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Hitachi Universal Storage Platform V
Hitachi Universal Storage Platform VM
Hitachi Data Retention Utility User's Guide

Hitachi Data Systems

ii

Contents

Preface

This document describes and provides instructions for using the Data Retention Utility software to configure and perform Data Retention Utility operations on the Hitachi Universal Storage Platform V (USP V) and Hitachi Universal Storage Platform VM (USP VM) storage systems.

Please read this document carefully to understand how to use this product, and maintain a copy for reference purposes.

This preface includes the following information:

- [Intended Audience](#)
- [Product Version](#)
- [Document Revision Level](#)
- [Changes in this Revision](#)
- [Source Documents for this Revision](#)
- [Document Organization](#)
- [Referenced Documents](#)
- [Document Conventions](#)
- [Convention for Storage Capacity Values](#)
- [Getting Help](#)
- [Comments](#)

Notice: The use of Data Retention Utility and all other Hitachi Data Systems products is governed by the terms of your agreement(s) with Hitachi Data Systems.

Intended Audience

This document is intended for system administrators, Hitachi Data Systems representatives, and Authorized Service Providers who are involved in installing, configuring, and operating the Hitachi Universal Storage Platform V and Hitachi Universal Storage Platform VM storage system.

This document assumes the following:

- The user has a background in data processing and understands RAID storage systems and their basic functions.

- The user is familiar with the Hitachi Universal Storage Platform V and Hitachi Universal Storage Platform VM storage systems and has read the *Universal Storage Platform V and Universal Storage Platform VM User and Reference Guide*.

- The user is familiar with the Storage Navigator software for the Hitachi Universal Storage Platform V and Hitachi Universal Storage Platform VM storage system and has read the *Storage Navigator User's Guide*.

Product Version

This document revision applies to USP V/VM microcode 60-07-3*x* and higher.

Document Revision Level

Revision	Date	Description
MK-96RD612-P	February 2007	Preliminary Release
MK-96RD612-00	April 2007	Initial Release, supersedes and replaces MK-96RD612-P
MK-96RD612-01	May 2007	Revision 1, supersedes and replaces MK-96RD612-00
MK-96RD612-02	September 2007	Revision 2, supersedes and replaces MK-96RD612-01
MK-96RD612-03	December 2007	Revision 3, supersedes and replaces MK-96RD612-02
MK-96RD612-04	November 2008	Revision 4, supersedes and replaces MK-96RD612-03
MK-96RD612-05	March 2009	Revision 5, supersedes and replaces MK-96RD612-04
MK-96RD612-06	June 2009	Revision 6, supersedes and replaces MK-96RD612-05
MK-96RD612-07	July 2010	Revision 7, supersedes and replaces MK-96RD612-06

Source Documents for this Revision

- mp-96rd612-06.doc

- mk-96rd612-07a.doc

Changes in this Revision

- Added a new interoperability section (see Dynamic Provisioning).

Document Organization

The following table provides an overview of the contents and organization of this document. Click the chapter title in the left column to go to that chapter. The first page of each chapter provides links to the sections in that chapter.

Chapter	Description
Chapter 1 - About Data Retention Utility Operations	Provides an overview of setting access attributes.
Chapter 2 - Preparing for Data Retention Utility Operations	Explains preparation for Data Retention Utility operations.
Chapater 3 - Using the Data Retention Utility GUI	Describes the Data Retention Utility windows.
Chapter 4 - Performing Data Retention Utility Operations	Provides instructions for performing the Data Retention Utility operations.
Chapter 5 - Troubleshooting	Provides troubleshooting information for Data Retention Utility and instructions for calling technical support
Acronyms and Abbreviations	Defines the acronyms and abbreviations used in this document.

Referenced Documents

Hitachi Universal Storage Platform V/VM:

- *User and Reference Guide*, MK-96RD635

- *Hitachi Storage Navigator User's Guide*, MK-96RD621

- *Command Control Interface User and Reference Guide*, MK-90RD011

- *Hitachi Virtual Partition Manager User's Guide*, MK-96RD629

- *Hitachi LUN Expansion User's Guide*, MK-96RD616

Document Conventions

The terms "Universal Storage Platform V" and "Universal Storage Platform VM" refer to all models of the Hitachi Universal Storage Platform V and VM storage systems, unless otherwise noted.

This document uses the following typographic conventions:

Convention	Description
Bold	Indicates text on a window, other than the window title, including menus, menu options, buttons, fields, and labels. Example: Click **OK**.
Italic	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: copy *source-file target-file* Angled brackets (< >) are also used to indicate variables.
screen/code	Indicates text that is displayed on screen or entered by the user. Example: # pairdisplay -g oradb
< > angled brackets	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: # pairdisplay -g <group> Italic font is also used to indicate variables.
[ ] 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.
underline	Indicates the default value. Example: [<u>a</u> | b]

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

Icon	Meaning	Description
⚠	Note	Calls attention to important and/or additional information.
💡	Tip	Provides helpful information, guidelines, or suggestions for performing tasks more effectively.
⚠	Caution	Warns the user of adverse conditions and/or consequences (e.g., disruptive operations).
⚠	WARNING	Warns the user of severe conditions and/or consequences (e.g., destructive operations).

Convention for Storage Capacity Values

Physical storage capacity values (e.g., disk drive capacity) are calculated based on the following values:

1 KB = 1,000 bytes
1 MB = $1,000^2$ bytes
1 GB = $1,000^3$ bytes
1 TB = $1,000^4$ bytes
1 PB = $1,000^5$ bytes

Logical storage capacity values (e.g., logical device capacity) are calculated based on the following values:

1 KB = 1,024 (2^{10}) bytes
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 block = 512 bytes

Getting Help

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).

- The exact content of any error messages displayed by Storage Navigator.

- The service information messages (SIMs), including reference codes and severity levels, displayed by Storage Navigator.

The Hitachi Data Systems customer support staff is available 24 hours/day, seven days a week. If you need technical support, please call:

- United States: (800) 446-0744

- Outside the United States: (858) 547-4526

Comments

Please send us your comments on this document: doc.comments@hds.com
Include the document title, number, and revision, and refer to specific section(s) and paragraph(s) whenever possible.

Thank you! (All comments become the property of Hitachi Data Systems.)

1

About Data Retention Utility Operations

The Hitachi Data Retention Utility software for the Hitachi Universal Storage Platform V (USP V) and Hitachi Universal Storage Platform VM (USP VM) enables you to set access attributes for open-systems volumes. This chapter provides an overview of setting access attributes.

☐ Data Retention Utility Components

☐ Data Retention Utility Functions

☐ Interoperability with other Products and Functions

Data Retention Utility Components

To be able to use Data Retention Utility, you need:

- The Universal Storage Platform V/VM storage system
- A computer that runs Storage Navigator (Storage Navigator computer)
- A license key for the Data Retention Utility program product
- Command Control Interface (CCI) (optional)

To perform Data Retention Utility operations, you must use the Storage Navigator software, which is a Java application to be downloaded to a Storage Navigator computer. To be able to use Storage Navigator, you must attach your Storage Navigator computer to the storage system via a LAN, and then make appropriate browser settings. If you are able to use Storage Navigator, you must enable the Data Retention Utility program product using the license key on the Storage Navigator computer. For detailed information, see the *Storage Navigator User's Guide*.

You can use CCI to make some Data Retention Utility settings. You can view some of the CCI settings in the Data Retention Utility GUI. For details, see the *Command Control Interface User and Reference Guide*.

Data Retention Utility Functions

This section explains the functions of Data Retention Utility.

Access Attributes

To restrict read and write operations, you must assign an access attribute to each volume. Data Retention Utility enables you to assign one of the following access attributes to each volume:

- **Read/Write**

  If a volume has the Read/Write attribute, open-systems hosts can perform both read and write operations on the volume.

  You can use USP V/VM copy software to copy data to volumes that have Read/Write attribute. However, if necessary, you can prevent copying data to volumes that have Read/Write attribute.

  All open-systems volumes have the Read/Write attribute by default.

- **Read Only**

  If a volume has the Read Only attribute, open-systems hosts can perform read operations but cannot perform write operations on the volume.

  You cannot use USP V/VM copy software to copy data to volumes that have Read Only attribute.

- **Protect**

  If a volume has the Protect attribute, open-systems hosts cannot access the volume. Open-systems hosts cannot perform either read nor write operations on the volume.

  You cannot use USP V/VM copy software to copy data to volumes that have Protect attribute.

Data Retention Utility does not allow you to assign any access attribute to:

- Mainframe volumes
- Volumes that are not mapped to physical devices

To assign access attributes to volumes, you use Storage Navigator to start Data Retention Utility and then edit access attributes in the Data Retention window. For details on how to assign access attribute, see Changing the Access Attributes.

While the storage administrator can set access attribute to the volumes in any control units (CUs) in the storage system, the storage partition administrator can set access attribute only to the volumes in CUs in the SLPR the storage partition administrator manages. Therefore, if you are a storage partition administrator and using the Data Retention window (see Figure 3-1), only the CUs in your SLPR are displayed. The CUs in the SLPRs which are managed by the other storage partition administrators are not displayed. For detailed information on SLPR, see the *Virtual Partition Manager User's Guide*.

Data Retention Term Function

If you change access attribute of a volume to Read Only or Protect, usually you will be prohibited from changing the access attribute to Read/Write for a certain period of time. The Data Retention window displays the words "**Retention Term**" to mention the period when attempts to change access attribute to Read/Write are prohibited.

You will be prompted to specify a retention term when you change the access attribute of a volume to Read Only or Protect.

After you specify the retention term, you can extend the term, but cannot shorten the term. For details on how to extend the retention term, see Extending the Data Retention Term. If you need to shorten the retention term, you must ask the maintenance personnel to do so.

Figure 1-1 shows an example of access attributes in the window. This example shows the access attributes of the volumes 00, 01, and 02.

LDEV	Attribute	Emulation	Capacity	S-VOL	Reserved	Retention Term	Paths	Mode
00	Read/Write	OPEN-V	58.59 GB	Enable	-	-	0	-
01	Read Only	OPEN-V	58.59 GB	Disable	-	2190 days	0	-
02	Protect	OPEN-V	58.59 GB	Disable	-	0 days	0	Inv

Figure 1-1   Access Attributes Displayed in the Window

In Figure 1-1, for example, you cannot change the access attribute of the volume #01 to Read/Write in the next 2,190 days, because the retention term for this volume is 2,190 days. If you need to change the access attribute of this volume to Read/Write, you must ask maintenance personnel to do so.

Expiration Lock Function

You will be able to change the access attribute of a volume from Read Only to Read/Write or from Protect to Read/Write when the retention term ends; **Retention Term** displays **0 days** when the retention term is over. In Figure 1-1, for example, you can change the access attribute of the volume #02 to Read/Write because the retention term is over. However, if you enable expiration lock in the Data Retention window, attempts to change Read Only volumes or Protect volumes to Read/Write volumes will fail even when the retention term is over. Expiration lock is disabled when you start Data Retention Utility for the first time. If you want to enable expiration lock, see Enabling/Disabling the Expiration Lock Function.

S-VOL Disable Function

When USP V/VM copy software copies data, the data on the copy destination volume (also known as secondary volume) will be overwritten. If a volume containing important data is specified as a secondary volume by mistake, USP V/VM copy software can overwrite important data on the volume and you could suffer loss of important data. Data Retention Utility enables you to avoid such loss of data.

If you assign S-VOL Disable attribute to a volume, USP V/VM copy software will be unable to copy data to that volume. Also, if you assign Read Only attribute or Protect attribute to a volume as an access attribute, any other write operations will be prohibited on that volume. For example, business application software will be unable to write data to such a volume.

If you want to prohibit USP V/VM copy software from copying data to a volume but do not want to prohibit other write operations to the same volume, you must ensure that the volume has Read/Write attribute. Also, you must assign S-VOL Disable attribute to that volume to prevent USP V/VM copy software from copying data to that volume. For detailed information about how to do this, see Setting the S-VOL Disable Function.

- USP V/VM copy software refers to TrueCopy, Universal Replicator, ShadowImage, and Copy-on-Write Snapshot.

- Secondary volumes (i.e. copy destination volumes) are often referred to S-VOLs in USP V/VM documentation.

Reserve Function

The LUN Manager software enables Storage Navigator users to change LU path configurations and command device configurations. However, if you use Data Retention Utility to protect a volume, Storage Navigator users will be unable to change LU path settings and command device setting on the volume. For detailed information about how to prevent Storage Navigator users from changing the settings, see Setting the Reserve Function.

The **Reserved** column in the Data Retention window shows whether Storage Navigator users can change LU path settings and command device settings on the volume.

If Command Control Interface (CCI) is installed on a host, you can change LU path settings and command device settings from the host.

Interoperability with other Products and Functions

This section explains notes on using Data Retention Utility with other products.

LUN Expansion

You cannot combine volumes that do not have Read/Write attribute when you create a LUSE volume. You can, however, assign an access attribute other than Read/Write to the resulting LUSE volume.

You cannot release a LUSE volume that does not have Read/Write attribute.

Virtual LVI/LUN

You cannot convert volumes that do not have Read/Write attribute into spaces.

You cannot initialize customized volumes that do not have Read/Write attribute.

Command Control Interface

When you view the Data Retention window, another user might be using the CCI to change the access attribute of a volume. If the CCI user changes the access attribute of a volume when you are viewing the Data Retention window, you will be unable to change the access attribute of the volume by using Data Retention Utility. Then, if you attempt to change the access attribute of the volume by using the Data Retention Utility, an error occurs. If the error occurs, click **File** and then **Refresh** on the menu bar of the Storage Navigator main window, and then retry changing the access attribute of the volume.

Dynamic Provisioning

With Dynamic Provisioning, you can use the Data Retention Utility when the pool is full. For detailed information, see the section describing full pool handling in the *Dynamic Provisioning User's Guide*.

Auto Start Products

Some program products are likely to start automatically at the time specified by the user. For example, if a Volume Migration user or a Performance Monitor user specifies the time for starting the monitor, the monitor will automatically start at the specified time.

If any program product that can start automatically is enabled, you must do one of the following:

- Perform Data Retention Utility operations when the program is not running
- Cancel the setting of the program start time

2

Preparing for Data Retention Utility Operations

This chapter explains preparation for Data Retention Utility operations.

☐ Prerequisites and Restrictions for Data Retention Utility

☐ Installing and Uninstalling Data Retention Utility

☐ Starting Data Retention Utility

Prerequisites and Restrictions for Data Retention Utility

Data Retention Utility does not allow you to change the access attribute of the following volumes:

- Volumes of types that are not supported by Data Retention Utility (e.g., mainframe volumes). The supported device emulation types are:
  - OPEN-V, OPEN-3, OPEN-8, OPEN-9, OPEN-E, OPEN-K, OPEN-L
- Volumes that are configured as command devices
- Volumes that are specified as TrueCopy S-VOLs*
- Volumes that are specified as Universal Replicator S-VOLs* or journal volumes
- Volumes that are specified as ShadowImage S-VOLs*
- Volumes that are specified as S-VOL of Copy-on-Write Snapshot*
- Volumes that are reserved for the Volume Migration function
- Pool volumes
- Virtual volumes that are used for Copy-on-Write Snapshot

⚠️ *Note:* You may change the access attribute of S-VOLs depending on the pair status. For details, see the user guide for the copy software.

Installing and Uninstalling Data Retention Utility

You need to install Data Retention Utility using a license key to perform the Data Retention Utility operations on the Storage Navigator computer.

To install the Data Retention Utility license key:

1. Start the Storage Navigator Java application for the desired storage system.

2. Enable the Data Retention Utility options on the Storage Navigator computer and on each storage system.

For details about these instructions and details on how to uninstall Data Retention Utility, see the *Storage Navigator User's Guide*.

Starting Data Retention Utility

This section describes how to start the Data Retention Utility software.

> ⚠️ **WARNING:** Do not perform Data Retention Utility operations if any other program product is running.

To start the Data Retention Utility software:

1. Log on to the service processor (SVP) to open the Storage Navigator main window.

   To assign access attributes, you must use a user account that has the write permission. If you use a user account that does not have the write permission, you will be able to view access attributes but will be unable to assign access attributes.

2. Select **Go**, **Data Retention**, and then **Data Retention** from the menu bar of the Storage Navigator main window.

   The Data Retention window appears (see <u>Figure 3-1</u>).

3. Change to Modify Mode.

   If you are going to implement any changes for Data Retention Utility, you must be in **Modify** mode. If you are in **View** mode, you can look at access attributes in the Data Retention window, but cannot implement any changes.

For detailed information on user accounts or **Modify** Mode, see the *Storage Navigator User's Guide*.

3

Using the Data Retention Utility GUI

This chapter describes the various elements of the Data Retention Utility graphical user interface:

☐ Data Retention Window

This chapter describes only the Data Retention Utility window and associated dialog boxes. For general information on Storage Navigator features, see the *Storage Navigator User's Guide*.

Data Retention Window

The Data Retention window appears when you start the Data Retention Utility. This window is the starting point for all the Data Retention Utility operations.

To open the Data Retention Utility window, on the menu bar of the Storage Navigator main window click **Go**, then **Data Retention**, and the **Data Retention**.
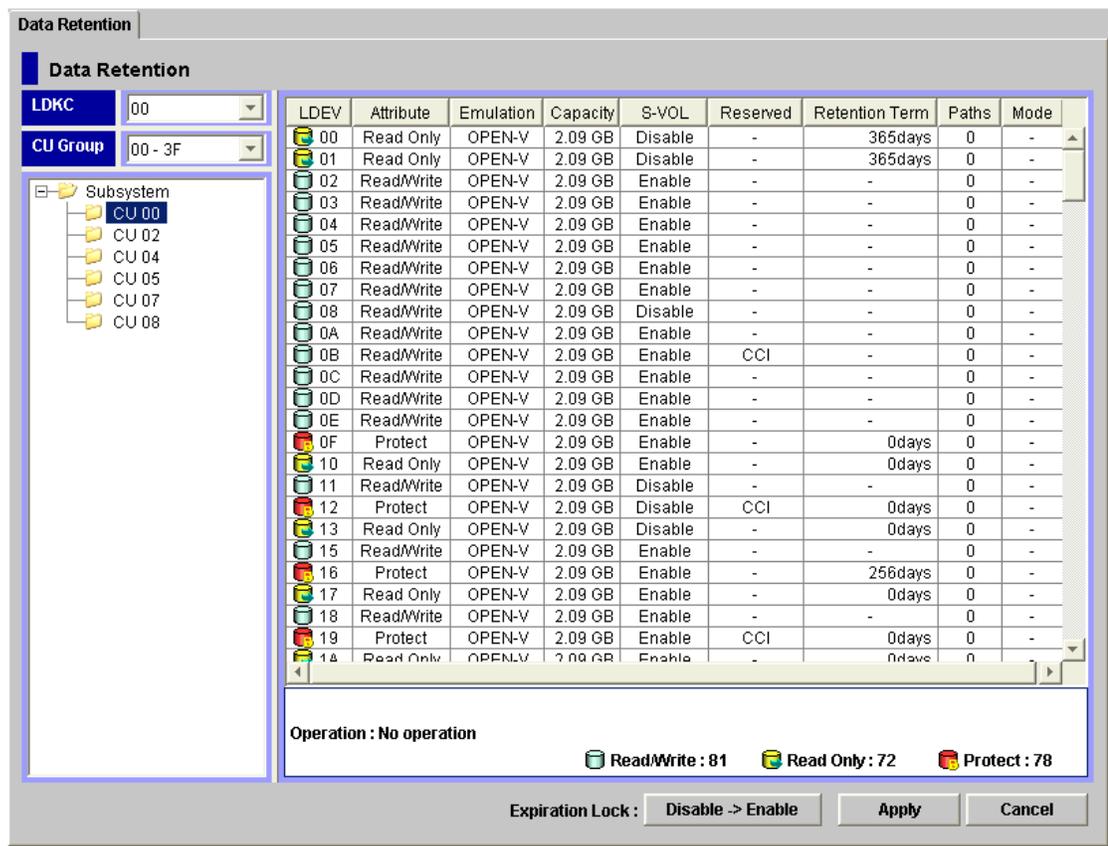

Figure 3-1   Data Retention Window

Item	Description
LDKC	Select the LDKC (00 or 01) that contains the desired CU group(s).
CU Group	Select the CU group that contains the desired CU(s). Choose from the following CU groups: ▪ 00-3F ▪ 40-7F ▪ 80-BF ▪ C0-FE
Tree	The tree shows the list of CUs. Select the CU that contains the desired LDEV(s). The individual LDEVs in the CU group appear in the Volume list. The tree displays only the CUs of the volumes to which the user can set access attribute. Therefore, when a partitioned-storage administrator is using the tree, the tree displays only the CUs of the SLPR that the partitioned-storage administrator manages.
Volume list	See Volume List.
Operation	The target of the operation or the name of the operation is displayed after the colon (:). When no operation is performed, **No Operation** is displayed.
Volume icons	In the lower right corner of the Data Retention window, icons for each of the three types of attributes are displayed with the number of volumes assigned these parameters. ▪ **Read/Write**: Enables open-systems hosts to perform both read and write operations on the volume. ▪ **Read Only**: Enables open-systems hosts to perform read operations but cannot perform write operations on the volume. ▪ **Protect**: Prevents open-systems hosts from accessing the volume. Open-systems hosts cannot perform either read nor write operations on the volume.
Expiration Lock	Lets you implement enhanced volume protection. When you enable the Expiration Lock, attempts to change access attribute from Read Only or Protect to Read/Write will fail even after the retention term is over. The status of the Expiration Lock is displayed in two combinations of the settings. When you start the Data Retention Utility for the first time, **Disable -> Enable** is displayed as the system default. ▪ **Disable -> Enable**: This combination means the expiration lock is disabled. You can change access attribute to Read/Write when the retention term is over (i.e., when **Retention Term** displays **0 days**). If you click the **Disable -> Enable** button, expiration lock will be enabled, and the button will change to **Enable -> Disable**. ▪ **Enable -> Disable**: This combination means the expiration lock is enabled. You cannot change access attribute to Read/Write even when the retention term is over (i.e., even when **Retention Term** displays **0 days**). If you click the **Enable -> Disable** button, expiration lock will be disabled, and the button will change to **Disable -> Enable**.
Apply	Applies settings in the Data Retention window to the storage system.
Cancel	Discards setting changes made before **Apply** is clicked.

Volume List

The Volume list appears in the right area of Data Retention window when you select a CU in the tree. The volume list displays a list of volumes in the specified CU and enables you to find the access attribute of each volume.

If two or more volumes are combined into a LUSE volume, Data Retention Utility displays only the top LDEV but does not display other LDEVs (other volumes) that are combined into the LUSE volume. For example, if three volumes **03**, **04**, and **05** in the CU **01** are combined into a LUSE volume, the volume list in the Data Retention window displays the volume number **03**, but does not display **04** and **05**. If you want to view all volumes that form a LUSE volume, see Viewing a List of Logical Volumes Combined into a LUSE Volume.

Item	Description
LDEV	Displays volume numbers with the following icons: : Indicates a volume that has the **Read/Write** attribute. : Indicates a volume that has the **Read Only** attribute. : Indicates a volume that has the **Protect** attribute. ▪ If **#** is displayed to the right of a volume number, the volume is an external volume. If **V** is displayed to the right of a volume number, the volume is a virtual volume. If **X** is displayed to the right of a volume number, the volume is a virtual volume for Dynamic Provisioning™. ▪ If two or more volumes are combined into a LUSE volume, the Data Retention Utility considers the combined volumes as a single unit.
Attribute	Indicates the access attribute of each volume. These values can also be assigned using the Command Control Interface (CCI).
Emulation	Displays volume emulation types. If an asterisk and a number appear to the right of an emulation type, the volume is a LUSE volume. For example, OPEN-V*36 indicates a LUSE volume in which 36 volumes are combined.
Capacity	Displays the capacity (in gigabytes) of each volume; this value is shown to two decimal places.
S-VOL	Indicates whether the volume can be specified as a secondary volume (S-VOL), which is a copy destination volume for USP V/VM copy operations (e.g., ShadowImage, TrueCopy). You can also use the CCI to specify whether each volume can be used as a secondary volume.
Reserved	Indicates by a hyphen or the letters CCI which tools can be used to set the LU path settings and command device settings. ▪ A **hyphen (-)** indicates that CCI and Storage Navigator can be used to make LU path settings and command device settings. LUN Manager is required when you use Storage Navigator to make these settings. ▪ **CCI** indicates that CCI can be used to make LU path and command device settings, but Storage Navigator cannot be used to do so.

Item	Description
Retention Term	Displays the period (in days) when you are prohibited from changing access attribute to Read/Write. For example, if **500 days** is displayed, attempts to change access attribute to Read/Write are prohibited in the next 500 days. If **Unlimited** is displayed, the retention term is extended unlimitedly. If the retention term is **0 days**, you can change access attribute to Read/Write. During the retention term, you can change Read Only to Protect, or vice versa.
	Caution: You can extend the retention term of the volume, but cannot shorten the retention term. For details on how to extend the retention term, see Extending the Data Retention Term. If you need to shorten the retention term, you must ask the maintenance personnel to do so.
Paths	Displays the number of LU paths to each volume.
Mode	Displays the mode that the CCI user assigns to the volume.
	Caution: You cannot use the Data Retention Utility to change modes. You must use the CCI to change modes.
	▪ **Zer** indicates that Zero Read Cap mode is assigned to the volume. If the Read Capacity command (which is a SCSI command) is issued to a volume in Zero Read Cap mode, it will be reported that the capacity of the volume is zero.
	▪ **Inv** indicates that Invisible mode is assigned to the volume. If the Inquiry command (which is a SCSI command) is issued to a volume in Invisible mode, it will be reported that the volume does not exist. Therefore, the hosts will be unable to recognize the volume.
	▪ **Zer/Inv** indicates that both Zero Read Cap mode and Invisible mode are assigned to the volume.
	▪ **-** (a hyphen) indicates that no mode is assigned by CCI to the volume.

4

Performing Data Retention Utility Operations

This chapter provides instructions for performing the Data Retention Utility operations.

- [Changing the Access Attributes](#)
- [Extending the Data Retention Term](#)
- [Enabling/Disabling the Expiration Lock Function](#)
- [Setting the S-VOL Disable/Enable Function](#)
- [Setting the Reserve Function](#)
- [Viewing a List of Logical Volumes Combined into a LUSE Volume](#)

Changing the Access Attributes

To change access attributes of volumes and apply the changes to the storage system, take the following steps:

> **WARNING:** Do not assign an access attribute to a volume if any job is manipulating data on the volume. If you assign an access attribute to such a volume, the job will possibly end abnormally.

Important:

- If you change access attribute of a volume to Read Only or Protect, usually you will be prohibited from changing the access attribute to Read/Write for a certain period of time. The Data Retention window displays the words "**Retention Term**" to mention the period when attempts to change access attribute to Read/Write are prohibited. If you need to change access attribute to Read/Write during the retention term, you must ask the maintenance personnel to do so.

- If you change the access attribute of a volume to S-VOL Disable, USP V/VM copy software will be unable to copy data to the volume.

To change access attributes of one or more volumes:

1. Ensure that you are in Modify mode. For detailed information, see the *Storage Navigator User's Guide*.

2. In the Data Retention window, select an LDKC number from the **LDKC** drop-down list.

3. From the **CU Group** drop-down list, select a group to which a CU belongs. The tree displays a list of CUs in the specified CU group.

4. Select a CU from the tree. The volume list displays a list of volumes in the specified CU.

5. Select and right-click a volume whose access attribute you want to change. You may select multiple volumes.

6. Select **Attribute** in the pop-up menu, and then select the desired access attribute from the submenu. If you select **Read Only** or **Protect**, you must also take the following steps:

   a. In the Term Setting dialog box, enter the desired retention term.

      If you want to protect the volume indefinitely, select **Unlimited**.

      If you select **Unlimited**, you will need to ask the maintenance personnel to change the retention term when you wish to change it.

   b. Select **OK** to close the Term Setting dialog box.

   The volume is displayed in blue and italics when the access attribute changes. The volume icon also changes when the access attribute changes. If you want to change access attribute of other volumes, repeat this step.

7. If you want to change access attributes of volumes in other CU, repeat steps 2 to 6. If not, go to the next step.

   Here, the settings have not been applied to the storage system.

8. To apply the settings, Click **Apply** in the Data Retention window. A message appears and asks whether you want to apply the settings to the storage system.

9. Click **OK**. The settings are applied to the storage system.

Figure 4-1   Using Pop-up Commands to Change Access Attribute (Step 1)

Notes :

- *R/W* indicates Read/Write. *R/O* indicates Read Only. *Pro* indicates Protect.
- The blue arrow *->* indicates that the access attribute will change. For example, *R/W -> R/O* indicates that the access attribute will change from Read/Write to Read Only. Also, *R/W -> Pro* indicates that the access attribute will change from Read/Write to Protect.

Figure 4-2   Using Pop-up Commands to Change Access Attribute (Step 2)

Extending the Data Retention Term

If you change access attribute of a volume to Read Only or Protect, usually you will be prohibited from changing the access attribute to Read/Write for a certain period of time. The Data Retention window displays the words "**Retention Term**" to mention the period when you are prohibited from changing the access attribute to Read/Write. The following procedure enables you to extend a retention term.

Important: Data Retention Utility does not enable you to shorten the retention term. If you want to shorten the retention term, you must ask the maintenance personnel to do so.

To extend the retention term of a volume:

1. Ensure that you are in Modify mode. For detailed information, see the *Storage Navigator User's Guide*.

2. In the Data Retention window, select an LDKC number from the **LDKC** drop-down list.

3. From the **CU Group** drop-down list, select a group to which a CU belongs. The tree displays a list of CUs in the specified CU group.

4. Select a CU from the tree. The volume list displays a list of volumes in the specified CU. The volume list displays the **Retention Term** column.

5. Select and right-click the desired volume, and select **Retention Term** from the pop-up menu to open the Term Setting dialog box appears.

6. In the Term Setting dialog box, specify the retention term. To extend the retention term indefinitely, select **Unlimited**.

   If you select **Unlimited**, you will need to ask the maintenance personnel to change the retention term when you wish to change it.

7. Select **OK** to close the Term Setting dialog box. The settings that you have made are displayed in italics and in blue.

   Here, the settings have not been applied to the storage system.

8. To apply the settings, Click **Apply** in the Data Retention window. A message appears and asks whether you want to apply the settings to the storage system.

9. Click **OK**. The settings are applied to the storage system.

Term Setting Dialog Box

The Term Setting dialog box enables you to specify a retention term, which is a period when attempts to change access attribute to Read/Write are prohibited.

Figure 4-3   Term Setting Dialog Box

The Term Setting dialog box displays the following items:

- **Term:** The following boxes enable you to specify a retention term.
    - The **years** box enables you to specify the number of years within the range of 0 to 60. Note that Data Retention Utility counts one year as 365 days, whether or not the year is a leap year.
    - The **days** box enables you to specify the number of days within the range of 0 to 21900.

    For example, if **10 years 5 days** or **0 years 3655 days** is specified, the access attribute of the volume cannot be changed to Read/Write in the next 3,655 days.

- **Unlimited:** This button extends the retention term indefinitely.

- **OK:** This button closes the Term Setting dialog box and applies settings in the Term Setting dialog box to the Data Retention window. Note that this button does not apply the settings to the storage system. To apply the settings to the storage system, you must click **Apply** in the Data Retention window.

- **Cancel:** This button discards settings in the Term Setting dialog box and closes the Term Setting dialog box.

Enabling/Disabling the Expiration Lock Function

The Expiration Lock function allows you to prohibit changes to Read/Write even when the retention term is over. If you enable the Expiration Lock function, the Read Only volumes and Protect volumes cannot be changed to Read/Write volumes even after the retention term.

To enable the Expiration Lock function:

1. Ensure that you are in Modify mode. For detailed information, see the *Storage Navigator User's Guide*.

2. In the Data Retention window, locate the button that is displayed to the right of **Expiration Lock**.

   – If the button is **Disable -> Enable**, go to the next step.

   – If the button is **Enable -> Disable**, you do not need to follow the rest of this procedure, because attempts to change access attribute to Read/Write are already prohibited.

3. Select **Disable -> Enable**. A message appears and asks whether you want to apply the settings to the storage system.

4. Click **OK**. The button changes to **Enable -> Disable**, and then expiration lock is enabled. When expiration lock is enabled, access attributes of volumes cannot be changed to Read/Write even after the retention term ends.

• If you disable the expiration lock, the access attribute can be changed to Read/Write after the retention term ends. To disable the expiration lock, click **Enable -> Disable** at the right of **Expiration Lock**.

• Sometimes nothing happens when you click **Disable -> Enable** or **Enable -> Disable**. To get out of this situation, see Troubleshooting.

Setting the S-VOL Disable/Enable Function

Assigning Read Only or Protect attribute is one of the ways to prevent data in a volume from being overwritten by USP V/VM copy software. Volumes having Read Only or Protect attribute are not only protected against these copy operations, but are also protected against any other form of write operations.

If you want to protect a volume from USP V/VM copy operations, you must ensure that the volume has the Read/Write attribute and then assign the S-VOL Disable attribute to the volume. This setting prohibits the volume from being used as a secondary volume for USP V/VM copy operations.

If you want to allow a volume to be used as a secondary volume for copy operations, you must ensure that the volume has the Read/Write attribute and then assign the S-VOL Enable attribute to the volume. This setting allows the volume to be used as a secondary volume for USP V/VM copy operations.

Assigning the S-VOL Disable Attribute

To prevent a Read/Write volume from being used as a secondary volume:

1. Ensure that you are in Modify mode. For detailed information, see the *Storage Navigator User's Guide*.

2. In the Data Retention window, select an LDKC number from the **LDKC** drop-down list.

3. From the **CU Group** drop-down list, select a group to which a CU belongs. The tree displays a list of CUs in the specified CU group.

4. Select a CU from the tree. The volume list displays a list of volumes in the specified CU. Look at the **S-VOL** column of the volume list to find whether volumes can be specified as secondary volumes.

   – The **S-VOL** column displays **Enable** if the volume can be specified as a secondary volume.

   – The **S-VOL** column displays **Disable** if the volume cannot be specified as a secondary volume.

5. Select and right-click the desired volume, and select **S-VOL** and then **Disable** from the pop-up menu. The volume is displayed in blue and italics.

6. If you want to prevent other volumes from being specified as a secondary volume, repeat steps 2 to 5. If not, go to the next step.

   Here, the settings have not been applied to the storage system.

7. To apply the settings, Click **Apply** in the Data Retention window. A message appears and asks whether you want to apply the settings that you have made.

8. Click **OK**. The settings are applied to the storage system.

In some USP V/VM copy software manuals, "S-VOL Disable" refers to the status which "Disable" is displayed in the **S-VOL** column in the Data Retention window.

06	Read/Write	OPEN-V	2.09 GB	Ena -> Dis	-	-
07	Read/Write	OPEN-V	2.09 GB	Enable	-	-
08	Read/Write	OPEN-V	2.09 GB	Disable	-	-
0A	Read/Write	OPEN-V	2.09 GB	Enable	-	-

Notes :
- *Ena* indicates Enable. *Dis* indicates Disable.
- *Ena -> Dis* indicates that the S-VOL column will change from Enable to Disable.

Figure 4-4   Preventing a Logical Volume from being Specified as a Secondary Volume

Assigning the S-VOL Enable Attribute

To allow a Read/Write volume to be used as a secondary volume:

1. Ensure that you are in Modify mode. For detailed information, see the *Storage Navigator User's Guide*.

2. In the Data Retention window, select an LDKC number from the **LDKC** drop-down list.

3. From the **CU Group** drop-down list, select a group to which a CU belongs. The tree displays a list of CUs in the specified CU group.

4. Select a CU from the tree. The volume list displays a list of volumes in the specified CU. Look at the **S-VOL** column of the volume list to find whether volumes can be specified as secondary volumes.

   – The **S-VOL** column displays **Enable** if the volume can be specified as a secondary volume.

   – The **S-VOL** column displays **Disable** if the volume cannot be specified as a secondary volume.

5. Select and right-click the desired volume, and select **S-VOL** and then **Enable** from the pop-up menu. The volume is displayed in blue and italics.

6. If you want to allow other volumes to be specified as a secondary volume, repeat steps 2 to 5. If not, go to the next step.

   Here, the settings have not been applied to the storage system.

7. To apply the settings, Click **Apply** in the Data Retention window. A message appears and asks whether you want to apply the settings that you have made.

8. Click **OK**. The settings are applied to the storage system.

In some USP V/VM copy software manuals, "S-VOL Enable" refers to the status which "Enable" is displayed in the **S-VOL** column in the Data Retention window.

08	Read/Write	OPEN-V	2.09 GB	Dis -> Ena	-	-
0A	Read/Write	OPEN-V	2.09 GB	Enable	-	-
0B	Read/Write	OPEN-V	2.09 GB	Enable	CCI	-
0C	Read/Write	OPEN-V	2.09 GB	Enable	-	-

Notes :
- *Dis* indicates Disable. *Ena* indicates Enable.
- *Dis -> Ena* indicates that the S-VOL column will change from Disable to Enable.

Figure 4-5   Allowing a Logical Volume to be Specified as a Secondary Volume

Setting the Reserve Function

The Reserve function prevents Storage Navigator users from making LU path settings and command device settings on the specified volume. Note that users of Command Control Interface (CCI) can make LU path settings and command device settings on the volume.

To prevent Storage Navigator users from making LU path settings and command device settings:

1. Ensure that you are in Modify mode. For detailed information, see the *Storage Navigator User's Guide*.

2. In the Data Retention window, select an LDKC number from the **LDKC** drop-down list.

3. From the **CU Group** drop-down list, select a group to which a CU belongs. The tree displays a list of CUs in the specified CU group.

4. Select a CU from the tree. The volume list displays a list of volumes in the specified CU.

    – If the **Reserved** column displays a hyphen (-), Storage Navigator users can change LU path settings and command device settings on the volume.

    – If the **Reserved** column displays **CCI**, Storage Navigator users cannot change LU path settings and command device settings on the volume. When this column displays **CCI**, Command Control Interface is required to make LU path settings and command device settings on the volume.

5. Check the **Reserved** column for volumes displayed by a hyphen, and then select and right-click the desired volume, and select **Reserved** and then **Set** from the pop-up menu.

    The **Reserved** column displays **CCI** for the selected volume. The volume is displayed in blue and italics.

6. If you want to prevent Storage Navigator users from configuring other volumes, repeat steps 2 to 5. If not, go to the next step.

    Here, the settings have not been applied to the storage system.

7. To apply the settings, Click **Apply** in the Data Retention window. A message appears and asks whether you want to apply the settings that you have made.

8. Click **OK**. The settings are applied to the storage system.

Tip: To permit Storage Navigator users to make LU path settings and command device settings on a volume, look for volumes displayed by **CCI** in the **Reserved** column, select and right-click the desired volume, and then select **Reserved** and **Release** from the pop-up menu. Finally, confirm that the **Reserved** column displays a hyphen (-), and then click **Apply**. If you need to release a volume, [call the Support Center].

Viewing a List of Logical Volumes Combined into a LUSE Volume

LUN Expansion (LUSE) combines two or more volumes to form a LUSE volume. If volumes are combined into a LUSE volume in your storage system, the Data Retention window does not display all the combined volumes but displays only the top LDEV. If you want to display all the volumes combined into a LUSE volume, follow the procedure below.

The top LDEV is a volume whose LDEV number is the smallest of all the volumes combined into a LUSE volume. For detailed information about LUSE volumes, see the *LUN Expansion User's Guide*.

To view a list of volumes combined into a LUSE volume:

1. Ensure that you are in Modify mode. For detailed information, see the *Storage Navigator User's Guide*.

   If you are in View mode, you will be unable to finish this operation procedure.

2. In the Data Retention window, locate a LUSE volume.

   To locate a LUSE volume, look at the **Emulation** column of the volume list. If the volume is a LUSE volume, an asterisk (*) and a number appear to the right of the emulation type. For example, OPEN-V*3 indicates a LUSE volume consisting of three OPEN-V volumes.

3. Select and right-click the LUSE volume. Next, select **Volume Detail** from the pop-up menu.

   The Volume Detail dialog box appears. This dialog box displays all the volumes combined into the same LUSE volume.

4. View the dialog box contents, and click **OK** to close the dialog box.

Volume Detail Dialog Box

The Volume Detail dialog box enables you to view a list of volumes combined into a LUSE volume. For detailed information about LUSE volumes, see the *LUN Expansion User's Guide*.
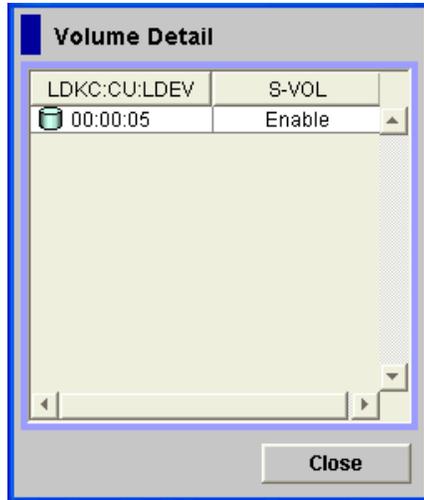

Figure 4-6   The Volume Detail Dialog Box

The Volume Detail dialog box displays the following items:

- **LDKC:CU:LDEV:** This column lists the LDKC number, CU number and the LDEV number (volume number) of volumes combined into a LUSE volume.

- **S-VOL:** This column indicates whether each volume can be specified as a copy destination volume (i.e., a secondary volume) for USP V/VM copy operations. **Enable** appears if the volume can be specified as a copy destination volume. **Disable** appears if the volume cannot be specified as a copy destination volume.

- **Close:** This button closes the Volume Detail dialog box.

5

Troubleshooting

This chapter provides troubleshooting information for Data Retention Utility and instructions for calling technical support.

☐ [Troubleshooting](#)

☐ [Troubleshooting When Using Command Control Interface](#)

☐ [Calling the Hitachi Data Systems Support Center](#)

Troubleshooting Data Retention Utility

If an error occurs with Data Retention Utility, the Error Detail dialog box appears (Figure 5-1). Table 5-1 listing possible problems with Data Retention Utility operations and probable solutions to the problems.

Table 5-1   Troubleshooting Data Retention Utility

Problems	Probable Causes and Solutions
You cannot find some volumes in the volume list of the Data Retention window.	If volumes are combined into a LUSE volume, the volume list displays only the top LDEV of the combined volumes. To view all the volumes combined into a LUSE volume, follow the instructions in Viewing a List of Logical Volumes Combined into a LUSE Volume.
The **Disable -> Enable** button or the **Enable -> Disable** button at the right of **Expiration Lock** is grayed out. Nothing happens when you click the button.	You have been making changes in the Data Retention window, but the changes have not been applied to the storage system. The changes you have been making are displayed in blue and italics. If you cannot find the changes, scroll the volume list up and down. If you still cannot find the changes, select another CU from the tree and then scroll the volume list up and down. If changes are found, do either of the following: ▪ Click **Apply** to apply the changes to the storage system. ▪ Click **Cancel** to discard the changes.
Open-systems hosts cannot read from or write to a volume.	▪ The volume is protected by the Read Only attribute. Write failure is reported as an error message. ▪ The volume is protected by the Protect attribute. Read (or write) failure is reported as an error message.
Mainframe hosts cannot read from or write to a volume.	▪ The volume is protected by the Read Only attribute. Write failure is reported as a Write Inhibit condition. ▪ The volume is protected by the Protect attribute. Read (or write) failure is reported as a cc=3 condition.

Error Detail Dialog Box

The Error Detail dialog box (Figure 5-1) appears when an error occurs in Data Retention Utility operations. The Error Detail dialog box indicates error locations and error messages.
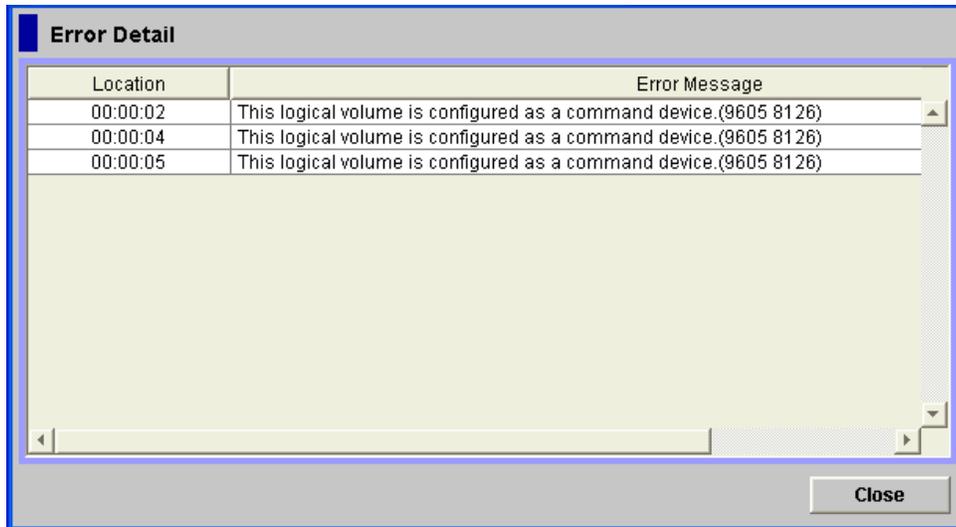

Figure 5-1   Error Detail Dialog Box

The Error Detail dialog box displays the following items:

- **Location:** This column indicates where errors occur. If an error occurs with a volume, this column displays the LDKC number, CU number and the LDEV number (volume number).

- **Error Message:** This column displays the error message. For information about how to remove errors, see the *Storage Navigator Messages*.

- **Close:** This button closes the Error Detail dialog box.

The Error Detail dialog box does not display Storage Navigator error messages. If you want to find information about Storage Navigator errors and the solutions, see the *Storage Navigator User's Guide*.

Troubleshooting When Using Command Control Interface

If an error occurs during the Data Retention Utility operation on the CCI, you might identify the cause of the error by referring to the log displayed on the CCI window or the CCI operation log file. The CCI operation log file is stored in the following directory by default.

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

where:

- * is the instance number.

- HOST is the host name.

To identify the cause of the error using the log file, follow the procedure below. For more information about CCI, see the *Hitachi Command Control Interface (CCI) User and Reference Guide*.

1. Open the CCI log file, and find the error code.

   Example: 11:06:03-37897-10413- SSB = 0xB901,4A96

   Error codes appear on the right of the equal symbol (=). The alphanumeric characters of last four digits on the left of the comma (,) indicate SSB1 (e.g., B901), and the right of the comma (,) indicate SSB2 (e.g., 4A96).

2. Refer to Table 5-2 to find the meaning of the error code.

To identify the cause of the error using the log displayed on the CCI window, follow the procedure below. For more information about CCI, see the *Hitachi Command Control Interface (CCI) User and Reference Guide*.

1. Find the error code from the logs displayed on the CCI window.

   Figure 5-2 shows an example of a log displayed on the CCI window.

It was rejected due to SKEY=0x05, ASC=0x20,SSB=0xB9E1,0xB901 on Serial#(64015)
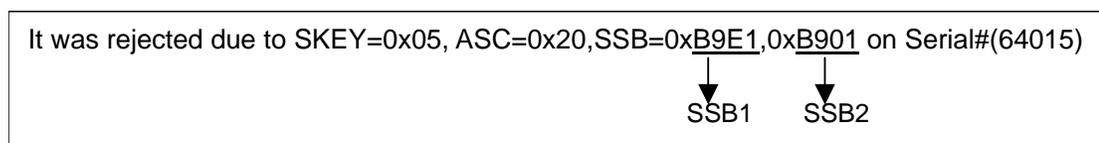
SSB1   SSB2

Figure 5-2   Example of a Log Displayed on The CCI Window.

Error codes appear on the right of "SSB=". The alphanumeric characters of last four digits on the left of the comma (,) indicate SSB1 (e.g., B9E1), and the alphanumeric characters of last four digits on the right of the comma (,) indicate SSB2 (e.g., B901).

2. Refer to Table 5-2 to find the meaning of the error code.

Table 5-2   Error Codes and Error Contents when Using CCI

Error Code (SSB1)	Error Code (SSB2)	Description
B9BF/B9BD	B9BD	The setting failed because the specified volume does not exist.
	B9C2	The specified volume is a command device.
	B9C4	The command was rejected due to one of the following reasons: ▪ The specified volume is a P-VOL or S-VOL of Copy-on-Write Snapshot. ▪ The specified volume is a virtual volume. ▪ The specified volume is a pool volume. ▪ The specified volume is an S-VOL of Universal Replicator. ▪ The specified volume is a journal volume. ▪ The specified volume is reserved for the Volume Migration function. ▪ The specified volume is a P-VOL or S-VOL of ShadowImage. ▪ The consumed capacity exceeded the licensed capacity. ▪ The access attribute cannot be changed because the data retention term is set. ▪ The specified volume is a command device. ▪ The specified volume is in the PAIR or COPY status. ▪ The specified volume does not exist. ▪ The S-VOL Disable attribute is set to the specified volume. ▪ The reserve function cannot be canceled by the CCI.
	B9C7	Data Retention Utility is not installed.
	B9C9	The consumed capacity exceeded the licensed capacity.
	B9CA	Either: ▪ More than 60 years are set as the data retention days, or ▪ The other interface updated the settings while Data Retention Utility was changing the settings (Java conflicted with the other interface).
	B9CB	The data retention term cannot be set because the access attribute is Read/Write.
Note: For details about error codes that are not described in this table, contact the Hitachi Data Systems Support Center (see Calling the Hitachi Data Systems Support Center).		

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).

- The exact content of any error messages displayed by Storage Navigator.

- The Storage Navigator configuration information (use the FD Dump Tool).

- The service information messages (SIMs), including reference codes and severity levels, displayed by Storage Navigator.

The Hitachi Data Systems customer support staff is available 24 hours/day, seven days a week. If you need technical support, call:

- United States: (800) 446-0744

- Outside the United States: (858) 547-4526

Acronyms and Abbreviations

CCI	Command Control Interface
CU	control unit
GB	gigabytes (see Convention for Storage Capacity Values)
I/O	input/output
ID	identification
KB	kilobytes (see Convention for Storage Capacity Values)
LAN	local-area network
LDEV	logical device
LDKC	logical disk controller
LU	logical unit
LUN	logical unit number
LUSE	LU Size Expansion
MB	megabytes (see Convention for Storage Capacity Values)
PB	petabytes (see Convention for Storage Capacity Values)
S-VOL	secondary volume
SLPR	storage logical partition
SVP	service processor
TB	terabyte (see Convention for Storage Capacity Values)
USP V	Hitachi Universal Storage Platform V
USP VM	Hitachi Universal Storage Platform VM

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