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Hitachi Freedom Storage™ Lightning 9900™ V Series

ShadowImage - FlashCopy® Extension User's Guide

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Referenced Documents

Hitachi Data Systems documentation:

- *Hitachi Lightning 9900™ V Series User and Reference Guide*, MK-92R100
- *Hitachi Lightning 9900™ V Series Remote Console – Storage Navigator User's Guide*, MK-92RD101
- *Hitachi Lightning 9900™ V Series ShadowImage – S/390® User Guide*, MK-92RD109

IBM® documentation:

- *DFSMS/MVS Advanced Copy Services* (SC35-0355)
- *DFSMSdfp Advanced Services* (SC26-4921)

Preface

The *Hitachi Lightning 9900™ V Series ShadowImage – FlashCopy® Extension User's Guide* describes and provides instructions for performing ShadowImage – S/390® FlashCopy® operations on the 9900V subsystem. 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 is familiar with the Hitachi Lightning 9900™ V Series array subsystem, and

- the user is familiar with the S/390® operating system.

Note: The term "9900V" refers to the entire Lightning 9900™ V Series subsystem family (9980V, 9970V), unless otherwise noted. For further information on the 9900V RAID subsystems, please refer to the *Hitachi Lightning 9900™ V Series User and Reference Guide* (MK-92RD100), or contact your Hitachi Data Systems account team.

Note: The use of Hitachi ShadowImage – S/390® and all other Hitachi Data Systems products is governed by the terms of your license agreement(s) with Hitachi Data Systems.

Microcode Level

This document revision applies to 9900V microcode version 21-03-*XX/XX* and higher.

COMMENTS

Please send us your comments on this document: doc.comments@hds.com.

Make sure to include the document title, number, and revision.
Please refer to specific page(s) and paragraph(s) whenever possible.

(All comments become the property of Hitachi Data Systems Corporation.)

Thank you!

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1.1   ShadowImage – FlashCopy® Extension

ShadowImage - FlashCopy® Extension option is functionally compatible with the IBM® FlashCopy® feature. It provides an immediate or point-in-time copy of a logical volume. Point-in-time copy functions give you an instantaneous copy of what the original data looked like at a specific point-in-time (PIT).

ShadowImage - FlashCopy® Extension is a Data Copy Services function that can quickly copy data from source volumes to target volumes that are within the same Logical Control Unit (LCU) on a 9900 storage subsystem set in 2105 mode. DFSMSdss can automatically use FlashCopy® to perform a full-volume copy of the data from the source volumes to the target volumes.

ShadowImage - FlashCopy® Extension makes it possible for you to access both the source volumes (S-VOLs) and the target volumes (T-VOLs) even before the physical copy process has completed. By creating an "instant" copy, ShadowImage - FlashCopy® Extension enables applications or servers that use either the source copy or the target copy to continue operating with minimal interruption.

ShadowImage - FlashCopy® Extension copy pair relationship is a set of extents, where an extent is the storage unit that the 9900V copies during the FlashCopy® operation. This relationship exists from the time you initiate a FlashCopy® operation, until the 9900V copies all data from the source extents to the target extents.

ShadowImage - FlashCopy® Extension is a Data Copy Services function that can quickly copy data from source volumes to target volumes that are within the same logical control unit (LCU) on a 9900V Storage subsystem set in 2105 mode. DFSMSdss automatically can use FlashCopy® to perform a full-volume copy of the data from the source volumes to the target volumes.

Note: The use of Hitachi ShadowImage – S/390® and all other Hitachi Data Systems products is governed by the terms of your license agreement(s) with Hitachi Data Systems.

1.2 ShadowImage – FlashCopy® Pair Status

Figure 1.1 illustrates the pair status transition and the relationship between the pair status and the ShadowImage - FlashCopy® Extension operations. Table 1.1 describes the ShadowImage - FlashCopy® pair status condition.
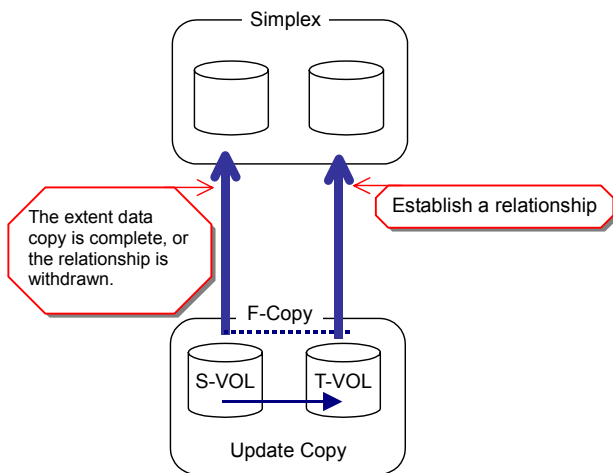
Figure 1.1   ShadowImage - FlashCopy® Pair Status Transition

Note: If the extent data copy fails, the ShadowImage - FlashCopy® relationship ends automatically (the status becomes *simplex*), and the T-VOL is blocked.

Table 1.1   ShadowImage - FlashCopy® Pair Status Condition

Status	Description	Host Status	S-VOL Access	T-VOL Access	
				Non-HRX	**HRX Volume**
F-Copy	ShadowImage - FlashCopy® is requested with host commands. The S−VOL differential data is copied to the T-VOL in the background. When the NOCOPY option is specified, no background copy is performed.	S-VOL = SIMPLEX T-VOL = SIMPLEX	Read/write	Read/write, can be varied online.	Read/write, can be varied online.

1.3   Establishing ShadowImage - FlashCopy® Pairs

You may establish a ShadowImage - FlashCopy® pair for an SI390 *simplex* volume. Table 1.2 shows the allowable ShadowImage - FlashCopy® operations for each pair status. You can also add a ShadowImage - FlashCopy® pair for SI390 S−VOL or T−VOL in the *split* or *duplex* status (see Table 1.3 and Table 2.1). However, you cannot establish a ShadowImage - FlashCopy® pair if the desired S-VOL already has three T-VOLs.

ShadowImage - FlashCopy® allows you to add a second layer of ShadowImage – FlashCopy® pairs onto the first layer of original SI390 pairs. These two layers of pairs (L1 and L2) allow you to create up to six copies of one original SI390 source volume (S-VOL).

Figure 1.2 shows an example of combining ShadowImage - FlashCopy® and SI390 pairs in the L1 and L2 pairs.

Note: You cannot add a ShadowImage - FlashCopy® L2 pair onto a ShadowImage - FlashCopy® L1 pair, an SI390 L2 pair onto an SI390 L1 pair, or any third layer pair (L3) onto an L2 pair.

Table 1.3 shows the relationship between the L1 SI390 pair status and the availability of ShadowImage - FlashCopy® pair operations on the associated L2 ShadowImage - FlashCopy® pairs. Table 1.4 shows the relationship between the L2 pair status and the availability of pair operations on the associated L1 pairs.

Table 1.2   Pair Status versus Allowable Operations

Operation	Pair Status									ShadowImage - FlashCopy®
	ShadowImage - S/390®									
	Simplex	Pending	Duplex	SP-Pend	V-Split	Split	Resync	Resync-R	Suspend	F-Copy
Split Pair	OK	OK	OK	x	x	x	x	x	x	x
Suspend Pair	x	OK	OK	OK	OK	OK	OK	x	OK	x
Resync Pair	x	x	x	x	OK	OK	x	x	OK	x
Reverse Resync, Quick Restore	x	x	x	x	x	OK	x	x	x	x
Delete Pair	x	OK	OK	OK	x	OK	OK	OK	OK	OK
Establish Relationship	OK	x	x	x	x	x	x	x	x	x
Withdraw Relationship	x	x	x	x	x	x	x	x	x	OK
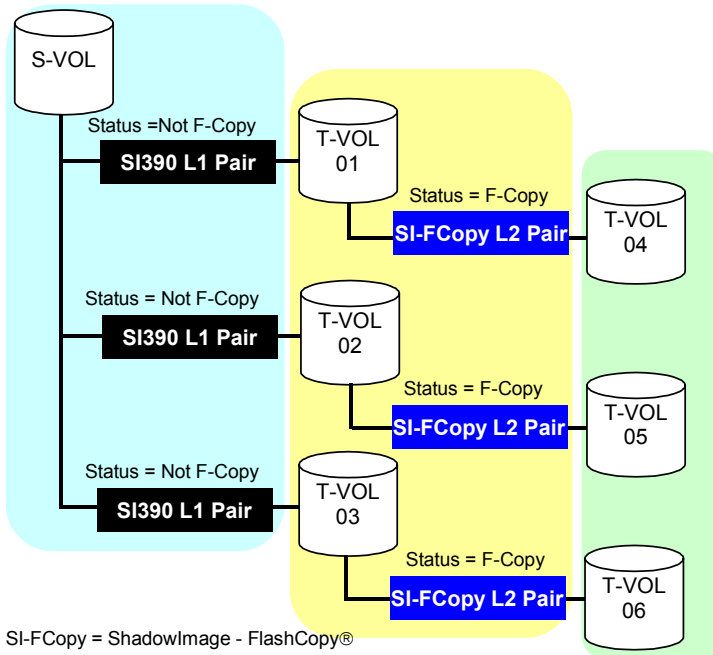
Figure 1.2   Possible Combination of ShadowImage - FlashCopy® and SI390 Pairs

Table 1.3   Relationship between L1 Pair Status and L2 Pair Operations

L1 Pair Status (SI390 Pair)	L2 Pair Operations (ShadowImage - FlashCopy® Pair)	
	Delete	Establish Relationship
Pending	OK	NO
Duplex	OK	NO
SP-Pend	OK	NO
V-Split	OK	NO
Split	OK	OK
Resync	OK	NO
Reverse Resync, Quick Restore	OK	NO
Suspend	OK	NO

Table 1.4   Relationship between L2 Pair Status and L1 Pair Operations

L2 Pair Status	L1Pair Operations						
	Add Pair	Split Pair	Resync Pair	Reverse Resync/ Quick Restore	Suspend	Delete	Establish Relationship
F-Copy	NO	NO	NO	NO	OK	OK	NO

Note: You cannot create a pair that has a T-VOL shared with the S-VOL of an L1 pair.

Chapter 2   Preparing for ShadowImage - FlashCopy® Operations

2.1   ShadowImage – FlashCopy® Extension Requirements

In order for FlashCopy® to operate, you must have the proper software and hardware prerequisites. Please review 2105 DEVICE Preventive Service Planning (PSP) bucket for the latest maintenance requirements.

The system requirements for ShadowImage – FlashCopy® Extension operations are:

- Host software:
    - DFSMS/MVS Version1, Release3 and later.
    - PTFs: Refer to the PSP bucket for a list of required PTFs for FlashCopy® support.
    - All S/390® ESCON® host models; supported S/390® systems include:

        IBM® ES/3090 (ESCON model)

        IBM® ES/9000 9021, 9121, 9221

        IBM® S/390® Multiprise 2000 Series 100 and 200

        IBM® S/390® Parallel Enterprise Server 9672 Gen1-, Gen2-, Gen3-, Gen4-, Gen5-, Gen6-Turbo

- Hitachi Lightning 9900™ V Series storage subsystem:
    - The 9900V must be set to 2105 controller emulation.
    - SSID boundary must be 256 LDEVs.
    - 9900V exploitation support is required.
    - ShadowImage – S/390® software license key must be installed.
    - ShadowImage – FlashCopy® Extension must be enabled.

- Source and target volumes:
    - The source and target volumes must have the same track format.
    - Source and target volumes must be within the same logical control unit (LCU).
    - Source and target volume cannot currently be in a FlashCopy® session.

2.2 Combining ShadowImage - FlashCopy® with Other Copy Solutions

You can combine a ShadowImage - FlashCopy® pair with a TrueCopy - S/390®, XRC, or CC pair (see Table 2.1 and Table 2.2). For further information about these combinations, please see the *Hitachi 9900V TrueCopy – S/390 User and Reference Guide*, MK-92RD107.

Table 2.1   ShadowImage - FlashCopy® and TC390 Shared Volume

	TC390 M-VOL	TC390 R-VOL
ShadowImage - FlashCopy® S-VOL	OK	OK*
ShadowImage - FlashCopy® T-VOL	NO	NO

Note*: The TC390 pair must be suspended (status = *suspend*).

Table 2.2   ShadowImage - FlashCopy® and XRC/CC Shared Volume

	XRC/CC Primary Volume	XRC/CC Secondary Volume
ShadowImage - FlashCopy® S-VOL	OK	OK
ShadowImage - FlashCopy® T-VOL	NO	NO

The ShadowImage - FlashCopy® and TC390 shared configuration is different from the IBM® FlashCopy® and PPRC shared configuration. For ShadowImage - FlashCopy® and TC390, you cannot create the following TC390 pairs (see Figure 2.1):

- A TC390 pair that includes a volume functioning as both a ShadowImage - FlashCopy® T-VOL and a TC390 M−VOL, and

- A TC390 pair that includes a volume functioning as both a ShadowImage - FlashCopy® T-VOL and a TC390 R−VOL.

Note: For IBM® FlashCopy® and PPRC, you can create a PPRC pair that includes a volume functioning as both a FlashCopy® target volume and a PPRC primary volume, and a PPRC pair that includes a volume functioning as both a FlashCopy® target volume and a PPRC secondary volume.

Case 1:

Case 2:
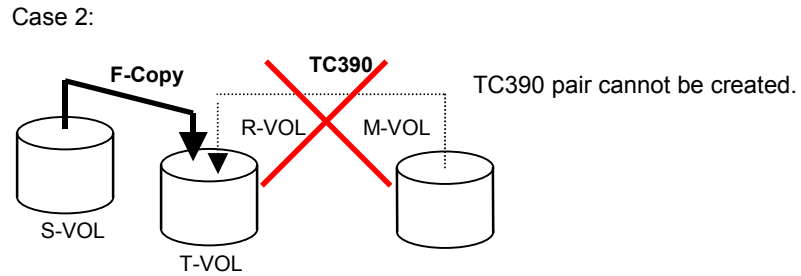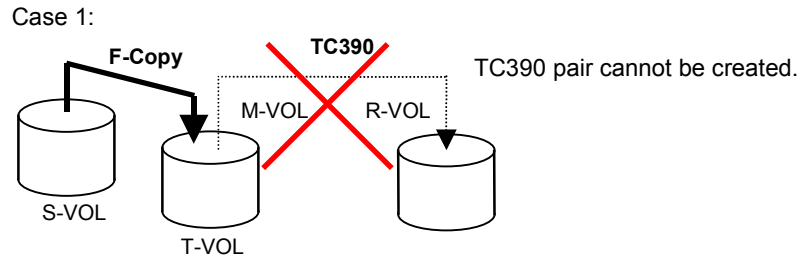
Figure 2.1   ShadowImage – FlashCopy® and TC390: Shared T-VOL and M-VOL/R-VOL (Not Allowed)

Chapter 3   Performing ShadowImage – FlashCopy® Operations

3.1   Using ShadowImage – FlashCopy® Host Commands

ShadowImage – FlashCopy® supports both DFSMSdss commands and TSO PPRC commands to enable you to perform ShadowImage - FlashCopy® operations from the S/390® host system. This user's guide does not provide complete instructions for using commands from the host system. For detailed information on using DFSMSdss and TSO PPRC commands, please refer to the following IBM® user documents: *DFSMS/MVS Advanced Copy Services* (SC35-0355) and *DFSMSdfp Advanced Services* (SC26-4921).

Note: Before you use ShadowImage - FlashCopy®, you must take the following steps:

1. Install the ShadowImage - S/390® feature and software from the Storage Navigator PC.

2. Enable the ShadowImage - FlashCopy® feature and software from the Storage Navigator PC.

3. Verify the devices offline (use the S/390 Vary offline command) to the host(s), and then verify the devices online (use the S/390 Vary offline command) to the host(s) again. This ensures that you have the latest device information before performing ShadowImage - FlashCopy® operations. This offline/online operation is required just once.

3.1.1   DFSMSdss Command Support

ShadowImage - FlashCopy® can be used by the COPYFULL command (description) via DFSMSdss commands. When ShadowImage - FlashCopy® copy is requested, DFSMSdss automatically determines whether it is a ShadowImage - FlashCopy® copy request or an ordinary SI390 copy request via the host. The COPYFULL command completes within a few seconds, and the ShadowImage - FlashCopy® pair is established at once. ShadowImage - FlashCopy® data is copied in the background, and the completion of the copy is not reported to the user. Figure 3.1 shows an example of the DFSMSdss commands.

```
//COPYFULL JOB.....
//*
//INSTIMG EXEC PGM=ADRDSSU
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=V,OUTLIM=3000
//SYSIN DD *
 COPY FULL INDYNAM (SORCEV) OUTDYNAM (TRGVOL) COPYVOLID
/*
```

Figure 3.1   Example of DFSMSdss Commands

ShadowImage - FlashCopy® can establish a relationship for one volume pair at a time. When ShadowImage - FlashCopy® copy is requested for a volume pair in the *F-Copy* status, DFSMSdss identifies the request as a SI390 copy request via the host and performs SI390 copy operations.

The COPYVOLID option is used to copy the volume serial number (VOLSER). If the COPYVOLID option is specified, the volume serial number is copied to the target volume, and the target volume is varied offline automatically. This COPYVOLID option was necessary for SMS-managed volumes until the DUMPCONDITIONING parameter was added to DFSMSdss with APAR OW 45674. If the DUMPCONDITIONING parameter is specified, there is no need to copy the volume serial number for SMS-managed volumes. *Note:* You cannot specify both the COPYVOLID option and DUMPCONDITIONING parameter at the same time.

Note: The following conditions cause the 9900V subsystem to output the ADR935W message, and end with CC = 4 (SI390 copy is performed via the host):

■   The size of the target volume is larger than the source volume within the same CU image.

■   The emulation types of the source and target volumes are different within the same CU image.

Note: When the SSID boundary is 64-LDEV and you establish a relationship between two volumes which have the same CU image but different SSIDs, you can copy data from S-VOL to T-VOL by the host program.

Note: The relationship between a T-VOL and an S-VOL must be within the same CU.

3.1.2 TSO Command Support

Table 3.1 lists and describes the TSO commands supported by ShadowImage - FlashCopy® Extension.

Table 3.2 lists and describes the TSO command parameters supported by ShadowImage - FlashCopy®.

Note: To use the following PPRC TSO commands, you must add the command names to the AUTHCMD PARM of IKJTSOxx that is a member of SYS1.PARMLIB, because the system is protected by RACF Facility.

Table 3.1   PPRC TSO Commands

ShadowImage - FlashCopy® Operation	PPRC TSO Command	Function	Restrictions
Add ShadowImage - FlashCopy® Pair	FCESTABL	Establishes a relationship between the source and target volumes.	The specified volume must be *simplex*. When the SSID boundary is 64-LDEV, S-VOL and T-VOL for ShadowImage - FlashCopy® must be established in the same CU image and SSID.
Delete ShadowImage - FlashCopy® Pair	FCWITHDR	Withdraws the relationship of an existing ShadowImage - FlashCopy® pair.	The specified volume must have an established relationship. When the SSID boundary is 64-LDEV, S-VOL and T-VOL for ShadowImage - FlashCopy® must be established in the same CU image and SSID. When S-VOL and T-VOL are in the different SSIDs, delete the relationship from the ShadowImage - S/390® panel on the Storage Navigator PC.
Display ShadowImage - FlashCopy® Pair Status	FCQUERY	Displays detailed pair status information.	None.

Table 3.2   PPRC TSO Command Parameters

Command	Parameter	Description
FCESTABL	SDEVN	Source device number.
	TDEVN	Target device number.

	MODE	COPY = Data is copied in the background. Normally, the relationship ends automatically once all of the data has been copied.
		
		NOCOPY = Data is not copied in the background. It is necessary to issue FCWITHDR command to delete the relationship specified with NOCOPY option. Before ShadowImage - FlashCopy® read/write processing actually starts, all of the data in an accessed track of the S-VOL is copied to the T-VOL when one of the following data access occurs:
		
		    1. Write data access to the extents of the S-VOL,
		
		    2. Write data access to the extents of the T-VOL, or
		
		    3. Read data access to the extents of T-VOL.
		
		Note: The timing of ShadowImage - FlashCopy® Extension data copying is different from IBM® FlashCopy®. The IBM FlashCopy® function copies data when data in either the source or target volume is updated.

	ONLINTGT	YES = The path group is not checked. NO = The path group is checked.
	EXTENTS	Extents specify the range of copy by CCHH. Up to five extents can be specified.
FCWITHDR	SDEVN	Source device number.
	TDEVN	Target device number.
FCQUERY	DEVN	Device number.

3.1.3 Adding ShadowImage - FlashCopy® Extension Pairs: FCESTABL

Figure 3.2 shows an example of the FCESTABL command.

```
FCESTABL  SDEVN(X'DE80')  TDEVN(X'DE81')  MODE(COPY)  ONLINTGT(YES)
          EXTENTS(X'00010000' X'0100000E')
```

Figure 3.2   Example of FCESTABL Command

3.1.4 Deleting ShadowImage - FlashCopy® Extension Pairs: FCWITHDR

The FCESTABL command may be issued to a ShadowImage - FlashCopy® pair for which a relationship has already been established. Figure 3.3 shows an example of the FCWITHDR command.

WARNING: If a pair is deleted by the FCWITHDR command, the data integrity of the T-VOL cannot be guaranteed.

```
FCWITHDR  SDEVN(X'DE80')  TDEVN(X'DE81')
```

Figure 3.3   Example of FCWITHDR Command

3.1.5 Displaying ShadowImage - FlashCopy® Extension Pair Status: FCQUERY

The FCQUERY command can be used to display ShadowImage - FlashCopy® pair status. Figure 3.4 shows an example of FCQUERY command. Table 3.3 lists and describes the status displayed by the FCQUERY command.

```
ANTF0090IF CQUERY Formatted
DEVN SSID  LSS CCA  CU     SERIAL      STATUS
0A4D 2830  03  0D   2105   0000325476  FC . . . . . 88%
____ 2830  03  07   2105   0000325476  FC . . . . . . . .
```
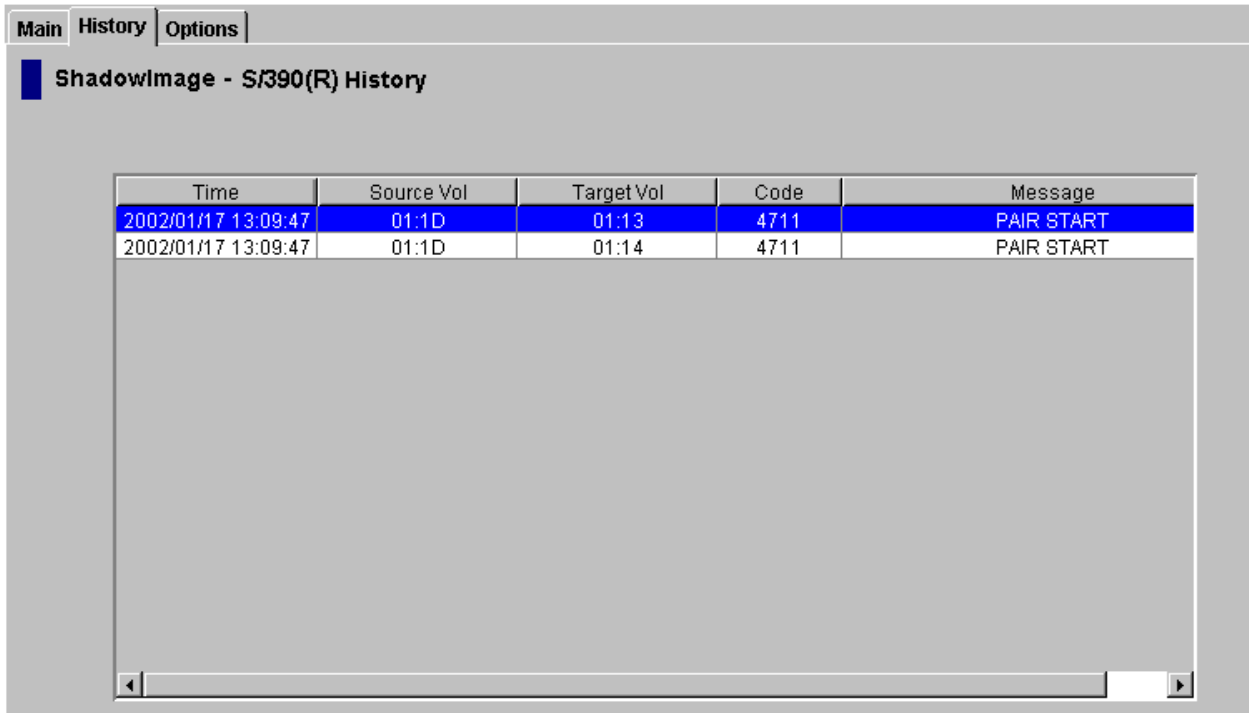
Figure 3.4   Example of FCQUERY Command

Table 3.3   Status Displayed by FCQUERY Command

Pair Status	Description
SIMPLEX	Volume is in the simplex status.
CC	Used by Concurrent Copy.
XRC	Used by XRC source volume.
PPRC	PPRC pair.
FC xxx%	ShadowImage - FlashCopy® pair. If data is being copied in the background, the copy progress (%) is also displayed.

3.2 Viewing ShadowImage – S/390® Pair Status & History

The History panel (see Figure 3.5) displays current ShadowImage – S/390® pair status information as well as ShadowImage – S/390® pair history information for the selected CU image. To open the History panel, select the History tab on the ShadowImage – S/390® main panel.

Figure 3.5   Status & History Panel

The ShadowImage – S/390® History box displays the following information:

■   SI390 pair activity listed by: date and time, S-VOL and T-VOL ID (CU:LDEV), SI390 code and message (see Table 3.4). The **Time** button sorts the list by date and time. The **Source Vol** and **Target Vol** buttons sort the list by S-VOL or T-VOL. The Code button sorts by code number. The **Message** button sorts according to message type.

■   The **Refresh** button on the Storage Navigator main panel updates all information on the History panel.

Table 3.4   ShadowImage Status & History Reference Codes and Messages

Code	Message	Description
4710 - 471F	DUPLEX START	The SI390 initial copy operation started.
4720 - 472F	DUPLEX END	The SI390 initial copy operation ended, and the pair status changed to *Duplex*.
4730 - 473F	SPLIT START	The SI390 split operation started, and the pair status changed to *SP-Pend* or *V-Split*.
4740 - 474F	SPLIT END	The SI390 split operation ended, and the pair status changed to *Split*.
4750 - 475F	RESYNC START RESYNC-R START	The SI390 resync operation started, and the pair status changed to *Resync* or *Resync-R*.
4760 - 476F	RESYNC END RESYNC-R END	The SI390 resync operation ended, and the pair status changed to *Duplex*.
4774	F-COPY START	The ShadowImage - FlashCopy® operation started.
4775	F-COPY END	The ShadowImage - FlashCopy® operation ended normally.
4776	F-COPY DELETE	The ShadowImage - FlashCopy® delete operation was performed.
47A0 - 47AF	PENDING WARNING END	A copy ended with a warning.
47B0 - 47BF	PENDING ABNORMAL END(SVOL BLOCKADE)	A copy ended abnormally due to S-VOL blockade.
47C0 - 47CF	PENDING ABNORMAL END(TVOL BLOCKADE)	A copy ended abnormally due to T-VOL blockade.
47D0 - 47DF	PENDING ABNORMAL END	A copy ended abnormally (reason other than above).
47E7	COMPULSION PAIR SUSPEND	A pair was suspended compulsorily.
4B00 - 4B0F	F-COPY ABNORMAL END	The ShadowImage - FlashCopy® operation ended abnormally.

3.3   Enabling the ShadowImage – S/390® Feature

The user enables the license key required for ShadowImage – S/390® operations on the 9900V Storage Navigator PC. To install the ShadowImage – S/390® license key:

1. Start the Storage Navigator Java applet program for the desired 9900V subsystem. For instructions, refer to the Hitachi 9900V Remote Console - Storage Navigator User's Guide.

2. Enable the ShadowImage – S/390® options on the 9900V Storage Navigator PC and on each ShadowImage – S/390® subsystem. If you plan to use ShadowImage - FlashCopy®, install the ShadowImage - FlashCopy® option, too. Please refer to the Hitachi 9900V Remote Console - Storage Navigator User's Guide for instructions.

Chapter 4   Troubleshooting

4.1   General Troubleshooting

The Hitachi Freedom Storage™ subsystems provide continuous data availability. For troubleshooting information on the subsystem, please refer to the *Hitachi Lightning 9900™ V Series User and Reference Guide* for the subsystem, or contact your Hitachi Data Systems representative.

Table 4.1 provides general troubleshooting information for ShadowImage – FlashCopy® operations. If you need to call the Hitachi Data Systems Support Center, please see section 4.2 for instructions.

Table 4.1   General Troubleshooting

Error	Corrective Action
The 9900V Storage Navigator PC hangs, or SI390 operations do not function properly.	Make sure that all ShadowImage – FlashCopy® requirements and restrictions are met. Check all input values and parameters to make sure you entered the correct information.
Channel enable LED indicators (9900V control panel) are off or flashing.	Please call the Hitachi Data Systems Support Center for assistance.
An R-SIM warning is displayed on the 9900V Storage Navigator PC.	Locate the SIM (see the *9900V Remote Console – Storage Navigator User's Guide* for instructions). Please contact the Hitachi Data Systems Support Center for further information on SIMs.
An SI390 error message is displayed on the Storage Navigator.	Resolve the specified error condition, and then try the SI390 operation again.
There is a problem with the Storage Navigator or SI390 software.	Make sure that the problem is not being caused by the PC or LAN hardware or software. Try restarting the PC and reconnecting to the subsystem.
The pair status is *suspended*.	Check the detailed pair status (SI390 Pair Status panel).

4.2 Calling the Hitachi Data Systems Support Center

If you need to call the Hitachi Data Systems Support Center, make sure to provide as much information about the problem as possible, including the circumstances surrounding the error or failure, the exact content of any error messages displayed on the host system(s), and the reference codes and severity levels of the recent 9900V service information messages (SIMs).

The worldwide Hitachi Data Systems Support Centers are:

- **Hitachi Data Systems North America/Latin America**
  San Diego, California, USA
  1-800-348-4357

- **Hitachi Data Systems Europe**
  Contact Hitachi Data Systems Local Support

- **Hitachi Data Systems Asia Pacific**
  North Ryde, Australia
  011-61-2-9325-3300

Acronyms and Abbreviations

CC	Concurrent Copy
CU	control unit
DKC	disk controller
F-COPY	FlashCopy® status
HRX	Hitachi RapidXchange
LCU	logical control unit
LDEV	logical device
LVI	logical volume image
M-VOL	main volume (for TrueCopy – S/390® pairs)
Pit	Point-in-time
PPRC	point-to-point remote copy
PSP	Preventive Service Planning
R-SIM	remote service information messages
R-VOL	remote volume (for TrueCopy – S/390® pairs)
SI390	ShadowImage – S/390®
SI-FCopy	ShadowImage - FlashCopy® (compatible with IBM FlashCopy®)
SSID	subsystem ID
S-VOL	secondary volume
TC	TrueCopy
TC390	TrueCopy – S/390®
TSO	Time Sharing Option
T-VOL	target volume
VOLSER	volume serial number
XRC	Extended Remote Copy