRC feature (Compatible XRC) for Hitachi Virtual Storage Platform 5000 series storage system provides compatibility with IBM Extended Remote Copy (XRC) asynchronous remote copy operations for data backup and recovery in the event of a disaster.

Compatible XRC, used in mainframe systems, interoperates with System Data Mover (SDM) in the Data Facility Storage Management Subsystem (DFSMS) in an XRC environment. Compatible XRC operations are similar to XRC operations, issuing Time Sharing Option (TSO) commands from the host system to logical devices on the Hitachi Virtual Storage Platform 5000 series storage system.

In Compatible XRC operations, the data written from the host to the primary volume in the primary Hitachi Virtual Storage Platform 5000 series storage system is also written temporarily as sidefiles in the cache memory of the primary Hitachi Virtual Storage Platform 5000 series storage system. At the secondary site, the System Data Mover (SDM) software asynchronously reads sidefiles through communication lines from the primary storage system at the primary site. SDM then writes the data to the secondary volume in the secondary storage system in the same order as it was written at the primary site.

SDM manages pair definitions of the primary and secondary storage systems or pair definitions of the primary and secondary volumes.

The following figure shows an overview of Compatible XRC operations.



Sessions

In Compatible XRC 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 volume pairs in the same session are suspended. The write operation is not performed due to the failure. However, the write order (sequence) is maintained so that the write process can be re-initiated after recovery.

A session is further divided into internal sessions called storage control (SC) sessions for each volume. SDM reads the data written to the VSP 5000 series storage system 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 is 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 defined for session IDs and volumes by the TSO command in the storage system.

TSO commands

Settings concerning XRC operations are defined by the Time Sharing Option (TSO) commands issued to the storage system from the host system.

- Creation and deletion of pair volumes
- Creation of utility volumes
- Display of pair status
- Display of session status
- Display of utility volume status

- Integration and withdrawal from the session
- Recovery at the secondary site
- Resuming suspended pairs
- Start and end of the session
- Suspending of pairs

For details on the TSO commands for Compatible XRC operations, see the IBM ® documentation for DFSMS advanced copy services (SC23-6847-01).

Note:

Document numbers might change from one document release to another. In addition, the last two digits of the IBM ® document number represent the document version. For example, the document SC23-6847-00 is the version of the Advanced Copy Services document for z/OS 2.1.

Resources available for each function

The Device Manager - Storage Navigator secondary window shows all the resources in the storage system. However, the functions described in this manual are only available to the resources that are assigned to the account of users who log into Device Manager - Storage Navigator.

Verify the resource group ID in the **Basic Information Display** dialog box, and then run the operations for the resources assigned to the user account. When you use the functions, the resources for each operation must satisfy the specific conditions.

For details about user accounts, see the *System Administrator Guide*.

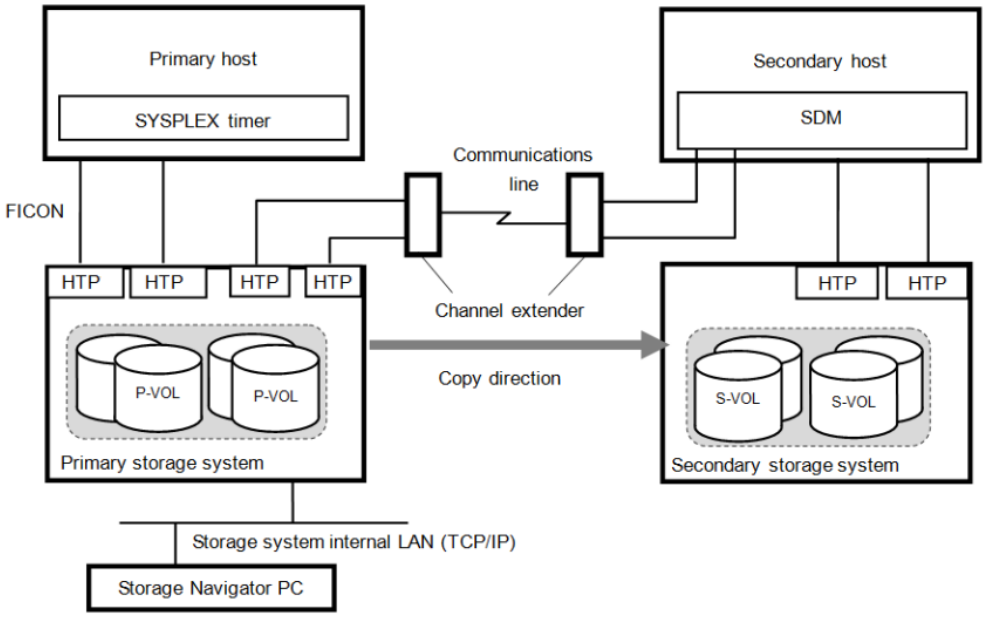
For details on the conditions of the resources, see the *Provisioning Guide for Open Systems* or the *Provisioning Guide for Mainframe Systems*.

System configuration

Compatible XRC operations require hosts and storage systems at the primary and secondary sites.

If an operation at the secondary site is required, the secondary storage system (or systems) must be capable of supporting the XRC workload. 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 the SDM host software for remote copy operations. The Compatible XRC feature needs to be installed in the primary storage system, and Device Manager - Storage Navigator is required at the primary site for setting XRC options.

The following figure shows the connection configuration of channel extenders for Compatible XRC operations.


Primary host
SYSPLEX timer
Secondary host
SDM
Communications line
FICON
HTP
HTP
HTP
HTP
HTP
HTP
Channel extender
Copy direction
P-VOL
P-VOL
S-VOL
S-VOL
Primary storage system
Secondary storage system
Storage system internal LAN (TCP/IP)
Storage Navigator PC

Chapter 2: Requirements and restrictions

This topic provides system requirements and restrictions for using Compatible XRC.

Requirements and supported features

System requirements

The Compatible XRC 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 the System Data Mover (SDM) host software for remote copy operations.

Primary Hitachi Virtual Storage Platform 5000 series

The Compatible XRC software must be installed in the primary Hitachi Virtual Storage Platform 5000 series storage system.

When the controller emulation type is I-2107, the Compatible XRC software must be installed.

Secondary Hitachi Virtual Storage Platform 5000 series

The secondary storage system does not have to be the same make and model as the primary, but we recommend that you use the Hitachi Virtual Storage Platform 5000 series storage system as a secondary storage system. The installation of the Compatible XRC software is not required for the secondary storage system.

Communication path connection

- If a director (such as Ultranet) is used for connection, the maximum distance between the primary storage system and the secondary host is 20 km.
- If a director and repeater are used for connection, the maximum distance between the primary storage system and the secondary host is 40 km.
- If a channel extender is used for connection, no restriction is applied to the distance between the primary storage system and the secondary host.

  The following channel extenders are supported: Brocade USD-X and 7500, ATM line type (up to 135 Mbps), IP lines (500 Mbps).

Device Manager - Storage Navigator

You must have Device Manager - Storage Navigator at the primary site. A license key for Compatible XRC must be installed in the primary array to enable the product, and the Device Manager - Storage Navigator secondary windows must be enabled for Compatible XRC.

For details, see the chapter on how to use the Device Manager - Storage Navigator secondary window in the *System Administrator Guide*.

Supported XRC functions in XRC2 and XRC3

The following table lists the supported Compatible XRC features in IBM XRC functions (XRC2 and XRC3).

Feature	Description	XRC2	XRC3
DEV blocking	Sidefile threshold tuning feature for each volume.	Supported	Supported
Unplanned outage	Differential copy feature for unplanned outage achieved by the differential bit management in the storage system.	Not supported	Supported
CNT MULTI path	Alternate path retry feature for CNT USD[1] connections.	Not supported	Supported
Fix utility	Fix or Float of Utility DEV setting feature.	Not supported	Supported [2]
Suspend on Long Busy	Suspend setting feature, which does not report SCP from SDM.	Not supported	Supported [3]
Write Pacing	Feature to set arbitrary Sleep Time from SDM when the amount of write data is controlled.	Not supported	Supported [4]
Multiple Reader	This function enables SDM to read the sidefile parallel using the primary session and its auxiliary sessions in the primary storage control session. It reduces data stagnation of the sidefile compared with ordinary Single Reader.	Not supported	Supported [5]
Extended Distance FICON	The IBM ® FICON ® function is used to reduce the handshake time to connect the channel and control unit, and then uses the extended IU Pacing protocol to maintain the long distance communication status.	Not supported	Supported
Notes:			

Feature	Description	XRC2	XRC3
1. CNT extender (Ultranet Storage Director). **2.** Only Fix of Utility DEV is supported (Float is not supported). **3.** Operates when Level 2 Suspend is set to Disabled in the Compatible XRC options. Level 2 Suspend operation is processed preferentially, when Level 2 Suspend is set to Enable. **4.** Operates when Block Option is set to Volume Level in the Compatible XRC options. Write Pacing does not operate when Block Option is set to Cache Level. **5.** Functioning on DKC emulation type I-2107 and later. Install Compatible PAV, Compatible Hyper PAV, or Compatible Super PAV, if you use this function. See Using Compatible XRC with Compatible Hyper PAV Software (on page 30) , when you use Compatible Hyper PAV or Compatible Super PAV.			

When the controller emulation type is I-2107, both XRC2 and XRC3 are supported.

Number of sessions for Compatible XRC and CC

The following table shows the number of supported sessions in Compatible XRC.

Unit	Number of Sessions
Per storage system	Number of CUs x 64
Per CU	64*
Per volume	1
*Primary and auxiliary sessions are assigned when Multiple Reader function is used. The number of auxiliary sessions is a parameter of NumberReaderTasks, which is defined in an XRC PARMLIB data set. This parameter defines the multiplicity of auxiliary sessions on a primary session. For example, the following example shows that the three auxiliary sessions are enabled and multiply on a primary session. `NumberReaderTasks *,4`	

The number of Concurrent Copy (CC) and Compatible XRC sessions for each volume depends on the combination of CC and XRC (XRC2 and XRC3). The following table shows the number of sessions for each volume.

Session Type	Device Emulation Type (3390-1, 3390-2, 3390-3, 3390-9, 3390-A, 3390-L, 3390-M)	
	Number of CC Sessions	Number of Compatible XRC Sessions
CC only	16	N/A

Session Type	Device Emulation Type (3390-1, 3390-2, 3390-3, 3390-9, 3390-A, 3390-L, 3390-M)	
	Number of CC Sessions	Number of Compatible XRC Sessions
CC and XRC2	15	1
CC and XRC3 Single Reader	15	1
CC and XRC3 Multiple Reader	15	1 (Primary session) 0-15 (Auxiliary Sessions)

Performance considerations

Note the following important performance considerations for Compatible XRC operations:

Block size
Consider the block sizes when configuring the SC sessions. Do not issue too many write I/Os with large blocks to one SC session.

SDM tuning
The performance of Compatible XRC is affected by the performance of SDM. You must tune SDM to achieve the desired performance. For information on SDM tuning, see the IBM document *Implementing ESS Copy Services on S/390*.

Restrictions on usage

Behavior of option settings

The behavior of options set in the **Change Option** window is affected by the `Do not Block` parameter of the SDM command **`XADDPAIR`**.

The following table shows the Compatible XRC options and the behavior of the Hitachi Virtual Storage Platform 5000 series storage system of the `Do not Block` parameter of the SDM command **`XADDPAIR`**.

Compatible XRC options		Behavior of the VSP 5000 series storage system	
Option	**Setting**	**`Do not Block` is specified by SDM**	**`Do not Block` is not specified by SDM (`Block` is Specified)**
Do not Block(Volume Level)	Enable	The storage system does not control the amount of data to be written to the specified volume.	According to the amount of used sidefile capacity, the storage system performs the **`"Sleep" - "Wait"`** command retry when the threshold specified by SDM is exceeded.
	Disable *	N/A	N/A
Level 1 Sleep	Enable *	N/A	N/A
	Disable	The storage system does not perform the **`"Sleep" - "Wait"`** command retry.	According to the amount of used sidefile capacity, the storage system performs the **`"Sleep" - "Wait"`** command retry when the threshold specified by SDM is exceeded.
Level 1 SIM	Enable	The storage system does not report an SIM to the host when the usage of sidefile exceeds the sleep wait threshold.	The storage system reports an SIM to the host when the usage of sidefile exceeds the sleep wait threshold.
	Disable	The storage system does not report an SIM to the host when the usage of sidefile exceeds the sleep wait threshold.	The storage system does not report an SIM to the host when the usage of sidefile exceeds the sleep wait threshold.
Level 2 Suspend	Enable *	—	—
	Disable	Even when the amount of used sidefile capacity exceeds the level-2 threshold, level-2 suspension does not occur and the storage system 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 storage system does not report SCP-SCI to the host.

Compatible XRC options		Behavior of the VSP 5000 series storage system	
Option	**Setting**	**`Do not Block` is specified by SDM**	**`Do not Block` is not specified by SDM (`Block` is Specified)**
* You cannot use this setting when Block Option is set to Volume Level in the Compatible XRC options.			

The following table shows the behavior of a storage system when Block Option is set to Cache Level.

Compatible XRC options		Behavior of the VSP 5000 series storage system	
Option	**Setting**	**`Do not Block` is specified by SDM and `Do not Block` (Volume Level) is enabled**	**`Do not Block` is not specified by SDM (`Block` is specified) or `Do not Block` (Volume Level) is disabled**
Level 1 SIM	Enable	The storage system does not report an SIM to the host when the amount of used sidefile capacity exceeds the sleep wait threshold.	If Level 1 Sleep is enabled, the storage system reports an SIM to the host when the amount of used sidefile capacity exceeds the sleep wait threshold. If Level 1 Sleep is disabled, the storage system does not report an SIM to the host when the amount of used sidefile capacity exceeds the sleep wait threshold.
	Disable		The storage system does not report an SIM to the host when the amount of used sidefile capacity exceeds the sleep wait threshold.
Level 1 Sleep	Enable	The storage system does not perform the **`"Sleep" - "Wait"`** command retry. Level 2 Suspend does not occur when the amount of used sidefile capacity exceeds the level 2 threshold, and the storage system does not report SCP-SCI to the host.[1,3]	The storage system performs the **`"Sleep" - "Wait"`** command retry when the sleep wait threshold is exceeded.

Compatible XRC options		Behavior of the VSP 5000 series storage system	
Option	**Setting**	**`Do not Block` is specified by SDM and `Do not Block` (Volume Level) is enabled**	**`Do not Block` is not specified by SDM (`Block` is specified) or `Do not Block` (Volume Level) is disabled**
Level 2 Suspend	Disable		Level 2 Suspend does not occur when the amount of used sidefile capacity exceeds the level 2 threshold, and the storage system reports SCP-SCI to the host. [2] (The storage system restricts the host I/O data flow to prioritize the retention of XRC pair status when the used sidefile capacity is overloaded.)
Level 1 Sleep	Disable	The storage system does not perform the **`"Sleep" - "Wait"`** command retry. Level 2 Suspend does not occur when the amount of used sidefile capacity exceeds the level 2 threshold, and the storage system does not report SCP-SCI to the host.[1,3]	The storage system does not perform the **`"Sleep" - "Wait"`** command retry when the sleep wait threshold is exceeded. Level 2 Suspend occurs when the amount of used sidefile capacity exceeds the level 2 threshold. [3] (The storage system suspends the XRC pair to prioritize the retention of host I/O performance when the used sidefile capacity is overloaded.)
Level 2 Suspend	Enable		

Notes:

1. When you specify the `Do not Block` in the **`XADDPAIR`** command parameter, enable the `Do not Block` in the Compatible XRC option settings.
2. When you prioritize the retention of XRC pair status, set Level 1 Sleep to Enable and Level 2 Suspend to Disable.
3. When you prioritize the retention of host I/O performance, specify the `Do not Block` parameter, or set Level 1 Sleep to Disable and Level 2 Suspend to Enable.

Multiple CLPR use

If you want to use Compatible XRC and more than one cache logical partition (CLPR), we recommend that you use SC sessions in the same CLPR.

Compatible XRC options can be set for each CLPR. If there are sessions in CLPR, when the sidefile usage for CLPR reaches level-2 (if the Level 2 Suspend option is enabled) or level-3, sessions containing the maximum number of sidefiles in the cache are suspended. If you want to use Compatible XRC in CLPRs, and if you assign MP units to LDEVs that are used as utility volumes, we recommend assigning different MP units to each CLPR.

3390-A and 3390-M device use

To use a 3390-A or 3390-M device as a Compatible XRC P-VOL or S-VOL, you need to apply some PTFs (program temporary fixes) to the System Data Mover (SDM) software at the secondary site.

If the following PTFs have not been applied to the SDM, the 3390-A or 3390-M devices cannot be used as P-VOLs or S-VOLs in Compatible XRC operations.

- z/OS V1R6:[PTF]UA18053: SUPPORT XRC VOLUME SIZE UP TO 65520 CYL
- z/OS V1R5:[PTF]UA18052: SUPPORT XRC VOLUME SIZE UP TO 65520 CYL
- z/OS V1R4:[PTF]UA18051: SUPPORT XRC VOLUME SIZE UP TO 65520 CYL

Offline microcode replacement or volatile PS-ON restrictions

Performing some actions while Compatible XRC is operating will result in the storage control (SC) session of the storage system being automatically terminated.

The SC session of the storage system is terminated if one of the following actions is performed while Compatible XRC is operating.

- Offline microcode replacement is performed, requiring a power cycle of the storage system.
- The information in the cache memory is not maintained across the power cycle. This is called "volatile PS-ON."

When this SC session is terminated, the session of the SDM side of the secondary site is suspended, but the subsequent RESUME operation might fail.

- Before replacing the microcode offline, delete all Compatible XRC pairs with the XDELPAIR command before PS-OFF, and then create all pairs again with the XADDPAIR command after PS-ON.
- When performing volatile PS-ON, delete all Compatible XRC pairs with the XDELPAIR command immediately after PS-ON, and then create all pairs again with the XADDPAIR command.

Maintenance operations

If you need to perform maintenance while Compatible XRC is being used, first stop I/Os for Compatible XRC volumes or stop Compatible XRC itself.

Before you start the maintenance operation, confirm that the usage of the Sidefile monitor is less than 20% of total Cache capacity by monitoring each combination of MPPK and CLPR usage. Do not perform the maintenance operation if the Sidefile monitor usage is greater than 20%.

Setting change of the MP unit assigned to LDEVs

The MP unit assigned to the LDEV that is used as a utility volume for Compatible XRC can be changed only when the XRC session is suspended and the number of sidefiles of the target session is zero.

Sidefile monitor can be incorrect after a failure

When the XRC session is suspended due to a failure, the sidefile monitor might not display 0%, even if all sessions in CLPR are suspended.

If the XRC session is removed, the display of the sidefile monitor changes to 0%.

Notes on when the sidefile capacity is specified for the level-2 threshold setting

You can change the capacity that can be used for sidefiles in an entire system, by specifying the level-2 threshold setting (from 30% to 70%). The maximum sidefile capacity per MP unit is 1.4 TB. Therefore, even if the total sidefile capacity does not reach the value specified for the level-2 threshold setting, the XRC session is suspended when the sidefile capacity per MP unit exceeds 1.4 TB.

The following table describes the sidefile capacity that can be used.

Cache capacity in the entire system	Capacity that can be used for sidefiles
No more than 2 TB	The capacity specified for the level-2 threshold setting, of the total cache memory capacity of CLPRs that own LDEVs used for utility volumes (as with the exiting models).
2 TB or more	The capacity specified for the level-2 threshold setting, of the total cache memory capacity of CLPRs that own LDEVs used for utility volumes. However, if the sidefile capacity per MP unit exceeds 1.4 TB, the XRC session is suspended even if the total sidefile capacity does not reach the value specified for the level-2 threshold setting.* Therefore, specify the level-2 threshold setting value so that the sidefile capacity calculated from the above setting value does not exceed 1.4 TB (as shown in the following table).
* If only one MP unit owns all LDEVs used for utility volumes, the XRC session is suspended in high possibility. Therefore, assign the LDEVs used for utility volumes to multiple MP units.	

The following table describes the recommended level-2 threshold setting values.

Recommended level-2 threshold setting value	30%	40%	50%	60%	70%
The maximum value of the total cache memory capacity of CLPRs that own the LDEVs used for utility volumes.*	4.6 TB	3.5 TB	2.8 TB	2.3 TB	2 TB
* If the total capacity is larger than this value, the XRC session might be suspended even if the capacity has not yet reached the value set for the level-2 threshold setting.					

Chapter 3: Interoperability with other products and functions

This topic provides information about Compatible XRC interoperability with other products and functions.

Volume sharing between Compatible XRC and other copy functions

The Hitachi Virtual Storage Platform 5000 series storage system supports concurrent operations of Compatible XRC with other copy functions.

The following table indicates whether Compatible XRC volumes can be shared with other copy functions.

Compatible XRC volumes	Volumes of other copy functions									
	Compatible XRC P-VOL	Compatible XRC S-VOL	URz P-VOL[1]	URz S-VOL[2]	TCz P-VOL[3]	TCz S-VOL[4]	SIz P-VOL[5]	SIz S-VOL[6]	FCv2 S-VOL[7]	FCv2 T-VOL[8]
Compatible XRC P-VOL	N/A	Yes[9]	No	No	Yes	No	Yes[10]	No	Yes	No
Compatible XRC S-VOL	Yes[9]	N/A	No	No	Yes	No	Yes	No	Yes	No

Notes:

1. Primary volume of a URz pair.
2. Secondary volume of a URz pair.
3. Primary volume of a TCz pair.
4. Secondary volume of a TCz pair.
5. Primary volume of an SIz pair.
6. Secondary volume of an SIz pair.
7. Source volume of a Compatible FlashCopy® pair.
8. Target volume of a Compatible FlashCopy® pair.

Compatible XRC volumes	Volumes of other copy functions									
	Compatible XRC P-VOL	Compatible XRC S-VOL	URz P-VOL[1]	URz S-VOL[2]	TCz P-VOL[3]	TCz S-VOL[4]	SIz P-VOL[5]	SIz S-VOL[6]	FCv2 S-VOL[7]	FCv2 T-VOL[8]

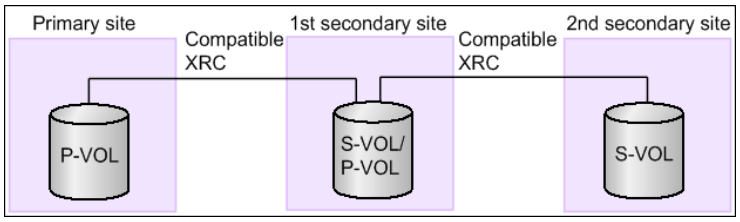
9. A Compatible XRC S-VOL cannot be used as a Compatible XRC P-VOL within the same Compatible XRC session, but it can be used as a Compatible XRC P-VOL in another Compatible XRC session.

10. When the Compatible XRC P-VOL and the SIz are the same volume, you cannot use the **`Reverse Copy`** or **`Quick Restore`** commands of SIz.

Using two Compatible XRC pairs together

You can use two Compatible XRC pairs together to maintain three copies of data at multiple secondary sites for disaster recovery purposes.

The following figure shows the configuration in which two Compatible XRC operations are performed. Data is copied from the primary site to the first secondary site using Compatible XRC, and then the same data is copied from the first secondary site to the second secondary site using Compatible XRC.

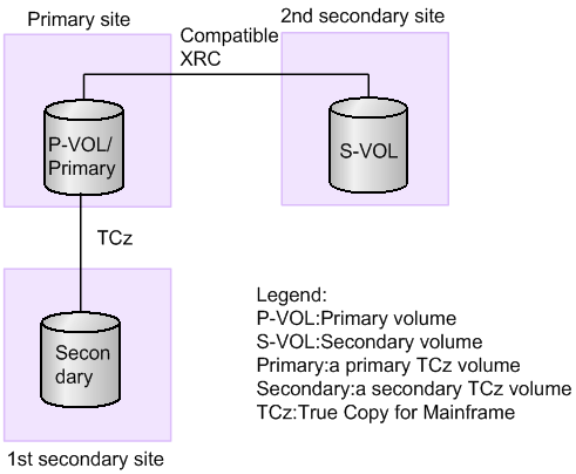


Using Compatible XRC with TrueCopy for Mainframe

The VSP 5000 series supports the use of Compatible XRC with TrueCopy for Mainframe (TCz) to maintain three copies of critical data across your primary and secondary sites for disaster recovery purposes.

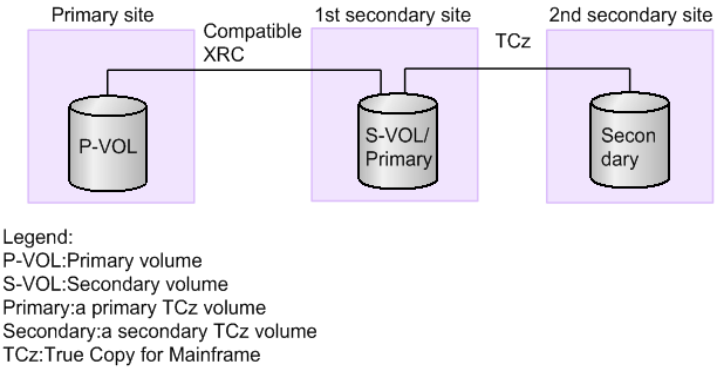
Compatible XRC P-VOL functioning as TCz primary volume

The following figure shows the configuration in which a volume is functioning as both a Compatible XRC P-VOL and a TCz primary volume. In this configuration, data is copied from the primary site to the first secondary site using TCz.



Compatible XRC S-VOL functioning as TCz primary volume

The following figure shows the configuration in which a volume is functioning as both a Compatible XRC S-VOL and a TCz primary volume. In this configuration, data is copied from the primary site to the first secondary site using Compatible XRC, and then copied from the first secondary site to the second secondary site using TCz.

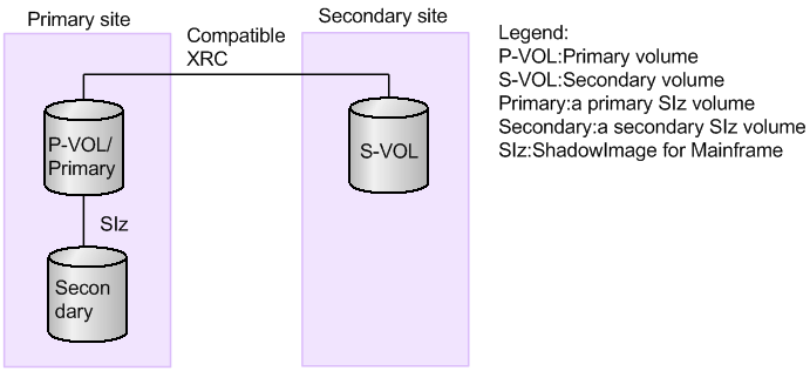


Using Compatible XRC with ShadowImage for Mainframe

The VSP 5000 series supports the use of Compatible XRC with ShadowImage for Mainframe (SIz) to maintain data in the secondary site and the primary site for disaster recovery and data migration purposes.

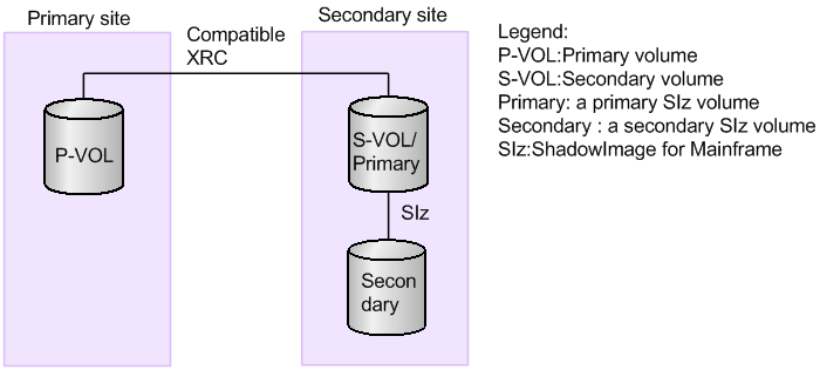
Compatible XRC P-VOL functioning as SIz S-VOL

The following figure shows the configuration in which a volume is functioning as both a Compatible XRC P-VOL and an SIz S-VOL. In this configuration, data is copied within the primary site using SIz, and it is copied from the primary site to the secondary site using Compatible XRC.



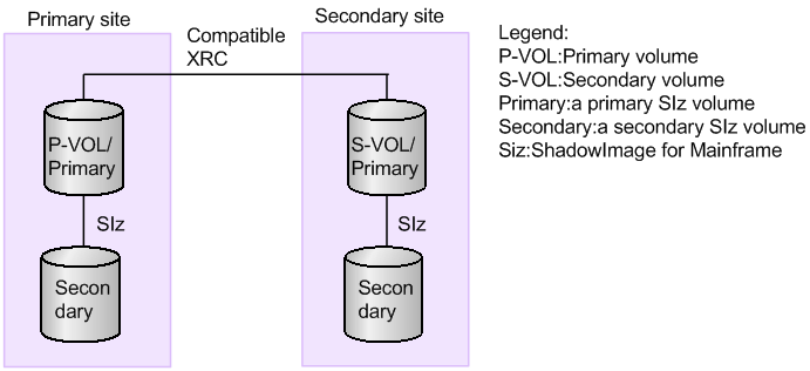
Compatible XRC S-VOL functioning as SIz primary volume

The following figure shows the configuration in which a volume is functioning as both a Compatible XRC S-VOL (secondary volume) and an SIz primary volume. In this configuration, data is copied from the primary site to the secondary site using Compatible XRC, and then it is copied within the secondary site using SIz.



Compatible XRC P-VOL and S-VOL both functioning as SIz primary volumes

The following figure shows the configuration in which one volume is functioning as both a Compatible XRC P-VOL and an SIz primary volume (source volume), and another volume is functioning as both a Compatible XRC S-VOL (secondary volume) and an SIz primary volume. In this configuration, data is copied within the primary site using SIz, and copied from the primary site to the secondary site using Compatible XRC. Afterward, it is copied within the secondary site using SIz.

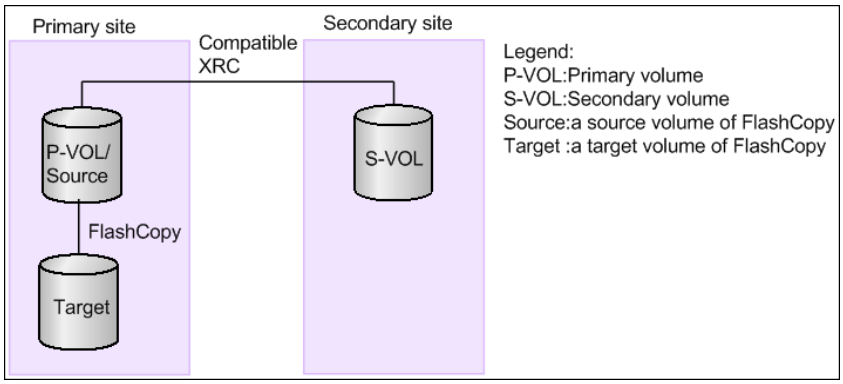


Using Compatible XRC with Compatible FlashCopy® V2

The VSP 5000 series supports the use of Compatible XRC with Hitachi Compatible Mirroring for IBM® FlashCopy® V2 (Compatible FlashCopy® V2) to maintain data in the secondary site and the primary site for disaster recovery and data migration purposes.

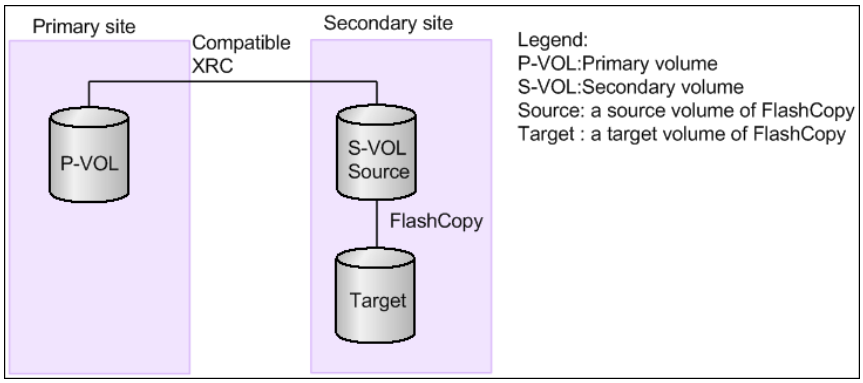
Compatible XRC P-VOL functioning as Compatible FlashCopy® V2 S-VOL

The following figure shows the configuration in which a volume is functioning as both a Compatible XRC P-VOL and a Compatible FlashCopy® V2 S-VOL. In this configuration, data is copied within the primary site using Compatible FlashCopy® V2, and then copied from the primary site to the secondary site using Compatible XRC.



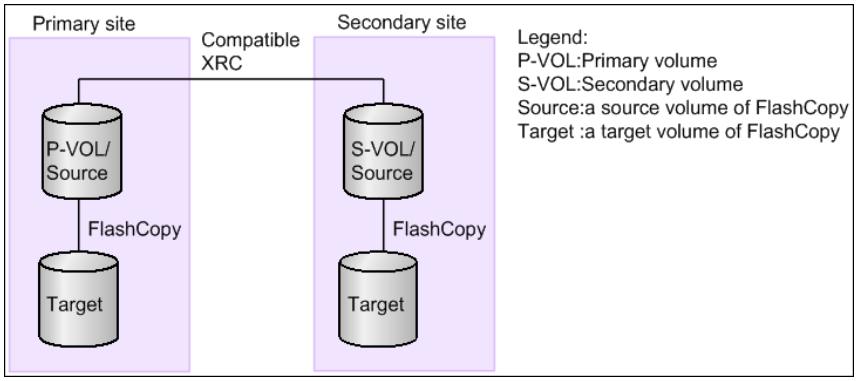
Compatible XRC S-VOL functioning as Compatible FlashCopy® V2 source volume

The following figure shows the configuration in which a volume is functioning as both a Compatible XRC source volume and a Compatible FlashCopy® V2 source volume. In this configuration, data is copied from the primary site to the secondary site using Compatible XRC, and copied within the secondary site using Compatible FlashCopy® V2.



Compatible XRC P-VOL and S-VOL both functioning as Compatible FlashCopy® V2 source volumes

The following figure shows the configuration in which one volume is functioning as both a Compatible XRC P-VOL and a Compatible FlashCopy® V2 source volume, and another volume is functioning as both a Compatible XRC S-VOL and a Compatible FlashCopy® V2 source volume. In this configuration, data is copied within the primary site using Compatible FlashCopy® V2, and then copied within the secondary site using Compatible FlashCopy® V2.



Using Compatible XRC with Compatible Hyper PAV or Compatible Super PAV software

Be careful when using Compatible Hyper PAV or Compatible Super PAV software with the XRC Multiple Reader function and FICON® Data Migration.

You might be unable to use the XRC Multiple Reader function because of abnormal termination of I/O in XRC Multiple Reader when the base volume for the alias is being used as the Mapping Volume (P-VOL for FICON DM pair) in FICON® Data Migration.

If the base volume on the Compatible PAV in Device Manager - Storage Navigator is being used this way, do not distribute aliases.

Note: When Compatible Super PAV is used for the XRC Multiple Reader function, some operations are performed as Compatible Hyper PAV instead of Compatible Super PAV. Because of this, if you use the XRC Multiple Reader function with Compatible Super PAV enabled, we recommend that you use the same settings as Compatible Hyper PAV for Compatible Super PAV.

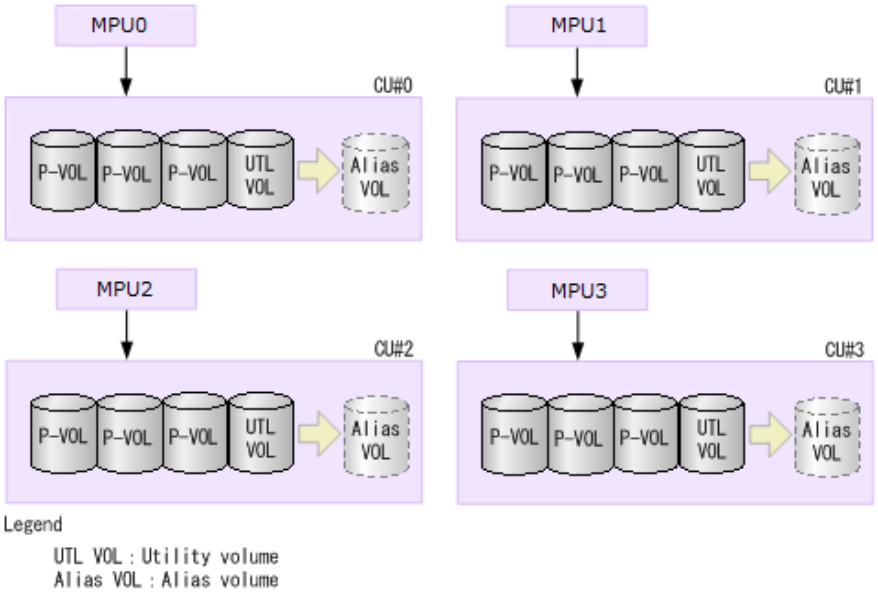
Configuration for the XRC Multiple Reader function

We recommend that the utility volume in a CU for the XRC session and an alias volume for Compatible Hyper PAV or Compatible Super PAV are owned by the same MP unit.

When you use the XRC Multiple Reader function, you can configure the LDEV ownership and Compatible PAV in several different ways.

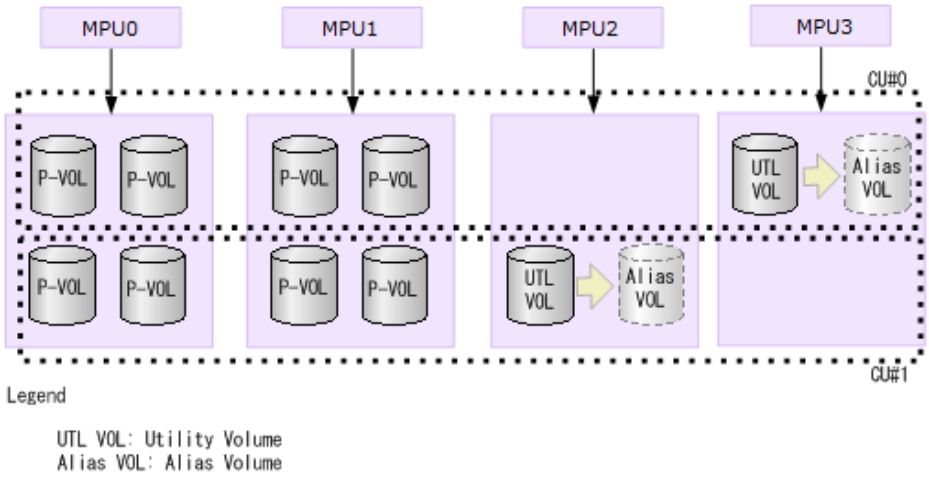
- Configure one MP unit to own all LDEVs in a CU.

  Using this configuration, you can create a record set for the data writing and process the Read Record Set with the same MP unit. This configuration balances the workload in the VSP 5000 series across the MP units. However, if the workload is not balanced among the CUs, the workload is not balanced for each MP unit.



- Assign LDEVs in a CU to multiple MP units.

  LDEVs in a CU are assigned to multiple MP units, and aliases assigned by Compatible PAV to the utility volume remain on one MP unit. In this configuration, the record sets are created in multiple blades, but the Read Record Set operation is performed in one blade. This configuration provides an alternative for using DKCs when you cannot configure all device ownership under one MP unit. This configuration can also reduce workload among MP units, because the data writing operations in a CU are performed in multiple MP units.

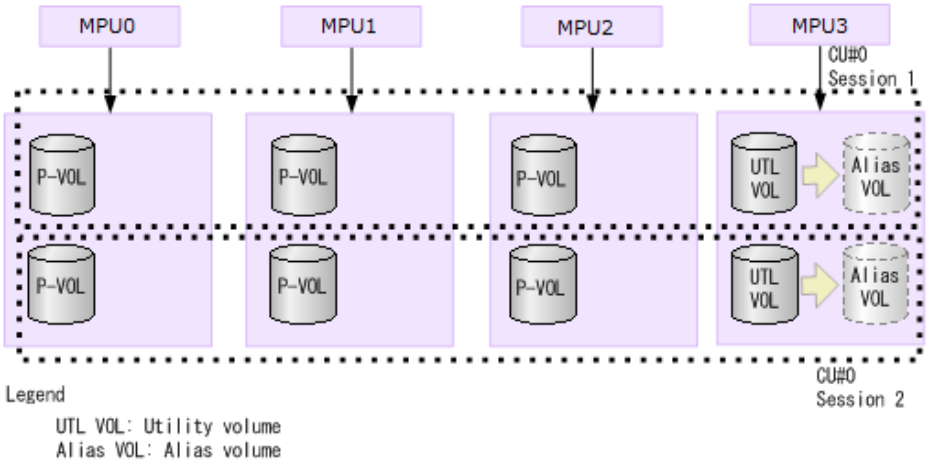


- Use volumes in a CU with several sessions.

  To use volumes in a CU with several sessions, define the configuration as follows:

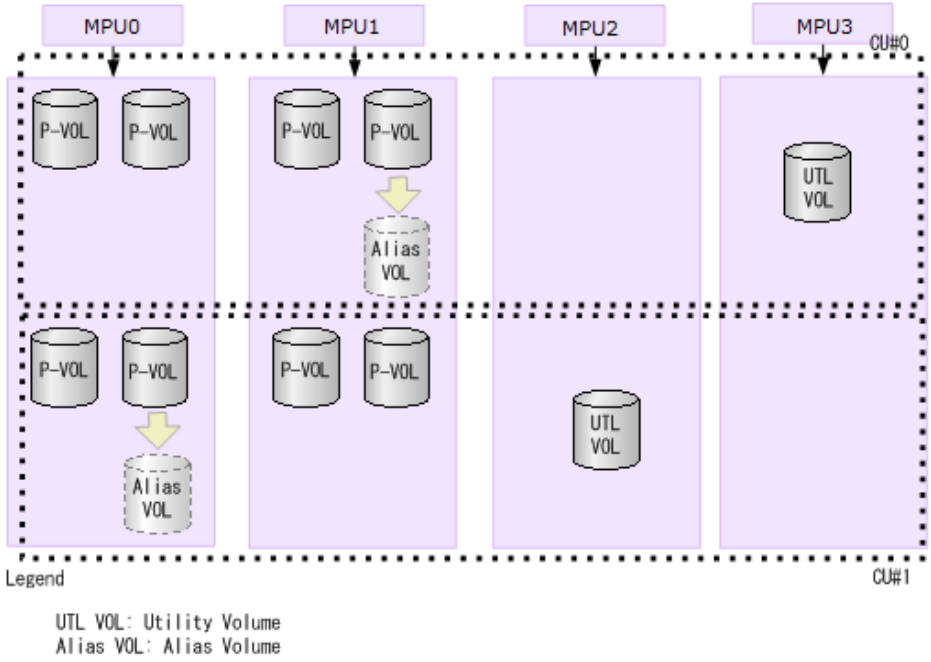
  - Allocate all alias volumes allocated by Compatible PAV to the utility volumes in any sessions.
  - Consolidate all utility volumes for each session into one MP unit.

    In this configuration, the record sets are created in multiple MP units, but the Read Record Set operation is performed in one blade. The data writing operations in a CU are performed in multiple MP units, and the MP working ratio is averaged. However, we do not recommend this setting, because processing is not efficient compared with assigning LDEVs in a CU to multiple MP units.



- Use the XRC Multiple reader function when the P-VOL uses PAV aliases.

  We do not recommend this setting. This setting is not efficient because both creating record set when writing data and the Read Record set processing are performed in multiple MP units.



Using Compatible XRC with other VSP 5000 series software

- You can use Compatible XRC with Hitachi Compatible FlashCopy®.

  For details, see the topic on interoperability with other products and functions in the *Hitachi Compatible FlashCopy/FlashCopy SE User Guide*.
- You can use Dynamic Provisioning for Mainframe, Dynamic Tiering for Mainframe, or active flash for mainframe for the Compatible XRC P-VOL and S-VOL.

Using Soft Fence

Soft Fence is a volume protection function provided by IBM for disaster recovery. For details about Soft Fence, see the *Provisioning Guide for Mainframe Systems* and IBM® documentation. Due to the following reasons, volumes for which Soft Fence is set cannot be used with Compatible XRC:

- When Soft Fence is set for the primary, secondary, or utility volume of Compatible XRC, the ANTX5001E message appears, and a Compatible XRC operation command (**`XADDPAIR`**, **`XDELPAIR`**, **`XSUSPEND`**, or **`XEND`**) ends abnormally.
- When an operation is in progress for a Compatible XRC pair, if Soft Fence is set for the primary, secondary, or utility volume of Compatible XRC, the ANTX5001E message appears, and the pair operation ends abnormally.

Chapter 4: Using Compatible XRC

This topic provides instructions for using the features of Compatible XRC.

Launching Compatible XRC

You can open the **Compatible XRC** window from Device Manager - Storage Navigator.

You must enable the Device Manager - Storage Navigator secondary window. For details, see the chapter on how to use the Device Manager - Storage Navigator secondary window in the *System Administrator Guide*.

Procedure

1. Display the Device Manager - Storage Navigator main window.
2. On the Device Manager - Storage Navigator menu bar, click **Actions** > **Mainframe Connection** > **XRC**.

   The **Compatible XRC** window appears.
3. Change to **Modify** mode.

   For information about changing to modify mode, see the *System Administrator Guide*.
4. To complete Compatible XRC operations, click **Close** ().

Configuring Compatible XRC

Use Compatible XRC to set the Compatible XRC options.

You must enable the Device Manager - Storage Navigator secondary window. For details, see the chapter on how to use the Device Manager - Storage Navigator secondary window in the *System Administrator Guide*.

Procedure

1. Display the Device Manager - Storage Navigator main window.
2. On the Device Manager - Storage Navigator menu bar, click **Action** > **Mainframe Connection** > **XRC**.

   The **Compatible XRC** window appears.
3. Change to **Modify** mode.

   For information about changing to modify mode, see the *System Administrator Guide*.

4. From the list of CLPRs, select one or more CLPRs, right-click them, and then select **Change Option**.
5. In the **Change Option** dialog box, set the desired options.

   To apply the same options to all CLPRs, select **The same setting is applied**.
6. Click **OK** to save your changes and close the **Change Option** dialog box.
   The requested settings are displayed in the **Preview** list. Changes are displayed in blue, bold, italics.
7. Click **Apply**.
   Depending on your settings, one or more pairs might be suspended.
8. Click **OK** in each confirmation dialog box.
   The applied settings are displayed in the **Compatible XRC** window.

Changing the settings in the preview list

Use the **XRC Option** window to change the settings of the Preview list.

You must enable the Device Manager - Storage Navigator secondary window. For details, see the chapter on how to use the Device Manager - Storage Navigator secondary window in the *System Administrator Guide*.

Procedure

1. On the **Preview** list in the **XRC Option** window, right-click the CLPR for which you want to change the option settings.
2. Click **Change** on the pop-up menu.
   The **Change Option** window appears.
3. In the **Change Option** window, change the Compatible XRC settings.
4. Click **OK** to apply your settings.
   The applied settings are displayed on the **Preview** list in the **XRC Option** window.

Deleting the settings in the preview list

Use the **XRC Option** window to delete the settings of the Preview list.

You must enable the Device Manager - Storage Navigator secondary window. For details, see the chapter on how to use the Device Manager - Storage Navigator secondary window in the *System Administrator Guide*.

Procedure

1. On the **Preview** list in the **XRC Option** window, right-click the CLPR for which you want to delete the option settings.
2. Click **Delete** in the pop-up menu.
   A confirmation dialog box appears.
3. Click **OK**.
   The deleted CLPR is removed from the **Preview** list, and the settings displayed in blue, bold italics in the XRC option disappear.

Chapter 5: Troubleshooting

This topic provides troubleshooting information for Compatible XRC.

Getting help

If you have difficulty with any of the procedures included in this document, or if a procedure does not provide the answer or results you expect, please contact the Hitachi Vantara Customer Support team.

For more information about accessing the support portal, see the *Getting Help* section of the *Preface*.

General troubleshooting

For information about troubleshooting errors encountered during Compatible XRC operation, see *Hitachi Device Manager - Storage Navigator Messages*.

For information about troubleshooting general errors for Device Manager - Storage Navigator, see the *System Administrator Guide*.

Console messages

The following table shows how to troubleshoot and solve problems when console messages appear while you are operating Compatible XRC.

Console message	Description
ANTX5001E `Device number`*, `CMD`*, F7, 0001, 0041, 0E00, Sense data, `occurred VOLSER`*, `---`	When this message is displayed during a delete operation for the Compatible XRC pairs, the problem might be the delete pair operation. When the error occurs, the retained pair status information between the SDM and the VSP 5000 series might differ because the SDM, which issued **`XDELPAIR`**, changes the pair status to DELETE while the pair status remains unchanged in the VSP 5000 series, since the session remains in it.

Console message	Description
	Run the **LISTSESS** command to confirm whether the session remains. If the session remains, run the **TERMSESS** command to terminate the session.
ANTX5104E (RC=0901)	If you run the **XADDPAIR** command within 30 seconds of executing the **XDELPAIR** command, the ANTX5104E(RC=0901) console message appears and the Compatible XRC pairs might be suspended. In this case, run the **RESUME** operation to the suspended pairs. When you run the **XADDPAIR** command, wait 5 minutes after executing the **XDELPAIR** command.
ANTX5105E (RC=1017)	When this message is displayed during a delete operation for the Compatible XRC pairs, the problem might be the delete pair operation. When the error occurs, the retained pair status information between the SDM and the VSP 5000 series might differ because the SDM, which issued **XDELPAIR**, changes the pair status to DELETE while the pair status remains unchanged in the VSP 5000 series, since the session remains in it. Run the **LISTSESS** command to confirm whether the session remains. If the session remains, run the **TERMSESS** command to terminate the session.
ANTX5106E LIC ERROR, REAS=00000020	This error can occur when the Compatible XRC session is suspended and the **RESUME** operation is performed after adding a new utility volume or migrating one with the **XADDPAIR** command. In this case, perform the **RESUME** operation again. During I/O, Compatible XRC pairs might be suspended if path failures or PK (CMPK/MPPK/CMFPK) failures occur. This can happen in z/os2.1 or later. In this case, perform the **RESUME** operation again after failure recovery.
ANTA5107E (RC=9014, REAS=604 or REAS=608)	If the ANTA5107E (RC=9014, REAS=604 or REAS=608) console message appears during the **XADDPAIR** operation, the Compatible XRC software might not be installed on the VSP 5000 series. If Compatible XRC is not installed, install it.

Console message	Description
ANTA5107E (RC=352, REAS=1)	If you run the Compatible XRC **EXDDPAIR** command from multiple LPARs using the same CU, the ANTA5107E (RC=352, REAS=1) console message appears and the command might fail. In this case, run the Compatible XRC **EXDDPAIR** command, on multiple LPARs in another CU, or on the same LPAR in the same CU.
ANTX5123W	If the ANTX5123W console message is displayed during the RESUME operation for Compatible XRC pairs, the operation might be unsuccessful. In this case, you must perform the **XDELPAIR** operation to delete the pairs, and then perform the **XADDPAIR** operation to create the pairs again.
ANTX5124W	If the Compatible XRC pairs are deleted when a number of sidefiles of the Compatible XRC pairs remain in cache, this message appears, and a time-out error might occur. Deleting the Compatible XRC pairs must not be performed. When the time-out error occurs, the **XQUERY** TSO command or an SCDATA operation must be performed to verify that no sidefiles of the Compatible XRC pairs exist on cache before deleting the Compatible XRC pairs. Additionally, with a time-out error, the pair information managed in SDM and DKC might not match. This might occur because the sessions remain in DKC, although the pair status in SDM where **XDELPAIR** was performed is deleted. Use the **LISTSESS** command to check for the sessions. If you find the remaining sessions, complete the sessions using the **TERMSESS** command. When the **XADDPAIR** command is performed after completing the sessions, the ANTA5107E (RC=608) message appears, and the **XADDPAIR** command might fail to perform. You must perform the **XADDPAIR** command again.
ANTX8117I DELAY=(**********)	This error can occur because of data transmission delay between SDM and the channel extender. In this case, contact the manufacturer of the channel extender.

Console message	Description
After the performing of the XQUERY command, "****" appears in RES CNT and THD NT.	This error can occur because of data transmission delay between SDM and the channel extender. In this case, contact the manufacturer of the channel extender.
Time-out error	If you resume the Compatible XRC pair when the sidefiles of the Compatible XRC pair remain on cache in the following condition, this error occurs. The Compatible XRC pair must not be performed. When the time-out error occurs, the **XQUERY** TSO command must be performed to verify that no sidefiles of the Compatible XRC pairs exist on cache before resuming the Compatible XRC pairs. If you delete Compatible XRC pairs after the time-out error occurs, the session might remain on the disk controller side. Run the **LISTSESS** command to confirm whether the session remains. If the session remains, run the **TERMSESS** command to terminate the session.
*The device number, CMD, and occurred VOLSER are unique for your system.	

Appendix A: Controlling the amount of write data

This topic describes how to control the amount of write data the storage system performs according to the sidefile capacity.

When the Do not Block option is enabled

When the Do not Block option is enabled for cache level, depending on the sidefile capacity, the storage system performs one of three levels for controlling the amount of write data.

Level 1

This level of control is performed when the sidefile capacity is equal to or larger than the level-1 threshold, and is smaller than the level-2 threshold.

When Level 1 Sleep is set to Enable, write I/Os to volumes are put in a wait status by a command retry when the sleep wait threshold (that is, level-1 threshold) is exceeded.

When Level 1 Sleep is set to Disable, write I/Os to volumes are not put in a wait status.

Level 2

This level of control is performed when the sidefile capacity is equal to or larger than the level-2 threshold, and is smaller than the level-3 threshold.

When Level 2 Suspend is set to Disable, write I/Os to volumes are put in a wait status by SCP-SCI reporting when the SCP-SCI reporting threshold (that is, level-2 threshold) is exceeded.

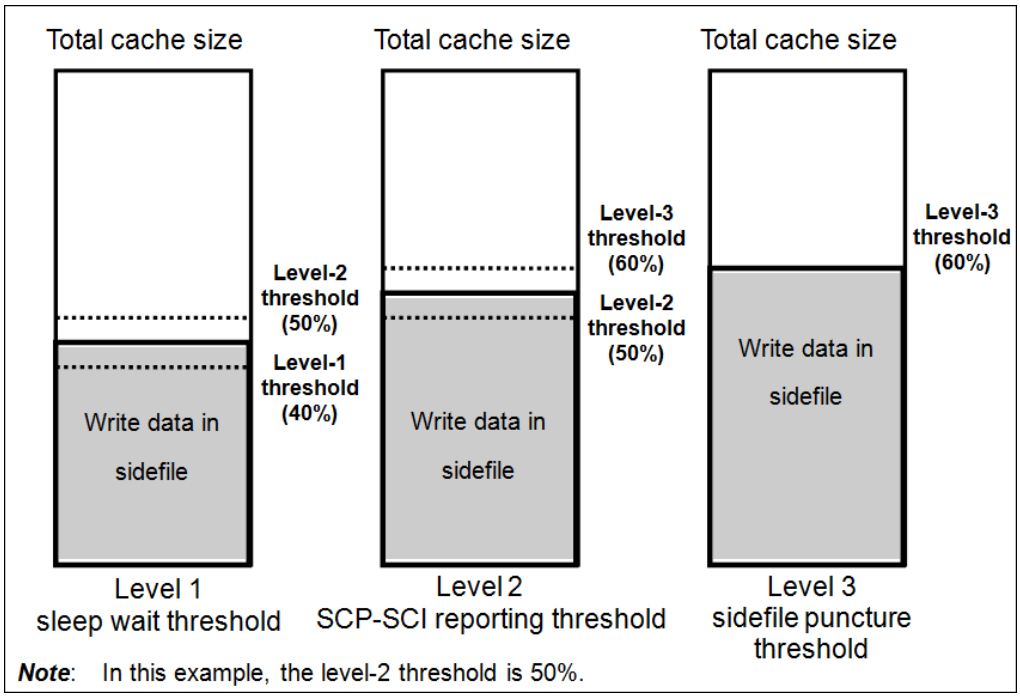
When Level 2 Suspend is set to Enable, the storage system does not report SCP-SCI to hosts. Sidefile puncture occurs and the target session is suspended. Sidefile puncture is the sidefile threshold plus 10%.

Level 3

This level of control is performed when the sidefile capacity is equal to or larger than the level-3 threshold.

Sidefile puncture can occur. The session for the sidefile, containing the maximum capacity in the cache in the CLPR, is suspended.

The following figure shows levels of controlling write data when the Do not Block option is set to cache level.



When the Do not Block option is disabled

When the Do not Block option is disabled, depending on the sidefile capacity, the storage system performs one of four levels for controlling the amount of write data.

Level 0

This level of control is performed when the sidefile capacity is smaller than the level-1 threshold.

When Level 1 Sleep is set to Enable, write I/Os to volumes are put in a wait status according to the threshold for the number of record sets for each volume. The threshold is specified by SDM; the default threshold is 0x500. When Level 1 Sleep is set to Disable, write I/Os to volumes are not put in a wait status.

Level 1

This level of control is 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 volumes are put in a wait status by command retry when the sleep wait threshold (that is, level-1 threshold) is exceeded.

Level 2

This level of control is performed when the sidefile capacity is equal to or larger than the level-2 threshold, and is smaller than the level-3 threshold.

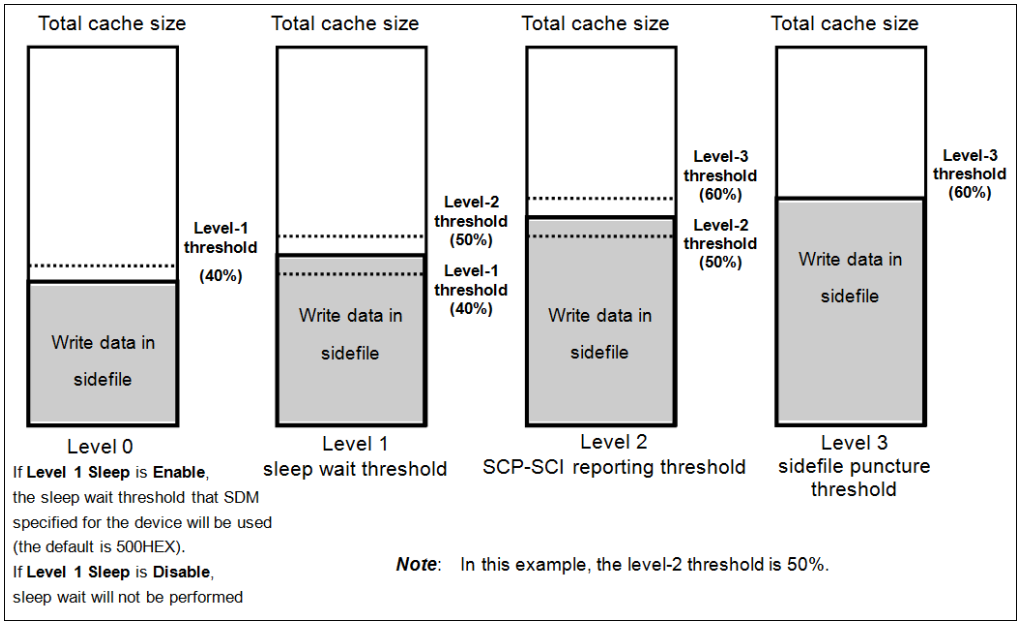
Write I/Os to volumes are put in a wait status by SCP-SCI reporting when the SCP-SCI reporting threshold (that is, level-2 threshold) is exceeded.

Level 3

This level of control is performed when the sidefile capacity is equal to or larger than the level-3 threshold.

Sidefile puncture will occur.

The following figure shows levels of controlling write data when the Do not Block option is disabled.

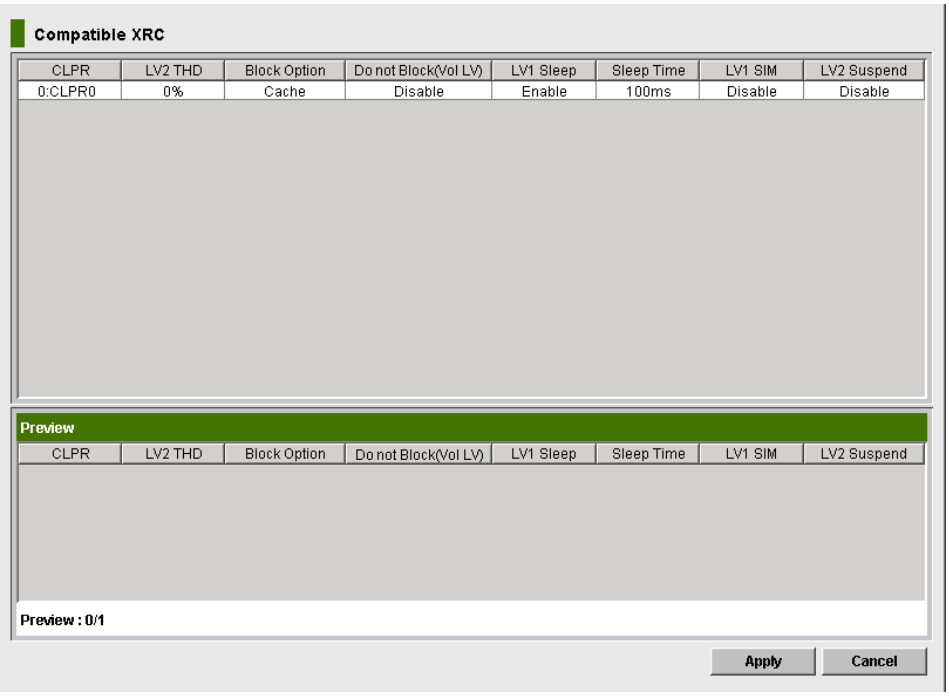


Appendix B: Compatible XRC GUI reference

This topic describes the **Compatible XRC** window and the **Change Option** window.

Compatible XRC window

The following is the **Compatible XRC** window.



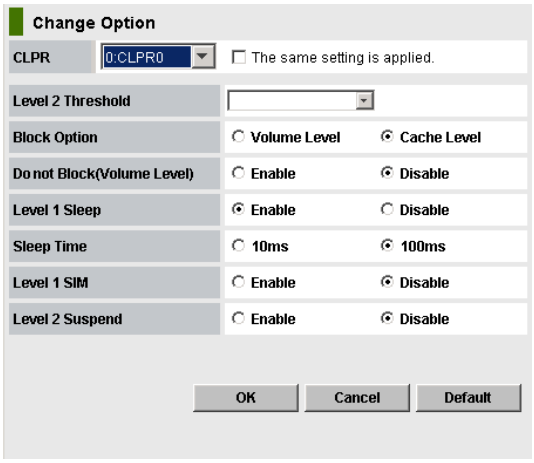
The following table shows the items in the **Compatible XRC** window.

Item		Description
Compatible XRC option list	CLPR	CLPR ID.
	LV2 THD	Threshold shown for Level 2 Threshold in the **Change Option** window.
	Block Option	Setting shown for Block Option in the **Change Option** window.
	Do not Block (Vol LV)	Setting shown for Do not Block(Volume Level) in the **Change Option** window.

Item		Description
	LV1 Sleep	Setting shown for Level 1 Sleep in the **Change Option** window.
	Sleep Time	Setting shown for Sleep Time in the **Change Option** window.
	LV1 SIM	Setting shown for Level 1 SIM in the **Change Option** window.
	LV2 Suspend	Setting shown for Level 2 Suspend in the **Change Option** window.
Preview list		Displays the settings from the **Change Option** window. The settings in this list are not applied to the storage system until you click Apply.
Apply		Applies the settings in the Preview list to the storage system.
Cancel		Cancels the settings in the Preview list.

Change Option window

The following is the **Change Option** window.



To open the **Change Option** window, right-click the desired CLPR in the Compatible XRC option list, and then select Change Option.

The following table shows the items in the **Change Option** window.

Item	Description
CLPR list	Select the desired CLPR.
The same setting is applied.	Check this box to apply the settings to all CLPRs. Clear this box to apply the settings only to the selected CLPR.
Level 2 Threshold list	Select the desired threshold (SCP-SCI reporting threshold or level 2 threshold) of the sidefiles of which the storage system performs an SCP (State Change Pending)-SCI (State Change Interrupt) reporting to the host. The level-2 threshold can be set from 30% to 70% in 10% increments. The default level-2 threshold setting is 50 percent. The level-2 threshold setting for SCP-SCI reporting applies to Concurrent Copy. When the level-2 threshold setting is changed, all of these functions are affected. To calculate the level-1 threshold, subtract 10% from the level-2 threshold, and add 10% to the level-2 threshold to calculate the level-3 threshold.
Block Option	Sets the IBM-compatibility mode for device blocking, which controls the amount of write data according to the sidefile capacity. **Volume Level** Sets the IBM-compatible mode of the Device Block feature. When the **"Sleep" - "Wait"** command is retried, the system monitors the I/O written to the volume. When the amount of I/O write data exceeds the threshold for the number of record sets for each volume specified by SDM, the following settings are made: When Volume Level is selected, Do not Block(Volume Level) is set to Enable, Disable for Level 1 Sleep is set to Disable, and Level 2 Suspend is set to Disable. **Cache Level** Disables the **"Sleep" - "Wait"** command retry according to the threshold for the number of record sets for each volume. The storage system controls the amount of three levels of write data based on the sidefile capacity. For details, see Controlling the amount of write data (on page 41) .
Do not Block(Volume Level)	Sets whether the storage system controls the amount of write I/Os to the specified volume.

Item	Description
	Enable Does not control the amount of data to be written to the specified volume. Write I/Os from hosts are not put in a wait status. When Block Option is set to Volume Level, Enable is set. For details, see Controlling the amount of write data (on page 41) . **Disable** Controls four levels of write data based on the sidefile capacity.
Level 1 Sleep	Sets whether the storage system retries the **"Sleep" - "Wait"** command when the sidefile threshold exceeds the sleep wait threshold (level-1 threshold). **Enable** Retries the **"Sleep" - "Wait"** command. **Disable** Does not retry the **"Sleep" - "Wait"** command. When Block Option is set to Volume Level, Disable is set.
Sleep Time	Sets the sleep wait time for the **"Sleep" - "Wait"** command retry. **10 ms** The storage system waits 10 milliseconds. **100 ms** The storage system waits 100 milliseconds.
Level 1 SIM	Sets whether the storage system reports SIM (Service Information Message) to the host when the sidefile threshold exceeds the sleep wait threshold (level-1 threshold). **Enable** Reports SIM indicating that the sidefile exceeds the sleep wait threshold to the host. **Disable** Does not report SIM to the host even when the sidefile exceeds the sleep wait threshold.
Level 2 Suspend	Sets whether the storage system reports SCP-SCI when the sidefile threshold reaches the SCP-SCI reporting threshold (level-2 threshold).

Item	Description
	Enable Does not report SCP-SCI to the host. The sidefile is filled up and the target session is suspended. **Disable** Reports SCP-SCI to the host. The host cannot issue write I/Os until the host receives SCI after receiving SCP from the storage system. When Block Option is set to Volume Level, Disable is set.
OK	Saves the requested Compatible XRC option changes, and closes the **Change Option** dialog box. The requested Compatible XRC option changes are displayed in the Preview list and in blue, bold, and italics in the Compatible XRC options table.
Cancel	Cancels the requested Compatible XRC option changes.
Default	Sets the Compatible XRC options to their default values.

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