HITACHI
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Command Control Interface
Command Reference

Hitachi Virtual Storage Platform G200, G400, G600, G800
Hitachi Virtual Storage Platform F400, F600, F800
Hitachi Virtual Storage Platform G1000, G1500, F1500
Hitachi Unified Storage VM
Hitachi Virtual Storage Platform
Hitachi Universal Storage Platform V/VM

FASTFIND LINKS

Product Version

Getting Help

Contents

Hitachi Data Systems

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Preface

This document describes and provides instructions for using the Command Control Interface (CCI) software to configure and perform operations on the Hitachi RAID storage systems.

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

- ☐ Intended audience
- ☐ Product version
- ☐ Release notes
- ☐ Changes in this revision
- ☐ Referenced documents
- ☐ Document conventions
- ☐ Convention for storage capacity values
- ☐ Accessing product documentation
- ☐ Getting help
- ☐ Comments

Intended audience

This document is intended for system administrators, Hitachi Data Systems representatives, and authorized service providers who install, configure, and operate the Hitachi RAID storage systems.

Readers of this document should be familiar with the following:

- Data processing and RAID storage systems and their basic functions.
- The Hitachi RAID storage system and the manual for the storage system (for example, *Hitachi Virtual Storage Platform G1000 Product Overview*, *Hitachi Virtual Storage Platform User and Reference Guide*).
- The management software for the storage system (for example, Hitachi Command Suite, Hitachi Device Manager - Storage Navigator, Storage Navigator) and the applicable user manuals (for example, *Hitachi Command Suite User Guide*, *System Administrator Guide*, *Hitachi Storage Navigator User Guide* for VSP, HUS VM, USP V/VM).
- The host systems attached to the Hitachi RAID storage systems.

Product version

This document revision applies to Command Control Interface software version 01-39-03/*xx* or later.

Release notes

The CCI Release Notes are available on Hitachi Data Systems Support Connect: https://knowledge.hds.com/Documents.

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.

Changes in this revision

- Added support for VSP G1500 and VSP F1500.
- Added support for the data deduplication and compression functions:
  - New command: `raidcom initialize pool`
  - Commands with new options: `raidcom add ldev`, `raidcom modify ldev`, `raidcom modify pool`, `raidcom get pool`
  - Command with new output: `raidcom get ldev`
- Added support for Thin Image cascade configuration and clone attribute pairs:
  - Commands with new options: `raidcom add snapshot`, `raidcom delete snapshot`, `raidcom modify snapshot`

    - Commands with new output: `raidcom get ldev`, `raidcom get snapshot`
- Added support for global-active device Active-Active at quorum disk blockage (pairdisplay).
- Added support for LDEV-level Server Priority Manager operations on VSP G1000, G1500, and VSP F1500.
- Added support for creating and deleting parity groups on VSP Gx00 models and VSP Fx00 models.
- Added support for setting and releasing spare drives on VSP Gx00 models and VSP Fx00 models.
- Updated the error code tables.

Referenced documents

Command Control Interface documents:

- *Command Control Interface Installation and Configuration Guide*, MK-90RD7008
- *Command Control Interface User and Reference Guide*, MK-90RD7010

Hitachi Command Suite documents:

- *Hitachi Command Suite User Guide*, MK-90HC172

Hitachi Virtual Storage Platform G200, G400, G600, G800 and Hitachi Virtual Storage Platform F400, F600, F800 documents:

- *Hitachi Thin Image User Guide* , MK-92RD8011
- *Provisioning Guide for Hitachi Virtual Storage Platform Gx00 and Fx00 Models*, MK-94HM8014
- *System Administrator Guide for Hitachi Virtual Storage Platform Gx00 and Fx00 Models*, MK-94HM8016
- *Hitachi Device Manager - Storage Navigator Messages*, MK-94HM8017
- *Hitachi TrueCopy® User Guide*, MK-94HM8019
- *Hitachi ShadowImage® User Guide*, MK-94HM8021
- *Hitachi Universal Replicator User Guide*, MK-94HM8023
- *Hitachi Universal Volume Manager User Guide* , MK-92RD8024

Hitachi Virtual Storage Platform G1000 documents:

- *Product Overview*, MK-92RD8051
- *Hitachi Thin Image User Guide*, MK-92RD8011
- *Provisioning Guide for Open Systems*, MK-92RD8014
- *System Administrator Guide*, MK-92RD8016
- *Hitachi Device Manager - Storage Navigator Messages*, MK-92RD8017
- *Hitachi TrueCopy® User Guide*, MK-92RD8019
- *Hitachi ShadowImage® User Guide*, MK-92RD8021

- *Hitachi Universal Replicator User Guide*, MK-92RD8023
- *Hitachi Universal Volume Manager User Guide*, MK-92RD8024
- *Global-Active Device User Guide*, MK-92RD8072

Hitachi Unified Storage VM documents:

- *Provisioning Guide*, MK-92HM7012
- *Hitachi ShadowImage® User Guide*, MK-92HM7013
- *Hitachi Storage Navigator User Guide*, MK-92HM7016
- *Hitachi Storage Navigator Messages*, MK-92HM7017
- *Hitachi TrueCopy® User Guide*, MK-92HM7018
- *Hitachi Universal Replicator User Guide*, MK-92HM7019
- *Hitachi Universal Volume Manager User Guide*, MK-92HM7020

Hitachi Virtual Storage Platform documents:

- *Hitachi Copy-on-Write Snapshot User Guide*, MK-90RD7013
- *Provisioning Guide for Mainframe Systems*, MK-90RD7021
- *Provisioning Guide for Open Systems*, MK-90RD7022
- *Hitachi ShadowImage® for Mainframe User Guide*, MK-90RD7023
- *Hitachi ShadowImage® User Guide*, MK-90RD7024
- *Hitachi Storage Navigator User Guide*, MK-90RD7027
- *Hitachi Storage Navigator Messages*, MK-90RD7028
- *Hitachi TrueCopy® User Guide*, MK-90RD7029
- *Hitachi TrueCopy® for Mainframe User Guide*, MK-90RD7030
- *Hitachi Universal Replicator for Mainframe User Guide*, MK-90RD7031
- *Hitachi Universal Replicator User Guide*, MK-90RD7032
- *Hitachi Universal Volume Manager User Guide*, MK-90RD7033

Hitachi Universal Storage Platform V/VM documents:

- *Hitachi Copy-on-Write Snapshot User Guide*, MK-96RD607
- *Hitachi Storage Navigator Messages*, MK-96RD613
- *LUN Manager User's Guide*, MK-96RD615
- *Hitachi ShadowImage® User Guide*, MK-96RD618
- *Hitachi ShadowImage for IBM® z/OS® User's Guide*, MK-96RD619
- *Hitachi Storage Navigator User Guide*, MK-96RD621
- *Hitachi TrueCopy® User Guide*, MK-96RD622
- *Hitachi TrueCopy for IBM® z/OS® User's Guide*, MK-96RD623
- *Hitachi Universal Replicator User Guide*, MK-96RD624
- *Hitachi Universal Replicator for IBM® z/OS® User's Guide*, MK-96RD625
- *Hitachi Universal Volume Manager User Guide*, MK-96RD626

Document conventions

This document uses the following terminology conventions:

Convention	Description
Hitachi RAID storage system	Refers to all supported models unless otherwise noted.
Hitachi Virtual Storage Platform G200, G400, G600, G800 (VSP G200, G400, G600, G800) VSP Gx00 models	Refers to all models of the Hitachi Virtual Storage Platform G200, G400, G600, G800 storage systems, unless otherwise noted.
Hitachi Virtual Storage Platform F400, F600, F800 (VSP F400, F600, F800) VSP Fx00 models VSP F series	Refers to all models of the Hitachi Virtual Storage Platform F400, F600, F800 storage systems, unless otherwise noted.
Hitachi enterprise storage system	Refers to the Hitachi RAID storage systems except for the VSP Gx00 models, VSP Fx00 models, and HUS VM.

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.

Convention	Description
| (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.
↓*value*↓ floor floor(*value*)	Floor function (round down value to the next integer)
↑*value*↑ ceiling ceiling(*value*)	Ceiling function (round up *value* to the next integer)
_ (underlined text)	Default value

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

Icon	Label	Description
	Note	Calls attention to important or additional information.
	Tip	Provides helpful information, guidelines, or suggestions for performing tasks more effectively.
	Important	Provides information that is essential to the completion of a task.
	Caution	Warns the user of adverse conditions or consequences (for example, disruptive operations).
	WARNING	Warns the user of severe conditions or consequences (for example, destructive operations).

Convention 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 KB	1,000 (10^3) bytes
1 MB	1,000 KB or $1{,}000^2$ bytes
1 GB	1,000 MB or $1{,}000^3$ bytes
1 TB	1,000 GB or $1{,}000^4$ bytes
1 PB	1,000 TB or $1{,}000^5$ bytes
1 EB	1,000 PB or $1{,}000^6$ bytes

Logical storage capacity values (for example, logical device 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
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 documentation is available on Hitachi Data Systems Support Connect: https://support.hds.com/en_us/documents.html. 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 Data Systems Support Connect is the destination for technical support of products and solutions sold by Hitachi Data Systems. To contact technical support, log on to Hitachi Data Systems Support Connect for contact information: https://support.hds.com/en_us/contact-us.html.

Hitachi Data Systems Community is a new global online community for HDS 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.hds.com, register, and complete your profile.

Comments

Please send us your comments on this document: doc.comments@hds.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 Data Systems Corporation.

Thank you!

1

Overview of commands

This chapter provides an overview of the Command Control Interface (CCI) commands.

- Summary of commands
- Typographic conventions for command format
- Differences between CCI and Device Manager - Storage Navigator

Summary of commands

Command Control Interface is command-line interface (CLI) software that enables you to perform operations on Hitachi RAID storage systems. CCI can be used from attached hosts and from management clients (for example, Storage Navigator computers).

This document describes and provides the specifications for the CCI commands. There are four types of CCI commands:

- Data management commands on page 1-2
- Configuration setting commands on page 1-4
- Command tools on page 1-11
- Subcommands on page 1-10

Data management commands

Data management operations include data replication and data protection operations. Table 1-1 Data management commands on page 1-2 lists the CCI data management commands in alphabetical order and provides a brief description of each command.

Table 1-1 Data management commands

Command	Description
horcctl	Used for both maintenance and troubleshooting on CCI. The horcctl command allows you to change and display the internal trace control parameters (for example, level, type, buffer size) of the HORC Manager/CCI commands. If a new value is not specified to a parameter, the trace control parameter that is specified currently is displayed. HORC Manager (HORCM) is another name for the CCI software.
horcmshutdown	Script for stopping HORCM.
horcmstart	Script that starts HORCM. This script can also set the environment variables for HORCM as needed (for example, HORCM_CONF, HORCM_LOG, HORCM_LOGS).
horctakeoff	Scripted command for executing multiple HORC operation commands combined. It checks the volume attribute (optionally specified) and decides a takeover action. The horctakeoff operation is defined to change from 3DC multi-target to 3DC multi-hop with the state of running APP, after that the horctakeover command can configure 3DC multi-target on the remote site without stopping the application. The granularity of either a logical volume or volume group can be specified with this command.
horctakeover	Scripted command for executing multiple TrueCopy takeover operations. It checks the specified volume's or group's attributes (paircurchk), decides the takeover function based on the attributes, executes the chosen takeover function, and returns the result.
paircreate	Creates a new volume pair from two unpaired volumes.
paircurchk	Checks the current status of the TrueCopy secondary volume(s) by evaluating the data consistency based on pair status and fence level.
pairdisplay	Displays the pair status allowing you to verify completion of pair operations (for example, paircreate, pairresync). The pairdisplay command is also used to confirm

Command	Description
	the configuration of the pair volume connection path (the physical link of paired volumes and servers).
pairevtwait	Waits for completion of pair creation and pair resynchronization and confirms the status of pair operations
pairmon	Obtains the pair status transition of each volume pair and reports it. If the pair status changes (due to an error or a user-specified command), the pairmon command issues a message.
pairresync	Re-establishes a split pair volume and then restarts the update copy operations to the secondary volume. The pairresync command can resynchronize either a paired logical volume or a group of paired volumes.
pairsplit	Splits and deletes volume pairs.
pairsyncwait	Used to confirm data consistency between the TrueCopy Async/Universal Replicator P-VOL and S-VOL by confirming that required writing was stored in the DFW area of RCU, and confirming whether the last writing just before this command reached the RCU DFW area.
pairvolchk	Checks the attributes and status of a pair volume. It acquires and reports the attribute of a volume or group connected to the local host (issuing the command) or remote host. The volume attribute is SMPL (simplex), P VOL (primary volume), or S VOL (secondary volume).
raidar	Displays the status and I/O activity information for the specified port/TID(s)/LUN(s) at the specified time interval. The configuration information is acquired directly from the storage system (not from the configuration definition file).
raidqry	Displays the configuration of the connected host and RAID storage system.
raidscan	Displays the status information for the specified port/TID(s)/LUN(s)/MU#(s). The information is acquired directly from the storage system (not the configuration definition file).
raidvchkdsp	Displays the parameters for data validation of the specified volumes. Unit of checking for the validation is based on the group of CCI configuration definition file.
raidvchkscan	Displays the port of the storage system (Lightning 9900 V or later), target ID, LDEV mapped for LUN#, and LDEV status, regardless of the configuration definition file.
raidvchkscan (for UR/URz)	Supports the (-v jnl [t] [unit#]) option to find the journal volume list setting. It also displays any information for the journal volume. The Universal Replicator function is available on the USP V/VM and TagmaStore USP/TagmaStore NSC storage systems.
raidvchkscan (for Thin Image, Copy-on-Write Snapshot, or Dynamic Provisioning pool)	Supports the option (-v pid[a] [unit#]) to find the Thin Image, Copy-on-Write Snapshot, or Dynamic Provisioning pool settings, and displays information for the Thin Image, Copy-on-Write Snapshot, or Dynamic Provisioning pool.
raidvchkset	You can set the parameters for data validation of the specified volumes. You also can set to off all of the validation checking without specifying [type]. Unit of checking for the validation is based on the group of CCI configuration definition file.

Configuration setting commands

Table 1-2 Configuration setting commands on page 1-4 lists and describes the CCI configuration setting commands, and Table 1-3 Configuration setting commands only supported by VSP Gx00 models and VSP Fx00 models on page 1-10 lists and describes the configuration setting commands supported only by VSP Gx00 models and VSP Fx00 models. The configuration setting commands include all commands that begin with "raidcom".

Table 1-2 Configuration setting commands

Command	Description
raidcom add copy_grp	Creates a copy group.
raidcom delete copy_grp	Deletes a copy group.
raidcom get copy_grp	Displays copy group information.
raidcom add device_grp	Creates a device group.
raidcom delete device_grp	Deletes a device group.
raidcom get device_grp	Displays a device group.
raidcom add external_grp	Maps an external volume.
raidcom check_ext_storage external_grp	Checks the connection for an external volume and restarts using.
raidcom delete external_grp	Unmaps an external volume to delete the registered external volume from the configuration.
raidcom disconnect external_grp	Disconnects the connection for an external volume.
raidcom get external_grp	Displays the external volume information that is already registered.
raidcom modify external_grp	Changes the attribute of an external volume.
raidcom discover external_storage	Searches the external storage information.
raidcom add host_grp	Creates a host group.
raidcom delete host_grp	Deletes a host group.
raidcom get host_grp	Displays the host group information.
raidcom modify host_grp	Sets the host mode.
raidcom add hba_wwn	Registers a host to a host group.
raidcom delete hba_wwn	Deletes a host (WWN) from a host group.
raidcom get hba_wwn	Displays WWN information of a registered host adapter.
raidcom add journal	Registers a journal volume to a journal.
raidcom delete journal	Deletes a journal volume from a journal. and delete the journal.
raidcom get journal	Displays a journal group information.

Command	Description
raidcom modify journal	Changes an option of Universal Replicator to be used at a journal.
raidcom add ldev	Creates LDEV or V-VOL.
raidcom delete ldev	Deletes LDEV or V-VOL.
raidcom extend ldev	Extends the capacity of V-VOL for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe volume.
raidcom get ldev	Displays LDEV information.
raidcom initialize ldev	Formats an LDEV.
raidcom modify ldev	Changes the attribute of an LDEV.
raidcom modify local_replica_opt	Sets the local replica option.
raidcom get local_replica_opt	View the local replica option.
raidcom add lun	Creates an LU path or alternate path mapping LDEV on LUN in a host group.
raidcom delete lun	Deletes an LU path on the host group of the specified port.
raidcom modify lun	Sets the attribute of an LU.
raidcom discover lun	Searches the external volume information.
raidcom get lun	Displays LU path information.
raidcom add path	Adds an external path to the existed path group.
raidcom check_ext_storage path	Recovers a path for the external volume.
raidcom delete path	Deletes an external path.
raidcom disconnect path	Stops a path for the external volume.
raidcom get path	Displays an external path.
raidcom delete pool	Deletes a pool for Thin Image, Copy-on-Write Snapshot, Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, and active flash for mainframe.
raidcom get pool	Displays pool information for Thin Image, Copy-on-Write Snapshot, Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, and active flash for mainframe.
raidcom modify pool	Sets the options of a pool for Thin Image, Copy-on-Write Snapshot, Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, and active flash for mainframe.
raidcom rename pool	Changes a pool name for a Thin Image, Copy-on-Write Snapshot, Dynamic Provisioning, Dynamic

Command	Description
	Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe pool.
raidcom get port	Displays Port information.
raidcom modify port	Sets an attribute value of a port.
raidcom get parity_grp	Displays a parity group information.
raidcom modify parity_grp	Enables or disables accelerated compression of a parity group.
raidcom add rcu	Registers an RCU.
raidcom delete rcu	Deletes an RCU.
raidcom get rcu	Displays RCU information.
raidcom modify rcu	Sets an attribute of RCU.
raidcom add rcu_path	Add a logical path of RCU.
raidcom delete rcu_path	Deletes a logical path between RCUs.
raidcom get resource	Displays resource group information.
raidcom lock resource	Locks a resource.
raidcom unlock resource	Unlocks a resource.
raidcom add snap_pool	Creates a pool for Thin Image or Copy-on-Write Snapshot.
raidcom get snap_pool	Displays pool information for Thin Image or Copy-on-Write Snapshot.
raidcom add ssid	Adds an SSID to an RCU.
raidcom delete ssid	Deletes an SSID from an RCU.
raidcom add dp_pool	Creates a pool for Dynamic Provisioning and Dynamic Provisioning for Mainframe.
raidcom get dp_pool	Displays pool information for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, and active flash for mainframe.
raidcom set hba_wwn	Sets a nickname to the WWN specified on the specified port.
raidcom reset hba_wwn	Deletes a nickname from the WWN specified on the specified port.
raidcom monitor pool	Starts or stops the performance monitoring pool for Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, and active flash for mainframe.
raidcom reallocate pool	Starts or stops a relocation of the Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, and active flash for mainframe pool.

Command	Description
raidcom get command_status	Displays an error information of the configuration setting command which is executed asynchronously.
raidcom reset command_status	Resets an error information of the configuration setting command which is executed asynchronously.
raidcom add resource	Creates a resource group and adds a resource to a resource group.
raidcom delete resource	Deletes a resource group and deletes a resource from a resource group.
raidcom map resource	Assigns a resource to the virtual storage system.
raidcom unmap resource	Releases a resource in the virtual storage system.
raidcom modify resource	Validates the virtual storage mode.
raidcom get error_message	Displays the error message for an error code.
raidcom modify clpr	Modifies a CLPR.
raidcom get clpr	Displays the CLPR information.
raidcom add snapshot	Adds a combination of the LDEV number and Pool ID to a snapshot group.
raidcom delete snapshot	Deletes the snapshot data and the snapshot group.
raidcom modify snapshot	Operates the snapshot group.
raidcom map snapshot	Maps the snapshot data to the S-VOL.
raidcom unmap snapshot	Unmaps the S-VOL which is mapping the snapshot data.
raidcom get snapshot	Displays the information of snapshot group and snapshot data.
raidcom replace snapshot	Replaces the snapshot data which is mapped to the S-VOL.
raidcom add spm_wwn	Specifies the Server Priority Manager name for WWN.
raidcom add spm_group	Registers Server Priority Manager target WWN to Server Priority Manager group.
raidcom delete spm_wwn	Deletes WWN from the Server Priority Manager targets.
raidcom delete spm_group	Deletes the Server Priority Manager target WWN from the Server Priority Manager group and releases the specified WWN from the monitoring.
raidcom modify spm_wwn	Specifies the Server Priority Manager information to the Server Priority Manager target WWN.
raidcom modify spm_group	Specifies the Server Priority Manager information to the Server Priority Manager target group.

Command	Description
raidcom get spm_wwn	Gets the Server Priority Manager information of the Server Priority Manager target WWN.
raidcom get spm_group	Gets the Server Priority Manager information of the Server Priority Manager target WWN in the specified port by the Server Priority Manager group unit.
raidcom monitor spm_wwn	Gets the monitoring information of Server Priority Manager target WWN.
raidcom monitor spm_group	Gets the monitoring information of Server Priority Manager target WWN by the Server Priority Manager group unit.
raidcom modify spm_ldev	Sets SPM information for a combination of an LDEV and WWN, or an LDEV and iSCSI name.
raidcom delete spm_ldev	Deletes a combination of the SPM target LDEV and WWN, or the SPM target LDEV and iSCSI name from the SPM target.
raidcom monitor spm_ldev	Obtains monitoring information of a combination of an LDEV and WWN, or an LDEV and iSCSI name.
raidcom get spm_ldev	Displays the SPM information for a combination of an LDEV and WWN, or an LDEV and iSCSI name.
raidcom add hba_iscsi	Registers the iSCSI name (on the initiator) of the host bus adapter on the iSCSI target of the specified port.
raidcom delete hba_iscsi	Deletes the host (initiator iSCSI name) from the host group.
raidcom set hba_iscsi	Sets a nickname for the iSCSI name of the initiator on the specified port.
raidcom reset hba_iscsi	Removes the nickname from the iSCSI name.
raidcom get hba_iscsi	Displays the iSCSI name of the host bus adapter on the initiator for each iSCSI target.
raidcom add chap_user	Sets CHAP user name for the specified iSCSI target, and registers the CHAP user name of the host on the initiator set in the specified iSCSI target.
raidcom delete chap_user	Deletes CHAP user name from the specified iSCSI target and the host on the initiator set in the specified iSCSI target.
raidcom set chap_user	Sets the password, called "secret", for the specified CHAP user.
raidcom reset chap_user	Removes the secret from the specified CHAP user.
raidcom get chap_user	Indicates the CHAP user name.
raidcom send ping	Sends a ping and then displays the sending result.

Command	Description
raidcom get license	Acquires the license information.
raidcom add external_iscsi_name	Registers the iSCSI name of the iSCSI target on the external storage system to the iSCSI port of the local storage system.
raidcom delete external_iscsi_name	Deletes the iSCSI name of the iSCSI target on the external storage system, which is registered in the iSCSI port of the specified local storage system.
raidcom modify external_chap_user	Sets the CHAP user name and the secret (password) to the iSCSI target of the specified external storage system.
raidcom modify initiator_chap_user	Sets the CHAP user name and the secret to the iSCSI initiator of the specified local storage system.
raidcom get external_iscsi_name	Displays the iSCSI name of the iSCSI target on the external storage system which is registered in the iSCSI port of the specified local storage system.
raidcom get initiator_iscsi_name	Displays the iSCSI initiator of the iSCSI port on the specified local storage system.
raidcom discover external_iscsi_name	From the iSCSI port of the local storage system, this command searches the iSCSI targets that are registered in the port of the external storage system, and then displays the iSCSI name of the iSCSI target.
raidcom check external_iscsi_name	Attempts to log in to the iSCSI target on the external storage system which has been registered in the local storage system, and then displays the result of the login.
raidcom add rcu_iscsi_port	Registers the RCU-side iSCSI port on the remote storage system to the MCU-side iSCSI port on the local storage system.
raidcom delete rcu_iscsi_port	Deletes the iSCSI port on the remote storage system registered as the RCU side port from the MCU-side iSCSI port on the local storage system.
raidcom get rcu_iscsi_port	Displays the RCU-side iSCSI port on the remote storage system on the remote storage system registered to the MCU-side iSCSI port on the local storage system.
raidcom modify quorum	For quorum disks, sets the period of Read Response Guaranteed Time When Quorum Disk is Blocked.
raidcom get quorum	Displays information about a quorum disk.
raidcom initialize pool	Initializes the deduplication system data volumes and the volumes that contain deduplicated data.

Table 1-3 Configuration setting commands only supported by VSP Gx00 models and VSP Fx00 models

Command	Description
raidcom add license	Installs the license.
raidcom delete license	Removes the license.
raidcom modify license	Changes the license status.
raidcom initialize parity_grp	Formats all areas in the drives of the specified parity group.
raidcom get drive	Displays drive information.
raidcom modify drive	Configures spare drives or cancels the settings.
raidcom add parity_grp	Creates parity groups.
raidcom delete parity_grp	Deletes parity groups.

Subcommands

CCI provides subcommands that are executed as options of CCI commands. The CCI subcommands include the Windows subcommands and the environment variable subcommands. Table 1-4 Windows subcommands on page 1-10 lists the Windows subcommands in alphabetical order and provides a brief description of each subcommand. Table 1-5 Environment variable subcommands on page 1-11 lists the environment variable subcommands in alphabetical order and provides a brief description of each subcommand.

Table 1-4 Windows subcommands

Subcommand	Description
drivescan	Displays the relationship between the disk numbers assigned by the Windows system and the LDEVs on the RAID storage system, and also displays attribute and status information for each LDEV.
findcmddev	Searches for command devices within the specified range of disk drive numbers. If it is found, the command device appears in the same format as in the configuration definition file. This subcommand is used when the command device name is not known and when the HORCM is not started.
mount	Mounts the specified drive to the specified partition on the specified data drive using the drive letter. When the mount subcommand is executed without an argument, all currently mounted drives (including directory mounted volumes) are displayed, and logical drive has been mounting an LDM volume then displays Harddisk#[n] configured an LDM volume.
portscan	Displays the devices on the specified port(s).
sync and syncd	The sync (synchronization) Windows subcommand sends unwritten data remaining on the Windows server to the specified device(s) to synchronize the pair(s) before the CCI command is executed.

Subcommand	Description
	The syncd (sync delay) Windows subcommand waits the delayed IO for dismount after issued 'sync'.

Table 1-5 Environment variable subcommands

Subcommand	Description
env	Displays the environment variables.
setenv	Sets the specified environment variables.
sleep	Causes CCI to wait for the specified time.
usetenv	Deletes the specified environment variables.

Command tools

Table 1-6 Command tools on page 1-11 lists and describes the CCI command tools.

Table 1-6 Command tools

Subcommand	Description
inqraid	Used to confirm the drive connection between the storage system and host system. The inqraid command displays the relation between special file(s) on the host system and actual physical drive of the RAID storage system.
mkconf	Used to make a configuration file from a special file (raw device file) provided via STDIN.
rmawk	Scriptable command used to associate pair operation commands and raidcom commands.

Typographic conventions for command format

This document uses the following terminology conventions for command format. If you specify a parameter that is not described in the options and parameters of the command, the parameter will be ignored.

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* ***Note:*** Angled brackets (< >) are also used to indicate variables.

Convention	Description
`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>` ***Note:*** Italic is also used to indicate variables.
[ ] square brackets	Indicates optional values. Example: [a | b] indicates that you can choose a, b, or nothing.
{ } braces	When items in braces are set off with vertical bars: • Indicates required or expected values. Example: { a | b } indicates that you must choose either a or b. When items in braces are enclosed by square brackets: • Indicates one or more items can be specified. Example: { [-A][-B][-C]} indicates that you can specify one or more items from A, B, or C.
| 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.
... ellipsis	Indicates that the user can type multiple arguments of the same type. The user types only the information, not the ellipsis (…). Example: -ldev_id <ldev#> … Multiple "ldev_id<ldev#>" can be specified.

Differences between CCI and Device Manager - Storage Navigator

This section describes the differences between CCI and Storage Navigator/ Device Manager - Storage Navigator:

- Supported characters on page 1-12
- Maximum number of characters on page 1-15

Supported characters

There are some differences between the supported characters for CCI and the supported characters for Storage Navigator and Device Manager - Storage Navigator. Because of this, you should always use only characters that are supported by both CCI and Storage Navigator/Device Manager - Storage Navigator.

Figure 1-1 Usable characters for CCI commands on page 1-14 shows the characters that can be used in CCI commands and their ASCII codes. Figure 1-2 Usable characters for Storage Navigator/Device Manager - Storage

Navigator on page 1-15 shows the characters that can be used in Storage Navigator and Device Manager - Storage Navigator commands and their ASCII codes. For CCI do not use characters that are not supported by the operating system in which the command is executed.

The following characters are not supported by both CCI and Storage Navigator/Device Manager - Storage Navigator. To ensure that names are usable in both CCI and Storage Navigator/Device Manager - Storage Navigator, do not use these characters in names.

- ! (exclamation mark)
- ' (quotation mark)
- # (number sign)
- $ (dollar sign)
- % (percent sign)
- & (ampersand)
- ' (apostrophe)
- ((left parenthesis)
-) (right parenthesis)
- + (plus sign)
- · (middle dot)
- { (left curly bracket)
- } (right curly bracket)
- | (vertical line)
- ~ (tilde)
- : (colon)
- = (equals sign)

Caution: Observe the following restrictions for using characters:

- The backslash character (\) can be used only on WIN32.
- The forward slash character (/) can be used only on UNIX systems.
- A hyphen can be used in a name, but it cannot be used at the beginning of the name. You can neither use some character codes according to the OS on which you execute the command.
- A space (SP) can be used in a name, but if you specify a space for a user name, reference commands will fail, because a space is used as a delimiter and the commands cannot distinguish whether the space is for user name or delimiter.
- A space can only be used between other characters. If you use a space at the beginning or end of a name, the space is omitted automatically. Also, you cannot use a name consisting only of one or more space characters.

  Examples of using space characters (SP) in a name:

  - "group name" (different from "groupname")

  - "g r o u p n a m e" (different from "groupname" and "group name")

  Examples in which you cannot use a space:

- " name" (same as "name")
- "name " (same as "name")
- " " (invalid)

Low4 bits	High 3 bits							
	0	1	2	3	4	5	6	7
0	NUL	DLE	SP	0	@	P	`	p
1	SOH	DC1	!	1	A	Q	a	q
2	STX	DC2	"	2	B	R	b	r
3	ETX	DC3	#	3	C	S	c	s
4	EOT	DC4	$	4	D	T	d	t
5	ENQ	NAC	%	5	E	U	e	u
6	ACK	SYN	&	6	F	V	f	v
7	BEL	ETB	'	7	G	W	g	w
8	BS	CAN	(	8	H	X	h	x
9	HT	EM	)	9	I	Y	i	y
A	LF/NL	SUB	*	:	J	Z	j	z
B	VT	ESC	+	;	K	[	k	{
C	FF	FS	,	<	L	\	l	|
D	CR	GS	-	=	M	]	m	}
E	SO	RS	.	>	N	^	n	~
F	SI	US	/	?	O	_	o	DEL

: usable

: unusable

Figure 1-1 Usable characters for CCI commands

Low 4 bits	High 3 bits							
	0	1	2	3	4	5	6	7
0	NUL	DLE	SP	0	@	P	`	p
1	SOH	DC1	!	1	A	Q	a	q
2	STX	DC2	"	2	B	R	b	r
3	ETX	DC3	#	3	C	S	c	s
4	EOT	DC4	$	4	D	T	d	t
5	ENQ	NAC	%	5	E	U	e	u
6	ACK	SYN	&	6	F	V	f	v
7	BEL	ETB	'	7	G	W	g	w
8	BS	CAN	(	8	H	X	h	x
9	HT	EM	)	9	I	Y	i	y
A	LF/NL	SUB	*	:	J	Z	j	z
B	VT	ESC	+	;	K	[	k	{
C	FF	FS	,	<	L	\	l	|
D	CR	GS	-	=	M	]	m	}
E	SO	RS	.	>	N	^	n	~
F	SI	US	/	?	O	_	o	DEL

: usable

: unusable

Figure 1-2 Usable characters for Storage Navigator/Device Manager - Storage Navigator

Maximum number of characters

There are some differences between the maximum number of characters for names in CCI commands and the maximum number of characters for names in Storage Navigator and Device Manager - Storage Navigator. Because of this, you should always try to use the number of characters that can be used in both CCI and Storage Navigator/Device Manager - Storage Navigator.

If you enter more than the maximum number of characters for a name in a CCI command, the name is truncated and only the allowable number of characters is used. For example, if the maximum number of characters is 32 and you enter 35 characters, only the first 32 characters are used.

Table 1-7 Maximum number of characters on page 1-16 specifies the maximum number of characters for names in CCI and Storage Navigator/ Device Manager - Storage Navigator. To ensure that names are usable in both CCI and Storage Navigator/Device Manager - Storage Navigator, observe the following requirements:

- WWN nickname: Do not use more than 32 characters.
- User ID: Do not use more than 63 characters.
- Password: Do not use more than 63 characters.

Table 1-7 Maximum number of characters

Name	CCI command	Storage Navigator/ Device Manager - Storage Navigator
Host group name	64 characters	64 characters
Device group name	32 characters	-
Device name	32 characters	-
LDEV nickname	32 characters	32 characters
WWN nickname	64 characters	64 characters
Copy group name	32 characters	32 characters
Pool name	32 characters	32 characters
Resource group name	32 characters	32 characters
User name (User ID)	63 characters	256 characters
User name (Password)	63 characters	256 characters

Operational differences

Table 1-8 Operational differences between CCI and Storage Navigator/Device Manager - Storage Navigator on page 1-16 lists the operational differences between CCI and Storage Navigator/Device Manager - Storage Navigator.

Table 1-8 Operational differences between CCI and Storage Navigator/ Device Manager - Storage Navigator

Operation	CCI	Storage Navigator/ Device Manager - Storage Navigator
Add path or change path for an external volume (UVM)	The path definition is required for each external volume in the path group.	You can specify the path groups on the screen and execute the add/change path at one time.
Operations when the software product is not installed	You can change and delete existing resources for this software product, but you cannot add new resources.	You cannot change or delete existing resources or add new resources.

Operation	CCI	Storage Navigator/ Device Manager - Storage Navigator
Display of WWN	The WWN is displayed only when LUN security is enabled.	The WWN is displayed when LUN security is enabled or disabled.
Pool ID setting	Optional	Required
Create LDEV	You can specify the LDEV size in GB, LBA, or cylinders. When you specify GB, CCI can perform with or without size correction. If the capacity of LDEVs that are created by each GUI and CLI are the same, a copy pair might not be created. To create a pair with the LDEV that is created by GUI, create an LDEV by specifying LBA.	You can specify the LDEV size in GB, LBA, or cylinders. When you specify GB, CCI performs size correction.
Extending the capacity of Dynamic Provisioning or Dynamic Provisioning for Mainframe virtual volume	You need to specify the capacity to be added to the volume.	You need to specify the total capacity after the volume is extended.
Moving the CLPR assigned to the parity groups of LUSE volumes or the parity groups of the volumes including LUSE volumes	CLPRs can be moved, but it is not recommended.	CLPRs cannot be moved.
Moving the CLPR assigned to the journal volumes	CLPRs cannot be moved.	CLPRs can be moved if you specify all LDEVs in the journal.
Deleting SPM name	The registration of the SPM name in the specified port is released by deleting the SPM name from WWN.	The SPM name of WWN is deleted, but the SPM registration is maintained.
Deleting SPM group	WWN is deleted from the group, and the registration of SPM in the specified port is released.	WWN is deleted from the group, but the SPM registration is maintained.
Moving the parity groups which configure the distributed parity group between the CLPRs	Parity groups cannot be moved.	All parity groups which are concatenated are moved.

2

Data management commands

This chapter provides the specifications for the CCI data management (replication and protection) commands.

- paircreate
- pairsplit
- pairresync
- pairevtwait
- pairmon
- pairvolchk
- pairdisplay
- paircurchk (for TrueCopy/global-active device)
- pairsyncwait
- horctakeover
- raidscan
- raidar
- raidqry
- raidvchkset

- raidvchkdsp
- raidvchkscan
- raidvchkscan for Universal Replicator
- raidvchkscan for Thin Image, Copy-on-Write Snapshot, and HDP Pools
- horcmstart
- horcmshutdown
- horcctl
- horctakeoff

paircreate

WARNING: Use the **paircreate** command with caution. The command starts the initial copy operation, which overwrites all data on the secondary (target) volume of the pair. If the primary and secondary volumes are not identified correctly, or if the wrong options are specified (for example, vl instead of vr), data is copied to the wrong volume overwriting and the data in the target of transferring is overwritten.

The *paircreate* command is used to create a new volume pair from two unpaired volumes. The *paircreate* command can create either a paired logical volume or a group of paired volumes. The *paircreate* command allows you to specify the direction (local or remote) of the pair generation (see Figure 2-1 Pair Creation on page 2-3). If local (vl option) is specified, the server issuing the *paircreate* command has the primary volume. If remote (vr option) is specified, the remote server has the primary volume. The -split option of the *paircreate* command (ShadowImage and Copy-on-Write Snapshot only) allows you to simultaneously create and split pairs using a replication command only. When -split is used, the pair status changes from COPY to PSUS (instead of PAIR) when the initial copy operation is complete.

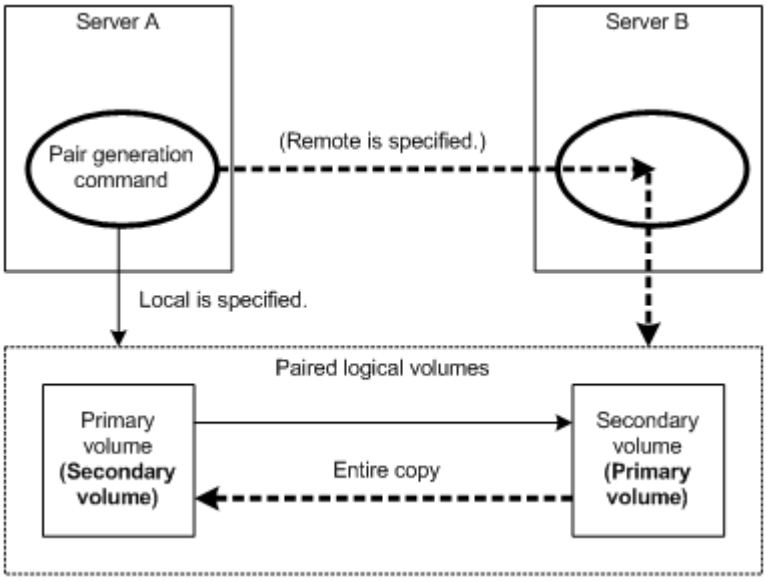


Figure 2-1 Pair Creation

Before issuing the *paircreate* command, make sure that the secondary volume is not mounted on any system. If the secondary volume is found to be mounted after *paircreate*, delete the pair (*pairsplit -S*), unmount the secondary volume, and then reissue the *paircreate* command.

The *paircreate* command terminates before the initial copy operation is complete (except when the nocopy option is specified). Use the pairevtwait or pairdisplay command to verify that the initial copy operation completed successfully (status changes from COPY to PAIR, or from COPY to PSUS if the -split option was specified).

Syntax

```
paircreate { -h | -q | -z[x] | -I[H][M][instance#] or
   -I[TC][SI][instance#]| -g <group>| -d <pair Vol> | -d[g]
<raw_device>
   [MU#] | -FHORC [MU#] or -FCA[MU#] | -d[g] <seq#> <ldev#>
   [MU#]| -f[g] <fence> [CTGID] | -v | -c <size> | -nocopy | -nomsg
|
   -split | [-m <mode>] | -jp <id> | -jq <id> | -js <id> | -pid
<PID> |
   -fq <mode>| -cto <o-time> [c-time] [r-time] | -pvol(svol)
[ldevgrp]-nocsus }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the command.
-z or -zx	Makes the *paircreate* command enter interactive mode. The -zx option guards performing of the HORCM in interactive mode. When this option detects a HORCM shutdown, interactive mode terminates. OpenVMS cannot use the -zx option.
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/ [ShadowImage], and used when specifying the CCI instance number.
-g <group>	Specifies a group name defined in the configuration definition file. The command is executed for the specified group unless the *-d <pair Vol>* option is specified.
-d <pair Vol>	Specifies paired logical volume name defined in the configuration definition file. When this option is specified, the command is executed for the specified paired logical volume.
-d[g] <raw_device > [MU#]	Searches whether the specified raw_device is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of *-g <group>* option. If the specified raw_device is contained in two or more groups, the command is executed for the first group.
-d[g] <seq#> <ldev#> [MU#]	Searches whether the specified LDEV is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of '-g <group>' option. If the specified LDEV is contained in two or more groups, the command is executed on the first group. The <seq#> <LDEV#> values can be specified in hexadecimal (add the '0x' prefix) or decimal notation. When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.

Option	Description
-f[g] <fence> [CTGID]	TrueCopy/TrueCopy Async/Universal Replicator/High Availability Manager/ global-active device only. Specifies the fence level for assuring the consistency of paired volume data. A fence level of 'data', 'status', 'never', or 'async' must be specified. This option must always be specified. Fence level '-f async' can be specified only for TrueCopy Async/Universal Replicator. The '-fg' option is used to make TrueCopy Sync CTG volume, and fence level must be specified as '-fg data', '-fg status', or '-fg never'. Specifies the fence level of '-f never' for HAM. Specifies the fence level of '-f never' or '-fg never' for GAD. The '-fg never' option is used to make CTG volume. 'CTG ID' is assigned as follows: • When no CTG ID is assigned to the other device in the specified volume group: The CTG ID specified by "CTGID" option. If the "CTGID" option is omitted, new CTG ID. • When the CTG ID is already assigned to the other device in the specified volume group: The CTG ID which has been assigned to the other device in the volume group. Note that the CTG ID specified by "CTGID" option is invalid. If 'CTGID' is not specified (with '-f async' or '-fg' option) and the maximum number of consistency groups already exists (for example, 256 for TagmaStore USP/TagmaStore NSC), an EX_ENOCTG error is returned. Therefore, the 'CTG ID' option can forcibly assign an existing CTG ID to a volume group (0-15/0-63/0-127/0-255) on the RAID storage systems only when no CTG ID has been assigned to the volume group. The CTGID option is ignored unless you specify the '-f async' or '-fg' option.
-vl or -vr -pvol [ldevgrp] or -svol [ldevgrp]	Specifies the data flow direction and must always be specified. The -vl(-pvol) option specifies 'local' and the host which issues the command possesses the primary volume. The -vr(-svol) option specifies 'remote' and the remote host possesses the primary volume while the local host possesses the secondary volume. [ldevgrp] makes the specified LDEV group as the second volume.
-c <size>	TrueCopy/TrueCopy Async/ShadowImage/global-active device only. Specifies the track size of extents (1 - 15) to be used for the copy operation. If you specify a large number, the time for copy operation will be shortened. When you want to copy in a short time by stopping Write of P-VOL, specify the maximum value 15. If this option is not specified, the default value (3) is used. In TrueCopy for Mainframe, when you specify the number less than or equal to 3, the copy pace is 3 tracks. When you specify the number more than or equal to 4, the copy pace is 15 tracks. In ShadowImage, when you specify 1 or 2, the copy pace is slow, when you specify 3, the copy pace is medium, and when you specify 4, the copy pace is fast.
-nocopy	Creates paired volumes without copying data when the data consistency of simplex volumes is assured by the user. ***Note:*** This option cannot be specified for ShadowImage or ShadowImage for Mainframe.

Option	Description
-nomsg	Suppresses messages to be displayed when this command is executed. It is used to execute this command from a user program. This option must be specified at the beginning of a command argument. The command execution log is not affected by this option.
-split	ShadowImage/Copy-on-Write Snapshot only. Splits the paired volume after the initial copy operation is complete. This option will return after changed the state in P-VOL_PSUS & S-VOL_COPY immediately, and S-VOL state is changed to 'S-VOL_SSUS' after all data is copied.
-m <mode>	Specifies the mode. mode = noread (ShadowImage only): Specifies the noread mode for hiding the secondary volume. The secondary volume becomes read-disabled when this mode option is specified. The secondary volume is read-enabled when this mode option is omitted. ***Note:*** The primary volume becomes read-disabled during a reverse resync operation (restore option of pairresync command). mode = cyl (TrueCopy/TrueCopy Async/Universal Replicator/High Availability Manager/global-active device only): Set this value when the difference of bitmap is managed by a cylinder unit. mode = trk (TrueCopy/TrueCopy Async/Universal Replicator/High Availability Manager/global-active device only): Set this value when the difference of bitmap is managed by a track unit. ***Note:*** When this mode (cyl or trk) is not specified, the default value is used. About the default value, see the user guide of the storage system or software product used. ***Note:*** When the storage system does not support the bitmap management by a unit of cylinder, the bitmap difference is managed by a track unit if you specify "cyl". For details about the bitmap management which is supported by the storage system, see the user guide of the storage system or software product used. ***Note:*** When the storage system which is the target of a connection does not support the bitmap management by a unit of cylinder, the bitmap difference is managed by a track unit if you specify "cyl". For details about the bitmap management which is supported by the storage system, see the user guide of the storage system or software product used. mode = grp [CTG ID] (ShadowImage/Copy-on-Write Snapshot/Volume Migration only). Makes a group for splitting all ShadowImage pairs specified in a group. Like a TrueCopy Async/Universal Replicator consistency group, ShadowImage guarantees data consistency among multiple LUNs in a group at a single point in time when doing a split using the 'pairsplit -g <group>' command (except '-S' or '-E' option). Specifies the fence level of '-f never' or '-fg never' for GAD. The '-fg never' option is used to make CTG volume. 'CTG ID' is assigned as follows: • When no CTG ID is assigned to the other device in the specified volume group: The CTG ID specified by "CTG ID" option. If the "CTG ID" option is omitted, new CTG ID. • When the CTG ID is already assigned to the other device in the specified volume group:

Option	Description
	The CTG ID which has been assigned to the other device in the volume group. Note that the CTG ID specified by "CTG ID" option is invalid. If 'CTG ID' is not specified and the maximum number of consistency groups already exists, an EX_ENOCTG error is returned. Therefore, the 'CTG ID' option can forcibly assign an existing CTG ID to a volume group (for example, 0-127 on USP V/VM) only when no CTG ID has been assigned to the volume group. For the detail, please refer to Restrictions on specified volumes with '–m grp' option on page 2-11. ***Note:*** This option cannot be specified with '-split' option in the same command. mode = cc (Volume Migration only): Specifies Volume Migration. The *-vl* option specifies 'local', and copies from the local instance LU(P-VOL) to the remote instance LU(S-VOL). An original volume as the local instance LU is migrated from P-VOL to S-VOL, and the physical volume mapping between P-VOL and S-VOL is swapped after copied. The *-vr* option specifies 'remote', and copies from the remote instance LU(P-VOL) to the local instance LU(S-VOL). An original volume as the remote instance LU is migrated from P-VOL to S-VOL, and the physical volume mapping between P-VOL and S-VOL is swapped after copied. During maintenance work on the storage system (Device Manager - Storage Navigator or the maintenance utility is in modify mode), this operation cannot be completed. ***Notes:*** This option cannot be specified with the '-split' option in the same command. This option ignores the '-c <size>' option.
-jp <id> or -jq <id>	Universal Replicator, the HAM configuration or the GAD configuration only. • For Universal Replicator: You can use -jp <id> option when specifying a journal ID for P-VOL. The -jp <id> option is valid when the fence level is set to 'ASYNC', and a journal ID is automatically bound to the CTG ID. • For the HAM configuration or the GAD configuration: You can create a HAM/GAD pair by using either -jp <id> or -jq <id> option. Specify the quorum ID with -f fence (never) option and quorum ID when creating a HAM pair or a GAD pair. You do not need to check the resource group of the quorum volume. The following conditions must be met in the case of the HAM configuration. • It is not a consistency group. • The fence level is set to 'Never'. • The RCU path is set to 'CU Free'. The following conditions must be met in the case of the GAD configuration. • The fence level is set to 'Never'. • The RCU path is set to 'CU Free'.

Option	Description
-js <id>	Universal Replicator only. This option is used when specifying a journal ID for S-VOL. Both the -jp <id> and -js <id> options are valid when the fence level is set to 'ASYNC', and each journal ID is automatically bound to the CTG ID.
-pid <PID>	Copy-on-Write Snapshot only. The user or application can specify the Pool ID so that they can specify independent ID for Copy-on-Write Snapshot pool different from [CTG ID] for splitting at time. LDEVs in a group which was specified by 'PID' belong to the specified Pool for the Copy-on-Write Snapshot. If 'PID' is not specified, then the corresponding LDEVs belong to the default pool ID(0). If the specified pool is for Thin Image, a Thin Image pair is created. If the specified pool is for Copy-on-Write Snapshot, a Copy-on-Write Snapshot pair is created.
-fq <mode>	ShadowImage only. This option is used when specifying the mode whether '-split' is performed or not as 'QUICK'.*mode = normal*. The '*paircreate -split*' is performed as non-quick mode regardless of setting of $HORCC_SPLT environment variable and/or the system option mode 122. *mode = quick*: The '*paircreate -split*' is performed as Quick Split regardless of setting of $HORCC_SPLT environment variable and/or the system option mode 122. If this option is not specified, then the performing of the 'Split' depends on $HORCC_SPLT environment variable and/or the system option mode setting through the SVP, whether the paircreate operation is Quick Split or not. The relationship between '-fq' option and $HORCC_SPLT is as shown below: --- *-fq option $HORCC_SPLT Behavior* --- quick Don't care Quick Split normal Don't care Normal Split Unspecified QUICK Quick Split Unspecified NORMAL Normal Split Unspecified Depends on system option mode 122 --- ***Notes:*** This -fq option also is validated on TrueCopy-TrueCopy/ShadowImage cascading operation using '-FBC [MU#]' option. The *-fq* option is applied to the following storage systems: • TagmaStore USP • TagmaStore NSC • USP V/VM • VSP

Option	Description
	• HUS VM • VSP G1000, G1500, and VSP F1500 • VSP Gx00 models and VSP Fx00 models This option is ignored for Lightning 9900 V, because this behavior maintains the compatibility on 9900V so that you can use the same script adding this option.
-FHORC [MU#] or -FCA [MU#]	This option is used when creating the cascading configuration with -g <group> and -gs <group> option from the local node (takeover node). *-g <group>* is used when specifying the cascading P-VOL, and also -gs <group> option is used when specifying the cascading S-VOL. This operation ignores the -vl or vr option, because S-VOL is specified with -gs <group> option. *-gs <group>:* This 's' option is used when specifying a group name for cascading S-VOL (defined in the configuration definition file). The command is executed for the specified group unless the -ds <pair Vol> option shown below is specified. When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345. *-ds <pair Vol>:* The following options can be specified for cascading S-VOL. -d[g]s <raw_device> [MU#] ... -d[g]s <seq#> <LDEV#> [MU#]
-cto <o-time> [c-time] [r-time]	TrueCopy Async and Universal Replicator only. These options are valid for only TrueCopy Async/Universal Replicator. If you specify -cto <o-time> [c-time] [r-time] option on TrueCopy Sync, it is ignored. o-time: This option is used when setting offloading timer for controlling inflow of write I/O to the specified consistency group. For TrueCopy Async, *o-time* must be specified within the limits of 255 from 1, in units of sec as value. If this option is not specified, 90 seconds is set as default. For Universal Replicator, *o-time* must be specified within the limits of 255 from 1, in units of sec as value. If this option is not specified, 60 seconds is set as default. Use the **`raidcom modify journal`** command to change the value range to 256 to 600. If o-time=0 is specified, the inflow of write I/O becomes invalid. If Sidefile quantity is over limit of Sidefile Area then host side Write I/O is waited for enough space of Sidefile when storing next new write data until this timeout value (1 second to 255 seconds for TrueCopy Async, and 1second to 600 seconds for Universal Replicator). The default timeout values are 90 seconds for TrueCopy Async, and 60 seconds for Universal Replicator. If the timeout happens with this waiting state, then the pair state is changed from PAIR to PSUS state of sidefile (Journal) Full, and its host side Write I/O is continued and Writing data is managed by BITMAP mode. Therefore o-time timeout value must have less a low value than I/O timeout value of the host system [c-time](TrueCopy Async only): This option is used when setting Copy Pending timer to the specified consistency group. c-time must be specified

Option	Description
	within the limits of 15 from 1, in units of minutes as value. If this option is not specified, then this value is set as below. • If consistency group is created, then sets 5 minutes as default, if not, it is not changed. [r-time] (TrueCopy Async only): This option is used when specifying RCU Ready timer to the specified consistency group. r-time can be set from 1 to 10 minutes. If this option is not specified, this value is set as follows: • If consistency group is created, then sets 5 minutes as default; if not, it is not changed. **Notes:** For TrueCopy Async, settings changed by these options are invalid if a consistency group already exists. These parameters are also forwarded to the S-VOL side with the *paircreate* command, and are used when S-VOL is changed to P-VOL. These parameters are maintained and become valid until and when the pair-volumes are changed to SMPL. For Universal Replicator, these parameters can be set and changed when a pair is created in a journal volume in the P(S)JSN status. The parameters are set for the journal on the P-VOL side when the pair is created. To set parameters for the journals on both P-VOL and S-VOL sides, specify as follows: 1. `paircreate -g <group> -vr -f async -nocopy -jp <id> -js <id> -cto <o-time>` 2. `pairsplit -g <group> -S` 3. `paircreate -g <group> -vl -f async -jp <id> -js <id> -cto <o-time>` These parameters are maintained on each journal. Therefore, if you set the value for offloading timer, execute the **`raidcom modify journal`** command on both P-VOL and S-VOL sides.
-nocsus	Universal Replicator only. This option is used to create the suspended journal volumes without copying data in order to make the delta-resync between DC2 (Sync-S-VOL) and DC3 (Universal Replicator-S-VOL).

Returned values

The paircreate command sets either of the following returned values in exit (), which allows users to check the execution results using a user program.

Normal termination: 0. When creating groups, 0 = normal termination for all pairs.

Abnormal termination: other than 0. Refer to the error code for error details.

Error codes

Unrecoverable errors are fixed and not resolved, even after re-executing the command. If the command fails, the detailed status is logged in the CCI command log ($HORCC_LOG), even if the user script has no error handling.

Category	Error Code	Error Message	Recommended Action	Value
Volume status (Unrecoverable)	EX_ENQVOL	Unmatched volume status within the group	Confirm status using the pairdisplay command. Make sure all volumes in the group have the same fence level and volume attributes.	236
	EX_INCSTG	Inconsistent status in group	Confirm pair status using pairdisplay.	229
	EX_INVVOL	Invalid volume status	Confirm volume status/attribute using pairdisplay (-l option) or 'raidvchkdsp -v aou'. "Aou" (allocation on use) refers to dynamic provisioning.	222
	EX_INVSTP	Invalid pair status	Confirm pair status using pairdisplay.	228
	EX_ENQSIZ	Unmatched volume size for pairing	Confirm volume size or number of LUSE volume using raidscan -f, and make sure volume sizes are identical.	212
Resource (Unrecoverable)	EX_ENOCTG	Not enough consistency groups in the RAID	Choose an existing CTG ID (pairvolchk displays CTG IDs). Use '-f async <CTG ID>' or '-m grp <CTG ID>' option of paircreate to force the pair into a pre-existing CTG ID.	217
	EX_ENXCTG	No consistency groups left for OPEN Vol use.	Confirm whether all consistency groups are already used by TrueCopy/TrueCopy Async/GAD or ShadowImage.	215
	EX_ENOPOL	Not enough Pool in RAID	Could not retain the pool for executing a command due to be exceeded the threshold rate. Delete unnecessary/earlier generations paired volume, or re-synchronize unnecessary/earlier generations split volume.	206

Restrictions on specified volumes with '–m grp' option

- Vollume group definition
  - Volume groups specified with -m grp can not define groups across the storage systems.
  - In case of including multiple groups of CCI within the same consistency group (CTG ID), the pair of group designation is operated on the entire consistency group.
  - In case that a ShadowImage, Copy-on-Write Snapshot, or Volume Migration volume is cascaded by TrueCopy, TrueCopy Async, Universal Replicator, or GAD volume, the data consistency is not guaranteed by the pairsplit command (including pairsplit -FMRCF) of the continuing I/O.
- Registration and limitations of the number of CTG ID

  When you create a pair, CCI maps and assigns the configuration definition file group to CTG ID managed by the storage system. The maximum number of consistency groups that can be registered to the storage system is 256 (CTG ID is from 0 to 255). If you register over 256

consistency groups, pair creation will be terminated with EX_ENOCTG error.

Examples

Example 1

The following figure shows an example of creating a cascading configuration with -g <group> and -gs <group> option from the local node (takeover node).

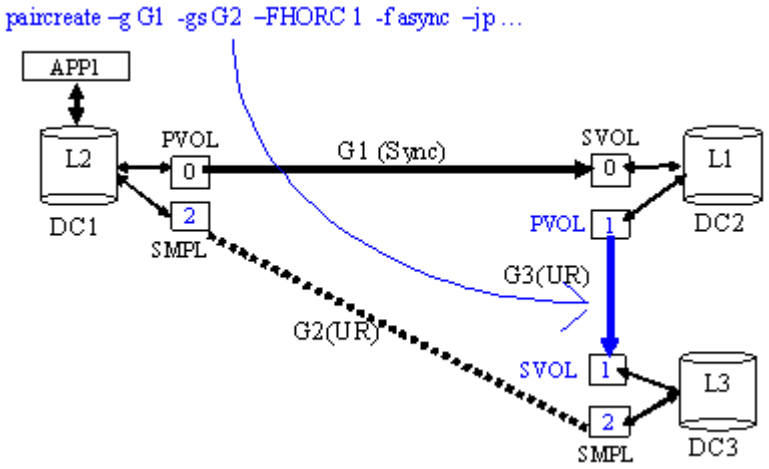


Figure 2-2 Creating a cascading configuration from the local node

Example 2

The following figure shows an example for creating a suspended journal volume.

On DC1 side:

```
paircreate -g G1 -gs G2 -FHORC 2 -nocsus -f async <CTG ID> -jp <id>
-js <id>
```

On DC2 side:

```
paircreate -g G3 -vl  -nocsus -f async <CTG ID>  -jp <id> -js <id>
```

On DC3 side:

```
paircreate -g G3 -vr  -nocsus -f async <CTG ID>  -jp <id> -js <id>
```

Note: The journal ID for the shared Universal Replicator-SVOL must be specified the same journal ID for S-VOL currently. The CTG ID for *paircreate* can be specified the same consistency group for S-VOL currently.

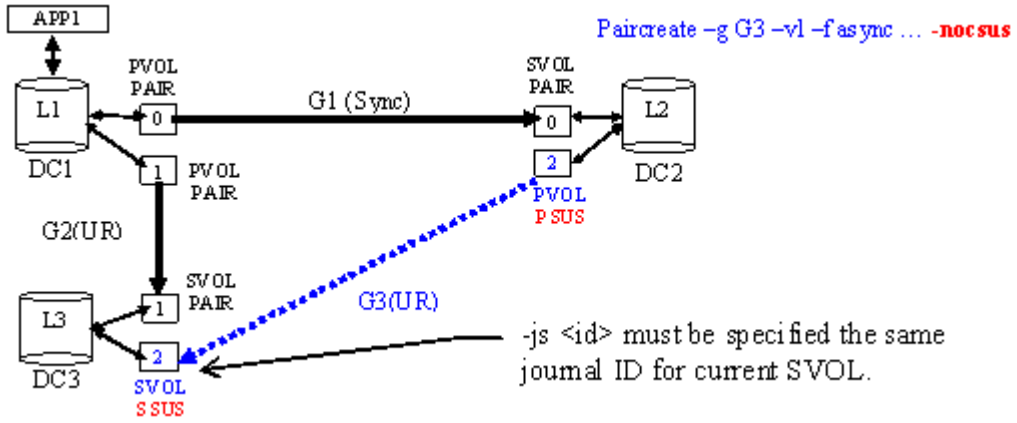


Figure 2-3 Example for creating a suspended journal volume

Example 3

The following figure shows a takeover example used to suspend a journal volume.

Note: The pairresync command must be issued after TC_Sync volume became SVOL_SSWS or PVOL_COPY/PAIR through the horctakeover command.

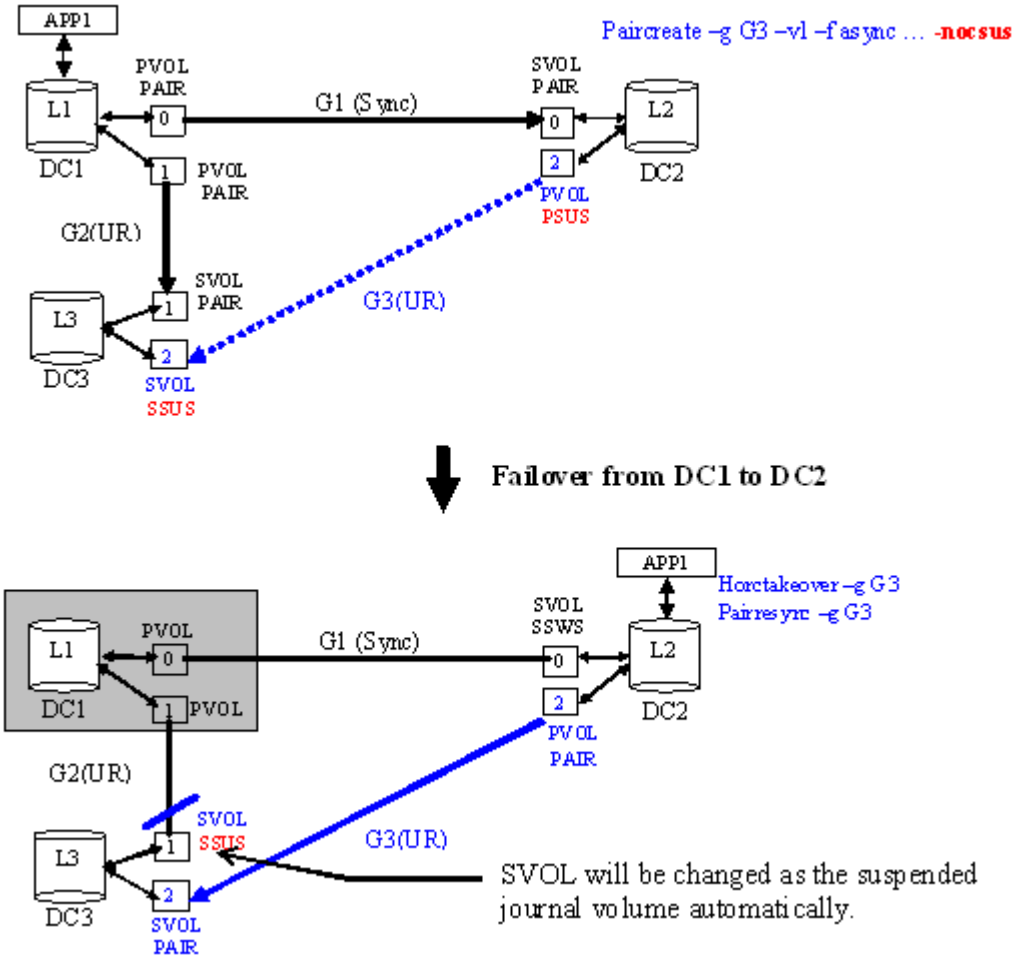


Figure 2-4 Takeover example used to suspend a journal volume

pairsplit

The **pairsplit** command is used to split volume pairs. This command stops updates to the secondary volume of a pair and can either maintain (status = PSUS) or delete (status = SMPL) the pairing status of the volumes. The **pairsplit** command can be applied to a paired logical volume or a group of paired volumes. The **pairsplit** command allows read access or read/write access to the secondary volume, depending on the selected options. When the **pairsplit** command is specified, acceptance of write requests to the primary volume depends on the fence level of the pair (data, status, never, or async).

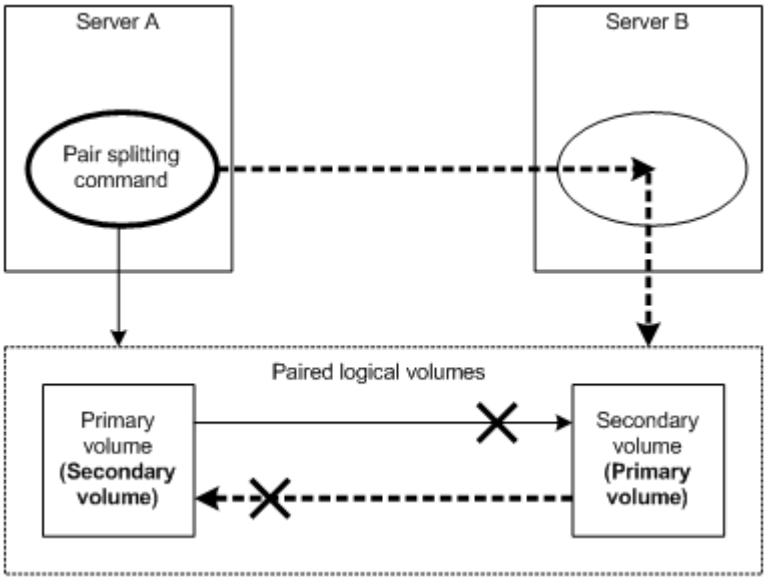


Figure 2-5 Pair Splitting

The primary volume's server is automatically detected by the **pairsplit** command, so the server does not need to be specified in the **pairsplit** command parameters. If the *-S* option (simplex) is used, the volume pair is deleted, the volumes are returned to the simplex state, and the primary and secondary volume status is lost. Paired volumes are split as soon as the pairsplit command is issued. If you want to synchronize the volumes, the pairsplit command must be issued after write I/Os to the paired volume have completed.

You can create and split ShadowImage pairs simultaneously using the -split option of the **paircreate** command (see paircreate on page 2-3).

You can delete pairs by using the -S option of the **pairsplit** command. When the pairsplit -S command is issued, the specified pair is deleted, and each volume is changed to SMPL (simplex) mode. If you want to re-establish a pair that has been deleted, you must use the **paircreate** command (not **pairresync**).

Note on Quick Split: If '$HORCC_SPLT=QUICK' environment variable is set for any of the following systems, the **pairsplit** and **paircreate -split** operations are performed as Quick Split regardless of the system option mode 122 setting on the SVP:

- TagmaStore USP
- TagmaStore NSC
- USP V/VM
- VSP
- HUS VM
- VSP G1000, G1500, and VSP F1500
- VSP Gx00 models and VSP Fx00 models

Syntax

```
pairsplit {-h | -q | -z[x] | -I[H][M][instance#] or -I[TC][SI]
[instance#] | -g <group> | -d <pair Vol> | -d[g] <raw_device> [MU#]
| -FHORC [MU#] | -FMRCF [MU#] | -d[g] <seq#> <LDEV#> [MU#] | -r |
-rw | -S | -SF[V] | -R[S|B] | -RF[V] | -P | -l | -nomsg | -C <size>
| -E | -fq <mode>}
```

Options and parameters

Only one **pairsplit** option (*-r*, *-rw*, *-S*, *-R*, *-P*, *-C*, or *-E*) can be specified. If more than one option is specified, only the last option is executed.

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits this command.
-z or -zx	Makes the pairsplit command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option is specified and a HORCM shutdown is detected, interactive mode terminates. OpenVMS cannot use the -zx option
-I [H] [M] [instance#] or -I [TC] [SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.
-g <group>	Specifies a group name defined in the configuration definition file. The command is executed for the specified group unless the -d <pair Vol> option is specified.
-d <pair Vol>	Specifies the paired logical volume name defined in the configuration definition file. When this option is specified, the command is executed for the specified paired logical volumes. This option is valid when the -g <group> option is specified.
-d[g] <raw_device> [MU#]	Searches whether the specified raw_device is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of *-g <group>* option. If the specified raw_device is contained in two or more groups, the command is executed for the first group.
-d[g] <seq#> <LDEV#> [MU#]	Searches whether the specified LDEV is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of '-g <group>' option. If the specified LDEV is contained in two or more groups, the command is executed on the first group. The <seq#> <LDEV#> values can be specified in hexadecimal (add the '0x' prefix) or decimal notation. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-r or -rw	TrueCopy, TrueCopy Async, Universal Replicator, and GAD only. Specifies a mode of access to the S-VOL after paired volumes are split. The -r option (default) allows read-only to the S-VOL. The -rw option enables read and write access to the S-VOL. The -rw option cannot be used for global-active device.

Option	Description
-S	Specify this option when deleting a pair to change the P-VOL and S-VOL back to the simplex status. **Note:** • Either volume of a pair might be unpaired due to a failure. To recover from this failure, delete the pair by using the pairsplit –S command to cancel the P-VOL and S-VOL relation, and then create the pair again by using the paircreate command. • Due to a path failure, the S-VOL might not be unpaired even if you execute the pairsplit –S command. If the S-VOL cannot be unpaired, CCI unpairs the P-VOL.
-SF[V]	Specify the `-SF[V]` option only when you must split a GAD pair forcibly. This option unpairs only the P-VOL of the GAD pair. It does not change the S-VOL pair status. • `-SFV` option: Specify this option to access the P-VOL from the host after deleting a GAD pair. This option leaves the virtual LDEV ID of the P-VOL. • `-SF` option: Specify this option if you do not access the P-VOL from the host after deleting a GAD pair. This option deletes the virtual LDEV ID of the P-VOL. **Caution:** Use the `-SF[V]` option only if you cannot change the P-VOL status to Simplex by using the `-S` option. Specify this option only when the I/O mode of both P-VOL and S-Vol is blocked. Contact technical support if you want to split GAD pair forcibly when the I/O mode is other than blocked. To confirm the I/O mode of the P-VOL and S-Vol, check the R/W row output with `pairdisplay -fe` command. B/B in the R/W row indicates the I/O mode of the P-VOL and S-VOL is blocked. **Note:** The data of P-VOL and S-VOL becomes inconsistent and it might cause errors if the volume status is changed to Simplex by using `-SFV` or `-RFV` option when the server can access both P-VOL and S-VOL. Follow the steps below when you delete GAD pair forcibly. 1. Stop the access to either the P-VOL or the S-VOL from the server. 2. Change the volume to which you stopped access to Simplex status. For example, if you stopped the access to P-VOL, change the P-VOL status to Simplex by specifying the `-SF` option. If you stopped the access to S-VOL, change the S-VOL status to Simplex by specifying the `-RF` option. When the volume status is changed to Simplex by specifying the `-SF` or `-RF` option, the virtual LDEV ID is deleted and the GAD reserve attribute is set. The volume becomes inaccessible from the server when the reserve attribute is set. 3. Change the volume to which you did not stop access to Simplex status. For example, if you did not stop access to the P-VOL, change the P-VOL status to Simplex by specifying the `-SFV` option. If you did not stop access to the S-VOL, change the S-VOL status to Simplex by specifying the `-RFV` option. **Note:** In some cases (incorrect configuration definition file or other reasons), the paired volumes that are the operation target of the pairsplit command might both become P-VOLs. If the pairsplit -SF[V] command is issued under these conditions, the CCI instance that executes the command directs the storage system to delete the GAD pair of only the volume managed by that CCI instance.
-R[S|B]	TrueCopy, TrueCopy Async, Universal Replicator, and GAD only. This option issues a command from the host at the secondary site if a failure or downtime occurs on the host accessing the P-VOL. The `-R` option changes the S-VOL to the unpaired status (simplex volume). It changes the S-VOL status, but it does not change the P-VOL pair status. When a temporary failure such as a link failure occurs and you switch the control from the primary site host to the secondary site host, if you specify the `-RS` option, you can change the S-VOL pair status to SSWS. • `-R`: Unpairs the S-VOL.

Option	Description
	• -RS: Changes the S-VOL status to SSWS. • -RB: Changes the S-VOL status from SSWS back to PSUS (PSUE) (SSUS). You can copy data from the S-VOL to the P-VOL after recovering from a link failure, before returning the control from the secondary site host to the primary site host. To do so, use the pairsplit -RB command to restore the original S-VOL status, which was changed to SSWS by the pairsplit -RS command. Specify the -RF[V] option. This option unpairs only the S-VOL of a GAD pair. It does not change the P-VOL pair status.
-RF[V]	Specify the -RF[V] option only when you must split a GAD pair forcibly. This option unpairs only the S-VOL of the GAD pair. It does not change the P-VOL pair status. • -RFV option: Specify this option to access the S-VOL from the host after deleting a GAD pair. This option leaves the virtual LDEV ID of the S-VOL. • -RF option: Specify this option if you do not access the S-VOL from the host after deleting a GAD pair. This option deletes the virtual LDEV ID of the S-VOL. **Caution:** Use the -RF[V] option only if you cannot change the S-VOL status to Simplex by using the -R option. Specify this option only when the I/O mode of both P-VOL and S-Vol is blocked. Contact technical support if you want to split GAD pair forcibly when the I/O mode is other than blocked. To confirm the I/O mode of the P-VOL and S-Vol, check the R/W row output with pairdisplay -fe command. B/B in the R/W row indicates the I/O mode of the P-VOL and S-VOL is blocked. **Note:** The data of P-VOL and S-VOL becomes inconsistent and it might cause errors if the volume status is changed to Simplex by using -SFV or -RFV option when the server can access both P-VOL and S-VOL. Follow the steps below when you delete GAD pair forcibly. 1. Stop the access to either the P-VOL or the S-VOL from the server. 2. Change the volume to which you stopped access to Simplex status. For example, if you stopped the access to P-VOL, change the P-VOL status to Simplex by specifying the -SF option. If you stopped the access to S-VOL, change the S-VOL status to Simplex by specifying the -RF option. When the volume status is changed to Simplex by specifying the -SF or -RF option, the virtual LDEV ID is deleted and the GAD reserve attribute is set. The volume becomes inaccessible from the server when the reserve attribute is set. 3. Change the volume to which you did not stop access to Simplex status. For example, if you did not stop access to the P-VOL, change the P-VOL status to Simplex by specifying the -SFV option. If you did not stop access to the S-VOL, change the S-VOL status to Simplex by specifying the -RFV option. **Note:** In some cases (incorrect configuration definition file or other reasons), the paired volumes that are the operation target of the pairsplit command might both become S-VOLs. If the pairsplit -RF[V] command is issued under these conditions, the CCI instance that executes the command directs the storage system to delete the GAD pair of only the volume managed by that CCI instance.
-P	TrueCopy, TrueCopyAsync, and Universal Replicator only. For TrueCopy Sync, this option is used to bring the primary volume forcibly into write disabled mode like PSUE with 'fence=data'. It is issued by the secondary host to disable P-VOL data changes by the host possessing the primary volume. For TrueCopy Async and Universal Replicator, this option is used to suspend and purge the remaining data into SideFile/Journal like link failure (PSUE) without updating S-VOL. This lets you stop journal operations forcibly when the journal utilization traffic becomes high. This is the same for the case of disaster that S-VOL data is not up to date, but it allows to specify '*-rw -P*' for writing enable. In that situation, if you are using the S-VOL as file

Option	Description
	system (that is, UFS, NTFS, HANFS), then an FSCK(CHKDSK) is necessary before mounting the volume even after the P-VOL is unmounted.
-l	When the remote host cannot be used due to host down, this option enables a pairsplit operation by a local host only. Except the *-R* option, the target volume of a local host must be P-VOL. (ShadowImage or Copy-on-Write Snapshot volumes are able to split only S-VOL.)
-nomsg	Suppresses messages to be displayed when this command is executed. It is used to execute a command from a user program. This option must be specified at the beginning of a command argument. The command execution log is not affected by this option.
-C <size>	ShadowImage only. Copies difference data retained in the primary volume into the secondary volume, then enables reading and writing from/to the secondary volume after completion of the copying. (This is the default option.) If not specified, the value used for paircreate or pairresync command is used. In ShadowImage, specify 1 or 2 for slow copy pace, specify 3 for medium copy pace, and specify 4 for fast copy pace.
-E	ShadowImage only. Suspends a paired volume forcibly when a failure occurs. Not normally used. When this option is specified, the copy pace is set to the default value (3: medium).
-FHORC [MU#] or -FCA [MU#]	Forcibly specifies a cascading remote copy volume for specified volume pair on local copy environment. If the -l option is specified, a cascading remote copy volume is split on a local host (near site). If the -l option is not specified, a cascading remote copy volume is split on a remote host (far site). The target remote copy volume must be a P-VOL, or '*-R[S][B]*' option can be specified on S-VOL.
-FMRCF [MU#] or -FBC [MU#]	Forcibly specifies a cascading local copy volume for specified volume pair on remote copy environment. If the -l option is specified, a cascading local copy volume is split on a local host (near site). If -l option is not specified, a cascading local copy volume is split on a remote host (far site). The target local copy volume must be a P-VOL, and the -E option cannot be specified.
-fq <mode>	ShadowImage only. This option is used to specify the mode whether 'pairsplit' is performed or not as 'QUICK'. *mode = normal*'pairsplit' is performed as Non quick mode regardless of setting of $HORCC_SPLT environment variable and/or the *system option mode 122* via SVP. *mode = quick*'pairsplit' is performed as *Quick Split* regardless of setting of $HORCC_SPLT environment variable and/or the *system option mode 122* via SVP. If this option is not specified, then performing the 'Split' depends on $HORCC_SPLT environment variable and/or the system option mode setting through the SVP whether the pairsplit operation is *Quick Split* or not. The relationship between '*-fq*' option and $HORCC_SPLT is as shown below. *-fq option $HORCC_SPLT Behavior* --- quick Don't care Quick Split normal Don't care Normal Split Unspecified QUICK Quick Split Unspecified NORMAL Normal Split Unspecified Depends on system option mode 122

Option	Description

	Note:
	• The *-fq* option is also validated on TrueCopy-TrueCopy/ShadowImage cascading operation using '*-FBC [MU#]*' option.
	• The *-fq* option is applied to the following storage systems:
	  ◦ TagmaStore USP
	  ◦ TagmaStore NSC
	  ◦ USP V/VM
	  ◦ VSP
	  ◦ HUS VM
	  ◦ VSP G1000, G1500, and VSP F1500
	  ◦ VSP Gx00 models and VSP Fx00 models
	This option is ignored for Lightning 9900 V, as this behavior maintains compatibility on 9900V so that you can use the same script adding this option.

Returned values

The *pairsplit* command sets the following returned values during exit allowing you to check the execution results.

Normal termination: 0. When splitting groups, 0 = normal termination for all pairs.

Abnormal termination: other than 0, refer to the error codes for error details.

Error codes

The following table lists and describes the error codes for the *pairsplit* command. Unrecoverable errors are fixed and not resolved, even after re-executing the command. If the command failed, the detailed status is logged in the CCI command log ($HORCC_LOG), even if the user script has no error handling.

Table 2-1 Specific Error Codes for pairsplit

Category	Error Code	Error Message	Recommended Action	Value
Volume status (Unrecoverable)	EX_ENQVOL	Unmatched volume status within the group	Confirm status using the pairdisplay command. Make sure all volumes in the group have the same fence level and volume attributes.	236
	EX_INCSTG	Inconsistent status in group	Confirm pair status using pairdisplay.	229
	EX_INVVOL	Invalid volume status	Confirm volume status/ attribute using pairdisplay -l or 'raidvchkdsp -v aou'.	222

Category	Error Code	Error Message	Recommended Action	Value
			"Aou" (allocation on use) refers to dynamic provisioning.	
	EX_EVOLCE	Pair volume combination error	Confirm pair status using pairdisplay, and change combination of volumes.	235
	EX_INVSTP	Invalid pair status	Confirm pair status using pairdisplay.	228
	EX_EWSUSE	Pair suspended at WAIT state	Issue pairresync manually to the identified failed paired volume to try to recover it. If the trouble persists, call the Hitachi Data Systems customer support.	234

Examples

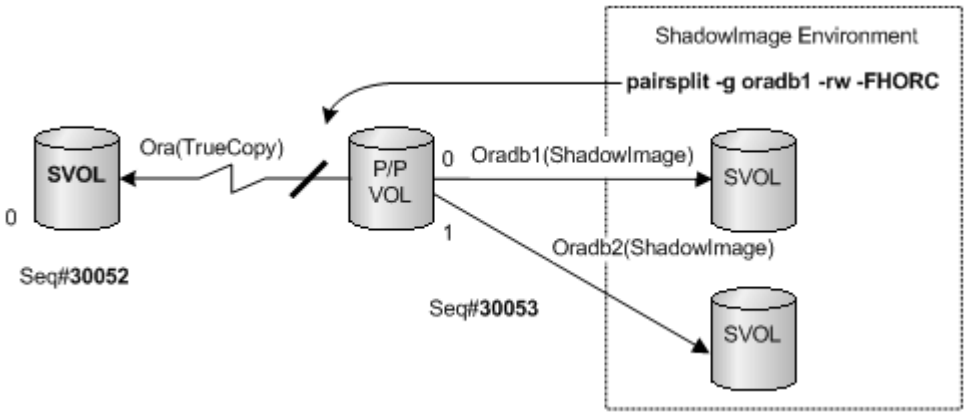


Figure 2-6 Example of -FHORC Option for pairsplit

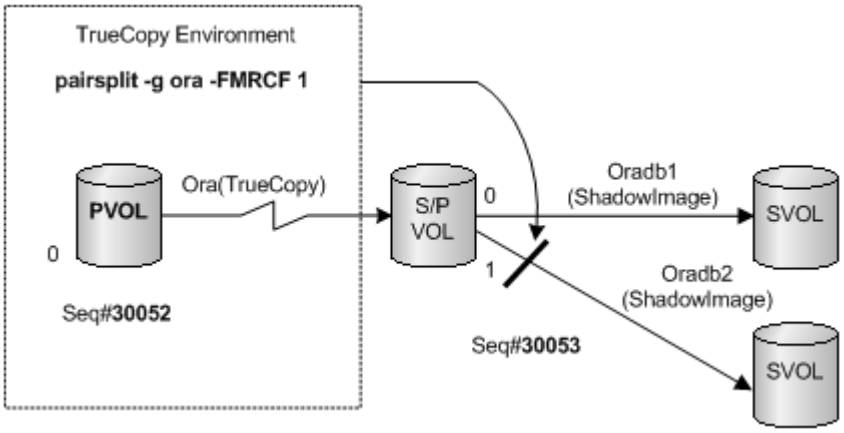


Figure 2-7 Example of -FMRCF Option for pairsplit

pairresync

The **pairresync** command re-establishes a split pair volume and then restarts the update copy operations to the secondary volume. The **pairresync** command can resynchronize either a paired logical volume or a group of paired volumes. The normal direction of resynchronization is from the primary volume to the secondary volume. If the --restore option is specified (ShadowImage only), the pair is resynchronized in the reverse direction (that is, secondary volume to primary volume). The primary volume remains accessible during *pairresync*, except when the -restore option is specified. The secondary volume becomes write-disabled when the *pairresync* command is issued.

The **pairresync** command terminates before resynchronization of the secondary (or primary) volume is complete. Use the pair event waiting (**pairevtwait**) or **pairdisplay** command to verify that the resync operation completed successfully (status changes from COPY to PAIR). The execution log file also shows completion of the resync operation. The status transition of the paired volume is judged by the status of the primary volume. The fence level is not changed (only for TrueCopy, TrueCopy Async, Universal Replicator, or global-active device).

If no data was written to the secondary volume while the pair was split, the differential data on the primary volume is copied. If data was written to the secondary volume, the differential data on the primary volume and secondary volume is copied. This process is reversed when the ShadowImage -restore option is specified.

Before issuing the *pairresync* command (normal or reverse direction), make sure that the secondary volume is not mounted on any UNIX system. Before issuing a reverse *pairresync* command, make sure that the primary volume is not mounted on any UNIX system.

Note on Quick Resync/Restore: If the '$HORCC_RSYN=QUICK' /'$HORCC_REST=QUICK' environment variable is set for any of the following systems, the pairresync operation is performed as Quick Resync regardless of the system option mode 87/80 setting via SVP:

- TagmaStore USP
- TagmaStore NSC
- USP V/VM
- VSP
- HUS VM
- VSP G1000, G1500, and VSP F1500
- VSP Gx00 models and VSP Fx00 models

The $HORCC_RSYN and $HORCC_REST environment variables are ignored for 9900V.

TrueCopy, TrueCopy Async, Universal Replicator, and GAD only: The swaps(p) option is used to swap volume from the S-VOL (P-VOL) to P-VOL (S-VOL) at suspending state on the S-VOL (P-VOL) side, and resynchronize

the new S-VOL based on the new P-VOL. At the result of this operation, the volume attributes of own host (local host) become the attributes for the new P-VOL (S-VOL). The **paircreate** command cannot execute copy rejection for an error condition which made the target volume is accompanied by maintenance work.

The swaps(p) option:

Ignores the -l option.

If -c size option is omitted, use 3 (default value of the number of copy track (-c size)).

Executes at PAIR state as well as PSUS/PSUE state (not applicable to COPY and SMPL).

If the target volume is already the P-VOL (S-VOL), the pair operation is skipped.

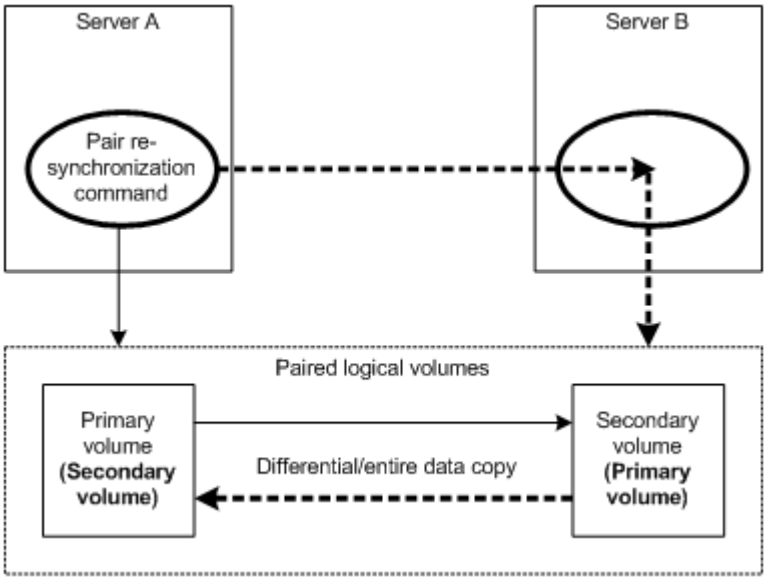


Figure 2-8 Pair Resynchronization

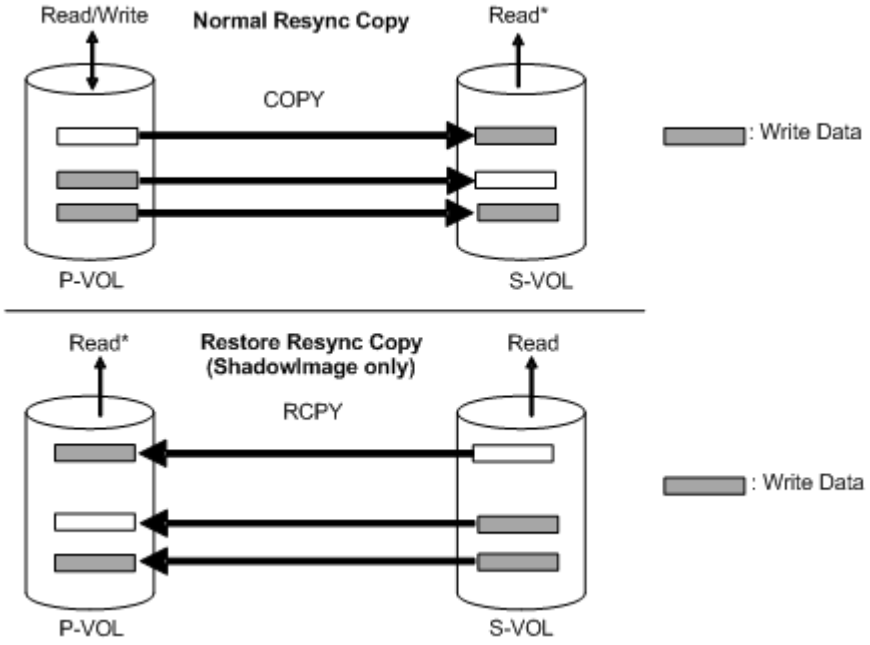


Figure 2-9 Normal Resync and ShadowImage Restore Resync

Note: Read*: Option when the pair was created. If you specified '-m noread', it is not readable.

Syntax

```
pairresync { -h | -q | -z[x] | -I[H][M][instance#] or -I[TC][SI]
[instance#]| -g <group> | -d <pair Vol>| -d[g] <raw_device> [MU#] | -
FHORC [MU#] | -FMRCF [MU#]| -d[g] <seq#> <LDEV#> [MU#] |-c <size> | -
nomsg | -l | -restore| -swaps | -swapp | -fq <mode>| -cto <o-time>
[c-time] [r-time]| -f[g] <fence> [CTG ID]}
```

Options and parameters

The primary volume's server is automatically detected by the **pairresync** command, so the server does not need to be specified in the **pairresync** command options.

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits this command.
-z or -zx	Makes the *pairresync* command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option.
-I [H] [M] [instance#] or	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.

Option	Description
-I [TC] [SI] [instance#]	
-g <group>	Used to specify a group name defined in the configuration definition file. The command is executed for the specified group unless the -d <pair Vol> option is specified.
-d <pair Vol>	Specifies a paired logical volume name defined in the configuration definition file. When this option is specified, the command is executed for the specified paired logical volumes. This option is valid when the -g <group> option is specified.
-d[g] <raw_device> [MU#]	Searches whether the specified raw_device is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of *-g <group>* option. If the specified raw_device is contained in two or more groups, the command is executed for the first group.
-d[g] <seq#> <LDEV#> [MU#]	Searches whether the specified LDEV is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of '-g <group>' option. If the specified LDEV is contained in two or more groups, the command is executed on the first group. The <seq#> <LDEV#> values can be specified in hexadecimal (add the '0x' prefix) or decimal notation. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-FHORC [MU#] or -FCA [MU#]	Forcibly specifies a cascading remote copy volume for specified pair logical volumes on local copy environment. If the -l option is specified, this option resyncs a cascading remote copy volume on a local host (near site). If no -l option is specified, this option resyncs a cascading remote copy volume on a remote host (far site). The target remote copy volume must be a P-VOL, the -swapp option cannot be specified.
-FMRCF [MU#] or -FBC [MU#]	Forcibly specifies a cascading local copy volume for specified volume pair on remote copy environment. If the -l option is specified, a cascading local copy volume is split on a local host (near site). If -l option is not specified, a cascading local copy volume is split on a remote host (far site). The target local copy volume must be a P-VOL, and the -E option cannot be specified.
-swaps -FHORC [MU#]	Swaps the cascading TrueCopy or Universal Replicator volume from the primary node for failback. In failback operation from 3DC Cascade Site Failure, if you want to failback to DC1 from DC3 directly, it is necessary to operate all cascading volume from DC1. In order to make this operation possible, CCI supports the 'pairresync -swaps -FHORC' option that swaps the Universal Replicator volume on the cascading TrueCopy Sync/ Universal Replicator volume.
-c <size>	TrueCopy, TrueCopy Async, ShadowImage, and global-active device only. Specifies the copy pace for the resync operation (range = 1 to 15 track extents). If not specified, the value used for paircreate or pairsplit command is used. However, when you use -swaps or -swapp option, unspecified copy pace becomes 3 as the default value. In TrueCopy for Mainframe, when you specify a number less than or equal to 3, the copy pace is 3 tracks. When you specify a number more than or equal to 4, the copy pace is 15 tracks. In ShadowImage, when you specify 1 or 2, the copy pace is slow; when you specify 3, the copy pace is medium; and when you specify 4, the copy pace is fast.
-nomsg	Suppresses messages to be displayed when this command is executed. It is used to execute this command from a user program. This option must be specified at the

Option	Description
	beginning of a command argument. The command execution log is not affected by this option.
-l	When this option cannot utilize the remote host for host down, this option enables a pairresync operation by the local host only. The target volume of the local host must be P-VOL. (ShadowImage or Copy-on-Write Snapshot volumes are able to resync only S-VOL.)
-restore	ShadowImage and Copy-on-Write Snapshot only. Performs reverse resync (from secondary volume to primary volume).
-swaps	TrueCopy, TrueCopy Async, Universal Replicator, and global-active device only. Executed from the S-VOL side when there is no host on the P-VOL side to help. Typically executed in PSUS state to facilitate 'fast failback' without requiring a full copy. For both -swaps and -swapp, the delta data from the original S-VOL becomes dominant and is copied to the original P-VOL, then the S, P-VOL designations are swapped.
-swapp	TrueCopy, TrueCopy Async, Universal Replicator, and global-active device only. Executes the equivalent of a -swaps from the original P-VOL side. Unlike -swaps, -swapp does require the cooperation of hosts at both sides.
-fq <mode>	ShadowImage and Copy-on-Write Snapshot only. Specifies the mode whether 'pairresync' is performed or not as 'QUICK'. *mode = normal* pairresync is performed as Non quick mode regardless of setting of $HORCC_RSYN environment variable and/or the *system option mode 87* via SVP. *mode = quick* pairresync is performed as Quick Resync regardless of setting of $HORCC_RSYN environment variable and/or the *system option mode 87* via SVP. If this option is not specified, then performing pairresync is dependent on $HORCC_RSYN environment variable and/or the system option mode setting through the SVP whether the pairresync operation is Quick Split or not. The relationship between '-fq' option and $HORCC_RSYN is as shown below. _____ *-fq option $HORCC_RSYN Behavior* ---------- quick Don't care Quick resync normal Don't care Normal resync Unspecified QUICK Quick resync Unspecified NORMAL Normal resync Unspecified Unspecified Dependent on mode 87
-fq <mode> (In the case of Restore (-restore is specified))	In the case of Restore (-restore is specified): mode = normal The pairresync -restore command is performed as Non quick mode regardless of the setting of the $HORCC_REST environment variable and/or the system option mode 80 via SVP. mode = quick The pairresync -restore command is performed as Quick Restore regardless of the setting of the $HORCC_REST environment variable and/or the system option mode 80 via SVP.

Option	Description
	If this option is not specified, then the performing of the pairresync has being depended on $HORCC_REST environment variable and/or the system option mode setting through the SVP whether the pairresync operation is Quick Restore or not. The relationship between '-fq' option and $HORCC_REST are shown as below. _____ *-fq option $HORCC_REST Behavior* ---------- quick Don't care Quick restore normal Don't care Normal restore Unspecified QUICK Quick restore Unspecified NORMAL Normal restore Unspecified Unspecified Dependent on Mode 80
-fq <mode> (Notes)	Notes: • This -fq option also is validated on TrueCopy-TrueCopy/ShadowImage cascading operation using '-F BC [MU#]' option. • The *-fq* option is applied to the following storage systems: o TagmaStore USP o TagmaStore NSC o USP V/VM o VSP o HUS VM o VSP G1000, G1500, and VSP F1500 o VSP Gx00 models and VSP Fx00 models This option is ignored for Lightning 9900 V, because this behavior maintains the compatibility on 9900V so that you can use the same script adding this option. • If this option is combined with '-restore' option in VSP, during the maintenance work in the storage system (SVP is in modify mode), this operation cannot be completed.
-cto <o-time> [c-time] [r-time]	TrueCopy Async and Universal Replicator only. These options are valid for only TrueCopy Async/Universal Replicator, if you specify '-cto <o-time> [c-time] [r-time]' option on TrueCopy sync, then it is ignored. o-time: This option is used when setting offloading timer for controlling inflow of write I/O to the specified consistency group. For TrueCopy Async, o-time can be set from 1 to 255 seconds. If this option is not specified, 90 seconds is set as default. For Universal Replicator, *o-time* must be specified within the limits of 255 from 1, in units of sec as value. If this option is not specified, 60 seconds is set as default. Use the **`raidcom modify journal`** command to change the value range to 256 to 600. If o-time=0 is specified, the inflow of write I/O becomes invalid. If sidefile quantity is over limit of sidefile area then host side write I/O is waited for enough space of sidefile when storing next new write data until this timeout value (1 second to 255 seconds for TrueCopy Async, and 1 second to 600 seconds for Universal Replicator). The default timeout values are 90 seconds for TrueCopy Async, and 60 seconds for Universal Replicator. If the timeout happens with this waiting state then pair state is changed from PAIR to PSUS state of sidefile(Journal) Full, and its host side Write I/O is continued and Writing data is managed by BITMAP mode. Therefore the o-time timeout value should be less than the I/O timeout value of the host system. [c-time]: (Applicable for only TrueCopy Async) This option is used when setting Copy Pending timer to the specified consistency group. c-time can be specified from 1 to 15

Option	Description
	minutes in increments of 1 minute. If this option is not specified, then this value is set as below. • If consistency group is created, then 5 minutes is set as the default. If not, it is not changed. [r-time]: (Applicable for only TrueCopy Async) This option is used when specifying RCU Ready timer to the specified consistency group. r-time can be specified from 1 to 10 minutes in increments of 1 minute. If this option is not specified, then it is not changed. ***Note:*** For TrueCopy Async, settings changed by these options are invalid if a consistency group already exists. These parameters are also forwarded to S-VOL side with pairresync command, and are used when S-VOL is changed to P-VOL. These parameters are maintained and become valid until and when the pair-volumes are changed to SMPL. For Universal Replicator, these parameters can be set and changed when a pair is resynchronized in a journal volume in the P(S)JSN status. The parameters are forwarded to the S-VOL side and set when the pair is resynchronized. To change settings of journals on the S-VOL side, specify as follows: 1. `pairsplit -g <group>` 2. `pairresync -g <group> -cto <o-time>` To change settings of journals on the P-VOL side, swap them from the P-VOL to the S-VOL before specifying the above. These parameters are maintained on each journal. Therefore, if you set the value for offloading timer, execute the **`raidcom modify journal`** command on both P-VOL and S-VOL sides.
-f[g] <fence> [CTG ID]	TrueCopy, TrueCopyAsync, Universal Replicator, and global-active device only. *-f[g] <fence> [CTG ID]* (TrueCopy only): This option is used to change from existing TrueCopy Sync volumes to TrueCopy Sync CTG without deleting paired-volume. It is possible to change the option (fence level) and the volume attribute as shown below. This option is valid without '-swaps' or '-swapp' option.

Changing the option (fence level) and the volume attribute:

Attribute	Options		
	-f fence	-fg fence	-fg fence CTG ID
Sync	Updates fence	Cmd rejected Abnormal term.	Changes to Sync CTG Updates fence*
Sync CTG	Changes to Sync Updates fence	Updates fence	Cmd rejected Abnormal term.
Async	Cmd rejected Abnormal term.	Cmd rejected Abnormal term.	Cmd rejected Abnormal term.
Explanation of terms: fence: data, status, or never ('async' cannot be specified) Cmd rejected/Abnormal term.: Command execution is rejected, and the operation terminates abnormally.			
*If the identical CTG ID is specified with the different group name of CCI, then the command is rejected. So different CTG ID must be specified for the different group name.			

Changing the volume attribute for global-active device:

Attribute	Options		
	-f never	-fg never	-fg never CTG ID
GAD	No Updates	Cmd rejected Abnormal term.	Changes to GAD CTG
GAD CTG	Cmd rejected Abnormal term.	No Updates	Cmd rejected Abnormal term.
Explanation of terms: Cmd rejected/Abnormal term.: Command execution is rejected, and the operation terminates abnormally.			

Returned values

The *pairresync* command sets the following returned values during exit allowing you to check the execution results.

Normal termination: 0. When resynchronizing groups, 0 = normal termination for all pairs.

Abnormal termination: other than 0, refer to the error codes for error details.

Error codes

Unrecoverable errors are fixed and not resolved, even after re-executing the command. If the command failed, the detailed status is logged in the CCI command log ($HORCC_LOG), even if the user script has no error handling.

The pairresync command updates both the P-VOL and the S-VOL. When you execute this command, make sure that neither the P-VOL nor the S-VOL is mounted. This command is rejected when the target volume is in a failure accompanying maintenance work (for example, one side cache failure) (TrueCopy, TrueCopy Async, Universal Replicator, and global-active device only).

Table 2-2 Specific Error Codes for pairresync

Category	Error Code	Error Message	Recommended Action	Value
Volume status (Unrecoverable)	EX_ENQVOL	Unmatched volume status within the group	Confirm status using the pairdisplay command. Make sure all volumes in the group have the same fence level and volume attributes.	236
	EX_INCSTG	Inconsistent status in group	Confirm pair status using pairdisplay.	229
	EX_INVVOL	Invalid volume status	Confirm pair status using pairdisplay -l.	222

Category	Error Code	Error Message	Recommended Action	Value
	EX_INVSTP	Invalid pair status	Confirm pair status using pairdisplay.	228

Examples

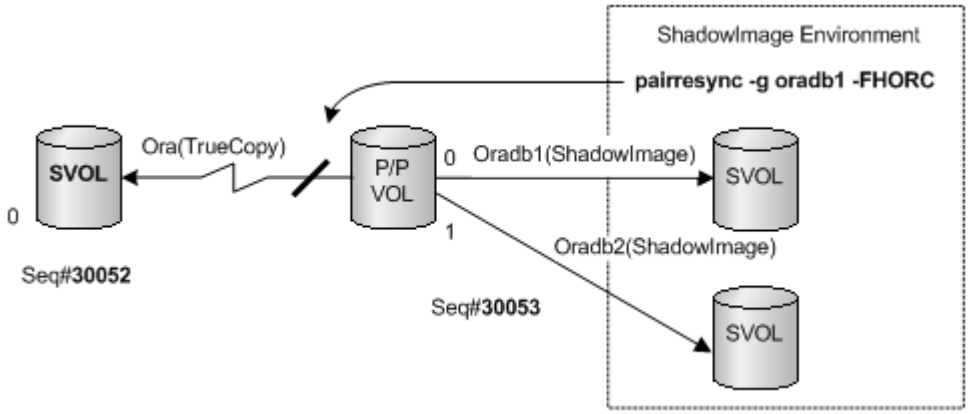


Figure 2-10 Example of -FHORC Option for pairresync

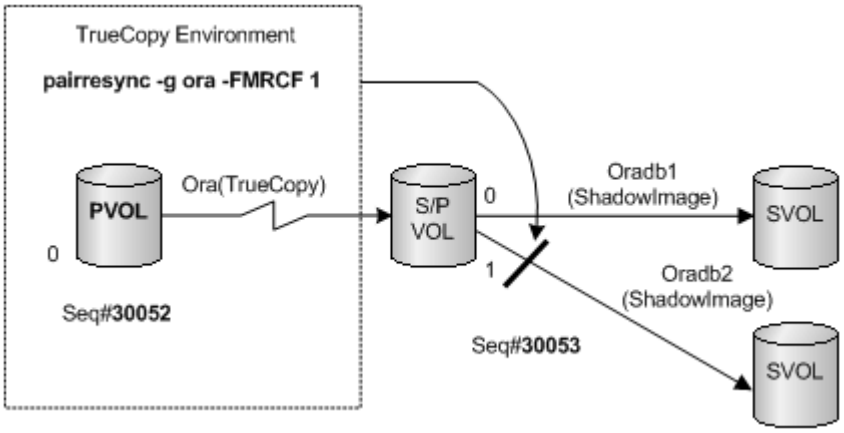


Figure 2-11 Example of -FMRCF Option for pairresync

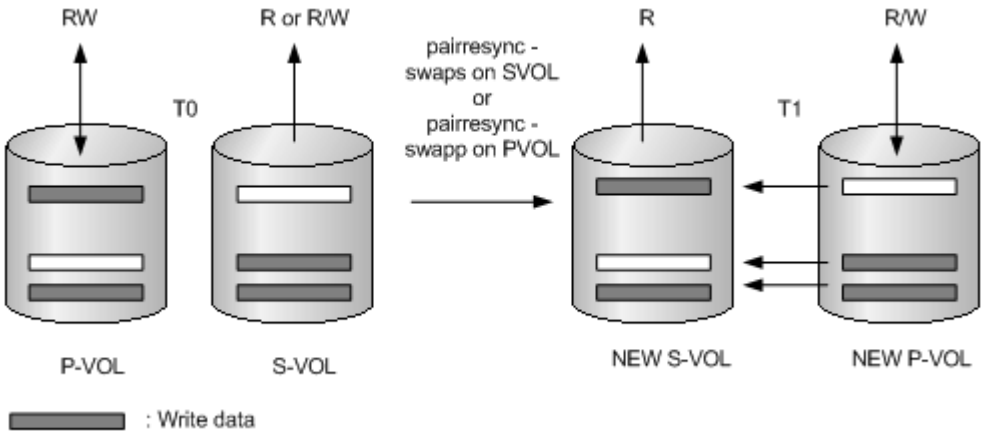


Figure 2-12 Swap Operation

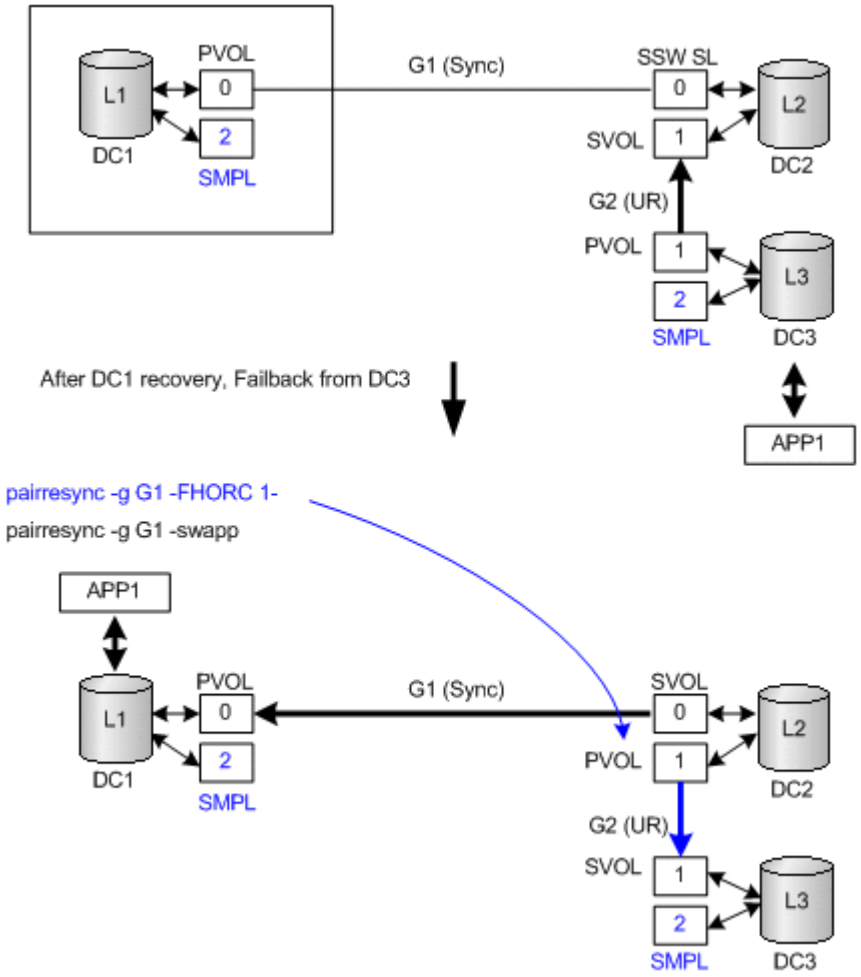


Figure 2-13 Example of -swaps option with -FHORC [MU#]

pairevtwait

The *pairevtwait* (pair event waiting) command is used to wait for another command to complete pair operations and to confirm the result of pair operations (see Figure 2-14 Pair Event Waiting on page 2-32). It waits ('sleeps') until the paired volume status becomes identical to a specified status, and terminates abnormally if an abnormal status is detected. The transition of the paired volume status is judged by the status of the volume, which is searched automatically.

The *pairevtwait* command can be executed by specifying a paired logical volume or a group of a paired volume. If the *pairevtwait* command is issued by specifying a group and the status, the command waits until the status of each volume in the group changes to the specified status. When the *pairevtwait* command with the -nowait or -nowaits option is issued for a group, the *pairevtwait* command returns the response immediately according to the status of each volume in the group. The primary and secondary volume's servers are automatically detected by the *pairevtwait* command, so the server does not need to be specified in the *pairevtwait* command parameters. For ShadowImage pairs, this command must be used to confirm a pair status transition.

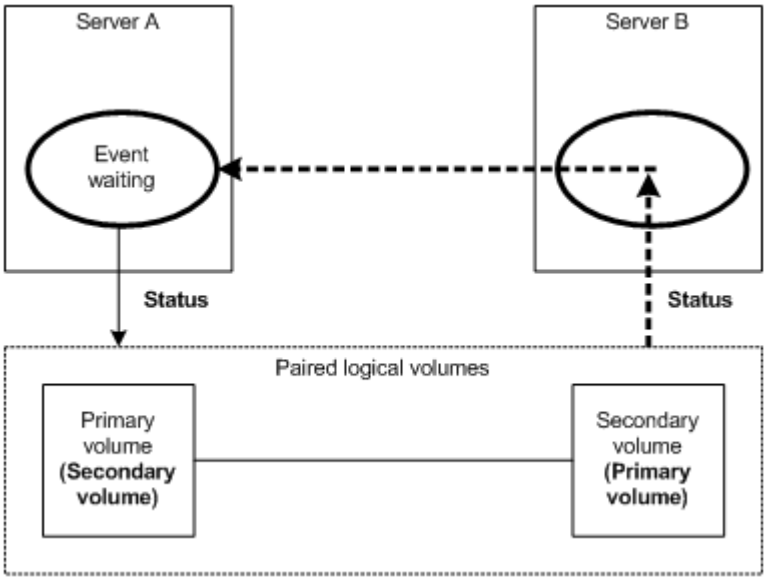


Figure 2-14 Pair Event Waiting

Syntax

```
pairevtwait{ -h | -q | -z[x] | -I[H][M][instance#] or
     -I[TC][SI][instance#] | -g <group> | -d <pair Vol>
     | -d[g] <raw_device> [MU#] | -FHORC [MU#] | -FMRCF [MU#]
     | -d[g] <seq#> <LDEV#> [MU#] | -s [s] <status> ...
     | -t <timeout>[interval] | -nowait[s] | -l | -nomsg }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits this command.
-z or -zx	Makes the pairevtwait command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option.
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.
-g <group>	Specifies a group name defined in the configuration definition file. The command is executed for the specified group unless the -d <pair Vol> option is specified.
-d <pair Vol>	Specifies a paired logical volume name defined in the configuration definition file. When this option is specified, the command is executed for the specified paired logical volumes. This option is valid when the -g <group> option is specified.
-d[g] <raw_device> [MU#]	Searches whether the specified raw_device is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of *-g <group>* option. If the specified raw_device is contained in two or more groups, the command is executed for the first group.
-FHORC [MU#] or -FCA [MU#]	Forcibly specifies a cascading remote copy volume for specified pair logical volumes on local copy environment. If the -l option is specified, this option tests status of a cascading remote copy volume on a local host (near site). If no -l option is specified, this option tests status of a cascading remote copy volume on a remote host (far site).
-FMRCF [MU#] or -FBC [MU#]	Forcibly specifies a cascading local copy volume for specified pair logical volumes on remote copy environment. If the -l option is specified, this option tests status of a cascading local copy volume on a local host (near site). If no -l option is specified, this option tests status of a cascading local copy volume on a remote host (far site).
-d[g] <seq#> <LDEV#> [MU#]	Searches whether the specified LDEV is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of '-g <group>' option. If the specified LDEV is contained in two or more groups, the command is executed on the first group. The <seq#> <LDEV#> values can be specified in hexadecimal (add the '0x' prefix) or decimal notation. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-s <status>	Specifies the waiting status, which is 'smpl', 'copy(including 'RCPY')', 'pair', 'psus', or 'psue'. If two or more statuses are specified following -s, waiting is done according to the logical OR of the specified statuses. This option is valid when the -nowait option is not specified.
-ss <status>	Specifies the waiting status, which is 'smpl', 'copy'('RCPY' is included), 'pair', 'ssus','psue' on S-VOL. If two or more statuses are specified following -ss, waiting is done according to the logical OR of the specified statuses. This option is valid when the -nowaits option is not specified.

Option	Description
-t <timeout> [interval]	Specifies the interval of monitoring a status specified using the *-s* and *-ss* option and the time-out period in increments of 1 second. Unless [interval] is specified, the default value (3 seconds) is used. This option is valid when the *-nowait* option is not specified. If <timeout> is specified more than 1999999, then 'WARNING' message appears. If you execute the command in the Out-of-Band method, specify 3 seconds (default value) or more to <timeout>. This option is valid only when the -nowait or -nowaits option is not specified.
-nowait	When this option is specified, the pair status at that time is reported without waiting. The pair status is set as a returned value for this command. When this option is specified, the -t and -s options are not needed.
-nowaits	When this option is specified, the pairing status on S-VOL at that time is reported without waiting. The pairing status is set as a returned value for this command. When this option is specified, the -t and -ss options are not needed.
-l	When this command cannot utilize a remote host for host down, this option executes this command by a local host only. When a paired volume used by this command meets any of the following conditions, if this option is not specified, the command fails with EX_EVOLCE: • Both paired volumes are P-VOLs • Both paired volumes are S-VOLs • Either paired volume is SMPL, and the other volume is S-VOL.
-nomsg	Suppresses messages to be displayed when this command is executed. It is used to execute a command from a user program. This option must be specified at the beginning of a command argument. The command execution log is not affected by this option.

Returned values

The *pairevtwait* command sets the following returned values during exit allowing you to check the execution results.

Table 2-3 Returned values for pairevtwait

Condition	Value
When the -nowait option is specified:	Normal termination: 1:The status is SMPL. 2:The status is COPY or RCPY. 3:The status is PAIR. 4:The status is PSUS. 5:The status is PSUE. When monitoring groups, 1/2/3/4/5 = normal termination for all pairs. Abnormal termination: other than 0 to 127, refer to the error codes for error details.
When the -nowaits option is specified:	Normal termination: 1:The status is SMPL.

Condition	Value
	2:The status is COPY or RCPY. 3:The status is PAIR. 4:The status is SSUS (Note that SVOL_PSUS appears as SSUS). 5:The status is PSUE. Abnormal termination: other than 0 to 127, refer to the error codes for error details.
When the -nowait and/or nowaits option is not specified:	Normal termination: 0. When monitoring groups, 0 = normal termination for all pairs. Abnormal termination: other than 0 to 127, refer to the error code for error details.

Error codes

Unrecoverable errors are fixed and not resolved, even after re-executing the command. If the command failed, the detailed status is logged in the CCI command log ($HORCC_LOG), even if the user script has no error handling.

Table 2-4 Specific Error Codes for pairevtwait

Category	Error Code	Error Message	Recommended Action	Value
Volume status (Unrecoverable)	EX_ENQVOL	Unmatched volume status within the group	Confirm status using the pairdisplay command. Make sure all volumes in the group have the same fence level and volume attributes.	236
	EX_INCSTG	Inconsistent status in group	Confirm pair status using pairdisplay.	229
	EX_INVVOL	Invalid volume status	Confirm pair status using pairdisplay -l.	222
	EX_EVOLCE	Pair volume combination error	Confirm pair status using pairdisplay, and change combination of volumes.	235
	EX_EWSUSE	Pair suspended at WAIT state	Issue pairresync manually to the identified failed paired volume to try to recover it. If the trouble persists, call the Hitachi Data Systems customer support	234
Timer (Recoverable)	EX_EWSTOT	Timeout waiting for specified status	Increase timeout value using the -t option.	233
	EX_EWSLTO	Timeout waiting for specified status on the local host	Confirm that CCI (HORCM) on the remote host is running.	232

Examples

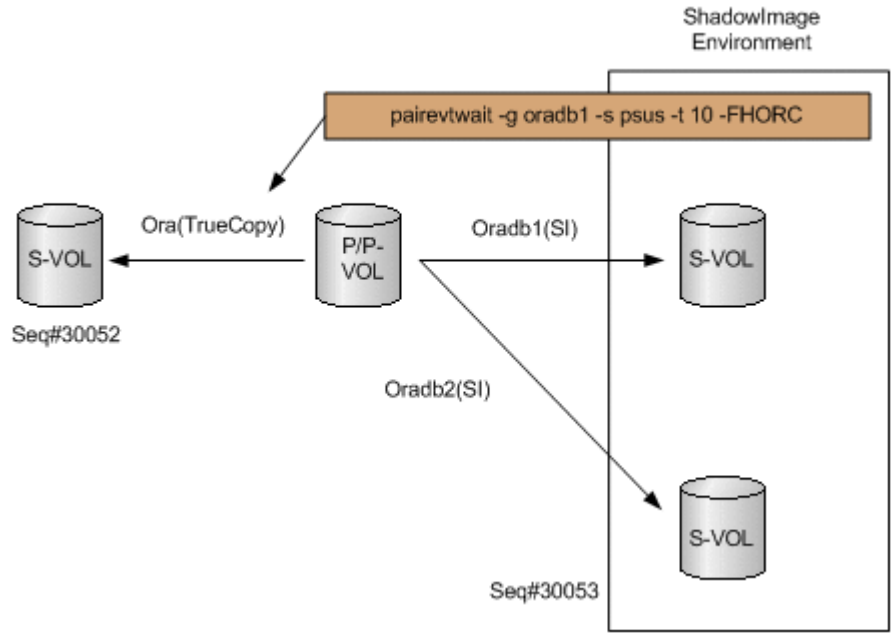


Figure 2-15 Example of -FHORC option for pairevtwait

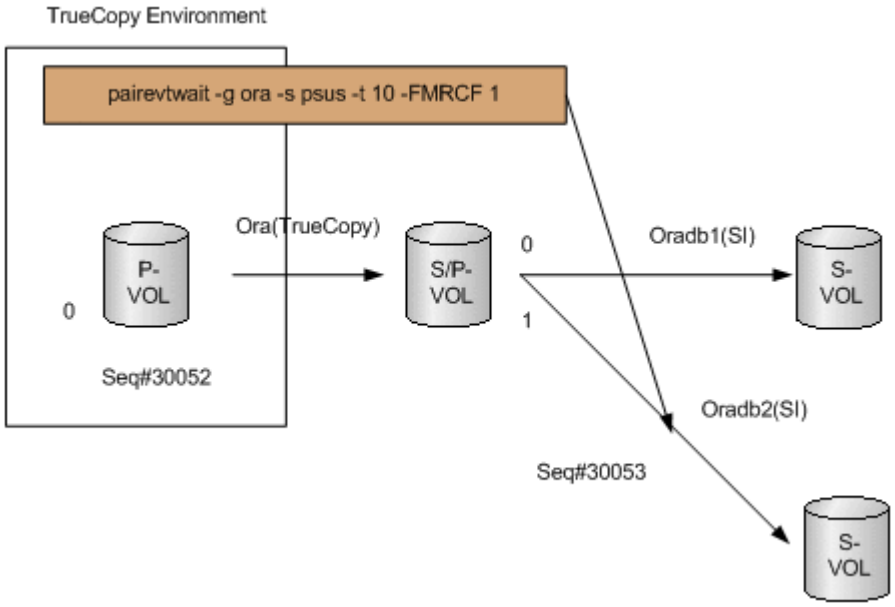


Figure 2-16 Example of -FMRCF option for pairevtwait

Using the -ss <status> … and -nowaits options. In PVOL_PSUS & SVOL_COPY state of ShadowImage quick mode, *pairevtwait* returns immediately even if the S-VOL is still in SVOL_COPY state because P-VOL is already in PVOL_PSUS state. If you want to wait the SVOL_SSUS state, then use the *-ss <status>* and *-nowaits* options to wait for the pair status on S-VOL side. This is needed for operating **pairresync -restore** or **pairsplit -S**.

The figure below shows five examples of waiting until 'PVOL_PSUS' & 'SVOL_COPY' state is changed to SVOL_SSUS.

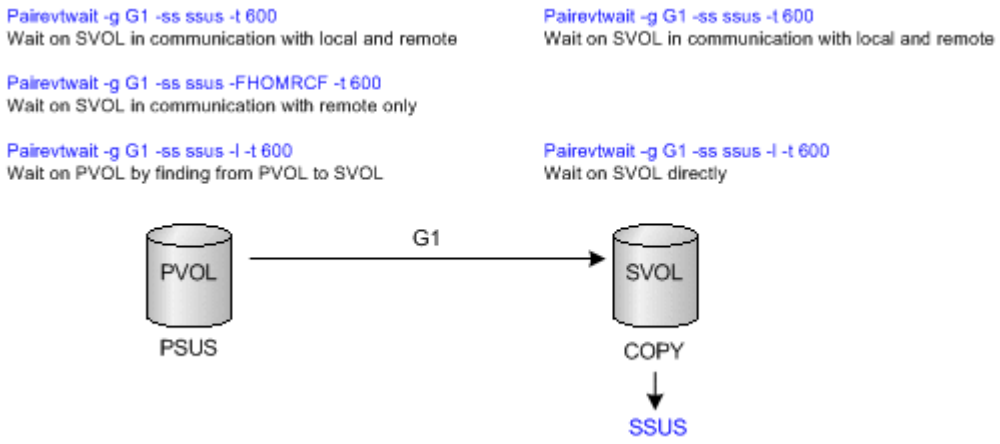


Figure 2-17 Example for waiting on ShadowImage

The **horctakeover** command suspends G2(CA-Jnl) automatically if **horctakeover** returns 'Swap-takeover' as an exit code. In DC1 host failure, if APP1 wants to wait until DC3 becomes the suspend state, then they can verify the 'SSUS' state by using the **pairevtwait** command as shown below.

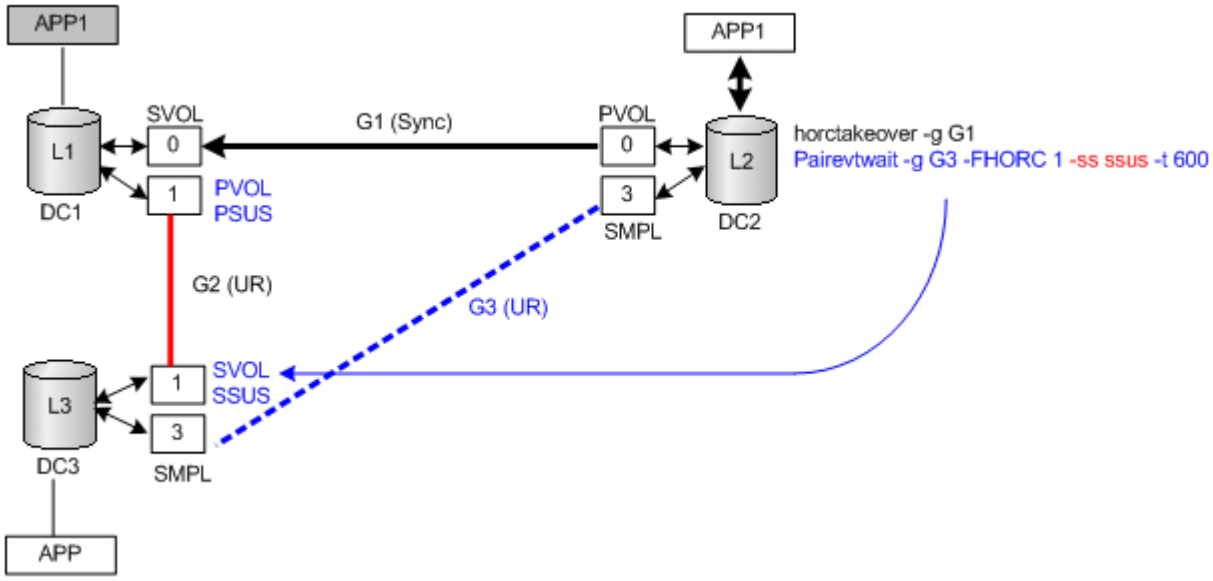


Figure 2-18 Example for waiting 'SSUS' on 3DC using TC/UR

pairmon

The *pairmon* (pair monitor) command, which is connected to the HORCM daemon, obtains the pair status transition of each volume pair and reports the status change. If the pair status changes (due to an error or a user-specified command), the *pairmon* command displays a message.

The pair status transition events exist in the HORCM pair state transfer queue. The -resevt option (reset event) deletes one/all events from the

HORCM pair state transfer queue. If reset event is not specified, the pair state transfer queue is maintained. If the -s option is not specified, *pairmon* displays all events for which it receives information from HORCM. If the -s option is specified, only the specified status transitions are displayed.

The CCI software supports the error monitoring and configuration confirmation commands for linkage with the system operation management of the UNIX server.

Syntax

```
pairmon { -h | -q | -z[x] | -I[H][M][instance#] or
     -I[TC][SI][instance#] | -D | -allsnd | -resevt | -nowait
     | -s <status> ... }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits this command.
-z or -zx	Makes the pairmon command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option.
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.
-D	Selects the default report mode. In the default mode, if there is pair status transition information to be reported, one event is reported and the event is reset. If there is no pair status transition information to be reported, the command waits. The report mode consists of the three flags: -allsnd, -resevt, and -nowait options.
-allsnd	Reports all events if there is pair status transition information.
-resevt	Reports events if there is pair status transition information, and then resets all events.
-nowait	When this option is specified, the command does not wait when there is no pair status transition information.
-s <status>...	Specifies the pair status transition to be reported: smpl, copy (includes rcpy), pair, psus, psue. If two or more statuses are specified following -s, masking is done according to the logical OR of the specified statuses. If this option is not specified, pairmon displays all events which received information from HORCM.

Examples

The following shows an example of the *pairmon* command and its output.

```
# pairmon  -allsnd   -nowait
Group Pair vol Port  targ#lun#LDEV#…Oldstat code -> Newstat code
```

```
oradb oradb1   CL1-A 1    5   145…SMPL      0x00 -> COPY    0x01
oradb oradb2   CL1-A 1    6   146…PAIR      0x02 -> PSUS    0x04
```

Output of the *pairmon* command:

Group: The group name (dev_group) described in the configuration definition file.

Pair vol: The paired volume name (dev_name) in the specified group that is described in the configuration definition file.

Port targ# lun#: The port ID, TID, and LUN which is described in the configuration definition file. For further information on fibre-to-SCSI address conversion, see the *Command Control Interface Installation and Configuration Guide*.

LDEV#: The LDEV ID for the specified device.

Oldstat: The old pair status when the status of the volume is changed.

Newstat: The new pair status when the status of the volume is changed.

code: The storage system-internal code for the specified status.

The following table specifies the results of the pairmon command options.

Table 2-5 Results of pairmon command options

-D	-nowait	-resevt	-allsnd	Actions
-D	-	-	-	When HORCM does not have an event, this option waits until an event occurs. If one or more events exist, then it reports one event and resets the event which it reported.
Invalid	-	-	-allsnd	When HORCM does not have an event, this option waits until an event occurs. If one or more events exist, then it reports all events.
Invalid	-	-resevt	-	When HORCM does not have an event, this option waits until an event occurs. If one or more events exist, then it reports one event and resets all events.
Invalid	-	-resevt	-allsnd	When HORCM does not have an event, this option waits until an event occurs. If one or more events exist, then it reports all events and resets all events.
Invalid	-nowait	-	-	When HORCM does not have an event, this option reports event nothing. If one or more events exist, then it reports one event and resets the event which it reported.
Invalid	-nowait	-	-allsnd	When HORCM does not have an event, this option reports event nothing. If one or more events exist, then it reports all events.
Invalid	-nowait	-resevt	-	When HORCM does not have an event, this option reports event nothing. If one or more events exist, then it reports one event and resets all events.

-D	-nowait	-resevt	-allsnd	Actions
Invalid	-nowait	-resevt	-allsnd	When HORCM does not have an event, this option reports event nothing. If one or more events exist, then it reports all events and resets all events.

pairvolchk

The *pairvolchk* command checks the attributes and status of a pair volume. It acquires and reports the attribute of a volume or group connected to the local host (issuing the command) or remote host. The volume attribute is SMPL (simplex), P-VOL (primary volume), or S-VOL (secondary volume). The -s[s] option reports the pair status in addition to the attribute.

Syntax

```
pairvolchk { -h | -q | -z[x] | -I[H][M][instance#] or
   -I[TC][SI][instance#] | -g <group> | -d <pair Vol> |
   -d[g] <raw_device> [MU#] | -FHORC [MU#] | -FMRCF [MU#] |
   -d[g] <seq#> <LDEV#> [MU#] | -c | -ss |-nomsg }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the pair volume check command.
-z or -zx	Makes the pairvolchk command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.
-g <group>	Specifies the group name defined in the configuration definition file. The command is executed for the specified group unless the -d <pair Vol> option is specified.
-d <pair Vol>	Specifies the paired logical volume name defined in the configuration definition file. When this option is specified, the command is executed for the specified paired logical volumes. This option is valid when the -g <group> option is specified.
-d[g] <raw_device> [MU#]	Searches whether the specified raw_device is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of *-g <group>* option. If the specified raw_device is contained in two or more groups, the command is executed for the first group.

Option	Description
-d[g] <seq#> <LDEV#> [MU#]	Searches whether the specified LDEV is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of '-g <group>' option. If the specified LDEV is contained in two or more groups, the command is executed on the first group. The <seq#> <LDEV#> values can be specified in hexadecimal (add the '0x' prefix) or decimal notation. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-c	Checks the conformability of the paired volumes of the local and remote hosts and reports the volume attribute of the remote host. If this option is not specified, the volume attribute of the local host is reported.
-ss	Used when acquiring the attribute of a volume and the pair status of a volume. If this option is not specified, the volume attribute of the local host is reported. For details on the pair status to be displayed, see Table 2-7 pairvolchk group status on page 2-46.
-nomsg	Suppresses messages to be displayed when this command is executed. It is used to execute a command from a user program. This option must be specified at the beginning of a command argument. The command execution log is not affected by this option.
-FHORC [MU#] or -FCA [MU#]	Forcibly specifies a cascading remote copy volume for specified pair logical volumes on local copy environment. If no -c option is specified, this option acquires the attributes of a cascading remote copy volume on a local host (near site). If the -c option is specified, this option acquires the attributes of a cascading remote copy volume on a remote host (far site).
-FMRCF [MU#] or -FBC [MU#]:	Forcibly specifies a cascading local copy volume for specified pair logical volumes on remote copy environment. If no -c option is specified, acquires the attributes of a cascading local copy volume on a local host (near site). If the -c option is specified, acquires the attributes of a cascading local copy volume on a remote host (far site).

Returned values

The **pairvolchk** command sets the following returned values during exit allowing you to check the execution results.

Table 2-6 pairvolchk returned values

Condition	Value
When the -ss option is not specified	Normal termination: 1: The volume attribute is SMPL. 2: The volume attribute is P-VOL. 3: The volume attribute is S-VOL. Abnormal termination: Other than 0 to 127, refer to the error codes for error details.
When the -ss option is specified	Normal termination: 11: The status is SMPL. Abnormal termination: specific error codes (see Error Codes) and generic error codes.

Condition	Value
For TrueCopy, ShadowImage, Copy-on-Write Snapshot, Volume Migration, and global-active device	22: The status is PVOL_COPY or PVOL_RCPY. 23: The status is PVOL_PAIR. 24: The status is PVOL_PSUS. 25: The status is PVOL_PSUE. 26: The status is PVOL_PDUB (TrueCopy & LUSE volume only). 32: The status is SVOL_COPY or SVOL_RCPY. 33: The status is SVOL_PAIR. 34: The status is SVOL_PSUS. 35: The status is SVOL_PSUE. 36: The status is SVOL_PDUB (TrueCopy & LUSE volume only). To identify TrueCopy Async and Universal Replicator, the pairvolchk command returns a value which is 20 more than the TrueCopy status code and adds PFUL and PFUS states to return code to identify sidefile status of TrueCopy Async or Universal Replicator journal file.
For TrueCopy Async and Universal Replicator	42: The status is PVOL_COPY. 43: The status is PVOL_PAIR. 44: The status is PVOL_PSUS. 45: The status is PVOL_PSUE. 46: The status is PVOL_PDUB. (TrueCopy & LUSE volume only) 47: The status is PVOL_PFUL. 48: The status is PVOL_PFUS. 52: The status is SVOL_COPY or SVOL_RCPY. 53: The status is SVOL_PAIR. 54: The status is SVOL_PSUS. 55: The status is SVOL_PSUE. 56: The status is SVOL_PDUB. (TrueCopy & LUSE volume only) 57: The status is SVOL_PFUL. 58: The status is SVOL_PFUS.
For Copy-on-Write Snapshot	Copy-on-Write Snapshot needs to show the status of Full of the Copy-on-Write Snapshot Pool as Copy-on-Write Snapshot condition. For this purpose, Copy-on-Write Snapshot also uses PFUL and PFUS status which is the status of Full of the sidefile for TrueCopy Async. The APP can refer this status as the return value. 22: The status is PVOL_COPY or PVOL_RCPY. 23: The status is PVOL_PAIR. 24: The status is PVOL_PSUS. 25: The status is PVOL_PSUE. 26: The status is PVOL_PDUB. (TrueCopy and LUSE volumes only) 27: The status is PVOL_PFUL. (PAIR closing Full status of the Copy-on-Write Snapshot Pool) 28: The status is PVOL_PFUS. (PSUS closing Full status of the Copy-on-Write Snapshot Pool) 32: The status is SVOL_COPY or SVOL_RCPY. 33: The status is SVOL_PAIR. 34: The status is SVOL_PSUS.

Condition	Value
	35: The status is SVOL_PSUE. 36: The status is SVOL_PDUB. (TrueCopy and LUSE volumes only) 37: The status is SVOL_PFUL. (PAIR closing Full status of the Copy-on-Write Snapshot Pool) 38: The status is SVOL_PFUS. (PSUS closing Full status of the Copy-on-Write Snapshot Pool) You can set the threshold for the specified pool via Storage Navigator and Device Manager - Storage Navigator. The default value is 80% of pool capacity. PFUS is set when the Copy-on-Write Snapshot pool became over threshold in the PSUS state. PFUL is set when the Copy-on-Write Snapshot pool became over threshold in the PAIR state.

Error codes

Category	Error code	Error message	Recommended action	Value
Volume status (Unrecoverable)	EX_ENQVOL	Unmatched volume status within the group	Confirm status using the pairdisplay command. Make sure all volumes in the group have the same fence level and volume attributes.	236
	EX_EVOLCE	Pair volume combination error	Confirm pair status using the pairdisplay command, and change combination of volumes.	235

Examples

Example 1

Display example for ShadowImage/Copy-on-Write Snapshot:

```
# pairvolchk -g oradb
pairvolchk : Volstat is P-VOL.[status = PAIR ]
```

Display example for ShadowImage (specified with '-m grp' option):

```
# pairvolchk -g oradb
pairvolchk : Volstat is P-VOL.[status = PAIR, CTGID = 1 ]
```

Display example for TrueCopy:

```
# pairvolchk -g oradb
pairvolchk : Volstat is P-VOL.[status = PAIR, fence = DATA,
MINAP = 2 ]
```

Display example for TrueCopy Sync CTG:

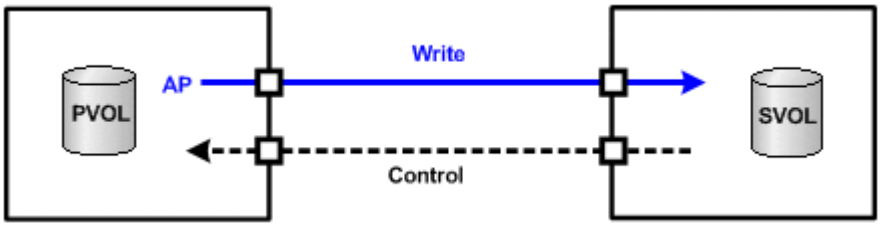
```
# pairvolchk -g oradb
pairvolchk : Volstat is P-VOL.[status = PAIR, fence = DATA,
CTGID = 2 MINAP = 2 ]
```

Display example for TrueCopy Async:

```
# pairvolchk -g oradb
pairvolchk : Volstat is P-VOL.[status = PAIR fence = ASYNC
CTGID = 2 MINAP = 2 ]
```

MINAP displays the following two conditions (status) according to the pair status:

PVOL: This shows the minimum in Active Paths on specified group in TrueCopy/TrueCopy Async.



SVOL_ SSUS(SSWS): MINAP shows the result of the suspend operation that indicates whether the remaining data on P-VOL was completely passed (synchronized) to S-VOL. If MINAP is 'one', all data is passed. Otherwise, all data is not passed from P-VOL.

Note: If the microcode on the storage system does not support the active paths, then the 'MINAP' item is not displayed as follows:

```
pairvolchk : Volstat is P-VOL.[status = PAIR fence = ASYNC CTGID = 2]
```

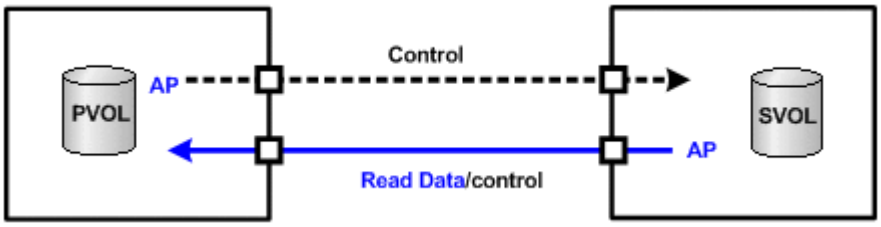
Example 2

Display example for Universal Replicator:

```
# pairvolchk -g oradb
pairvolchk : Volstat is P-VOL.[status = PAIR fence = ASYNC
CTGID = 2 MINAP = 2 ]
```

MINAP displays the following two conditions (status) according to the pair status:

PVOL or SVOL_PAIR (except SSUS(SSWS)): this shows the minimum in Active Paths on specified group in Universal Replicator.



SVOL_ SSUS(SSWS): MINAP shows the result of the suspend operation that indicates whether or not the remaining All data on P-VOL were Passed (synchronized) to S-VOL completely. If MINAP is 'one', All data were passed. If not, all data were not passed from P-VOL.

Note: If the microcode on the storage system does not support the active paths, then the 'MINAP' item is not displayed as follows:

```
pairvolchk : Volstat is P-VOL.[status = PAIR fence = ASYNC
CTGID = 2]
```

Example 3

Display example for LDEV blockading:

```
# pairvolchk -g oradb
pairvolchk : Volstat is P-VOL.[status = PAIR fence = DATA
MINAP = 2  LDEV = BLOCKED]
```

LDEV = *BLOCKED*: Displays the status of LDEV blockading in order to detect a link failure of E-LUN.

Example 4

The following shows examples of the **pairvolchk** command and its output.

TrueCopy Async:

```
# pairvolchk -g oradb
pairvolchk : Volstat is P-VOL.[status = PAIR fence = ASYNC
CTGID = 2]
```

TrueCopy:

```
# pairvolchk -g oradb
pairvolchk : Volstat is P-VOL.[status = PAIR fence = DATA ]
```

ShadowImage:

```
pairvolchk -g oradb
pairvolchk : Volstat is P-VOL.[status = PAIR ]
```

ShadowImage pair splitting with specifying the consistency group:

```
# pairvolchk -g oradb
pairvolchk : Volstat is P-VOL.[status = PAIR CTGID = 1]
```

Example 5

The following shows a pairvolchk example that acquires the status (PVOL_PSUS) of the intermediate P/Pvol through specified pair group on ShadowImage environment. The following figure shows a pairvolchk example that acquires the status (PVOL_PSUS) of the intermediate S/Pvol (MU#1) through specified pair group on TrueCopy environment.

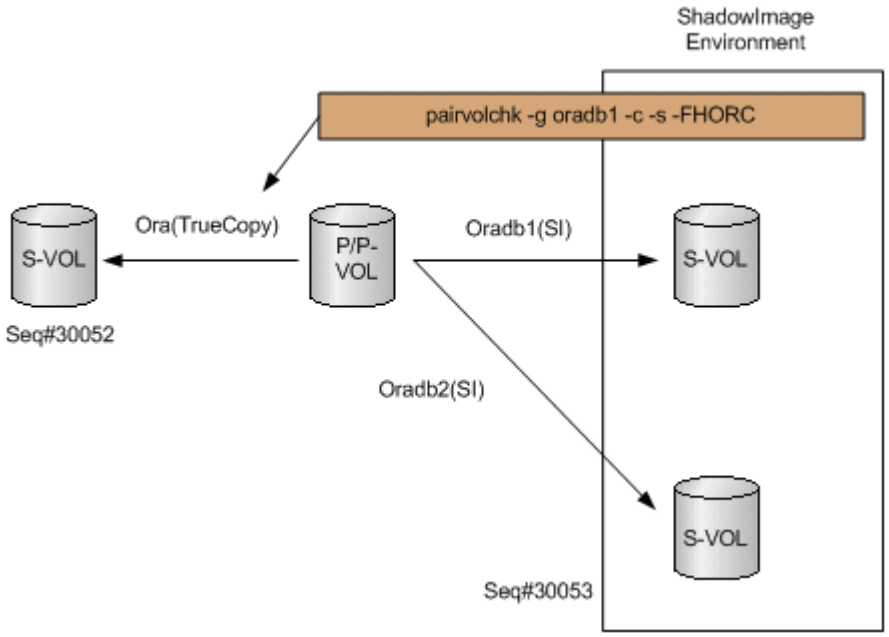


Figure 2-19 Example of -FHORC option for pairvolchk

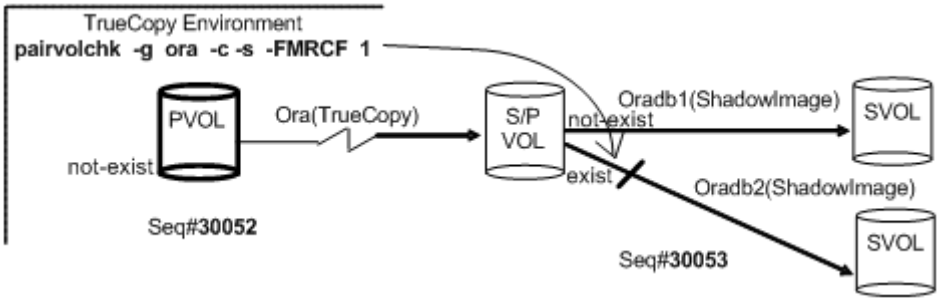


Figure 2-20 Example of -FMRCF option for pairvolchk

The following table shows the *pairvolchk* group status.

Table 2-7 pairvolchk group status

Option	COPY/ RCPY	PSUE	PDUB	PFUS	PSUS	PFUL	PAIR	Group status
	Status of each volume in the group							-
See *Note* under this table	exist	ignore	ignore	ignore	ignore	ignore	ignore	COPY/RCPY
	not-exist	exist	ignore	ignore	ignore	ignore	ignore	PSUE
	not-exist	not-exist	exist	ignore	ignore	ignore	ignore	PDUB
	not-exist	not-exist	not-exist	exist	ignore	ignore	ignore	PFUS
	not-exist	not-exist	not-exist	not-exist	exist	ignore	ignore	PSUS

Option	COPY/ RCPY	PSUE	PDUB	PFUS	PSUS	PFUL	PAIR	Group status
	not-exist	not-exist	not-exist	not-exist	not-exist	exist	ignore	PFUL
	not-exist	not-exist	not-exist	not-exist	not-exist	not-exist	exist	PAIR
-ss	exist	ignore	ignore	ignore	ignore	ignore	ignore	COPY/RCPY
	not-exist	exist	ignore	ignore	ignore	ignore	ignore	PSUE
	not-exist	not-exist	exist	ignore	ignore	ignore	ignore	PDUB
	not-exist	not-exist	not-exist	ignore	ignore	exist	ignore	PFUL
	not-exist	not-exist	not-exist	ignore	ignore	not-exist	exist	PAIR
	not-exist	not-exist	not-exist	exist	not-exist	not-exist	not-exist	PFUS
	not-exist	not-exist	not-exist	not-exist	exist	not-exist	not-exist	PSUS
exist: The target status exists in the group. not-exist: The target status does not exist in the group.								

Note: This option can be used only when 'pairvolchk -s' has the variable, USE_OLD_VCHK.

The PFUL state appears as PAIR by all commands (except the -fc option of the *pairdisplay* command), since PFUL indicates PAIR state with sidefile at the HWM.

The PFUS state appears as PSUS by all commands (except the -fc option of the *pairdisplay* command), since PFUS indicates SUSPENDED state due to sidefile full.

The SVOL_PSUS state appears as SSUS by the *pairdisplay* command and other commands.

pairdisplay

The *pairdisplay* command displays the pair status allowing you to verify completion of pair operations (for example, paircreate, pairresync). The *pairdisplay* command is also used to confirm the configuration of the pair volume connection path (the physical link of paired volumes and servers). The *pairdisplay* command can be used for a paired volume or a group of paired volumes.

Syntax

```
pairdisplay{ -h | -q | -z[x] | -I[H][M][instance#] or
     -I[TC][SI][instance#]
     | -g <group> | -d <pair Vol> | -d[g] <raw_device> [MU#]
     | -FHORC [MU#]| -FMRCF  [MU#] | -d[g] <seq#> <LDEV#> [MU#]
     | -c | -l  | -f[xcdmew] | -CLI | -m <mode> | -v jnl[t]
     | -v ctg  | -v pid }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the pair volume check command.
-z or -zx	Makes the pairdisplay command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.
-g <group>	Specifies the group name defined in the configuration definition file. The command is executed for the specified group unless the -d <pair Vol> option is specified.
-d <pair Vol>	This option is used to specify the paired logical volume name defined in the configuration definition file. When this option is specified, the command is executed for the specified paired logical volumes. This option is valid when the -g <group> option is specified.
-d[g] <raw_device> [MU#]	Searches whether the specified raw_device is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of *-g <group>* option. If the specified raw_device is contained in two or more groups, the command is executed for the first group.
-FHORC [MU#] or -FCA [MU#]	Forcibly specifies a cascading remote copy volume for specified pair logical volumes on local copy environment. If the -l option is specified, this option displays status of a cascading remote copy volume on a local host (near site). If no -l option is specified, this option displays status of a cascading remote copy volume on a remote host (far site). This option cannot be specified with -m <mode> option on the same command line.
-FMRCF [MU#] or -FBC [MU#]	Forcibly specifies a cascading local copy volume for specified pair logical volumes on remote copy environment. If the -l option is specified, this option displays status of a cascading local copy volume on a local host (near site). If no -l option is specified, this option displays status of a cascading local copy volume on a remote host (far site). This option cannot be specified with -m <mode> option on the same command line.
-d[g] <seq#> <LDEV#> [MU#]	Searches whether the specified LDEV is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of '-g <group>' option. If the specified LDEV is contained in two or more groups, the command is executed on the first group. The <seq#> <LDEV#> values can be specified in hexadecimal (add the '0x' prefix) or decimal notation.

Option	Description
	Note for VSP G1000, G1500, and VSP F1500: When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-c	Checks the configuration of the paired volume connection path (physical link of paired volume among the servers) and displays illegal pair configurations. If this option is not specified, the status of the specified paired volume is displayed without checking the path configuration.
-l	Displays the paired volume status of the local host (which issues this command).
-fx	Displays the LDEV ID as a hexadecimal number.
-fc	Displays copy operation progress, sidefile percentage, bitmap percentage, or Universal Replicator journal percentage. Displays PFUL/PFUS for TrueCopy Async and Universal Replicator. Used to confirm SSWS state as indication of SVOL_SSUS-takeover after.

-fd	Displays the relation between the Device_File and the paired volumes, based on the group (as defined in the local instance configuration definition file). If Device_File column shows 'Unknown' as shown in the Display example, it means that the volume cannot be recognized by the host because the volume has not been registered when you start CCI, and pair operation are rejected (except the local option such as '-l') in protection mode.
	Display example:
	`# pairdisplay -g oradb -fd`
	`Group PairVol(L/R) Device_File M ,Seq#,LDEV#.P/S,Status, Seq#,P-LDEV# M`
	`oradb oradev1(L) c0t3d0 0 35013 17..P-VOL COPY, 35013 18 -`
	`oradb oradev1(R) Unknown 0 35013 ****..---- ----, ----- -- -`

-fm	Displays the Bitmap mode to output of M column.

-fe	Displays the serial# and LDEV# of the external LUNs mapped to the LDEV and additional information for the pair volume. This option displays the information above by adding to last column, and then ignores the format of 80 column. This option is not valid if the cascade options (-m all,-m cas) are specified.
	Display example for TC/TC Async/UR/GAD:
	`# pairdisplay -g oradb -fe`
	`Group PairVol(L/R) (Port#,TID, LU), Seq#, LDEV#.P/S, Status, Fence,Seq#,`
	`P-LDEV# M CTG JID AP EM E-Seq# E-LDEV# R/W QM`
	`Oradb dev1(L) (CL5-A-0,30, 0) 64568 301.P-VOL PAIR ASYNC, 64568`
	`303 - 0 2 1 - - - -/- AA`
	`Oradb dev1(R) (CL5-A-0,30, 2) 64568 303.S-VOL PAIR ASYNC,-----`
	`301 - 0 4 1 - - - -/- AA`
	`Oradb dev2(L) (CL5-A-0,30, 1) 64568 302.P-VOL PAIR ASYNC, 64568`
	`304 - 0 3 1 - - - -/- AA`
	`Oradb Dev2(R) (CL5-A-0,30, 3) 64568 304.S-VOL PAIR ASYNC,-----`
	`302 - 0 5 1 - - - -/- AA`
	Display example for SI/Copy-on-Write Snapshot/Volume Migration:
	`# pairdisplay -g horc0 -fe`
	`Group ... Seq#,LDEV#.P/S,Status, Seq#,P-LDEV# M CTG CM EM E-Seq# E-LDEV#`
	`horc0 ... 63528 65.P-VOL COPY,63528 64 - - N - - -`
	`horc0 ... 63528 64.S-VOL COPY,----- 65 - - N - - -`
	-fe CTG: For TC, TC Async, UR, and GAD, it displays the consistency group ID when the fence level is ASYNC. For TC Sync CTG, it displays the consistency group ID when the fence level is DATA, STATUS, or NEVER. For SI, it displays the consistency group ID on volumes split with specifying the consistency group using SI.

Option	Description

	Note: If the snapshot is made by `raidcom add snapshot`, the displayed consistency group ID is not correct. To confirm the status of a snapshot that was made by `raidcom add snapshot`, use the `raidcom get snapshot` command.
	JID: The journal ID for P-VOL or S-VOL. In a HAM or GAD configuration, it shows the quorum ID and the fence level is set to 'Never'. When it is not the UR or HAM configuration, '-' is displayed.
	AP: The number of active paths for UR links on P-VOL, and it displays the number of active paths for UR links on P-VOL and S-VOL.'Unknown'is shown as '-'. Refer to 'MINAP' information that is displayed by running the pairvolchk command.
	CM: The Copy mode
	• N: Non SnapShot
	• S: SnapShot. In the SMPL state, this shows that pair-volume is created as SnapShot.
	• C: Cruising Copy
	EM: The external connection mode
	• H: Mapped E-lun as hidden from the host.
	• V: Mapped E-lun as visible to the host
	• ' - ': Unmapped to the E-lun
	• BH: Mapped E-lun as hidden from the host, but LDEV blockading.
	• BV: Mapped E-lun as visible to the host, but LDEV blockading
	• B: Unmapped to the E-lun, but LDEV blockading
	E-Seq#: The production (serial) number of the external LUN. 'Unknown' is shown as '-'. The serial number for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345).
	E-LDEV#: The LDEV# of the external LUN, 'Unknown' is shown as '-'.
	R/W: Displays the I/O mode when Read/Write is performed. For GAD configuration, the following modes are displayed:
	• L/L: Read/Write is performed on both the primary and secondary volumes.
	• L/M: Read is performed on both the primary and secondary volumes. Write is performed on the primary volume first, and then done on the secondary volume.
	• B/B: Read/Write is rejected (Illegal Request is replied). LU-undefined is returned as a response of the Inquiry command on this volume.
	QM: For GAD pairs, displays the pair operation mode when the quorum disk is blocked.
	• SP: Pair suspended.
	• AS: Pair retained (P-VOL accessible, S-VOL inaccessible).
	• AA: Pair retained (Both P-VOL and S-VOL accessible).
	• - (hyphen): Displayed for any of the following:
	  ◦ A non-GAD pair
	  ◦ A suspended GAD pair
	  ◦ A GAD pair without operation mode display support
	  ◦ A GAD pair, but the operation mode that is not supported by CCI is set

-fw	Used when displaying the WWN setting (defined by '50060E80+RAID Type,Serial#,Port#)) to the port instead of a port name. If this option is specified with the '-fe' option at the same line, then 'LUN WWN' appears as shown below. If WWN is not computed, then 'Unknown' appears (for example, SCSI). Display example:

Option	Description
	# pairdisplay -g PG01 -fw Group PairVol(L/R) (WWN, LU-M),Seq#,LDEV#.P/S,Status, Seq#,P-LDEV# M PG01 ora01(L) (**500060e804f42001**, 3-0) 62496 67. P-VOL COPY, 62496 69 - PG01 ora01(R) (**500060e804f42001**, 5-0) 62496 69. S-VOL COPY, ----- 67 - PG01 ora02(L) (**500060e804f42001**, 4-0) 62496 68. P-VOL COPY, 62496 64 - PG01 ora02(R) (**500060e804f42001**, 6-0) 62496 64. S-VOL COPY, ----- 68 - Display example: # pairdisplay -IH -g PG01 -CLI -l -fweGroup PairVol L/R WWN LU Seq# LDEV# P/S Status Fence Seq# P-LDEV# M CTG JID AP EM E-Seq# E-LDEV# **LUN-WWN** PG01 oradb01 L 500060e804fa0f01 1 64015 11 P-VOL PAIR ASYNC 62496 11 - 5 - 1 - - - **60060e8005fa0f000000fa0f0000000b** PG01 oradb02 L 500060e804fa0f01 2 64015 12 P-VOL PAIR ASYNC 62496 12 - 5 - 1 - - - **60060e8005fa0f000000fa0f0000000c**
-CLI	Used when specifying display for command line interface (CLI). This option displays to the same position that defined number of columns, and displays one header. The delimiters between columns are displayed as spaces or hyphens (-). Display example: Group PairVol L/R Port# TID LU-M Seq# LDEV# P/S Status Seq# P-LDEV# M homrcf1 deva0 L CL1-D 3 5 0 30053 271 P-VOL PAIR 30053 263 - homrcf1 deva1 L CL1-D 3 5 1 30053 271 SMPL - - - - homrcf1 deva2 L CL1-D 3 5 2 30053 271 SMPL - - - -
-m <mode>	Used when displaying a paired status of each mirror descriptors for the specified pair logical volume, and used for paired status indication of the cascading volume. The <mode> option can be designated 'cas' or 'all': • The 'cas' option is used when displaying a paired status of specified group that is registered to the mirror descriptor (MU#) on the cascading configuration file. • The 'all' option is used when displaying a paired status of all mirror descriptors (MU#). This option (-m <mode>) is not affected with command execution environment (TrueCopy/TrueCopy Async/Universal Replicator/GAD and ShadowImage/Copy-on-Write Snapshot /Volume Migration), and displays the paired status. This option cannot be specified with the -FHORC/-FMRCF option on the same command line.
-v jnl[t]	Displays the JNL status for the local and remote interconnected to the group. Also finds the journal ID for each local and remote interconnected to the group via the specified group or <raw_device>, and displays information of each journal ID corresponding the local and remote. The first line shows the journal information for the local host, second line shows the journal information for the remote host. The item for displaying is the same as **raidvchkscan -v jnl[t]**. The serial number (Seq#) for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345). Example: # pairdisplay -g VG01 -v jnl JID MU CTG JNLS AP U(%) Q-Marker Q-CNT D-SZ(BLK) Seq# Nnm LDEV# 001 0 2 PJNN 4 21 43216fde 30 512345 62500 2 265 002 0 2 SJNN 4 95 3459fd43 52000 512345 62538 3 270 Example: # pairdisplay -g VG01 -v jnlt JID MU CTG JNLS AP U(%) Q-Marker Q-CNT D-SZ(BLK) Seq# DOW PBW APW

Option	Description
	001 1 2 PJNN 4 21 43216fde 30 512345 62500 20 300 40 002 1 2 SJNN 4 95 3459fd43 52000 512345 62538 20 300 40 Example: # pairdisplay -g VG01 -v jnl -FCA 1 JID MU CTG JNLS AP U(%) Q-Marker Q-CNT D-SZ(BLK) Seq# Nnm LDEV# 003 1 2 PJNN 4 21 43216fde 30 512345 62500 2 265 **Notes:** • This option can be specified with following options on the same command line: {-g<group> | -d <pair Vol> | -d[g] <raw_device> [MU#] | -FCA [MU#] | -d[g] <seq#> <LDEV#> [MU#] | -l | -f[x] } **Note for VSP G1000, G1500, and VSP F1500:** When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345. • The '-FHORC [MU#]' or '-FCA [MU#]' option is used when displaying the journal information of cascading Universal Replicator volume, and then it shows the journal information for the remote host only. • This option displays nothing if the target volume is NOT a Universal Replicator volume.
-v ctg	This option finds the consistency group for each local and remote interconnected to the group via the specified group or <raw_device>, and displays any information of each consistency group corresponding the local and remote. The first line shows the consistency group information for the local host, second line shows the consistency group information for the remote host. Example: # pairdisplay -g VG01-v ctg CTG P/S Status AP U(%) Q-Marker QM-Cnt SF(%) Seq# IFC OT/s CT/m RT/m 001 P-VOL PAIR 2 0 00000080 3 50 63528 ON 90 5 5 001 S-VOL PAIR - 0 0000007d - 50 63528 - - - - **CTG**: Displays the consistency group ID. **P/S**: The attribute of a volume in first LDEV of the specified group. **Status**: The status of the paired volume in first LDEV of the specified group. **AP**: Displays the number of Active Path in Universal Replicator links on P-VOL, also displays the number of active path in Universal Replicator links on P-VOL and S-VOL, 'Unknown' is shown as '-'. **U(%)**:The usage sidefile/journal data, it is valid at PAIR state. For TrueCopy Async: The sidefile percentage for consistency group in relationship to a 100% full sidefile in cache. For Universal Replicator: The usage rate of the current journal data as 100% of the journal data space. **Q-Marker**: In P-VOL, the latest sequence # of the MCU PVol when the write command was received. In S-VOL, the latest sequence # of the DFW on RCU. This item is valid at PAIR state. **QM-Cnt**: The number of remaining Q-Marker within consistency group of the Unit. TrueCopy Async sends a token called 'dummy recordset' at regular interval time, therefore QM-Cnt always shows '2' or '3' even if host has NO writing. This item is valid at PAIR state. **SF(%)**:The usage of cache setting as the sidefile regardless of Universal Replicator and TrueCopy Async.

Option	Description
	Seq#: The serial number of the RAID storage system. The serial number for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345). **IFC**: Shows 'ON'/ 'OFF' for controlling Inflow. **OT/s**: The 'offloading timer' (specified in seconds) setting to consistency group for TrueCopy Async and Universal Replicator. In Universal Replicator, this is the same as 'DOW' item shown by raidvchkscan -v jnlt or pairdisplay -v jnlt. **CT/m**: The 'Copy Pending timer' (specified in minutes) setting to consistency group for only TrueCopy Async. **RT/m**: The 'RCU Ready timer' (specified in minutes) setting to consistency group for only TrueCopy Async. ***Note:*** This option displays nothing if the target volume is NOT a TrueCopy Async or Universal Replicator volume. The '-FHORC [MU#]' or '-FCA [MU#]' option is used when displaying the information of cascading TrueCopy Async/Universal Replicator volume, and then it shows the consistency group information for the remote host only.

-v pid	Finds the pool ID for each local and remote interconnected to the group via the specified group or <raw_device>, and displays any information of each pool ID corresponding the local and remote. The first line shows the pool information for the local host, second line shows the pool information for the remote host. The displayed items are the same as for **raidvchkscan -v pid**. The serial number (Seq#) for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345).
	Example:
	`# pairdisplay -g VG01 -v pid`
	`PID POLS U(%) SSCNT Available(MB) Capacity(MB) Seq# Num LDEV# H(%)`
	`127 POLN 0 6 3000 3000 63528 2 864 80`
	`127 POLN 0 6 3000 3000 63528 2 864 80`
	`# pairdisplay -g VG01 -v pid -l`
	`PID POLS U(%) SSCNT Available(MB) Capacity(MB) Seq# Num LDEV# H(%)`
	`127 POLN 0 6 3000 3000 63528 2 864 80`
	H(%): Displays the threshold rate being set to the Copy-on-Write Snapshot pool as High water mark. 'Unknown' is shown as '-'.
	Note: This option displays nothing if the target volume is NOT Copy-on-Write Snapshot volume.

-v pid -FMRCF	The '-FBC [MU#]' option is used for displaying the pool information of cascading Copy-on-Write Snapshot volume, so that you can monitor the pool status on remote host connected to cascading TrueCopy P-VOL to TrueCopy S-VOL/Copy-on-Write Snapshot P-VOL. It shows the pool information for the remote host only.
	Example:
	`# pairdisplay -g VG01 -v pid -FMRCF`
	`PID POLS U(%) SSCNT Available(MB) Capacity(MB) Seq# Num LDEV# H(%)`
	`127 POLN 0 6 3000 3000 63528 2 864 80`

Returned values

--

Error codes

--

Examples

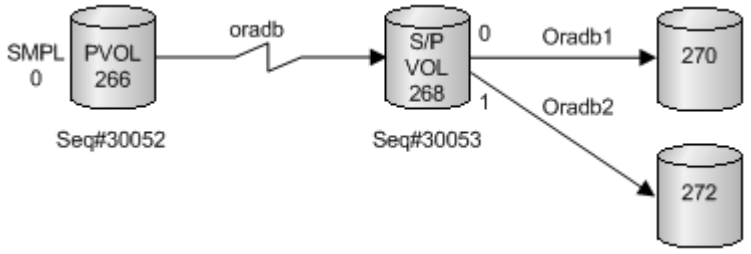
pairdisplay command example for TrueCopy, TrueCopy Async, Universal Replicator, and global-active device:

```
# pairdisplay -g oradb -fcx
Group  Pair Vol(L/R)  (P,T#,L#),   Seq#,  LDEV#..P/S,  Status,
Fence, Copy%, P-LDEV#  M
oradb  oradb1(L)      (CL1-B, 1,0) 1234      64..P-VOL   PAIR
Never,    75       C8  -
oradb  oradb1(R)      (CL1-A, 1,0) 5678      C8..S-VOL   PAIR
Never,  ----       64  -
```

pairdisplay command example for ShadowImage and Copy-on-Write Snapshot:

```
# pairdisplay  -g oradb
Group  Pair Vol(L/R) (Port#,TID,LU-M),  Seq#,  LDEV#..P/S, Status,
Fence,  Seq#, P-LDEV# M
oradb      oradb1(L)     (CL1-A, 1,0)  30053      18..P-VOL  PAIR
Never, 30053      19  -
oradb      oradb1(R)     (CL1-D, 1,0)  30053      19..S-VOL  PAIR
Never,  ----      18  -
```

Examples of **pairdisplay -m**




```
Display example for -m cas:
# pairdisplay -g oradb -m cas
Group   PairVol(L/R) (Port#,TID,LU-M), Seq#,  LDEV#..P/S,  Status,
Seq#, P-LDEV# M
oradb   oradev1(L)   (CL1-D , 3,  0-0) 30052  266....SMPL  ----,
----- ----    -
oradb   oradev1(L)   (CL1-D , 3,  0)   30052  266....P-VOL COPY,
30053 268     -
oradb1  oradev11(R)  (CL1-D , 3,  2-0) 30053  268....P-VOL COPY,
30053 270     -
oradb2  oradev21(R)  (CL1-D , 3,  2-1) 30053  268....P-VOL PSUS,
30053 272     W
oradb   oradev1(R)   (CL1-D , 3,  2)   30053  268....S-VOL COPY,
----- 266     -

Display examples for -m all:
# pairdisplay -g oradb -m all
Group   PairVol(L/R) (Port#,TID,LU-M), Seq#,  LDEV#..P/S,  Status,
Seq#, P-LDEV# M
oradb   oradev1(L)   (CL1-D , 3,  0-0) 30052  266....SMPL  ----,
----  ----    -
```

```
-----   -----(L)     (CL1-D , 3,  0-1) 30052  266....SMPL  ----,
----  ----    -
-----   -----(L)     (CL1-D , 3,  0-2) 30052  266....SMPL  ----,
----  ----    -
oradb   oradev1(L)   (CL1-D , 3,  0)   30052  266....P-VOL PAIR,
30053 268     -
oradb1  oradev11(R)  (CL1-D , 3,  2-0) 30053  268....P-VOL COPY,
30053 270     -
oradb2  oradev21(R)  (CL1-D , 3,  2-1) 30053  268....P-VOL PSUS,
30053 272     W
-----   -----(R)     (CL1-D , 3,  2-1) 30053  268....SMPL  ----,
----- ----    -
oradb   oradev1(R)   (CL1-D , 3,  2)   30053  268....S-VOL COPY,
----- 266     -

# pairdisplay -d /dev/rdsk/c0t3d0 -l -m all
Group  PairVol(L/R) (Port#,TID,LU-M), Seq#,  LDEV#..P/S,  Status,
Seq#, P-LDEV# M
oradb  oradev1(L)   (CL1-D , 3,  0-0) 30052  266....SMPL  ----,
----   ----   -
-----  -----(L)     (CL1-D , 3,  0-1) 30052  266....SMPL  ----,
----   ----   -
-----  -----(L)     (CL1-D , 3,  0-2) 30052  266....SMPL  ----,
----   ----   -
oradb  oradev1(L)   (CL1-D , 3,  0)   30052  266....P-VOL PAIR,
30053  268    -
```

Output of the **pairdisplay** command:

Group = group name (dev_group) as described in the configuration definition file

Pair Vol(L/R) = paired volume name (dev_name) as described in the configuration definition file. (L) = local host; (R) = remote host

(P,T#,L#) (TrueCopy, TrueCopy Async, Universal Replicator, global-active device) = port, TID, and LUN as described in the configuration definition file.

(Port#,TID,LU-M) (ShadowImage, Copy-on-Write Snapshot) = port number, TID, LUN, and MU number as described in the configuration definition file.

Seq# = serial number of the RAID storage system. The serial number for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345).

LDEV# = logical device number

P/S = volume attribute

Status = status of the paired volume

Fence (TrueCopy, TrueCopy Async, Universal Replicator, global-active device) = fence level

% = copy operation completion, or percent pair synchronization

Vol.	Copy	Pair	Other	Copy	Pair	Other	Copy	Pair	Pvol_psus Svol_copy	Other
	TrueCopy Async status			TrueCopy Sync/GAD status			ShadowImage, Copy-on-Write Snapshot, or Volume Migration status			
P-VOL	CR	SF	BMP	CR	BMP	BMP	CR	CR	BMP	CR
S-VOL	-	SF	BMP	-	BMP	BMP	CR	CR	CR	CR

Volume	Copy	Pair	PSUS/SSUS (PJNS/SJNS)	Other
	Universal Replicator status			
P-VOL	CR	JF	JF	BMP
S-VOL	-	JF	JF	BMP

CR: Shows the copy operation rate (identical rate of a pair).

BMP: Shows the identical percentage of BITMAP both P-VOL and S-VOL.

SF: Shows sidefile percentage of each consistency group as sidefile 100% on cache of both P-VOL and S-VOL. Following is an arithmetic expression using the high water mark (HWM) as 100% of a sidefile space:

HWM(%) = HWM(%)/Sidefile space (30 to 70) × 100

JF: Shows the usage rate of the current journal data as 100% of the journal data space.

P-LDEV# = LDEV number of the partner volume of the pair

M

For P-VOL and 'PSUS' state:

M='W' shows that S-VOL is suspending with R/W enabled through the pairsplit.

M='-' shows that S-VOL is suspending with read only through the pairsplit.

For S-VOL and 'SSUS' state:

M='W' shows that S-VOL has been altered since entering SSUS state.

M='-' shows that S-VOL has NOT been altered since entering SSUS state.

For 'COPY/RCPY/PAIR/PSUE' state:

M='N' shows that its volume are read-disabled through the paircreate '-m noread'.

paircurchk (for TrueCopy/global-active device)

The **paircurchk** command is used to check the currency of the TrueCopy secondary volume(s) by evaluating the data consistency based on pair status and fence level.

The following table specifies the data consistency for each possible state of a TrueCopy volume. A paired volume or group can be specified as the target of the **paircurchk** command. The **paircurchk** command assumes that the target is an S-VOL. If the **paircurchk** command is specified for a group, the data consistency of each volume in the group is checked, and all inconsistent volumes are found in the execution log file and displayed. The **paircurchk** command is also executed as part of the **horctakeover** command (see next section).

Table 2-8 Data consistency displayed by the paircurchk command

Object Volume			Currency	
Attribute	**Status**	**Fence**	**Paircurchk**	**SVOL_takeover**
SMPL	-	-	To be confirmed	-
P-VOL	-	-	To be confirmed	-
S-VOL	*COPY*	Data	Inconsistent	Inconsistent
		Status		
		Never		
		Async	Inconsistent	Inconsistent
	PAIR	Data	OK	OK
		Status	OK	OK
		Never	To be analyzed	To be analyzed
	PAIR	*Async*	To be analyzed	*OK* (assumption)
	PFUL		To be analyzed	*OK* (assumption)
	PSUS	Data	Suspected	Suspected
		Status	Suspected	Suspected
		Never	Suspected	Suspected
	PSUS	*Async*	Suspected	Suspected
	PFUS		Suspected	Suspected
	PSUE *PDUB*	Data	OK	OK
		Status	Suspected	Suspected
		Never	Suspected	Suspected
		Async	Suspected	*OK* (assumption)
	SSWS	Data	Suspected	-
		Status	Suspected	
		Never	Suspected	
		Async	Suspected	

Legend:

To be confirmed = It is necessary to check the object volume, since it is not the secondary volume.

Object Volume			Currency	
Attribute	**Status**	**Fence**	**Paircurchk**	**SVOL_takeover**
Inconsistent = Data in the volume is inconsistent because it was being copied. *To be analyzed* = It cannot be judged from the status of the secondary volume whether data is consistent or not. It is OK if the status of the primary volume is PAIR. It is Suspected if the status is PSUS or PSUE. *Suspected* = The primary volume data and secondary volume data are not consistent. *OK (assumption)* = Mirroring consistency is not assured, but as S-VOL of TrueCopy Async or Universal Replicator, the sequence of write data is ensured.				

Syntax

```
paircurchk { -h | -q | -z[x] | -I[H][M][instance#] or
     -I[TC][SI][instance#]
     | -g <group> | -d <pair Vol> | -d[g] <raw_device> [MU#]
     | -d[g] <seq#> <LDEV#> [MU#] | -nomsg }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the command.
-z or -zx	Makes the paircurchk command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option.
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.
-g <group>	Specifies a group name defined in the configuration definition file. The command is executed for the specified group unless the -d <pair Vol> option is specified.
-d <pair Vol>	Specifies paired logical volume name defined in the configuration definition file. When this option is specified, the command is executed for the specified paired logical volume.
-d[g] <raw_device> [MU#]	Searches whether the specified raw_device is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of *-g <group>* option. If the specified raw_device is contained in two or more groups, the command is executed for the first group.
-d[g] <seq#> <LDEV#> [MU#]	Searches whether the specified LDEV is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of '-g <group>' option. If the specified LDEV is contained in two or more groups, the command is executed on the first group. The <seq#> <LDEV#> values can be specified in hexadecimal (add the '0x' prefix) or decimal notation.

Option	Description
	Note for VSP G1000, G1500, and VSP F1500: When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-nomsg:	Suppresses messages to be displayed when this command is executed. This option must be specified at the beginning of a command argument. The command execution log is not affected by this option.

Returned values

The paircurchk command sets the following returned values during exit allowing you to check the execution results.

Normal termination (data is consistent): 0

Abnormal termination: other than 0, refer to the error codes for error details.

Error codes

The following table lists and describes the error codes for the *paircurchk* command. Unrecoverable errors are fixed and is not resolved, even after re-executing the command. If the command fails, the detailed status is logged in the CCI command log ($HORCC_LOG), even if the user script has no error handling.

Table 2-9 Specific error code for paircurchk

Category	Error Code	Error Message	Recommended Action	Value
Volume status (Unrecoverable)	EX_VOLCUR	S-VOL currency error	Check volume list to see if an operation was directed to the wrong S-VOL.	225

Examples

The following shows an example of the *paircurchk* command for a group and the resulting display of inconsistent volumes in the specified group.

```
# paircurchk -g oradb
Group  Pair vol  Port  targ# lun# LDEV#  Volstatus  Status  Fence
To be...
oradb  oradb1    CL1-A  1    5    145    S-VOL      PAIR    NEVER
Analyzed
oradb  oradb2    CL1-A  1    6    146    S-VOL      PSUS    STATUS
Suspected
```

pairsyncwait

The **pairsyncwait** command is used to confirm data consistency between the TrueCopy Async/Universal Replicator P-VOL and S-VOL by confirming that

required writing was stored in the DFW area of RCU, and confirming whether the last writing just before this command reached the RCU DFW area.

This command gets the latest sequence # of the MCU sidefile (P-VOL latest sequence # within the consistency group ID) and the sequence # of the RCU DFW within the consistency group ID corresponding to the <*group*> or <*raw_device*> specified by **pairsyncwait**, and compares the MCU with the RCU sequence # at that time and at regular intervals. If the RCU sequence # is over the value of the MCU sequence # within the term specified by **pairsysncwait**, this command displays the return code 0 with the meaning of completion of synchronization. The **-nowait** option shows the latest sequence # (Q-marker) of MCU PVol and CTG ID. The marker is a 10-digit hexadecimal number.

When a client issues the **pairsyncwait** command, this command is placed on the queue buffer for waiting in the HORCM daemon as a command request. HORCM gets the latest sequence # from the MCU sidefile and the sequence # whose block was transferred and stored in the DFW area of RCU with data consistency, and compares the latest sequence # of MCU sidefile with the sequence # of the RCU DFW area within the term. HORCM replies return codes to this command, when the write of MCU sidefile was stored in RCU DFW area.

Using this function, a client can confirm that a commit() has reached the remote site, and also the backup utility on a remote site can split the cascading ShadowImage volumes (TrueCopy Async/Universal Replicator to TrueCopy Async/ShadowImage/Universal Replicator) without splitting TrueCopy Async/Universal Replicator.

More robust systems need to confirm the data consistency between the TrueCopy Async/Universal Replicator P-VOL and S-VOL. In DB operations (for example, Oracle), the commit() of DB transaction (see the following figure) is needed to confirm that a last writing for the commit() on a local site reached the remote site by using CCI-unique API command.

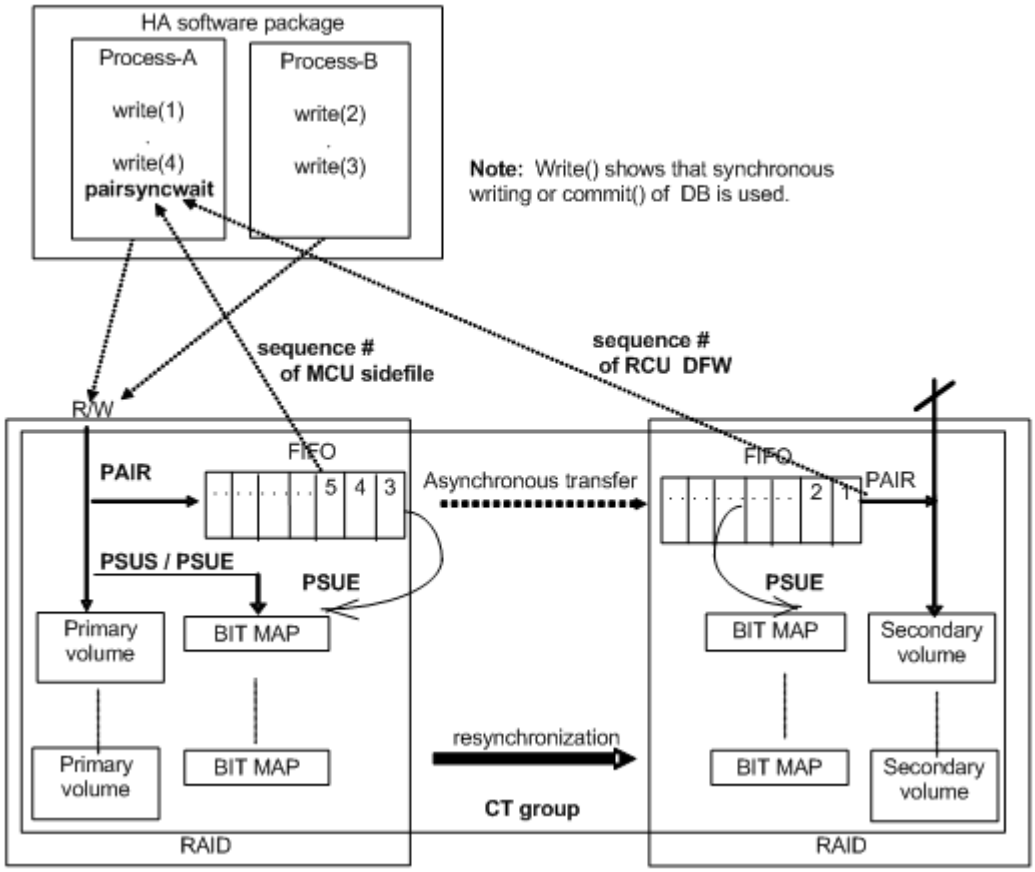


Figure 2-21 Synchronization for TrueCopy Async/Universal Replicator

Caution: If an extended consistency group is used in Universal Replicator, the pairsyncwait command cannot be used.

Syntax

```
pairsyncwait{ -h | -q | -z[x] | -I[H][M][instance#] or -I[TC][SI]
[instance#]| -g <group> | -d <pair Vol>| -d[g] <raw_device> [MU#] | -
d[g] <seq#> <LDEV#> [MU#]| -m <marker> | -t <timeout> | -nowait | -
nomsg | -fq }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the command.
-z or -zx	Makes the *pairsyncwait* command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option.
-I [H] [M] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.

Option	Description
or -I [TC] [SI] [instance#]	
-g <group>	Specifies a group name defined in the configuration definition file. The command is executed for the specified group unless the -d <pair Vol> option is specified.
-d <pair Vol>	Specifies paired logical volume name defined in the configuration definition file. When this option is specified, the command is executed for the specified paired logical volume.
-d[g] <raw_device> [MU#]	Searches whether the specified raw_device is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of *-g <group>* option. If the specified raw_device is contained in two or more groups, the command is executed for the first group.
-d[g] <seq#> <LDEV#> [MU#]	Searches whether the specified LDEV is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of '-g <group>' option. If the specified LDEV is contained in two or more groups, the command is executed on the first group. The <seq#> <LDEV#> values can be specified in hexadecimal (add the '0x' prefix) or decimal notation. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-m <marker>	Specifies the sequence # of MCU P-VOL in 10-digit hexadecimal, called the Q-marker. If the application gets Q-marker as the result of execution of pairsyncwait because of timeout or '-nowait', the application can reconfirm the completion of Async transfer by using pairsysncwait with Q-marker. If the application does not specify Q-marker, CCI uses the latest sequence # when CCI receives pairsysncwait. It is also possible to wait for the completion from S-VOL side with this option. Q-Marker format: iissssssss, where ii = regeneration # of pair volume, and ssssssss = latest sequence # on the side of P-VOL.
-t <timeout>	Specifies the timeout value to wait for the completion of RCU DFW area. The unit is 100 ms. MCU gets the latest sequence # from RCU at regular interval.
-nowait	Gets the latest sequence # of MCU PVol and CTG ID without waiting. When this option is specified, the latest sequence # of MCU PVol is reported immediately, and -t <timeout>option is ignored.
-nomsg	Suppresses messages to be displayed when this command is executed from a user program. This option must be specified at the beginning of the command arguments.
-fq	Displays the number of remaining Q-Markers within the consistency group by adding 'QM-Cnt' to the last column. 'QM-Cnt' is shown as follows: • When specifying '-nowait -fq' 'QM-Cnt' is shown as the number of remaining Q-Marker at this time within consistency group. • When specifying '-nowait -m <marker> -fq' 'QM-Cnt' is shown as the number of remaining Q-Marker from the specified <marker> within consistency group. • When specifying 'TIMEOUT' without '-nowait' 'QM-Cnt' is shown as the number of remaining Q-Marker at this timeout within consistency group.

Option	Description

	'QM-Cnt' is shown as '-', if the status for Q-Marker is invalid (that is, status is 'BROKEN' or 'CHANGED').
	Example:
	`# pairsyncwait -g oradb -nowait -fq`
	`UnitID CTGID Q-Marker Status Q-Num QM-Cnt`
	`0 3 01003408ef NOWAIT 2 120`
	`# pairsyncwait -g oradb -nowait -m 01003408e0 -fq`
	`UnitID CTGID Q-Marker Status Q-Num QM-Cnt`
	`0 3 01003408e0 NOWAIT 2 105`
	`# pairsyncwait -g oradb -t 50 -fq`
	`UnitID CTGID Q-Marker Status Q-Num QM-Cnt`
	`0 3 01003408ef TIMEOUT 2 5`

Restriction	Specified <group> volume must be PVol with status PAIR. Other cases reply with error (EX_INVVOL). It is possible to issue pairsysncwait from S-VOL side with -m <marker>.

Returned values

The **pairsyncwait** command sets the following returned values during exit allowing you to check the execution results.

Condition	Returned Value
When the -nowait option is specified	• Normal termination: 0: The status is NOWAIT. • Abnormal termination: other than 0 to 127, refer to the error code for error details.
When the -nowait option is not specified	• Normal termination: 0: The status is DONE (completion of synchronization). 1: The status is TIMEOUT (timeout). 2: The status is BROKEN (Q-marker synchronized process is rejected). 3: The status is CHANGED (Q-marker is invalid due to resynchronize). • Abnormal termination: other than 0 to 127, refer to the error codes for error details.

Error codes

Unrecoverable errors are fixed and not resolved, even after re-executing the command. If the command failed, the detailed status is logged in the CCI command log ($HORCC_LOG), even if the user script has no error handling.

Category	Error Code	Error Message	Recommended Action	Value
Volume status (Unrecoverable)	EX_INVVOL	Invalid volume status	Confirm pair status using pairdisplay -l.	222

Examples

The following shows examples of the **pairsyncwait** command with and without the **-nowait** option.

```
# pairsyncwait -g oradb  -nowait          <=-nowait is specified.
UnitID   CTGID     Q-Marker     Status    Q-Num
     0       3     01003408ef   NOWAIT        2
# pairsyncwait -g oradb  -t 100       <=-nowait is not specified.
UnitID   CTGID     Q-Marker     Status    Q-Num
     0       3     01003408ef   DONE          2
# pairsyncwait -g oradb  -t 1
UnitID   CTGID     Q-Marker     Status    Q-Num
     0       3     01003408ef   TIMEOUT       3
# pairsyncwait -g oradb  -t 100 -m 01003408ef
UnitID   CTGID     Q-Marker     Status    Q-Num
     0       3     01003408ef   DONE          0
# pairsyncwait -g oradb  -t 100
UnitID   CTGID     Q-Marker     Status    Q-Num
     0       3     01003408ef   BROKEN        0
# pairsyncwait -g oradb  -t 100     -m  01003408ef
UnitID   CTGID     Q-Marker     Status    Q-Num
     0       3     01003408ef   CHANGED       0
 -> '01003408ef' is invalid because the pair volume is not already
resynchronized.
```

Output of the **pairsyncwait** command:

UnitID: Unit ID in the case of multiple storage system connection

CTGID: Consistency group ID within Unit ID

Q-Marker: The latest sequence # of MCU PVol (Marker) when the command is received.

Status: The status after the execution of command.

Q-Num: The number of process queues to wait for synchronization within the consistency group (CTG).

QM-Cnt: The number of remaining Q-Markers within consistency group of the Unit. TrueCopy Async/Universal Replicator sends a token called 'dummy recordset' at regular intervals, therefore QM-Cnt always shows '2' or '3' even if host has NO writing.

Arithmetic expression for determining the remaining data in a consistency group (CTG):

Remaining data in CTG = sidefile capacity × sidefile percentage ÷ 100

Sidefile percentage is the rate showed to '%' column with 'PAIR' state by Pairdisplay command. Sidefile capacity is the capacity within 30% to 70% of the cache setting as the sidefile.

Arithmetic expression for determining the average data per Q-Marker in a consistency group (CTG):

Data per Q-Marker = Remaining data in CTG ÷ QM-Cnt

horctakeover

The **horctakeover** command is a scripted command for executing several takeover operations. The **horctakeover** command checks the specified volume's or group's attributes (**paircurchk**), decides the takeover function based on the attributes, executes the chosen takeover function, and returns the result. The four takeover functions designed for HA software operation are (see *Horctakeover command functions* in the *User and Reference Guide*): takeover-switch, swap-takeover, PVOL-takeover, and SVOL-takeover. A paired volume or a group can be specified as the target of the TrueCopy takeover command. If SVOL-takeover is specified for a group, the data consistency check is executed for all volumes in the group, and all inconsistent volumes are found in the execution log file and displayed (same as **paircurchk** command). You can execute the **horctakeover** command only for remote copy pairs.

The **horctakeover** command allows swapping of the primary and secondary volumes, so that if the primary or secondary volume is switched due to a server error or package transfer, duplex operations can be continued using the reversed volumes. When control is handed over to the current node, swapping the volumes again eliminates the need to copy them. The **horctakeover** command also allows the secondary volume to be separated for disaster recovery operations.

Syntax

```
horctakeover { -h | -q | -z[x] | -I[H][M][instance#] or
     -I[TC][SI][instance#] | -g <group> | -d <pair Vol>
     | -d[g] <raw_device> [MU#] | -d[g] <seq#> <LDEV#> [MU#]
     | -S | -l | -t <timeout> | -nomsg }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the command.
-z or -zx	Makes the horctakeover command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option.
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used to specify the CCI instance number.
-g <group>	Specifies a group name defined in the configuration definition file. The command is executed for the specified group unless the -d <pair Vol> option is specified.
-d <pair Vol>	Specifies paired logical volume name defined in the configuration definition file. When this option is specified, the command is executed for the specified paired logical volume.

Option	Description
-d[g] <raw_device> [MU#]	Searches whether the specified raw_device is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of *-g <group>* option. If the specified raw_device is contained in two or more groups, the command is executed for the first group.
-d[g] <seq#> <LDEV#> [MU#]	Searches whether the specified LDEV is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of '-g <group>' option. If the specified LDEV is contained in two or more groups, the command is executed on the first group. The <seq#> <LDEV#> values can be specified in hexadecimal (add the '0x' prefix) or decimal notation. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-S	Selects and executes SVOL-takeover. The target volume of the local host must be an S-VOL. If this option is specified, then the following '-l' option is invalid.
-l	Enables read and write to the primary volume(s) by a local host only without a remote host, and executes PVOL-takeover when the primary volume cannot be used because it is fenced (fence = DATA or STATUS, state = PSUE or PDUB, or PSUE or PDUB volume is contained in the group). If the primary volume can be accessed, nop-takeover is executed. The target volume of the local host must be a P-VOL.
-t <timeout>	Can be specified for asynchronous pairs only, ignored for synchronous pairs. Specifies the maximum time to wait (in seconds) for swap-takeover and SVOL-takeover operation to synchronize the P-VOL and S-VOL. If this timeout occurs, the horctakeover command fails with EX_EWSTOT. To avoid timeout, set this value less than or equal to the start-up timeout value of the HA control script.
-nomsg	Suppresses messages to be displayed when this command is executed. This option must be specified at beginning of a command argument. The command execution log is not affected by this option.

Returned values

The **horctakeover** command sets the following returned values during exit allowing you to check the execution results.

Normal termination:

0: Nop-takeover (no operation).

1: Swap-takeover was successfully executed.

2: SVOL-takeover was successfully executed.

3: PVOL-SMPL-takeover was successfully executed.

4: PVOL-PSUE-takeover was successfully executed. (This value depends on the microcode level.)

5: SVOL-SSUS-takeover was successfully executed. (This value depends on the microcode level.)

Abnormal termination: other than 0-5, refer to the error codes for error details.

Error codes

The following table lists and describes the error codes for the *horctakeover* command. Unrecoverable errors are fixed and not resolved, even after re-executing the command. If the command fails, the detailed status is logged in the CCI command log ($HORCC_LOG), even if the user script has no error handling.

Table 2-10 Specific error codes for horctakeover

Category	Error Code	Error Message	Recommended Action	Value
Volume status (Unrecoverable)	EX_ENQVOL	Unmatched volume status within the group	Confirm status using pairdisplay command. Make sure all volumes in the group have the same fence level and volume attributes.	236
	EX_INCSTG	Inconsistent status in group	Confirm pair status using pairdisplay.	229
	EX_EVOLCE	Pair volume combination error	Confirm pair status using pairdisplay, and change combination of volumes.	235
	EX_VOLCUR	S-VOL currency error	Check volume list to see if an operation was directed to the wrong S-VOL.	225
	EX_VOLCUE	Local volume currency error	Confirm pair status of the local volume.	224
	EX_VOLCRE	Local and remote volume currency error	Confirm pair status of remote and local volumes using pairdisplay command.	223
Timer (Recoverable)	EX_EWSTOT	Timeout waiting for specified status	Increase timeout value using -t option.	233

raidscan

The **raidscan** command displays configuration and status information for the specified port/TID(s)/LUN/MU#. The information is acquired directly from the storage system (not the configuration definition file).

Syntax

```
raidscan { -h | -q | -z[x] | -I[H][M][instance#] or
    -I[TC][SI][instance#] | -p <port#> [hgrp]|-pd[g] <raw_device>
     | -s <seq#> | -t <targ> | -l <lun> | [ -f[xfgde] ] | -CLI
     | -find[g] [op] [MU#] | [-g <group>] | -pi <strings>
     | -m <MU#>}
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the command.
-z or -zx	Makes the raidscan command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option.
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.
-p <port#> [hgrp]	Specifies the port ID of the port to be scanned. • Valid ports are CL1-A to CL1-R and CL2-A to CL2-R (excluding CL1-I, CL1-O, CL2-I, CL2-O). • Valid expanded ports are CL3-A to CL3-R (excluding CL3-I and CL3-O) and CLG-A to CLG-R (excluding CLG-I and CLG-O). The port is not case sensitive (for example, CL1-A = cl1-a = CL1-a = cl1-A). This option must be specified if '-find' or '-pd <raw_device>'option is not specified. *[hgrp]* is specified to display only the LDEVs mapped to a host group on a port.
-pd[g] <raw_device>	Specifies the raw device name. This option finds Seq# and port_name of the storage system to which the specified device can be connected, and scans the port of the storage system which corresponds with the unit ID that searches the unit ID from Seq#. This option must be specified if the '-find' option is not specified. If this option is specified, the following -s <seq#> option is not valid. The -pdg option is used when displaying a LUN on the host view by finding a host group.
-s <seq#>	Used to specify the seq# (serial#) of the storage system when this option cannot specify the unit ID which is contained for '-p <port>' option. This option scans the port specified by '-p <port>' option of the storage system which corresponds with the unit ID that searches the unit ID from seq#. If this option is specified, then the unit ID that is contained in '-p <port>' option is invalid. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-t <targ>	Specifies the target ID of the specified port. If this option is not specified, the command applies to all target IDs.
-l <lun>	Specifies the LUN of the specified target ID. If this option is not specified, the command applies to all LUNs. If this option is specified, the TID must also be specified.
-f or -ff	Specifies display of volume-type for a display column. If this is specified, -f[g] [d] option is invalid.
-fx	Displays the LDEV number in hexadecimal notation.
-fg	Specifies display of group_name for a display column. This option searches a group on the configuration definition file (local CCI instance) from the scanned LDEV, and

Option	Description
	displays a group_name when the scanned LDEV is contained in the group. If this option is specified, the -f[f] option is not allowed and the -f[d] option is invalid.
-fd	Displays the Device_File that was registered to the group of the HORCM in the output, based on the LDEV (as defined in local instance config. def. file). If this option is specified, -f[f][g] option is not allowed.

-fe	Displays the serial# (E-Seq#) and LDEV# (E-LDEV#) of the external LUNs only mapped to the LDEV. If the external LUN mapped to the LDEV on a specified port does not exist, then this option does nothing. Also if this option is specified, -f[f][g][d] option is not allowed.
	Display example:
	`# raidscan -p cl1-a-0 -fe -CLI`
	`PORT# /ALPA/C TID# LU#  Seq# Num LDEV# P/S Status Fence E-Seq# E-LDEV#`
	`CL1-A-0 ef  0    0  48 62468   2   256 SMPL     -     - 30053      17`
	`CL1-A-0 ef  0    0  49 62468   2   272 SMPL     -     - 30053      23`
	`CL1-A-0 ef  0    0  50 62468   1   288 SMPL     -     - 30053      28`
	The serial number (Seq#) for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345).

-CLI	Specifies display for command line interface (CLI). This option displays to the same position that defined number of columns, and displays one header. The delimiters between columns are displayed as spaces or hyphens (-).
	Display example:
	`Port# TargetID# Lun#  Seq# Num LDEV#   P/S Status Fence  P-Seq#  P-LDEV#`
	`CL1-C         1    0 30053   1   274  SMPL      -     -     -        -`
	`CL1-C         2    2 30053   1   260 P-VOL   PAIR  NEVER 30053      268`
	`CL1-C         2    3 30053   1   261 P-VOL   PAIR  NEVER 30053      269`

-m <MU#>	This option is used for displaying only the specified mirror descriptor. If you want to display all mirror descriptor, specify '-m all' for displaying all MUs.
-pi <strings>	Changes a strings via STDIN for -find option to '<strings>'. If this option is specified, the -find option is ignored a raw device file provided via STDIN, and <strings> is used as input. A <strings> must be specified within 255 characters.
-find [op] [MU#]	Executes the specified [op] using a raw device file provided via STDIN. If the -pi <strings> option is specified, this option does not use a strings via STDIN, and -pi <strings> is used as input. Restrictions: Special files via STDIN are specified in the following ways: • HP-UX: /dev/rdsk/* or /dev/rdisk/disk* • Solaris: /dev/rdsk/*s2 or c*s2 • Linux: /dev/sd... or /dev/rd..., /dev/raw/raw*. • zLinux: /dev/sd... or /dev/dasd… or /dev/rd... /dev/raw/raw*. • AIX: /dev/rhdisk* or /dev/hdisk* or hdisk* • DIGITAL or Tru64: /dev/rrz*c or /dev/rdisk/dsk*c or /dev/cport/scp* • IRIX64: /dev/rdsk/*vol or /dev/rdsk/node_wwn/*vol/* or /dev/dsk/*vol or /dev/dsk/node_wwn/*vol/*

Option	Description
	• Windows: hdX-Y,$LETALL,$Volume,$Phys, D:\Vol(Dms,Dmt,Dmr)X\DskY, \Vol(Dms,Dmt,Dmr)X\DskY For further information on LDM volumes for Windows systems, see *Volume Discovery Function* in the *User and Reference Guide*. • OpenVMS: 1* or DK* or DG* or GK* Lines starting with '#' via STDIN are interpreted as comments. Lines starting with 'quit' via STDIN are interpreted as exit.
-find[g]	Displays the port, target ID, LUN (RAID storage system notation) and so on that was mapped for LDEV using a special file (raw device file) provided via STDIN. If target ID and LUN are Unknown for the target device file, you should start CCI without any description for HORCM_DEV and HORCM_INST, and should describe the shown port, target ID, and LUN for HORCM_DEV. This option also uses the -fx option to display the LDEV numbers in hexadecimal. The -findg option is used to show a LUN on the host view by finding a host group.
-find inst	Registers the Device File name (raw device file provided via STDIN) to all mirror descriptors of the LDEV map table for HORCM, permits the matching volumes on horcm.conf in protection mode, and is started automatically. Therefore, you do not need to use this option normally. This option is also terminated to avoid wasteful scanning when the registration has been finished with based on HORCM. Therefore if HORCM does not need the registration any more, then nothing is done and it exits. This option can be used with '-fx' option to display LDEV numbers in hexadecimal. Example for HP-UX: # ioscan -fun | grep rdsk | raidscan -find inst DEVICE_FILE Group PairVol PORT TARG LUN M SERIAL LDEV /dev/rdsk/c0t3d0 oradb oradev1 CL1-D 3 0 - 35013 17 /dev/rdsk/c0t3d0 oradb oradev1 CL1-D 3 0 0 35013 17 /dev/rdsk/c0t3d0 oradb1 oradev2 CL1-D 3 0 1 35013 17 ***Note:*** When multiple device files share the same LDEV, the first device file is registered to the LDEV map table. • *Group*: Displays the group name (dev_group) defined in the configuration definition file. • *PairVol*: Displays the paired volume name (dev_name) within the group defined in the configuration definition file. • *PORT*: Displays the port number (port#) defined in the configuration definition file. • *TARG*: Displays the target ID (TargetID) defined in the configuration definition file. • *LUN*: Displays the LUN (LU#) defined in the configuration definition file. • *M*: Displays the MUN (MU#) defined in the configuration definition file. MU# for TrueCopy/GAD are shown as '-'. MU# for ShadowImage/Copy-on-Write Snapshot are shown as '0', '1', '2'. • *SERIAL*: Displays the production (serial#) number of the RAID storage system. The serial number for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345). • *LDEV*: Displays the LDEV# within the RAID storage system.
-find verify [MU#]	Displays the relation between group on the configuration definition file and Device_File registered to the LDEV map tables, based on the Device File name (raw device file provided via STDIN). This option can be used with '-fx' and '-fd' options. This option is affected by the command execution environment (HORCC_MRCF). `# ioscan -fun | grep rdsk | raidscan -find verify`

Option	Description
	DEVICE_FILE Group PairVol PORT TARG LUN M SERIAL LDEV /dev/rdsk/c0t3d0 oradb oradev1 CL1-D 3 0 0 35013 17 /dev/rdsk/c0t3d1 oradb oradev2 CL1-D 3 1 0 35013 18 /dev/rdsk/c0t3d2 - - - - - 0 35013 19 # ioscan -fun | grep rdsk | raidscan -find verify 1 -fd DEVICE_FILE Group PairVol Device_File M SERIAL LDEV /dev/rdsk/c0t3d0 oradb oradev1 c0t3d0 1 35013 17 /dev/rdsk/c0t3d1 oradb oradev2 Unknown 1 35013 18 /dev/rdsk/c0t3d2 - - - 1 35013 19 ***Note:*** If the device name is different between DEVICE_FILE and Device_File, then it shows shared LDEV among multiple device files. • *Group*: Displays the group name (dev_group) defined in the configuration definition file. • *PairVol*: Displays the paired volume name (dev_name) within the group defined in the configuration definition file. • *PORT*: Displays the port number (port#) defined in the configuration definition file. • *TARG*: Displays the target ID (TargetID) defined in the configuration definition file. • *LUN*: Displays the LUN (LU#) defined in the configuration definition file. • *M*: Displays the MUN (MU#) defined in the configuration definition file. MU# for TrueCopy/GAD are shown as '-'. MU# for ShadowImage/Copy-on-Write Snapshot are shown as '0', '1', '2'. • *Device_File*: Displays Device_File which is registered to the LDEV map tables into the CCI. • *SERIAL*: Displays the production (serial#) number of the RAID storage system. The serial number for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345). • *LDEV*: Displays the LDEV# within the RAID storage system.
-find[g] conf [MU#] [-g <group>]	Displays the port, target ID, LUN in horcm.conf image by using a special file (raw device file) provided via STDIN. If *target ID & LUN are Unknown* for the target device file, you must start CCI without any description for HORCM_DEV and HORCM_INST, and should be described the shown port, target ID, LUN for HORCM_DEV. This option can be used with the '-fx' option. *[-g <group>]* specifies the group for 'dev_group' on horcm.conf. If omitted, the group applies 'VG' as default. The *-findg* option is used when displaying a LUN on the host view by finding a host group. # cat /etc/horcmperm.conf | raidscan -find conf 0 -g ORA HORCM_DEV #dev_group dev_name port# TargetID LU# MU# # /dev/rdsk/c23t0d0 SER = 61456 LDEV = 192 [FIBRE FCTBL = 4] ORA ORA_000 CL2-J 0 0 0 # /dev/rdsk/c23t0d1 SER = 61456 LDEV = 193 [FIBRE FCTBL = 4] ORA ORA_001 CL2-J 0 1 0 # /dev/rdsk/c23t0d2 SER = 61456 LDEV = 194 [FIBRE FCTBL = 4] ORA ORA_002 CL2-J 0 2 0 # /dev/rdsk/c23t0d3 SER = 61456 LDEV = 195 [FIBRE FCTBL = 4] ORA ORA_003 CL2-J 0 3 0 # ERROR [CMDDEV] /dev/rdsk/c23t0d7 SER = 61456 LDEV = 259 [OPEN-3-CM]

Option	Description

	The serial number (SER) for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345).
	If the target device has shared an LDEV among multiple device files and an LDEV is displayed by another target device already, then its target device is suppressed as a comment as shown below:
	`# ERROR [LDEV LINK] /dev/rdsk/c24t0d3 SER = 61456 LDEV = 195 [FIBRE FCTBL = 4]`
	If the target device does not have a valid MU#, then its target device is suppressed as a comment as shown below:
	`# ERROR [INVALID MUN (2 < 1)] /dev/rdsk/c24t0d3 SER = 61456 LDEV = 195 [ OPEN-3 ]`
	If the target device is mixed with a different RAID TYPE, then its target device is suppressed as a comment as shown below:
	`# ERROR [MIXING RAID TYPE] /dev/rdsk/c24t0d3 SER = 61456 LDEV = 195 [ OPEN-3 ]`

-find sync[d] [MU#] [-g <group>]	Flushes the system buffer associated to a logical drive which corresponds to a *[-g <group>]* through the KEY WORD*($Volume,$LETALL, $Physical)* provided via STDIN.
	[-g <group>] specifies the group for 'dev_group' on horcm.conf. If this option is not specified, then flushes the system buffer associated to all groups for the local instance.
	Example of flushing the system buffer associated to ORB group through *$Volume* (Windows):
	`echo $Volume | raidscan -find sync -g ORB or`
	`raidscan -pi $Volume -find sync -g ORB`
	`[SYNC] : ORB ORB_000[-] -> \Dmt1\Dsk1 : Volume{bf48a395-0ef6-11d5-8d69-00c00d003b1e}`
	`[SYNC] : ORB ORB_001[-] -> \Dmt1\Dsk2 : Volume{bf48a395-0ef6-11d5-8d69-00c00d003b1e}`
	`[SYNC] : ORB ORB_002[-] -> \Dmt1\Dsk3 : Volume{bf48a395-0ef6-11d5-8d69-00c00d003b1e}`
	Example of flushing the system buffer associated to all groups for the local instance (Windows):
	`echo $Volume | raidscan -find sync or`
	`raidscan -pi $Volume -find sync`
	`[SYNC] : ORA ORA_000[-] -> \Vol44\Dsk0 : Volume{56e4954a-28d5-4824-a408-3ff9a6521e5d}`
	`[SYNC] : ORA ORA_000[-] -> \Vol45\Dsk0 : Volume{56e4954a-28d5-4824-a408-3ff9a6521e5e}`
	`[SYNC] : ORB ORB_000[-] -> \Dmt1\Dsk1 : Volume{bf48a395-0ef6-11d5-8d69-00c00d003b1e}`
	`[SYNC] : ORB ORB_001[-] -> \Dmt1\Dsk2 : Volume{bf48a395-0ef6-11d5-8d69-00c00d003b1e}`
	`[SYNC] : ORB ORB_002[-] -> \Dmt1\Dsk3 : Volume{bf48a395-0ef6-11d5-8d69-00c00d003b1e}`
	Notes:
	(2) The option cannot be specified the device object name as follows: D:\Vol(Dms,Dmt,Dmr)X\DskY,\Vol(Dms,Dmt,Dmr)X\DskY
	(3) *Sync* executes the following behavior under any conditions:
	• If the logical drive which corresponds to a [-g <group>] is not open by any applications, then *sync* flushes the system buffer to a drive and makes the dismount state for this drive.
	• If the logical drive which corresponds to a *[-g <group>]* is already opened by any applications, then *sync* flushes only the system buffer to a drive. This is allowed to flush the system buffer before pairsplit with mounting the P-VOL (opening state),

Option	Description
	and indicates the behavior as *[FLUSH]* below: [FLUSH] : ORA ORA_000[-] -> \Vol44\Dsk0 : Volume{56e4954a-28d5-4824-a408-3ff9a6521e5d}

Returned values

--

Error codes

--

Examples

raidscan command examples for fibre-channel ports

```
# raidscan -p cl1-r
PORT#/ALPA/C,TID#,LU#Num(LDEV#...)P/S,Status,Fence,LDEV#,P-Seq#P-
LDEV#
CL1-R/  ce/15,15, 7 5(100,101..)P-VOL PAIR    NEVER   100,5678   200
CL1-R/  ce/15,15, 6 5(200,201..)SMPL  ----    ----  ----  ----  -----

# raidscan -p cl1-r -f
PORT#/ALPA/C,TID#,LU#Num(LDEV#...)P/S,Status,Fence,LDEV#,Vol.Type
CL1-R/  ce/15,15, 7 5(100,101..)P-VOL PAIR   NEVER   100,OPEN-3
CL1-R/  ce/15,15, 6 5(200,201..)SMPL  ----   ----   ----OPEN-3
```

Example of -find option for raidscan

```
# ls /dev/rdsk/* | raidscan -findDEVICE_FILE     UID S/F  PORT TARG
LUN SERIAL LDEV    PRODUCT_ID
/dev/rdsk/c0t0d4  0   S CL1-M    0   4  31168  216 OPEN-3-CVS-CM
/dev/rdsk/c0t0d1  0   S CL1-M    0   1  31168  117 OPEN-3-CVS
/dev/rdsk/c1t0d1  -   - CL1-M    -   -  31170  121 OPEN-3-CVS
```

Output of the raidscan command:

Port#, ALPA/C, TID#, LU#: port ID, arbitrated loop physical address, target ID, LUN.

For ShadowImage, raidscan displays the MU# for each LUN (for example, LUN 7-0, 7-1, 7-2).

Num(LDEV#…): number of LDEVs and LDEV ID for a LUSE volume

P/S: volume attribute

Status: status of the paired volume

Fence: fence level (TrueCopy/global-active device only)

P-Seq#: serial # of the storage system which contains the partner volume of the pair. The serial number for VSP G1000, G1500, and VSP F1500 is displayed with a “3” at the beginning (“312345” = serial # 12345).

P-LDEV#: LDEV number of the partner volume of the pair

Vol.Type: logical unit (LU) type (for example, OPEN-V, OPEN-9)

Group: group name (dev_group) as described in the configuration definition file

UID: Displays the unit ID for multiple storage system configuration. If UID appears as '-', the command device for HORCM_CMD is not found.

S/F: Displays "S" for a SCSI port or "F" for a port other than SCSI. For storage system models newer than VSP and HUS VM, confirm the port type with the TYPE field which is the execution result of the `raidcom get port` command.

PORT: Displays the RAID storage system port number

TARG: Displays the target ID (that was converted by the fibre conversion table)

LUN: Displays the LUN (that was converted by the fibre conversion table)

SERIAL: Displays the production (serial#) number of the RAID storage system. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

LDEV: Displays the LDEV# within the RAID storage system

PRODUCT_ID: Displays product-id field in the STD inquiry page

raidar

The **raidar** command displays configuration, status, and I/O activity information for the specified port/TID(s)/LUN at the specified time interval. The configuration information is acquired directly from the storage system (not from the configuration definition file).

The I/O activity of a TrueCopy, TrueCopyAsync, Universal Replicator, or global-active device S-VOL in the COPY or PAIR state includes TC/TC Async/UR/GAD remote I/Os (update copy operations) in addition to host-requested I/Os.

The I/O activity of a ShadowImage, Copy-on-Write Snapshot, or Volume Migration S-VOL in the COPY or PAIR state includes only host-requested I/Os (ShadowImage, Copy-on-Write Snapshot, and Volume Migration update copy operations are excluded).

The I/O activity of a P-VOL or simplex volume includes only host-requested I/Os. If the status changed into SMPL in S-VOL (COPY, PAIR) I/O activity, I/O activity is reported as the SMPL status, until the pair status is changed.

Syntax

```
raidar { -h | -q | -z[x] | -I[H][M][instance#] or -I[TC][SI]
[instance#] |
```

```
-p <port#> <targ> <lun> [mun]| -pd[g] <raw_device> [mun] |
-s [interval] [count] }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the command.
-z or -zx	Makes the raidar command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option.
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.
-p <port#> <targ> <lun> [mun]....	Monitors one or more (up to 16) devices at a time. • *<port#>*: Specifies the port to be reported: CL1-A to CL1-R and CL2-A to CL2-R (excluding CL1-I, CL1-O, CL2-I, CL2-O). In case of the expanded port, specify from following: CL3-A to CL3-R (excluding CL3-I and CL3-O), or CLG-A to CLG-R (excluding CLG-I and CLG-O). The port is not case sensitive (for example, CL1-A= cl1-a= CL1-a= cl1-A, CL3-a= CL3-A= cl3-a= cl3-A). • *<targ>*: Specifies the SCSI TID of the specified port. • *<lun>*: Specifies the LUN on the specified TID. • *[mun]*: Specifies the MU number of the specified LUN within the range of 0 to 63 (ShadowImage or Copy-on-Write Snapshot only).
-pd[g] <raw_device>	Allows designation of an LDEV by raw device file name. The -pdg option is used to show a LUN on the host view by finding a host group.
-s [interval] or -sm [interval]	Designates the time interval in seconds. • *-s*: Interprets the time interval as seconds. • *-sm*: Interprets the time interval as minutes. • *[interval]*: Designates the time interval value (1 to 60). If not specified, the default interval (3) is used. • *[count]*: Designates the number of repeats. When omitted, this command repeats until CNTL-C.

Returned values

--

Error codes

--

Examples

The following shows an example of the **raidar** command and its output.

```
# raidar -p cl1-a  15 6   -p cl1-b  14 5   -p cl1-a  12 3    -s 3
TIME[03] PORT   T L VOL   STATUS IOPS HIT(%)W(%)IOCNT
13:45:25 -      - -   -       -    -   -      -    -
13:45:28 CL1-A 15 6 SMPL  -     200.0 80.0  40.0  600
         CL1-B 14 5 P-VOL PAIR  133.3 35.0  13.4  400
         CL1-A 12 3 P-VOL PSUS  200.0 35.0  40.6  600
```

Output of the **raidar** command:

IOPS: # of I/Os (read/write) per second (total I/O rate).

HIT(%): Hit rate for read I/Os (read hit rate).

W(%): Ratio of write I/Os to total I/Os (percent writes).

IOCNT: number of write and read I/Os.

raidqry

The **raidqry** command (RAID query) displays the configuration of the connected host and RAID storage system.

Syntax

```
raidqry { -h | -q | -z[x] | -I[H][M][instance#] or
     -I[TC][SI][instance#] | -l[m] | -r <group> | [ -f ] | -g}
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the command.
-z or -zx	Makes the raidqry command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option.
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.
-l[m]	Displays the configuration information for the local host and the local RAID storage system. • -l option: Display DKCMAIN microcode version in CCI format. • -lm option: Display DKCMAIN microcode version in Device Manager - Storage Navigator format.

Option	Description
-r <group>	Displays the configuration information for the remote host and the remote storage system which contains the specified group.
-f	Displays the host name (ip_address) as specified in the configuration definition file. Use this option if 'floatable IP address' is used for the host name (ip_address) in the configuration file.
-g	This option is used when displaying the lists of group name (dev_group) which described in the configuration file of a local host (instance).

Returned values

--

Error codes

--

Examples

Example 1

The following shows an example of the **raidqry** command and its output.

```
# raidqry -l
No Group Hostname    HORCM_ver  Uid  Serial#   Micro_ver Cache(MB)
 1   ---     HOSTA  01-22-03/06    0    30053 50-04-00/00   256
 1   ---     HOSTA  01-22-03/06    1    30054 50-04-00/00   256

# raidqry -lm
No Group   Hostname    HORCM_ver   Uid  Serial#    Micro_version
 1  ---    JSSA1012  01-37-03/04     0   302614   80-04-20-00/00

# raidqry -r oradb
No Group Hostname    HORCM_ver  Uid  Serial#   Micro_ver Cache(MB)
 1 oradb    HOSTA  01-22-03/06    0    30053 50-04-00/00   256
 2 oradb    HOSTB  01-22-03/06    0    30053 50-04-00/00   256
 1 oradb    HOSTA  01-22-03/06    1    30054 50-04-00/00   256
 2 oradb    HOSTB  01-22-03/06    1    30054 50-04-00/00   256

# raidqry -l  -f
No Group Floatable Host  HORCM_ver Uid Serial# Micro_ver Cache(MB)
 1   ---          FH001 01-22-03/06   0  30053 50-04-00/00 256
```

Output of the **raidqry** command:

No: This column shows the order when the group name (dev_group) which is described in the configuration definition file has multiple remote hosts.

Group: When the *-r* option is used, this column shows the group name (dev_group) which is described in the configuration definition file.

Hostname: When using -l[m] option, this column shows the host name of local host. When using -r option, this column shows the host name of remote

host which is included the group name (dev_group) described in a configuration definition file. Over 30 characters long of the host name is not displayed.

Floatable Host: When the *-f* option is used, this column shows the host name (ip_address) which is described in the configuration definition file. Up to 30 host names can be displayed. The *-f* option interprets the host name as utilizing floatable IP for a host.

HORCM_ver: This column shows the version of CCI on the local or remote host. The *-l[m]* option specifies local host. The *-r* option specifies remote host.

Uid Serial# Micro_ver (Micro_version): This column shows unitID, serial number, and (DKCMAIN) microcode version of the storage system that is connected to the local or remote host. The *-l[m]* option specifies local host. The *-lm* option displays Micro_version. The *-r* option specifies remote host. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

Cache(MB): Shows the logical cache capacity (in MB) of the storage system connected to the local or remote host. The *-l* option specifies local host, and *-r* specifies remote host.

Example 2

```
# raidqry -g
GNo  Group            RAID_type    IV/H  IV/M  MUN/H  MUN/M
  1  ora              HTC_RAID       12     9      4     64
  2  orb              XP_RAID        12     9      4     64
  3  orc              HTC_DF          8     6      1      1
```

GNo: The order of the group name (dev_group) described in the configuration definition file.

Group: The group name (dev_group) described in the configuration definition file.

RAID_type: The type of RAID configured in the group.

IV/H: The interface version for TrueCopy/TrueCopy Async/Universal Replicator/global-active device in a group, and this is used for maintenance.

IV/M: The interface version for ShadowImage/Copy-on-Write Snapshot/ Volume Migration in a group, and this is used for the maintenance.

MUN/H: The number of maximum MUs for Universal Replicator in a group.

MUN/M: The number of maximum MUs for ShadowImage/Copy-on-Write Snapshot in a group.

raidvchkset

The **raidvchkset** command sets the parameters for validation checking of the specified volumes, and can also be used to turn off all validation checking

without specifying [type]. Unit of checking for the validation is based on the group of CCI configuration definition file.

This command is controlled as protection facility. This command is rejected with EX_ERPERM by connectivity checking between CCI and the RAID storage system.

Syntax

```
raidvchkset { -h | -q | -z[x] | -I[H][M][instance#] or
   -I[TC][SI][instance#]
   | -g <group> | -d <pair Vol> | -d[g] <raw_device> [MU#]
   | -d[g] <seq#> <LDEV#> [MU#] | -nomsg | -vt [type]
   | -vs <bsize> [slba] [elba] | -vg  [type] [rtime]
   | -vext <size> }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the command.
-z or -zx	Makes the raidvchkset command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option.
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.
-g <group>	Specifies a group name written in the configuration definition file.
-d <pair Vol>	Specifies paired logical volume name defined in the configuration definition file. When this option is specified, the command is executed for the specified paired logical volume.
-d[g] <raw_device> [MU#]	Searches whether the specified raw_device is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of *-g <group>* option. If the specified raw_device is contained in two or more groups, the command is executed for the first group.
-d[g] <seq#> <LDEV#> [MU#]	Searches whether the specified LDEV is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of '-g <group>' option. If the specified LDEV is contained in two or more groups, the command is executed on the first group. The <seq#> <LDEV#> values can be specified in hexadecimal (add the '0x' prefix) or decimal notation. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-nomsg	Suppresses messages to be displayed when this command is executed. It is used to execute this command from a user program. This option must be specified at the

Option	Description
	beginning of a command argument. The command execution log is not affected by this option.
-vt [type]	Specifies the following data type that assumes the target volumes as Oracle database. If *[type]* is not specified, then this option disables all of the checking. • *redo8*: The target volumes sets the parameter for validation checking as Oracle redo log files (including archive logs) prior Oracle9I. This option sets <bsize> to 1(512bytes) or 2(1024bytes). • *data8*: The target volumes sets the parameter for validation checking as Oracle data files (including control files) prior Oracle9I. • *redo9*: The target volumes sets the parameter for validation checking as Oracle redo log files (including archive logs) for Oracle9IR2 or later. This option sets <bsize> to 1 (512 bytes) or 2 (1024 bytes). • *data9*: The target volumes sets the parameter for validation checking as Oracle data files (including control files) for Oracle9IR2 later. For Oracle for Tru64 or Windows, set the parameter in the init.ora file to '_HARD_PROTECTION = TRUE '. If not so, a parameter for validation must be changed by using the following '-vmf we' option: raidvchkset -vt data9 -vmf we • *rd10g*: The target volumes sets the parameter for validation checking as Oracle ALL files (including redo and data and RMAN backup piece) for Oracle10gR2 or later. This option sets <bsize> to 1 (512 bytes) or 2 (1024 bytes). This option sets to the low 5 bits DBA for checking regarding CHK-F2. You can specify this option only for VSP/HUS VM or earlier models. If you specify this option for VSP G1000, G1500, and VSP F1500 or later models, SSB code 0xB9B0 or 0xB9B5 is output.
-vs <bsize> [slba] [elba]	Specifies the data block size of Oracle I/O and a region on a target volume for validation checking. • <bsize> is used when specifying the data block size of Oracle I/O, in increments of 512 bytes. <bsize> is able to specify between 1 (512 bytes) and 64 (32 KB) (effective size for Oracle is also 1-64). • [slba] [elba] is used when specifying a region defined between Start_LBA (0 based) and End_LBA on a target volume for checking, in increments of 512 bytes. • [slba] [elba] can be specified in hexadecimal (by addition of '0x ') or decimal notation. If this option is not specified, then a region for a target volume is set as all blocks (slba=0,elba=0). You can specify this option only for VSP/HUS VM or earlier models. If you specify this option for VSP G1000, G1500, and VSP F1500 or later models, SSB code 0xB9B0 or 0xB9B5 is output.
-vg [type] [rtime]	Specifies the following guard type to the target volumes for Data Retention Utility. If *[type]* is not specified, this option releases all of the guarding. The following values are available to specify on *[type]*. • *inv*: The target volumes are concealed from SCSI Inquiry command by responding 'unpopulated volume'. • *sz0*: The target volumes replies with 'SIZE 0' through SCSI Read capacity command. • *rwd*: The target volumes are prohibited from reading and writing. • *wtd*: The target volumes are prohibited from writing. • *svd*: If the target volume is SMPL, it is protected from paircreate (from becoming an S-VOL). If the target volume is P-VOL, it is protected from pairresync restore or pairresync swaps(p). If the target volume is SVOL_PSUS(SSUS), it is protected from pairresync synchronous copy.

Option	Description
	svd option can be used with the other option (inv, sz0, rwd, wtd) in parallel. For example, if you want to protect the absolute volume from the writing executed by the copy series software product and the host access, set the both wtd and svd options. The only setting of wtd option cannot protect the absolute volume from the writing by the copy processing of the copy series software product. *[rtime]*: Specifies the retention time in days. If [rtime] is not specified, the default time defined by the storage system is used. • This option sets each four flags for guarding type as follows: *typeINQRCAPREADWRITE inv*1111 *Sz0*0111 *rwd*0011 *wtd*0001
-vext <size>	Used when extending the LUN capacity of a Dynamic Provisioning volume. The increment size of capacity can be specified in bytes or blocks. When specifying in bytes, the unit is t/T (terabyte), g/G (gigabyte), m/M (megabyte), or k/K (kilobyte). If this unit is omitted, block (512 bytes) is used. Examples for extending 1GB (gigabyte) are: -vext 1G, -vext 1g, -vext 1024M, -vext 1024m, -vext 1048576K, -vext 1048576k, -vext 2097152 Examples for extending 1KB (kilobyte) are: -vext 1K, -vext 1k, -vext 2 LUN capacity and usage rate for Dynamic Provisioning volume can be verified by referring 'LU_CAP' of the 'raidvchkdsp -v aou' or 'raidvchkdsp -v aoub' command. "Aou" (allocation on use) refers to dynamic provisioning. ***Note:*** When a group operation is specified, a warning message appears, and this command enters the interactive mode.

Returned values

The raidvchkset command sets the following returned values during exit allowing you to check the execution results.

Normal termination: 0

Abnormal termination: see Error Codes.

Error codes

The *raidvchkset -vg* option command returns the following error code as well as generic error codes.

Table 2-11 Specific error code for raidvchkset -vg option

Category	Error Code	Error Message	Recommended Action	Value
Volume Status (Unrecoverable)	EX_EPRORT	Mode changes denied due to retention time	Confirm the retention time for a target volume by using *raidvchkscan -v gflag* command.	208

Examples

Sets volumes in oralog group as redolog file prior to Oracle9I:

```
raidvchkset -g oralog -vt redo8
```

Sets volumes in oradat group as data file that Oracle block size is 8KB:

```
raidvchkset -g oradat -vt data8 -vs 16
```

Sets volumes in oradat group as data file that Oracle block size is 16KB:

```
raidvchkset -g oradat -vt data8 -vs 32
```

Releases all checking to volumes in oralog group:

```
raidvchkset -g oralog -vt
```

Sets Oracle10g volumes for oralog group as redolog file:

```
raidvchkset -g oralog -vt rd10g
```

Sets Oracle10g volumes for oradat group as data file with block size of 8KB:

```
raidvchkset -g oradat -vt rd10g -vs 16
```

Disables writing to volumes in oralog group:

```
raidvchkset -g oralog -vg wtd
```

Disables writing and sets retention time to volumes in oralog group:

```
raidvchkset -g oralog -vg wtd 365
```

Releases all guarding to volumes in oralog group:

```
raidvchkset -g oralog -vg
```

raidvchkdsp

The **raidvchkdsp** command displays the parameters for validation checking of the specified volumes. Unit of checking for the validation is based on the group of CCI configuration definition file.

Syntax

```
raidvchkdsp { -h | -q | -z[x] | -I[H][M][instance#] or
     -I[TC][SI][instance#] | -g <group> | -d <pair Vol>
     | -d[g] <raw_device> [MU#] | -d[g] <seq#> <LDEV#> [MU#]
     | -f[xde] | -v <op> | -c }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the command.
-z or -zx	Makes the raidvchkdsp command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option.
-I[H][M] [instance#] or	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.

Option	Description
-I[TC][SI] [instance#]	
-g <group>	Specifies a group name written in the configuration definition file.
-d <pair Vol>	Specifies paired logical volume name defined in the configuration definition file. When this option is specified, the command is executed for the specified paired logical volume.
-d[g] <raw_device> [MU#]	Searches whether the specified raw_device is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of *-g <group>* option. If the specified raw_device is contained in two or more groups, the command is executed for the first group.
-d[g] <seq#> <LDEV#> [MU#]	Searches whether the specified LDEV is included in a group on the configuration definition file (local instance). If it is in the group, the target volume is executed as the paired logical volume (-d) or group (-dg). This option is effective without specification of '-g <group>' option. If the specified LDEV is contained in two or more groups, the command is executed on the first group. The <seq#> <LDEV#> values can be specified in hexadecimal (add the '0x' prefix) or decimal notation. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-fx	Displays the LDEV/STLBA/ENLBA number in hexadecimal.
-fd	Displays the relation between the Device_File and the paired volumes, based on the group (as defined in the local instance configuration definition file). If Device_File column shows 'Unknown' to host (instance), then the volume is not recognized on own host, and *raidvchkdsp* command is rejected in protection mode. Non-permitted volume is shown without LDEV# information (LDEV# '-').
-fe	Displays the serial# and LDEV# of the external LUNs mapped to the LDEV for the target volume by adding to last column (ignores the format of 80 column).
-c	When CCI starts, *HORCM_DEV* in horcm.conf is translated from port/target/lun numbers to the CU:Ldev information, on one hand *HORCM_LDEV* in horcm.conf is translated from the CU:Ldev information to port/target/lun numbers, because RAID needs to specify 'Port#, Targ#, Lun#' and 'LDEV' for specifying the target device, and then HORCM keeps this information as internal database for the configuration. If a storage administrator changes the LDEV to LUN/port mapping, such as • a new/different LDEV is mapped to a previously used port/LUN, or • an LDEV is mapped to a different/new port then pair operations might be rejected because the new mapping is different from the mapping information of the database in the running CCI instance. A pairdisplay command shows the real LDEV mapping at the time of the command execution and hence shows different information than what is stored in the internal database of the CCI instance. The '-c' option for *raidvchkdsp* allows you to see if there is a difference between the current running CCI instance information and the real mapping. This indication should be used to find such issues which indicate that: • the CCI instance should be restarted to discover and use the new mapping information, or • a configuration change occurred without changing the affected configuration files of the CCI instance. *Example change from LDEV#785 to LDEV#786:*

Option	Description
	# raidvchkdsp -g VG000 -c Group PairVol Port# TID LU Seq# LDEV# LDEV#(conf) -change-> LDEV# VG000 vg0001 CL4-E-0 0 17 63528 786 785(conf) -change-> 786 # raidvchkdsp -g VG000 -c -fx Group PairVol Port# TID LU Seq# LDEV# LDEV#(conf) -change-> LDEV# VG000 vg0001 CL4-E-0 0 17 63528 312 311(conf) -change-> 312 *Example remove LDEV#785 from a port:* # raidvchkdsp -g VG000 -c Group PairVol Port# TID LU Seq# LDEV# LDEV#(conf) -change-> LDEV# VG000 vg0001 CL4-E-0 0 17 63528 - 785(conf) -change-> NO LDEV # raidvchkdsp -g VG000 -c -fx Group PairVol Port# TID LU Seq# LDEV# LDEV#(conf) -change-> LDEV# VG000 vg0001 CL4-E-0 0 17 63528 - 311(conf) -change-> NO LDEV ***Note:*** If there have not been any changes to the specified volumes, this option displays nothing. The serial number (Seq#) for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345).
-v [op]	Specifies the following operation that displays each parameter for validation checking: • cflag: Displays all flags for checking regarding data block validation for target vols. • offset: Displays the range setting for data block size of Oracle I/O and a region on a target volume for validation checking. • errcnt: Displays the statistical information counted as an error for each checking on the target volumes. Each statistical information counted as an error is cleared when the individual flag for validation checking is disabled. • gflag: Displays the parameter for guarding on the specified target volumes. • *pool*: This option displays the capacity and the usable capacity of the Copy-on-Write Snapshot pool corresponding to the group. Usually, this option displays the pool capacity and the usable capacity for the pool ID of which the group is belonging because pool ID is specified in pair creation with group. This is needed to help the decision whether the restore operation is possible or not, because the pool capacity is consumed by the restore operation of the Copy-on-Write Snapshot. • *aou[b]*: Displays the LUN capacity and usage rate for Dynamic Provisioning volume corresponding to the group of RM configuration file, and displays the ID of the pool to which LDEV belongs. • *aoub*: Displays the LUN capacity in blocks (1 block = 512 bytes).

Returned values

--

Error codes

--

Examples

Example 1

Example of raidvchkdsp command with **-fd** option:

```
raidvchkdsp -g vg01 -fd -v cflag
Group PairVol Device_File Seq# LDEV# BR-W-E-E MR-W-B BR-W-B
SR-W-B-S
vg01  oradb1  Unknown     2332    -  - - - -   - - -   - - -
- - - -
vg01  oradb2  c4t0d3      2332    3  D E B R   D D D   D E E
D E D D
```

Example 2

Example of raidvchkdsp command with **-fe** option and its output:

```
# raidvchkdsp -g horc0 -v gflag -fe
Group... TID LU Seq# LDEV# GI-C-R-W-S PI-C-R-W-S R-Time EM E-Seq#  E-
LDEV#
horc0...  0  20 63528   65  E E E E E  E E E E E     0   -    -
-
horc0...  0  20 63528    66  E E E E E  E E E E E    0   -    -
-
```

Output of the **raidvchkdsp** command with **-fe** option:

EM: external connection mode.

- H = Mapped E-lun is hidden from the host.
- V = Mapped E-lun is visible to the host.
- — = Unmapped to the E-lun.
- *BH* = Mapped E-lun as hidden from the host, but LDEV blockading.
- *BV* = Mapped E-lun as visible to the host, but LDEV blockading.
- *B* = Unmapped to the E-lun, but LDEV blockading.

E-Seq#: production (serial) number of the external LUN ('Unknown' shown as '-'). For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a “3” added to the beginning (for example, “312345” = serial number 12345).

E-LDEV#: LDEV# of the external LUN ('Unknown' shown as '-').

Example 3

Example of raidvchkdsp command with **-v cflag** option and its output:

```
raidvchkdsp -g vg01 -fd -v cflag
Group   PairVol Device_File    Seq# LDEV#  BR-W-E-E  MR-W-B
BR-W-B-Z  SR-W-B-S
vg01    oradb1  c4t0d2         2332    2    D E B R   D D D
D E E E  D E D D
vg01    oradb2  c4t0d3         2332    3    D E B R   D D D
D E E E  D E D D
```

Output of the **raidvchkdsp** command with **-v cflag** option:

BR-W-E-E: Displays the flags for checking data block size.

R=E: Checking for data block size on read is enabled. R=D: Checking for data block size on read is disabled.

W=E: Checking for data block size on write is enabled. W=D: Checking for data block size on write is disabled.

E=L: Data block on read/write is interpreted as little endian format.
E=B: Data block on read/write is interpreted as big endian format.

E=W: This shows the Warning that read/write is not rejected when validation error is detected. E=R: This shows the Reject that read/write is rejected when validation error is detected.

MR-W-B: Displays the flags for checking CHK-F3 in the data block.

R=E: Checking for CHK-F3 on read is enabled. R=D: Checking for CHK-F3 on read is disabled.

W=E: Checking for CHK-F3 on write is enabled. W=D: Checking for CHK-F3 on write is disabled.

B=E: Checking for CHK-F3 in the data block #0 is enabled. B=D: Checking for CHK-F3 in the data block #0 is disabled.

BR-W-B-Z: Displays the flags for checking regarding CHK-F2 in the data block.

R=E: Checking for CHK-F2 on read is enabled. R=D: Checking for CHK-F2 on read is disabled.

W=E: Checking for CHK-F2 on write is enabled. W=D: Checking for CHK-F2 on write is disabled.

B=E: Comparing for CHK-F2 in the data block is enabled. B=D: Comparing for CHK-F2 in the data block is disabled.

Z=E: The NON zero checking for CHK-F2 in the data block shows to being enabled. Z=D: The NON zero checking for CHK-F2 in the data block shows to being disabled.

SR-W-B-S: Displays the flags for checking regarding CHK-F1 in the data block.

R=E: Checking for CHK-F1 on read is enabled. R=D: Checking for CHK-F1 on read is disabled.

W=E: Checking for CHK-F1 on write is enabled. W=D: Checking for CHK-F1 on write is disabled.

B=E: Checking for CHK-F1 in the data block #0 is enabled. B=D: Checking for CHK-F1 in the data block #0 is disabled.

S=E: Referring for CHK-F1 flag contained in the data block is enabled.
S=D: Referring for CHK-F1 flag contained in the data block is disabled.

Example 4

Example of **raidvchkdsp** command with**-v offset** option and its output:

```
# raidvchkdsp -g vg01 -fd -v offset
Group  PairVol Device_File  Seq# LDEV# Bsize STLBA   ENLBA BNM
vg01    oradb1      c4t0d2  2332   2    1024     1  102400   9
vg01    oradb2      c4t0d3  2332   3    1024     1  102400   9
```

Output of the *raidvchkdsp* command with -v offset option:

Bsize: Displays the data block size of Oracle I/O in bytes.

STLBA: Displays the start of LBA on a target volume for checking in blocks (512 bytes).

ENLBA: Displays the end of LBA on a target volume for checking in blocks (512 bytes).

Note: If STLBA and ENLBA are both zero, this means to check all blocks.

BNM: Displays the number of bits for checking regarding CHK-F2 (in bits). If BNM is zero, this means the checking for CHK-F2 is disabled.

Example 5

Example of **raidvchkdsp** command with **-v errcnt** option and its output:

```
# raidvchkdsp -g vg01 -fd -v errcnt
Group  PairVol Device_File  Seq# LDEV#  CfEC  MNEC  SCEC  BNEC
vg01    oradb1     c4t0d2   2332   2      0     0     0     0
vg01    oradb2     c4t0d3   2332   3      0     0     0     0
```

Output of the *raidvchkdsp* command with -v errcnt option:

CfEC: Displays the error counter for checking of block size validation.

MNEC: Displays the error counter for checking of CHK-F3 validation.

SCEC: Displays the error counter for checking of CHK-F1 validation.

BNEC: Displays the error counter for checking of CHK-F2 validation.

Example 6

Example of **raidvchkdsp** command with **-v gflag** option and its output:

```
# raidvchkdsp -g vg01 -fd -v gflag
Group PairVol Device_File Seq# LDEV# GI-C-R-W-S PI-C-R-W-S R-Time
vg01   oradb1  c4t0d2     2332   2   E E D D E   E E D D E   365
vg01   oradb2   c4t0d3    2332   3   E E D D E   E E D D E     -
```

Output of the *raidvchkdsp* command with -v gflag option:

GI-C-R-W-S: Displays the flags for guarding as for the target volume.

I=E: Enabled for Inquiry command. I=D: Disabled for Inquiry command.

C=E: Enabled for Read Capacity command. C=D: Disabled for Read Capacity command.

R=E: Enabled for Read command. R=D: Disabled for Read command.

W=E: Enabled for Write command. W=D: Disabled for Write command.

S=E: Enabled for becoming the S-VOL. S=D: Disabled for becoming the S-VOL.

PI-C-R-W-S: Displays the permission flags that show whether each mode flag can be changed to enable or not.

I=E: 'I' flag can be changed to enable. I=D: 'I' flag cannot be changed to enable.

C=E: 'C' flag can be changed to enable. C=D: 'C' flag cannot be changed to enable.

R=E: 'R' flag can be changed to enable. R=D: 'R' flag cannot be changed to enable.

W=E: 'W' flag can be changed to enable. W=D: 'W' flag cannot be changed to enable.

S=E: 'S' flag can be changed to enable. S=D: 'S' flag cannot be changed to enable.

R-Time: Displays the retention time for write protect in days. The hyphen (-) shows that the retention time is infinite. The application knows whether the target volume is denied to change to writing enable by referring 'R-Time'.

R-time (Rtime) is identical to rtime and both of them indicate Retention Time. This setting value can normally be identified as a value of R-time that is output by raidychkdsp (the logging format is Rtime=xxxx). However, R-time (Rtime) is indicated as the value of 'Retention Time + 1000000' when the expiration lock is enabled. The setting of raidvchkset command in this status is denied.

Audit lock status is shown as the retention time plus 1000000. 'R-Time + 1000000' shows the retention time with Audit lock status.

Example 7

Example of **raidvchkdsp** command with **-v pool** option and its output:

```
raidvchkdsp -g vg01 -v pool
Group PairVol Port# TID LU Seq# LDEV# Bsize Available    Capacity
Vg01   oradb1 CL2-D   2  7 62500  167  2048    100000  1000000000
Vg01   oradb2 CL2-D   2 10 62500  170  2048    100000  1000000000
```

Output of the **raidvchkdsp** command with **-v pool** option:

Bsize: Displays the data block size of the pool in blocks (512 bytes).

Available(Bsize): Displays the available capacity for the volume data on the Copy-on-Write Snapshot pool in units of Bsize.

Capacity(Bsize): Displays the total capacity in the Copy-on-Write Snapshot pool in units of Bsize.

Example 8

Example of **raidvchkdsp** command with **-v aou** option and its output ("aou" (allocation on use) refers to dynamic provisioning):

```
[Display example]
# raidvchkdsp -v aou -g AOU
Group  PairVol Port# TID LU Seq# LDEV# Used(MB) LU_CAP(MB) U(%)
T(%) PID
AOU    AOU_001 CL2-D  2   7 62500  167   20050  1100000   10
70    1
AOU     AOU_002 CL2-D  2  10 62500  170 110000  1100000   10
70    1
```

Output of the **raidvchkdsp** command with the -v aou option:

Used(MB): Displays the usage size of the allocated block on this LUN. Range: 0 ≤ Used (MB) < LU_CAP(MB) + 42 MB

LU_CAP(MB): Displays the LUN capacity responded to the 'Readcapacity' command as SCSI interface.

LU_CAP(BLK): Displays the LUN capacity (in block/512 bytes) responded to the 'Readcapacity' command as SCSI interface.

U(%): Displays the usage rate of the allocated block on the Dynamic Provisioning pool containing this LU.

T(%): Displays the threshold rate being set to the Dynamic Provisioning pool as high water mark.

PID: Displays the Dynamic Provisioning pool ID assigned to this Dynamic Provisioning volume.

raidvchkscan

The *raidvchkscan* command displays the port of the storage system (9900V or later), target ID, LDEV mapped for LUN# and MU#, and status of LDEV, regardless of the configuration definition file.

Note: This command is rejected with EX_ERPERM by connectivity checking between CCI and the RAID storage system.

Syntax

```
raidvchkscan { -h | -q | -z[x] | -I[H][M][instance#] or
     -I[TC][SI][instance#] | -p <port#> [hgrp] | -pd[g] <raw_device>
     | -s <seq#> | -t <target> | -l <lun> | [ -f[x] ] | -v <op> }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the command.

Option	Description
-z or -zx	Makes the raidvchkscan command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option.
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.
-p <port#> [hgrp]	Specifies the port ID of the port to be scanned. Valid ports are CL1-A to CL1-R and CL2-A to CL2-R (excluding CL1-I, CL1-O, CL2-I, CL2-O). In addition, it is able to specify from CL3-a to CL3-r (except CL3-i, CL3-o), or CL4-a to CL4-r (except CL4-i, CL4-o) for the expanded port. The port is not case sensitive (for example, CL1-A= cl1-a= CL1-a= cl1-A, CL3-a= CL3-A= cl3-a= cl3-A). This option must be specified if '-find' or '-pd <raw_device>'option is not specified. Specify [hgrp] to display only the LDEVs mapped to a host group on a port.
-pd[g] <raw_device>	Specifies the raw device name. This option finds Seq# and port_name of the storage system to which the specified device can be connected, and scans the port of the storage system which corresponds with the unit ID that searches the unit ID from Seq#. This option must be specified if the '-find' option is not specified. If this option is specified, the following -s <seq#> option is invalid. -pdg: Shows a LUN on the host view by finding a host group.
-s <seq#>	Used to specify the seq# (serial#) of the storage system when this option cannot specify the unit ID which is contained for '-p <port>' option. This option scans the port specified by '-p <port>' option of the storage system which corresponds with the unit ID that searches the unit ID from seq#. If this option is specified, then the unit ID which is contained in '-p <port>' option is invalid. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-t <target>	Specifies a target ID (0 to 15) of the specified port. If this option is not specified, the command applies to all target IDs.
-l <lun>	Specifies a LUN (0 to 2047) of the specified target ID. If this option is not specified, the command applies to all LUNs. If this option is specified, the TID must also be specified.
-fx	Displays the LDEV/STLBA/ENLBA number in hexadecimal notation.
-v [op]	Specifies the following operation that displays each parameter for validation checking: cflag: Displays all flags for checking regarding data block validation for target vols. offset: Displays the range setting for data block size of Oracle I/O and a region on a target volume for validation checking. errcnt: Displays the statistical information counted as an error for each checking on the target volumes. Each statistical information counted as an error is cleared when the individual flag for validation checking is disabled. gflag: Displays the parameter for guarding on the specified target volumes. *pool*: This option displays the pool capacity and the usable capacity for the pool ID to which the LDEV belongs. This is needed to help the decision whether the restore

Option	Description
	operation is possible or not, because the pool capacity is consumed by the restore operation of the Copy-on-Write Snapshot. *aou[b]*: Displays the LUN capacity and usage rate for only Dynamic Provisioning volume mapped to the specified port, and displays the ID of the pool to which LDEV belongs. *aoub*: Displays the LUN capacity in blocks (512 bytes).

Returned values

--

Error codes

--

Examples

Example 1

Example of **raidvchkscan** command with **-v cflag** option

```
# raidvchkscan -p CL1-A -v cflag
PORT# /ALPA/C TID# LU#   Seq#  Num LDEV#   BR-W-E-E  MR-W-B  BR-W-B-
Z  SR-W-B-S
CL1-A / ef/ 0    0   0   2332    1     0    D E B R   D D D   D E E
E  D E D D
CL1-A / ef/ 0    0   1   2332    1     1    D E B R   D D D   D E E
E  D E D D
```

Output of the **raidvchkscan** command with **-v cflag** option:

BR-W-E-E: Displays the flags for checking regarding data block size.

R=E: Checking for data block size on read is enabled. R=D: Checking for data block size on read is disabled.

W=E: Checking for data block size on write is enabled. W=D: Checking for data block size on write is disabled.

E=L: Data block on read/write is interpreted as little endian format.
E=B: Data block on read/write is interpreted as big endian format.

E=W: This shows the Warning that read/write is not rejected when validation error is detected. E=R: This shows the Reject that read/write is rejected when validation error is detected.

MR-W-B: Displays the flags for checking regarding CHK-F3 in the data block.

R=E: Checking for CHK-F3 on read is enabled. R=D: Checking for CHK-F3 on read is disabled.

W=E: Checking for CHK-F3 on write is enabled. W=D: Checking for CHK-F3 on write is disabled.

B=E: Checking for CHK-F3 in the data block #0 is enabled. B=D: Checking for CHK-F3 in the data block #0 is disabled.

BR-W-B-Z: Displays the flags for checking regarding CHK-F2 in the data block.

R=E: Checking for CHK-F2 on read is enabled. R=D: Checking for CHK-F2 on read is disabled.

W=E: Checking for CHK-F2 on write is enabled. W=D: Checking for CHK-F2 on write is disabled.

B=E: Comparing for CHK-F2 in the data block is enabled. B=D: Comparing for CHK-F2 in the data block is disabled.

Z=E: The NON zero checking for CHK-F2 in the data block is enabled.
Z=D: The NON zero checking for CHK-F2 in the data block is disabled.

SR-W-B-S: Displays the flags for checking regarding CHK-F1 in the data block.

R=E: Checking for CHK-F1 on read is enabled. R=D: Checking for CHK-F1 on read is disabled.

W=E: Checking for CHK-F1 on write is enabled. W=D: Checking for CHK-F1 on write is disabled.

B=E: Checking for CHK-F1 in the data block #0 is enabled. B=D: Checking for CHK-F1 in the data block #0 is disabled.

S=E: Referring for CHK-F1 flag contained in the data block is enabled.
S=D: Referring for CHK-F1 flag contained in the data block is disabled.

Example 2

Example of **raidvchkscan** command with **-v offset** option

```
# raidvchkscan -p CL1-A -v offset
PORT# /ALPA/C TID# LU#   Seq#  Num LDEV#   Bsize
STLBA         ENLBA BNM
CL1-A / ef/ 0    0   0   2332    1     0    1024
1        102400   9
CL1-A / ef/ 0    0   1   2332    1     1    1024
1        102400   9
CL1-A / ef/ 0    0   2   2332    1     2    1024
1        102400   9
CL1-A / ef/ 0    0   3   2332    1     3    1024
1        102400   9
CL1-A / ef/ 0    0   4   2332    1     4    1024
1        102400   9
```

Output of the **raidvchkscan** command with **-v offset** option:

Bsize: Displays the data block size of Oracle I/O in bytes.

STLBA: Displays the Start of LBA on a target volume for checking in blocks (512 bytes).

ENLBA: Displays the End of LBA on a target volume for checking in blocks (512 bytes).

Note: If STLBA and ENLBA are both zero, this means to check all blocks.

BNM: Displays the number of bits for checking regarding CHK-F2 (in bits). If BNM is zero, this means the checking for CHK-F2 is disabled.

Example 3

Example of **raidvchkscan** command with **-v errcnt** option

```
# raidvchkscan -p CL1-A -v errcnt
PORT# /ALPA/C TID# LU#   Seq#  Num LDEV#      CfEC      MNEC
SCEC      BNEC
CL1-A / ef/ 0    0   0   2332    1     0         0         0
0         0
CL1-A / ef/ 0    0   1   2332    1     1         0         0
0         0
CL1-A / ef/ 0    0   2   2332    1     2         0         0
0         0
CL1-A / ef/ 0    0   3   2332    1     3         0         0
0         0
CL1-A / ef/ 0    0   4   2332    1     4         0         0
0         0
```

Output of the **raidvchkscan** command with **-v errcnt** option:

CfEC: Displays the error counter for checking of block size validation.

MNEC: Displays the error counter for checking of CHK-F3 validation.

SCEC: Displays the error counter for checking of CHK-F1 validation.

BNEC: Displays the error counter for checking of CHK-F2 validation.

Example 4

Example of **raidvchkscan** command with **-v gflag** option

```
# raidvchkscan -p CL1-A -v gflag
PORT# /ALPA/C TID# LU#   Seq#  Num LDEV#   GI-C-R-W-S  PI-C-R-W-S R-
Time
CL1-A / ef/ 0    0   0   2332    1     0    E E D D E   E E D D E
365
CL1-A / ef/ 0    0   1   2332    1     1    E E D D E   E E D D
E      -
CL1-A / ef/ 0    0   2   2332    1     2    E E D D E   E E D D
E      0
```

Output of the **raidvchkscan** command with **-v gflag** option:

GI-C-R-W-S: Displays the flags for guarding as for the target volume.

I=E: Enabled for Inquiry command. I=D: Disabled for Inquiry command.

C=E: Enabled for Read Capacity command. C=D: Disabled for Read Capacity command.

R=E: Enabled for Read command. R=D: Disabled for Read command.

W=E: Enabled for Write command. W=D: Disabled for Write command.

S=E: Enabled for becoming the S-VOL. S=D: Disabled for becoming the S-VOL.

PI-C-R-W-S: Displays the permission flags that show whether each mode flag can be changed to enable or not.

I=E: 'I' flag can be changed to enable. I=D: 'I' flag cannot be changed to enable.

C=E: 'C' flag can be changed to enable. C=D: 'C' flag cannot be changed to enable.

R=E: 'R' flag can be changed to enable. R=D: 'R' flag cannot be changed to enable.

W=E: 'W' flag can be changed to enable. W=D: 'W' flag cannot be changed to enable.

S=E: 'S' flag can be changed to enable. S=D: 'S' flag cannot be changed to enable.

R-Time: Displays the retention time for write protect in days. The hyphen (-) shows that the retention time is infinite. The application knows whether the target volume is denied to change to writing enable by referring 'R-Time'.

Audit lock status is shown as the retention time plus 1000000. 'R-Time + 1000000' shows the retention time with Audit lock status.

Example 5

Example of **raidvchkscan** command with **-v pool** option

```
# raidvchkscan -v pool -p CL2-d-0
PORT# /ALPA/C TID# LU#   Seq#  Num LDEV#   Bsize     Available
Capacity
CL2-D-0 /e4/ 0   2   0  62500    1   160    2048        100000
1000000000
CL2-D-0 /e4/ 0   2   1  62500    1   161    2048        100000
1000000000
```

Output of the **raidvchkscan** command with **-v pool** option:

Bsize: Displays the data block size of the pool in blocks (512 bytes).

Available(Bsize): Displays the available capacity for the volume data on the Copy-on-Write Snapshot pool in units of Bsize.

Capacity(Bsize): Displays the total capacity in the Copy-on-Write Snapshot pool in units of Bsize.

Example 6

Example of **raidvchkscan** command with **-v aou** option ("aou" (allocation on use) refers to dynamic provisioning)

```
# raidvchkscan -v aou -p CL2-d-0
PORT# /ALPA/C TID# LU#   Seq#  Num LDEV#  Used(MB)  LU_CAP(MB)  U(%)
T(%) PID
CL2-D-0 /e4/ 0   2   0  62500    1   160    20050     1100000
```

```
1    60     1
CL2-D-0 /e4/ 0    2    1   62500     1    161    200500      1100000
18    60     2
```

Output of the **raidvchkscan** command with **-v aou** option:

Used(MB): Displays the usage size the allocated block on this LUN. Range: 0 ≤ Used (MB) < LU_CAP(MB) + 42MB

LU_CAP(MB): Displays the LUN capacity responded to the 'Readcapacity' command as SCSI interface.

LU_CAP(BLK): Displays the LUN capacity (in block/512 bytes) responded to the 'Readcapacity' command as SCSI interface.

U(%): Displays the usage rate of the allocated block on the Dynamic Provisioning pool containing this LU.

T(%): Displays the threshold rate being set to the Dynamic Provisioning pool as high water mark.

PID: Displays the Dynamic Provisioning pool ID assigned to this Dynamic Provisioning volume.

raidvchkscan for Universal Replicator

The **raidvchkscan** command supports the (-v jnl [t] [unit#]) option to find the journal volume list. It also displays any information for the journal volume.

Syntax

```
raidvchkscan { -h | -q | -z[x] | -I[H][M][instance#] or -I[TC][SI]
[instance#]| -v jnl [t] [unit#] | [ -s <seq#>] | [ -f[x] ] }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the command.
-z or -zx	Makes the raidvchkscan command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option.
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.

Option	Description
-s <seq#>	Used to specify the seq# (serial#) of the storage system when this option cannot specify unitID which is contained for '-v jnl' option. If this option is specified, the unitID which is contained in '-v jnl' is invalid. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-fx	Displays the LDEV number in hexadecimal notation.
-v jn	Displays information for the journal volume.
-v jnlt	Displays the *DOW*, *DPW*, and *APW* time-out values for controlling the journal.

Returned values

--

Error codes

--

Examples

Example 1

Example of **raidvchkscan** command with **-v jnl 0** option

```
# raidvchkscan -v jnl 0
JID MU CTG  JNLS  AP  U(%)  Q-Marker   Q-CNT  D-SZ(BLK)   Seq# Nnm
LDEV#
001  0   1  PJNN   4   21   43216fde      30     512345  62500   2
265
002  1   2  PJNF   4   95   3459fd43   52000     512345  62500   3
270
002  2   2  SJNS   4   95   3459fd43   52000     512345  62500   3
270
003  0   3  PJSN   4    0          -       -     512345  62500   1
275
004  0   4  PJSF   4   45   1234f432      78     512345  62500   1
276
005  0   5  PJSE   0    0          -       -     512345  62500   1
277
006  -   -  SMPL   -    -          -       -     512345  62500   1
278
007  0   6  SMPL   4    5   345678ef      66     512345  62500   1
278
```

Output of the **raidvchkscan** command with **-v jnl 0** option:

JID: journal ID

MU: mirror descriptions on Universal Replicator

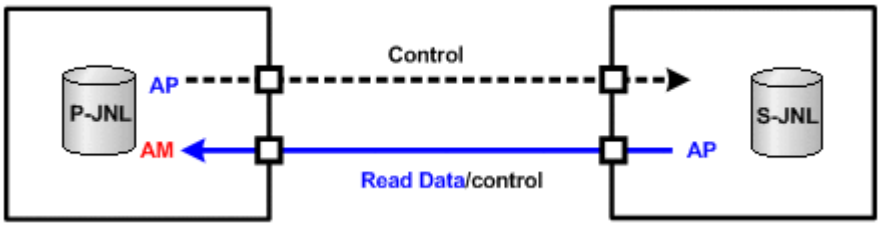
CTG: consistency group ID

JNLS: Status of the journal:

- SMPL: This means the journal volume which does not have a pair, or in the state of deleting.
- P(S)JNN: This means 'P(S) Journal Volume is in Normal status'.
- P(S)JNS: This means 'P(S) Journal Volume is suspended in Normal status' created with **-nocsus** option.
- P(S)JSN: This means 'P(S) Journal Volume is suspended in Normal status'.
- P(S)JNF: This means 'P(S) Journal Volume is in Full status'.
- P(S)JSF: This means 'P(S) Journal Volume is suspended in Full status'.
- P(S)JSE: This means 'P(S) Journal Volume is suspended by an error (including link failures)'.
- P(S)JES: This means 'P(S) Journal Volume is suspended by an error' created with **-nocsus** option.

AP: Displays the following two conditions (status) according to the pair status.

Shows the number of active paths on the initiator port in Universal Replicator links. 'Unknown' is shown as '-'.



AM: The activity monitor that detects whether or not there is a request for data from the initiator at regular intervals. If AM detects a time-out, the P-JNL state is changed from P-JNN to PJSE.

Note: The same path information is used for AP for three commands (pairvolchk, pairdisplay, raidvchkscan). The differential is that pairvolchk and pairdisplay are to show a special meaning with SSUS(SSWS) state.

Q-Marker: Displays the sequence # of the journal ID, called the Q-marker. For P-JNL, Q-Marker shows the latest sequence # on the P-JNL volume. For S-JNL, the Q-Marker shows the latest sequence # of the cache(DFW).

Q-CNT: Displays the number of remaining Q-Markers within each journal volume.

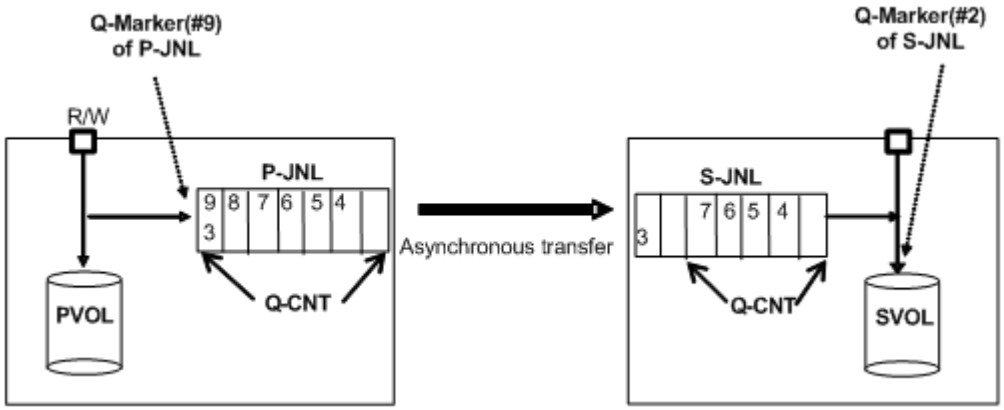


Figure 2-22 Example of Q-Marker and Q-CNT

U(%): Displays the usage rate of the journal data.

D-SZ: Displays the capacity for the journal data on the journal volume. For details about the displayed capacity, see the *Hitachi Universal Replicator User Guide*.

Seq#: Displays the serial number of the RAID storage system. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

Num: Displays the number of LDEVs configured the journal volume.

LDEV#: Displays the first number of the LDEV that is configured for the journal volume. Using a combination of JNLS status and other information, the application knows the following detail state.

The following table lists information about the different journal volume statuses. QCNT=0 indicates that the number of remaining Q-Markers is '0'. The letter 'N' indicates a non-zero.

Table 2-12 Detailed Status of the Journal Volume

JNLS		Other Information		Description
P-JNL	S-JNL	QCNT	AP	
SMPL		0	-	Configured as journal volume, but NOT pair
		N	-	Deleting the journal volume
PJNN (PJNS)	SJNN (SJNS)	0	-	Normal state of the journal volume without data
PJNN (PJNS)	-	N	-	Normal state of the journal volume with data
-	SJNN (SJNS)	N	N	Normal state of the journal volume with data
			0	Still normal state of the journal volume at Link failure

JNLS		Other Information		Description
P-JNL	S-JNL	QCNT	AP	
PJSN	SJSN	0	-	Suspended journal volume via operation
		N	-	Suspending the journal volume
PJNF	-	N	-	High water mark state
PJSF	SJSF	0	-	Suspended journal volume due to full journal
		N	-	Suspending the journal volume due to full journal
PJSE	-	0	-	Suspended journal volume due to failure/Link failure
		N	-	Suspending the journal volume due to failure/Link failure
-	SJSE	0	N	Suspended journal volume due to failure
			0	Suspended journal volume due to Link failure
		N	N	Suspending the journal volume due to failure
			0	Suspending the journal volume due to Link failure

Example 2

Example of **raidvchkscan** command with **-v jnlt** option

```
# raidvchkscan -v jnlt
JID MU CTG  JNLS  AP  U(%)   Q-Marker   Q-CNT  D-SZ(BLK)   Seq# DOW
PBW APW
001  0   1  PJNN   4   21    43216fde      30     512345  63528  20
300  40
002  1   2  PJNF   4   95    3459fd43   52000     512345  63528  20
300  40
003  0   3  PJSN   4    0           -       -     512345  63528  20
300  40
```

Output of the **raidvchkscan** command with **-v jnlt** option:

DOW: Data Overflow Watch' timer (in seconds) setting per the Journal.

PBW: Path Blockade Watch timer setting (in seconds) per the Journal. If the setting is more than 3600 seconds, it displays 6000 seconds.

APW: This shows 'Active Path Watch' timer (in seconds) for detecting Link failure.

raidvchkscan for Thin Image, Copy-on-Write Snapshot, and HDP Pools

The **raidvchkscan** command supports the option (**-v pid[a] [unit#]**) to find the Thin Image, Copy-on-Write Snapshot, or Dynamic Provisioning pool settings via SVP, and displays information for the Thin Image, Copy-on-Write Snapshot, or Dynamic Provisioning pool.

Syntax

```
raidvchkscan {  -h | -q | -z[x] | -I[H][M][instance#] or
     -I[TC][SI][instance#] | -v  pid[a][s] [unit#]
     | [ -s <seq#>] |  [ -f[x ] | }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the command.
-z or -zx	Makes the raidvchkdsp command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option.
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.
-s <seq#>	Used to specify the Seq# (serial#) of the storage system when this option cannot specify unitID which is contained for '-v jnl[a]' option. If this option is specified, the unitID which is contained in '-v jnl[a]' is invalid. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-fx	Displays the LDEV number in hexadecimal notation.
-v pid[s]	Displays information for the Thin Image/Copy-on-Write Snapshot/Dynamic Provisioning pool.
-v pid[a]	Displays information for the Dynamic Provisioning pool.

Returned values

--

Error codes

--

Examples

Example of **raidvchkscan** command example with **-v pid option**

```
# raidvchkscan -v pid 0
PID  POLS   U(%)  SSCNT  Available(MB)  Capacity(MB)     Seq#  Num
LDEV#  H(%)
001  POLN    10     330      10000000    1000000000     62500
2    265   80
002  POLF    95    9900        100000    1000000000     62500
```

```
3    270   70
003  POLS   100   10000           100    1000000000     62500
1    275   70
004  POLE     0       0             0             0     62500
0      0   80
```

Output of the **raidvchkscan** command with **-v pid** option:

PID: Displays the Thin Image/Copy-on-Write Snapshot/Dynamic Provisioning pool ID.

POLS: Displays the following status in the Thin Image/Copy-on-Write Snapshot/Dynamic Provisioning pool.

POLN = 'Pool Normal'

POLF = 'Pool Full'

POLS = 'Pool Suspend'

POLE = 'Pool failure'. In this state, information for the pool has no meaning and is displayed as '0'.

U(%): Displays the usage rate of the Thin Image/Copy-on-Write Snapshot/ Dynamic Provisioning pool.

SSCNT: Displays the number of Thin Images/Copy-on-Write Snapshot volume in Thin Image/Copy-on-Write Snapshot pool or the total number of Dynamic Provisioning volumes mapped in this Dynamic Provisioning pool.

Available(MB): Displays the available capacity for the volume data on the Thin Image/Copy-on-Write Snapshot/Dynamic Provisioning pool.

Capacity(MB): Displays the total capacity in the Thin Image/Copy-on-Write Snapshot/Dynamic Provisioning pool.

Seq#: Displays the serial number of the RAID storage system. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a “3” added to the beginning (for example, “312345” = serial number 12345).

Num: Displays the number of LDEVs configured the Thin Image/Copy-on-Write Snapshot/Dynamic Provisioning pool.

LDEV#: Displays the first number of LDEV configured the Thin Image/Copy-on-Write Snapshot/Dynamic Provisioning pool.

H(%): Displays the threshold rate being set to the Thin Image/Copy-on-Write Snapshot/Dynamic Provisioning pool as High water mark. 'Unknown' is shown as '-'.

Example of **raidvchkscan** command example with **-v pida** option

```
# raidvchkscan -v pida 0
PID  POLS U(%)  AV_CAP(MB)  TP_CAP(MB) W(%) H(%) Num LDEV#  LCNT
TL_CAP(MB)
001  POLN  10    45000000    50000000   50   80    2   265    33
65000000
002  POLF  95       10000   100000000   50   80    3   270   900
100000000
```

```
004  POLN   0    10000000   100000000   80   90    2   280
0          0
```

Output of the **raidvchkscan** command with **-v pida** option:

PID: Displays the Dynamic Provisioning pool ID.

POLS: Displays the following status of the Dynamic Provisioning pool:

- *POLN* = 'Pool Normal'
- *POLF* = 'Pool Full'
- *POLS* = 'Pool Suspend'
- *POLE* = 'Pool failure'. In this state, information for the pool has no meaning and is displayed as '0'.

U(%): Displays the usage rate of the Dynamic Provisioning pool.

AV_CAP(MB): Displays the available capacity for the Dynamic Provisioning volumes mapped to this pool.

TP_CAP(MB): Displays the total capacity of the Dynamic Provisioning pool.

W(%): Displays the threshold value for 'WARNING' set for this Dynamic Provisioning pool.

H(%): Displays the threshold rate set for the Dynamic Provisioning pool as high water mark.

Num: Displays the number of LDEVs configured the Dynamic Provisioning pool.

LDEV#: Displays the first number of LDEV configured the Dynamic Provisioning pool.

LCNT: Displays the total number of Dynamic Provisioning volumes mapped to this Dynamic Provisioning pool.

TL_CAP(MB): Displays the total capacity of all Dynamic Provisioning volumes mapped to this Dynamic Provisioning pool.

horcmstart

The **horcmstart** command is a script that starts HORCM. This script also sets the environment variables for HORCM as needed (for example, HORCM_CONF, HORCM_LOG, HORCM_LOGS).

Syntax

```
horcmstart.sh { inst ... }      (UNIX systems)
horcmstart.exe { inst ... }     (Windows systems)
```

Options and parameters

Option	Description
inst	Specifies the HORCM instance number (range= from 0 to 2047). When this option is specified, the horcmstart shell script sets the environment variables (HORCMINST, HORCM_CONF, HORCM_LOG, HORCM_LOGS) corresponding to the instance number, and starts the specified HORCM instance. (Environment variables set by the user become invalid.) When this option is not specified, the horcmstart shell script starts 1 HORCM and uses the environment variables set by the user. If you have designated full environment variables, use horcmstart.sh without any arguments. If you did not designate environment variables (HORCM_CONF, HORCM_LOG, HORCM_LOGS), then this shell script sets the environment variables as follows: For UNIX-based platforms: If HORCMINST is specified: HORCM_CONF = /etc/horcm*.conf (* is instance number) HORCM_LOG = /HORCM/log*/curlog HORCM_LOGS = /HORCM/log*/tmplog If HORCMINST is not specified: HORCM_CONF = /etc/horcm.conf HORCM_LOG = /HORCM/log/curlog HORCM_LOGS = /HORCM/log/tmplog For Windows platform: If HORCMINST is specified: HORCM_CONF = %windir%\horcm*.conf (* is the instance number) HORCM_LOG = \HORCM\log*\curlog HORCM_LOGS = \HORCM\log*\tmplog If HORCMINST is not specified: HORCM_CONF = %windir%\horcm.conf HORCM_LOG = \HORCM\log\curlog HORCM_LOGS = \HORCM\log\tmplog [environmental variable] The HORCM_LOGS environment variable is used when specifying the log file directory for automatic storing. When HORCM starts up, the log files created in the operation are stored automatically in the HORCM_LOGS directory. This log directory must give an equality class with HORCM_LOG HORCMSTART_WAIT (for waiting the CCI instance with start-up). Horcmgr does fork/exec() horcmd_XX as daemon process, and verifies/waits until HORCM become ready state. The timeout is used for only avoiding infinite loop, currently the default time is 200 sec in consideration of maximum LDEV. However, it may be needed to change the default timeout value for starting HORCM under high-loading of the server, or the remote command device. In such a case, this environmental variable is used when changing a timeout value (in seconds) from the current default value (200 sec), this value must be specified more than 5 seconds and multiple of 5 seconds. For example, setting 500 sec: `HORCMSTART_WAIT=500 Export HORCMSTART_WAIT` For OpenVMS platform: OpenVMS needs to make the Detached LOGINOUT.EXE Process as a JOB in the background by using the 'RUN /DETACHED' command. For details see *Requirements and restrictions for OpenVMS* (item *4*) in the *Installation and Configuration Guide*.

horcmshutdown

The **horcmshutdown** command is a script for stopping HORCM.

Syntax

```
horcmshutdown.sh {inst...}      (UNIX systems)
horcmshutdown.exe {inst...}     (Windows systems)
```

Options and parameters

Option	Description
inst	Specifies the HORCM (CCI) instance number (range= from 0 to 2047). When this option is specified, the command stops the specified HORCM instance. When this option is not specified, the command refers to the instance (environment variable HORCMINST) of the execution environment of this shell script and stops the following the HORCM instance. When HORCMINST is specified, this command stops the HORCM instance of the execution environment of this shell script. When HORCMINST is not specified, this command stops the HORCM having no instance setting.

Caution: After direction of stopping HORCM instance, this command returns a response just before stopping HORCM instance. Thus to return the response of this command, it does not mean HORCM instance disappeared.

horcctl

The HORCM software have logs that identify the cause of software and/or hardware errors as well as a tracing function for investigating such errors. The location of the log files depends on the user's command execution environment and the HORCM execution environment. The command trace file and core file reside together under the directory specified in the HORCM execution environment.

The **horcctl** command can be used for both maintenance and troubleshooting. The **horcctl** command allows you to change and display the internal trace control parameters (for example, level, type, buffer size) of the HORC Manager (CCI) software. If a new value for a parameter is not specified, the current trace control parameter is displayed.

Caution: Do not change the trace level unless directed to do so by a Hitachi Data Systems representative. Level 4 is the normal trace level setting. Levels 0-3 are for troubleshooting. Setting a trace level other than 4 may impact problem resolution. If you request a change of the trace level using the horcctl -l <level> command, a warning message appears, and this command enters interactive mode.

Syntax

```
horcctl { -h | -q | -z[x] | -I[H][M][instance#] or
     -I[TC][SI][instance#] | -d | -c | -l <level> | -b <y/n>
     | -s <size(KB)> | -t <type> | -S | -D[I] | -C
     | [-u <-unitid> | -ND | -NC | -g <group> }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the command.
-z or -zx	Makes the horcctl command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shut down, interactive mode terminates. OpenVMS cannot use the -zx option.
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.
-d	Interprets the control options following this option (-l <level>, -b <y/n>, -s <size(KB)>, and -t <type>) as the parameters of the CCI commands.
-c	Interprets the control options following this option (-l <level>, -b <y/n> and -t <type>) as the parameters of the HORC Manager (HORCM).
-l <level>	Sets the trace level (range = 0 to 15). If a negative value is specified, the trace mode is canceled. A negative value 'n' must be specified as '--n'. ***Caution:*** Do not change the trace level unless directed to do so by a Hitachi Data Systems representative. Level 4 is the normal trace level setting. Levels 0-3 are for troubleshooting. Setting a trace level other than 4 may impact problem resolution. If you request a change of the trace level using the horcctl -l <level> command, a warning message appears, and this command enters interactive mode.
-b <y/n>	Sets the trace writing mode: Y = buffer mode, N = synchronous mode.
-t <type>	Sets the trace type (range = 0 to 511). When this option is used, only traces of the specified type are output. One or more values can be specified.
-s <size(KB)>	Sets the trace buffer size in increments of 1024 bytes (default = 1 MB).
-S	Shuts down HORCM.
-D	Displays the command device name currently used by HORCM. If the command device is blocked due to online maintenance (microcode replacement) of the storage system, you can check the command device name in advance using this option.
-C	Changes the command device name being used by HORCM and displays the new command device name. If the command device is blocked due to online maintenance (microcode replacement) of the storage system, you can change the command device in advance using this option. ***Note:*** horcctl -D -C command designates a protection mode command device by adding '*' to the device file name as follows: *HP-UX example with command device security:*

Option	Description
	# horcctl -D Current control device = /dev/rdsk/c0t0d0* 'horcctl -D*I*' command shows the number of CCI instances of when HORCM has being started as follows: *HP-UX example without command device security:* # horcctl -D*I* Current control device = /dev/rdsk/c0t0d0 *AI = 14 TI = 0 CI = 1* where AI: NUM of actual instances in use TI: NUM of temporary instances in RAID CI: NUM of instances using current (own) instance
-u <unitid>	Used when specifying the unit ID of a command device as the target. This option is effective when the -D or -C option is specified. If this option is not specified, the unit ID is 0.
-ND -g <group>	Displays the network address and port name being used by HORCM. The -g <group> option is used when specifying the group name defined in the configuration definition file.
-NC -g <group>	Changes the network address and port name being used by HORCM and displays the new network address name. The -g <group> option specifies the group name defined in the configuration definition file.

horctakeoff

This is a scripted command for executing several HORC operation commands combined. It checks the volume attribute (optionally specified) and decides a takeover action. The **horctakeoff** operation is defined to change from 3DC multi-target to 3DC multi-hop with the state of running APP, after that the **horctakeover** command is able to configure 3DC multi-target on the remote site without stopping the APP. The granularity of either a logical volume or volume group can be specified with this command.

Syntax

```
horctakeoff | -h | -q | -z[x] | -I[H][M][instance#] or
     -I[TC][SI][instance#] | -g[s] <group> | -d[s] <pair Vol>
     | -d[g][s] <raw_device> [MU#] | -d[g][s] <seq#> <LDEV#> [MU#]
     | -jp <id> | -js <id> | [-t  <timeout> ]| -nomsg }
```

Options and parameters

Option	Description
-h	Displays help/usage and version information.
-q	Terminates the interactive mode and exits the command.

Option	Description
-z or -zx	Makes the raidvchkdsp command enter the interactive mode. The -zx option guards performing of the HORCM in the interactive mode. When this option detects a HORCM shutdown, interactive mode terminates. OpenVMS cannot use the -zx option.
-I[H][M] [instance#] or -I[TC][SI] [instance#]	Specifies the command as [HORC]/[HOMRCF] or [TrueCopy]/[ShadowImage], and used when specifying the CCI instance number.
-g[s] <group>	Specifies a group name (defined in the configuration definition file). The command is executed for the specified group unless the -d <pair Vol> option shown below is specified.
-d[s] <pair Vol>	Specifies a logical (named) volume (defined in the configuration definition file). When this option is specified, the command is executed for the specified paired logical volume.
-d[g][s] <raw_device> [MU#]	Searches the configuration definition file (local instance) for a volume that matches the specified raw device. If a volume is found, the command is executed on the paired volume (-d) or group (-dg). This option is effective without specification of the '-g <group>' option. If the specified raw_device is listed in multiple device groups, this applies to the first one encountered.
-d[g][s] <seq#> <LDEV#> [MU#]	Searches the configuration definition file (local instance) for a volume that matches the specified sequence # and LDEV. If a volume is found, the command is executed on the paired logical volume (-d) or group (-dg). This option is effective without specification of the '-g <group>' option. If the specified LDEV is listed in multiple device groups, this applies to the first one encountered. <seq#> <LDEV#> can be specified in a hexadecimal (by addition of '0x') or decimal. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-jp <id> (HORC/UR only)	Horctakeoff command can change 3DC configuration from 3DC multi-target to 3DC multi-hop. To create a 3DC multi-hop (TC_Sync to TC_Sync/UR P-VOL to UR), you must specify a journal ID for UR P-VOL. So this option is used for that purpose. If this option is not specified, a journal ID for UR P-VOL used for 3DC multi-target is inherited automatically.
-js <id>(HORC/UR only)	Horctakeoff command can be changed 3DC configuration from 3DC multi-target to 3DC multi-hop. To create a 3DC multi-hop (TC_Sync to TC_Sync/UR to UR S-VOL), you must specify a journal ID for UR S-VOL. So this option is used for that purpose. If this option is not specified, a journal ID for UR S-VOL used with 3DC multi-target is inherited automatically. The CTG ID is also inherited automatically for the internal paircreate command.
-t <timeout>	Specifies the maximum time to wait for the Sync P-VOL to Sync S-VOL delta data resynchronizing operation. Used for the internal pairresync command with the time-out period in seconds. If this option is not specified, the default timeout value (7200 sec) is used.
-noms	Suppresses messages when this command is executed from a user program. This option must be specified at the beginning of the command arguments.

Returned values

The **horctakeoff** command sets the following returned values during exit allowing you to check the execution results.

Normal termination: 0

Abnormal termination: The **horctakeoff** command returns the following error codes as well as generic error.

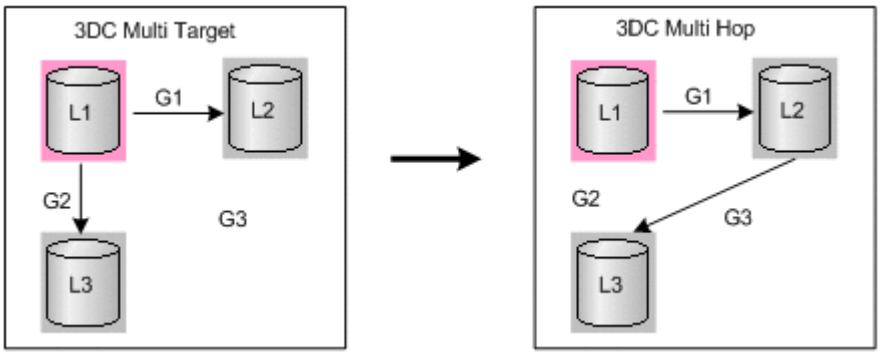
Error codes

Unrecoverable error should have been done without re-execute by handling of an error code. If the command failed, then the detailed status is logged in CCI command log ($HORCC_LOG), even though the user script has no error handling.

Category	Error Code	Error Message	Value
Volume status (Unrecoverable)	EX_ENQVOL	Unmatched volume status within the group	236
	EX_INCSTG	Inconsistent status in group	229
	EX_EVOLCE	Pair Volume combination error	235
	EX_VOLCRE	Local and Remote Volume currency error	223
Timer (Recoverable)	EX_EWSTOT	Timeout waiting for specified status	233

Examples

Example 1

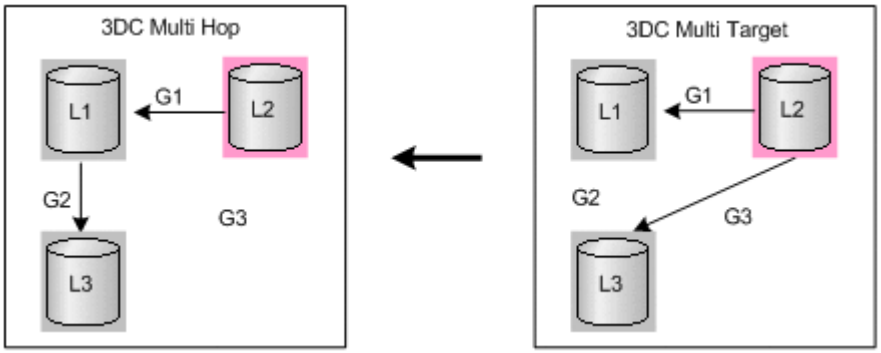


horctakeoff command on L1 local site

```
# horctakeoff -g G1 -gs G2
horctakeoff : 'pairsplit -g G1 -S -FHORC 2' is in progress
horctakeoff : 'pairsplit -g G1' is in progress
horctakeoff : 'pairsplit -g G2 -S' is in progress
horctakeoff : 'paircreate -g G1 -gs G2 -FHORC 2 -nocopy -f async
-jp 0 -js 1' is in progress
horctakeoff : 'pairsplit -g G1 -FHORC 2' is in progress
horctakeoff : 'pairresync -g G1' is in progress
```

```
horctakeoff : 'pairresync -g G1 -FHORC 2' is in progress
horctakeoff : horctakeoff done
```

Example 2



horctakeoff command on L2 local site

```
# horctakeoff -g G1 -gs G3
horctakeoff : 'pairsplit -g G1 -S -FHORC 1' is in progress.
horctakeoff : 'pairsplit -g G1' is in progress.
horctakeoff : 'pairsplit -g G3 -S' is in progress.
horctakeoff : 'paircreate -g G1 -gs G3 -FHORC 1 -nocopy -f async
-jp 0 -js 1' is in progress.
horctakeoff : 'pairsplit -g G1 -FHORC 1' is in progress.
horctakeoff : 'pairresync -g G1' is in progress.
horctakeoff : 'pairresync -g G1 -FHORC 1' is in progress.
horctakeoff : horctakeoff done.
```

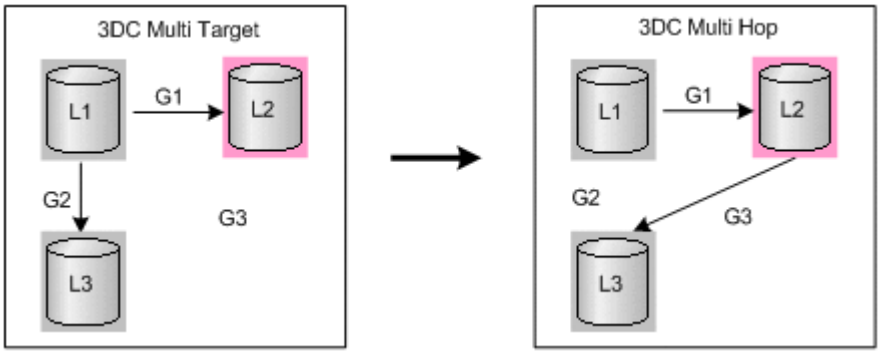
Example 3



horctakeoff command on L1 remote site

```
# horctakeoff -g G1 -gs G2
horctakeoff : 'pairsplit -g G2 -S' is in progress.
horctakeoff : 'pairsplit -g G1' is in progress.
horctakeoff : 'pairsplit -g G1 -FHORC 2 -S' is in progress.
horctakeoff : 'paircreate -g G2 -vl -nocopy -f async -jp 0
-js 1' is in progress.
horctakeoff : 'pairsplit -g G2' is in progress.
horctakeoff : 'pairresync -g G1' is in progress.
horctakeoff : 'pairresync -g G2' is in progress.
horctakeoff : horctakeoff done.
```

Example 4



horctakeoff command on L2 remote site

```
# horctakeoff -g G1 -gs G3
horctakeoff : 'pairsplit -g G3 -S' is in progress.
horctakeoff : 'pairsplit -g G1' is in progress.
horctakeoff : 'pairsplit -g G1 -FHORC 1 -S' is in progress.
horctakeoff : 'paircreate -g G3 -vl -nocopy -f async -jp 0
-js 1' is in progress.
horctakeoff : 'pairsplit -g G3' is in progress.
horctakeoff : 'pairresync -g G1' is in progress.
horctakeoff : 'pairresync -g G3' is in progress.
horctakeoff : horctakeoff done.
```

3

Subcommands

This chapter provides the specifications for the CCI subcommands.

- Windows subcommands
- Environment variable subcommands

Windows subcommands

CCI provides subcommands for the Windows platform that are executed as an option of another command. When you specify a subcommand as the only option of a command, you do not need to start HORCM. If another option of the command and the subcommand are specified on the same command line,place the other option after the subcommand.

The Windows subcommands are:

- findcmddev on page 3-2
- drivescan on page 3-3
- portscan on page 3-4
- sync, syncd on page 3-5
- mount on page 3-7
- umount, umountd on page 3-8

findcmddev

The **findcmddev** subcommand searches for command devices within the specified range of disk drive numbers. If it is found, the command device appears in the same format as in the configuration definition file. This subcommand is used when the command device name is not known and when the HORCM is not started.

Caution: The **findcmddev** subcommand must be used when HORCM is running.

Note: The **findcmddev** subcommand searches for the physical and logical drives associated with the command device. If the command device is indicated as a logical drive in addition to a physical drive, then a drive letter is assigned to the command device. You must delete the drive letter assigned to the command device to prevent utilization by general users.

The 'Volume{GUID}' must be made by setting a partition using the disk management. Do not format it (no file system). In a SAN environment, the physical drive number might be changed on every reboot. For this case, use the Volume (GUID) that keeps as the same name.

Syntax

```
-x findcmddev drive#(0-N)
```

Argument

drive#(0-N): Specifies the range of disk drive numbers on the Windows system.

Example

The following shows an example of the **findcmddev** subcommand used as an option of the **raidscan** command and its output. This example searches for command devices in the range of disk drive numbers 0 through 20.

```
D:\HORCM\etc> raidscan  -x  findcmddev   hdisk0, 20
cmddev of Ser# 62496 = \\.\PhysicalDrive0
cmddev of Ser# 62496 = \\.\E:
cmddev of Ser# 62496 = \\.\Volume{b9b31c79-240a-11d5-
a37f-00c00d003b1e}
```

drivescan

The **drivescan** subcommand displays the relationship between the disk numbers assigned by the Windows system and the LDEVs on the RAID storage system, and also displays attribute and status information for each LDEV.

Syntax

```
-x drivescan drive#(0-N)
```

Argument

drive#(0-N): Specifies the range of data drive numbers on the Windows system.

Example

The following shows an example of the **drivescan** subcommand used as an option of the **raidscan** command and its output. This example displays the devices for the range of disk drive numbers from 0 to 20.

```
raidscan -x drivescan  harddisk0,20
Harddisk 0..Port[1] PhId[0] TId[0] Lun[0] [HITACHI] [DK328H-43WS]
Harddisk 1..Port[2] PhId[4] TId[29] Lun[0] [HITACHI] [OPEN-3]
            Port[CL1-J] Ser#[   30053] LDEV#[   9(0x009)]
            HORC=P-VOL HOMRCF[MU#0 = SMPL MU#1 = SMPL MU#2 = SMPL]
            RAID5[Group  2- 1] SSID = 0x0008 CTGID = 3
Harddisk 2..Port[ 2] PhId[ 4] TId[29] Lun[ 1] [HITACHI] [OPEN-3]
            Port[CL1-J] Ser#[ 30053] LDEV#[  10(0x00A)]
            HORC=S-VOL HOMRCF[MU#0 = SMPL MU#1 = SMPL MU#2 = SMPL]
            RAID5[Group  2- 1] SSID = 0x0004 CTGID = 3
Harddisk 3..Port[2] PhId[4] TId[29] Lun[ 6] [HITACHI] [OPEN-3-CM]
            Port[CL1-J] Ser#[ 30053] LDEV#[  15(0x00F)]
```

Output of the **drivescan** subcommand:

Harddisk #: Shows the data drive recognized by the Windows system.

Port: Shows the port number on the device adapter recognized by the Windows system.

Phid: Shows the bus number on the device adapter port recognized by Windows system.

Tid: Shows the target ID of the data drive(s) connected to device adaptor port. For the detail of fibre-to-SCSI address conversion, see the *Command Control Interface Installation and Configuration Guide*.

LUN: Shows the LU number of the data drive connected to device adaptor port.

Port[CLX-Y]: Shows the port number on the storage system.

Ser#: Shows the production number (serial number) of the storage system. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

LDEV#: Shows the LDEV ID (hexadecimal) of the specified volume.

HORC: Shows the TrueCopy/global-active device attribute (P-VOL, S-VOL, SMPL) of the specified volume.

HOMRCF: Shows the ShadowImage or Copy-on-Write Snapshot attribute (P-VOL, S-VOL, or SMPL) and MU number (0-2) of the specified volume.

RAIDX[Group]: Shows the physical location (frame number-parity group number) of the specified volume and the RAID level of this parity group.

SSID: Shows the SSID (hexadecimal) of the specified volume. The Unified Storage VM does not support SSID but displays the specified value.

CTGID (TrueCopy Async, Universal Replicator, global-active device only): Shows the consistency group ID of specified volume.

portscan

The **portscan** subcommand displays the devices on the specified port(s).

Syntax

```
-x portscan port#(0-N)
```

Argument

port#(0-N): Specifies the range of port numbers on the Windows system.

Example

The following shows an example of the **portscan** subcommand used as an option of the **raidscan** command and its output. This example displays the devices for the range of ports from 0 to 20.

```
raidscan  -x  portscan  port0,20
PORT[ 0] IID [ 7] SCSI Devices
     PhId[ 0] TId[ 3] Lun[ 0] [MATSHIT] [CD-ROM CR-508]...Claimed
     PhId[ 0] TId[ 4] Lun[ 0]  [HP    ] [C1537A       ]...Claimed
PORT[ 1] IID [ 7] SCSI Devices
     PhId[ 0] TId[ 0] Lun[ 0] [HITACHI] [DK328H-43WS  ]...Claimed
PORT[ 2] IID [ 7] SCSI Devices
     PhId[ 0] TId[ 5] Lun[ 0]  [HITACHI] [OPEN-3      ]...Claimed
     PhId[ 0] TId[ 5] Lun[ 1]  [HITACHI] [OPEN-3      ]...Claimed
     PhId[ 0] TId[ 5] Lun[ 2]  [HITACHI] [OPEN-3      ]...Claimed
     PhId[ 0] TId[ 6] Lun[ 0]  [HITACHI] [3390-3A     ]...Claimed
```

Note: This example displays the devices for the range of ports from 0 to 20.

Output of the **portscan** subcommand:

Port: Shows the port number on the device adapter recognized by the Windows system

IID: Shows the initiator ID on the specified device adapter port

Phid: Shows the BUS number on the specified device adapter port

Tid: Shows the target ID of the data drive(s) connected to device adapter port.

LUN: Shows the LU number of each data drive connected to device adapter port. This item shows LDEV# of the partner who becomes a pair in or among the RAID storage systems.

sync, syncd

The **sync** (synchronization) subcommand sends unwritten data remaining on the Windows server to the specified device(s) to synchronize the pair(s) before the CCI command is executed. The **syncd** (synchronization delay) subcommand waits for the delayed IO for dismount after issued '**sync**'.

Syntax

```
-x sync[d] A: B: C:  ...
-x sync[d] all
-x sync[d] drive#(0-N)
-x sync[d] Volume#(0-N) ...
-x sync[d] D:\Directory or \Directory pattern...
```

Arguments

Argument	Description

A: B: C: [\directory or \Directory pattern]	Specifies the logical drive that you want to synchronize. Data is flushed into the specified logical drive and the physical drive corresponding to the logical drive. If the specified logical drive has the directory mount volumes then SYNC is executed to all of the volumes on the logical drive as shown below:
	`pairsplit -x sync D:`
	`[SYNC] D: HarddiskVolume2`
	`[SYNC] D:\hd1 HarddiskVolume8`
	`[SYNC] D:\hd2 HarddiskVolume9`
	[\directory or \Directory pattern] is used to find the directory mount point on the logical drive. If the directory is specified, then SYNC does execute to a directory mounted volume only.
	`pairsplit -x sync  D:\hd1`
	`[SYNC] D:\hd1 HarddiskVolume8`
	If the directory pattern is specified, then SYNC does execute to any directory mounted volumes identified to '\directory pattern'.
	`pairsplit  -x  sync  D:\h`
	`[SYNC] D:\hd1 HarddiskVolume8`
	`[SYNC] D:\hd2 HarddiskVolume9`

all	Synchronizes all logical drives and the physical drives corresponding to the logical drives assuming that they are on the data drives. The logical drive on which the CCI software is installed and the logical drive containing the Windows directory are excluded. If the logical drive has

Argument	Description

	the directory mount volumes then SYNC is executed to all volumes on the logical drive as shown below:
	`pairsplit -x sync all`
	`[SYNC] C: HarddiskVolume1`
	`[SYNC] D:\hd1 HarddiskVolume8`
	`[SYNC] D:\hd2 HarddiskVolume9`
	`[SYNC] G: HarddiskVolume10`

drive#(0-N)	Specifies the physical drives to be flushed.
Volume#(0-N)	Specifies the LDM volumes to be flushed. Volume# must be specified '*\Vol#, \Dms#, \Dmt#, \Dmr#* or Volume{...}' as LDM volume for Windows systems. To flush HarddiskVolumeX: `-x sync \VolX` For information on '*\Vol#*, *\Dms#, \Dmt#, \Dmr#* or Volume{...}' for LDM volumes, see *Volume Discovery Function* in the *User and Reference Guide*.

Examples

The following examples show the **sync** subcommand used as an option of the **pairsplit** command.

sync subcommand with pairsplit

For the following example, the data remaining on logical drives C: and D: is written to disk, all pairs in the specified group are split (status = PSUS), and read/write access is enabled for all S-VOLs in the specified group.

```
pairsplit -x sync C: D: -g oradb -rw
```

sync subcommand with pairsplit -S

For the following example, the data remaining on physical devices harddisk2 and harddisk3 is written to disk, all pairs in the specified group are deleted (status = SMPL), which enables read/write access for all secondary volumes.

```
pairsplit -x sync hdisk2 hdisk3 -g oradb -S
```

Note: The sync subcommand has the following behavior on any conditions:

If the logical drives designated as the objects of the sync command are not opened to any applications, then sync flushes the system buffer to a drive and makes the dismount state for this drive.

If the logical drives designated as the objects of the sync command are already opened to any applications, then sync only flushes the system buffer to a drive.

This flushes the system buffer before pairsplit without unmounting the P-VOL (opening state), and indicates as [WARNING] below:

```
pairsplit -x sync C:
WARNING: Only flushed to [\\.\C:] drive due to be opening
[SYNC] C: HarddiskVolume3
```

Note: Syncd has the following behavior as well:

- If the logical drives designated as the objects of the **sync** command are not opened to any applications, then **syncd** flushes the system buffer to a drive and waits (30 sec) the delayed (paging) IO for dismount after made the dismount state about the drive. If the logical drives are opened to applications, the syncd waits (30 sec) after the flush of system buffer.

  This avoids a problem that NTFS on P-VOL is split on inconsistent state because Windows 2003 delays the IO for dismounting.

Note: If sync has failed, you need to confirm the following conditions:

- The logical and physical drives designated as the objects of the sync command are not opened to any applications. For example, confirm that Explore is not pointed on the target drive. If Explore is pointed on the target drive, the target drive is opening.
- The sync command does not ignore the detected error on the NT file system, so sync executes successfully in normal case (NO ERROR case) only on NT file system. For example, confirm the target drive has no failure on the system for Event Viewer. In this case, you must reboot the system or delete the partition and reconfigure the target drive.

mount

The **mount** subcommand mounts the specified drive to the specified partition on the specified data drive using the drive letter. When the **mount** subcommand is executed without an argument, all currently mounted drives (including directory mounted volumes) are displayed, and logical drive has been mounting an LDM volume then displays Harddisk#[n] configured an LDM volume.

Syntax

```
-x mount
-x mount drive: Volume#(0-N)
-x mount drive: [\directory] Volume#(0-N)
```

Arguments

Argument	Description
drive: hdisk# [partition #]	Specifies the logical drive, data drive (number), and partition to be mounted.
drive: [\directory] Volume#	Specifies the logical drive and LDM volume name and number to be mounted. Volume# must be specified '\Vol# or \Dms# or \Dmt# or \Dmr# ' as LDM volume for Windows. To mount HarddiskVolumeX: -x mount C: hdX or -x mount C: \VolX For information on '*Vol#* or *Dms#* or *Dmt#* or *Dmr#*' for LDM volumes, see *Volume Discovery Function* in the *User and Reference Guide*. [\directory]: Specifies the directory mount point on the logical drive. pairsplit -x mount D:\hd1 \Vol8 D:\hd1 <+> HarddiskVolume8 pairsplit -x mount D:\hd2 \Vol9 D:\hd2 <+> HarddiskVolume9

Caution: The partition on the specified data drive must be recognized on the Windows system.
[\directory] for the mount must be specified a mount point without embedded space character.
If *[\directory]* is detected as mount point with embedded space (that is, *aaa bbb*), then the directory is shown by adding '*…*' to first strings as below.
pairsplit -x mount
Drive FS_name VOL_name Device Partition ... Port PathID Targ Lun
D: NTFS Null Harddiskvolume3 ... Harddisk2
D:*aaa…* NTFS Null Harddiskvolume4 ... Harddisk3
The same method is used for 'inqraid $LETALL' and 'raidscan -pi $LETALL -find' command.

Example

The following example shows the **mount** subcommand used as an option of the **pairsplit** command and its outputs.

This example executes the mount command from a sub-command option of pairsplit. It mounts the "F:"drive to the harddiskvolume2, and then displays mounted devices.

```
pairsplit -x mount  F: hdisk2
pairsplit  -x mount
Drive  FS_name VOL_name Device Partition ... Port PathID Targ Lun
C      NTFS    Null     Harddiskvolume1  ...   Harddisk0
F:     NTFS    Null     Harddiskvolume2  ...   Harddisk1
D:     NTFS    Null     Harddiskvolume3  ...   Harddisk2
D:\hd1 NTFS    Null     Harddiskvolume4  ...   Harddisk3
D:\hd2 NTFS    Null     Harddiskvolume5  ...   Harddisk4
G:     NTFS    Null     HarddiskDmVolumes\…\Volume1...Harddisk5[3]
```

This example executes mount from command option of the **pairsplit** command and then displays the mounted devices:

Output of the **mount** subcommand:

Drive: Shows the logical drive recognized by the Windows system

FS_name: Shows the name of the file system formatted on the logical drive

VOL_name: Shows the volume label name for the logical drive

Device, Partition: Shows the device name and partition for the mounted logical drive

Port,PathID,Targ,Lun: Shows the port number, path group ID (bus), target ID, and LUN for the device adaptor of the mounted logical drive.

umount, umountd

The **umount** subcommand unmounts the specified logical drive and deletes the drive letter. Before deleting the drive letter, this subcommand executes sync internally for the specified logical drive and flushes unwritten data. The **umountd** subcommand unmounts the logical drive after waiting the delayed IO for dismount.

Syntax

```
-x umount[d] drive:[\directory] [time]
```

Argument

Argument	Description
drive	Specifies the mounted logical drive.
[\directory] [time]	Specifies the directory mount point on the logical drive. This command option calls 'mountvol /P' internally, if 'USE_MOUNTVOL_P' environment variable is specified. In case of Windows 2008/2012, it is required to specify 'USE_MOUNTVOL_P' variable to avoid a problem of mount. pairsplit -x umount D:\hd1 D:\hd1 <-> HarddiskVolume8 set USE_MOUNTVOL_P=1 pairsplit -x umount D:\hd2 D:\hd2 <-> HarddiskVolume9 Example for waiting 45 sec: pairsplit -x umount D: 45 D: <-> HarddiskVolume8



Caution: Umountd has above restriction and it will prompt the delayed IO for dismount. Wait 30 seconds until the completion and release the mount point after making dismount status of the logical drive. This avoids a problem (Windows 2003 only) that the delayed writing for dismount as Event ID51, 57.

Example

The following example shows the **umount** subcommand used as an option of the **pairsplit** command.

```
pairsplit -x umount F:  -x umount G: -g oradb -rw
pairsplit -x mount

Drive FS_name VOL_name Device    Partition... Port PathID Targ Lun
C:    FAT     Null     Harddisk0 Partition1...   1     0     0   0
Z:    Unknown Unknown  CdRom0              ...  Unknown
```

This example unmounts the F: and G: drives, splits all pairs in the specified group (status = PSUS), enables read/write access to all secondary volumes in the specified group, and then displays all mounted drives.

Output of the **umount** subcommand:

Drive: Shows the logical drive recognized by the Windows system

FS_name: Shows the name of the file system formatted on the logical drive

VOL_name: Shows the volume label name for the logical drive

Device, Partition: Shows the device name and partition for the mounted logical drive

Port,Phid,Targ,Lun: Shows the port number, path group ID (bus), target ID, and LUN for the device adaptor of mounted logical drive.

Note: The **umount** command flushes (sync) the system buffer of the associated drive before deleting the drive letter. If umount fails, confirm the following conditions:

The logical and physical drives designated as the objects of the **umount** command are not opened to any applications. For example, confirm that Explore is not pointed on the target drive. If it is, then the target drive is opening.

Umount command does not ignore the detected error on the NT file system, so that umount is successful in a normal case (NO ERROR case) only on NT file system. For example, confirm the target drive has no failure on the system for Event Viewer. If so, you must reboot the system or delete the partition and reconfigure the target drive.

Note: The **umountd** command has the following behavior as well.

Unmount the logical drive after waiting (30 sec) the delayed (paging) IO for dismount after flushed the system buffer to a drive.

This avoids a problem (Windows 2003 only) that NTFS on P-VOL is split on inconsistent state because Windows 2003 (SP1) delays the IO for dismounting. This also avoids a problem that the delayed (paging) IO for dismounting is written on SVOL_PAIR(Writing Disable) state by rescan, and logged as Windows event (that is, ID51,57).

These problems do not occur on Windows 2008 systems.

Environment variable subcommands

If no environment variables are set in the execution environment, the following environment variable subcommands set or cancel an environment variable within the CCI command.

setenv: The **setenv** subcommand sets the specified environment variable(s).

usetenv: The **usetenv** subcommand deletes the specified environment variable(s).

env: The **env** subcommand displays the environment variable(s).

sleep: The **sleep** subcommand causes CCI to wait for the specified time.

Syntax

```
-x setenv vaname value
-x usetenv vaname
-x env
-x sleep time
```

Arguments

Argument	Description
Vaname	Specifies the environment variable to be set or canceled.
Value	Specifies the value or character string of the environment variable to be set.
Time	Specifies the sleep time in seconds.



Caution: The environment variables must be set before connecting to HORCM. And it must be specified during interactive mode (-z[x] option). If specified with other than interactive mode, all specified environment variables are not enable. Changing an environment variable after a CCI command execution error is invalid.

Example

The following examples show the **setenv** and **usetenv** subcommands used as an option of the **raidscan** command. This example changes from 'HORC' to 'HOMRCF' an execution environment of the **raidscan** command that makes a dialog mode, because of establishing 'HORCC_MRCF' as an environment variable.

```
raidscan[HORC]:  -x setenv  HORCC_MRCF 1
raidscan[HOMRCF]:

raidscan[HOMRCF]:  -x usetenv  HORCC_MRCF
raidscan[HORC]:
```

4

Command tools

This chapter provides the specifications for the CCI command tools.

- inqraid
- mkconf
- rmawk

inqraid

The *inqraid* command is a CCI command tool used to confirm the drive connection between the storage system and host system. The *inqraid* command displays the relation between special file(s) on the host system and actual physical drive of the RAID storage system.

Syntax

```
/HORCM/usr/bin/inqraid [-h | quit | -inqdump
| -fx[p][l][g][c][h][n] | -find[c] | <special file>
| -CLI[W][P][N][B] | -sort [-CM ] | -pin | -export]

/HORCM/etc/inqraid [-h | quit | -inqdump | -fx[p][l][g][c][h][n]
| -find[c] | <special file> |-CLI[W][P][N][B] | -sort [-CM ]
| -gvinf | -svinf | -gplba | -fv| -pin| -export]
```

Options and parameters

Option	Description
-h	Displays Help/Usage.
quit	Terminates from waiting STDIN and exits this command.
-inqdump	Displays information for standard inquiry with Dump Image of hexadecimal.
-fx	Displays the LDEV number (hexadecimal).

-find[c]	Finds the appropriate group within the configuration file using a special file provided by STDIN.
	-find: Searches a group on the configuration definition file (local instance) from <special file> of STDIN by using pairdisplay command, and uses the following options of the pairdisplay command to display its state. This option must be specified HORCMINST as command execution environment.
	For ShadowImage/Copy-on-Write Snapshot:
	`pairdisplay -d <Seq#> <LDEV#> 0 1 2 -l [-fx] [-CLI] 2>/dev/null`
	For TrueCopy/Universal Replicator/global-active device:
	`pairdisplay -d <Seq#> <LDEV#> -l [-fx] [-CLI] 2>/dev/null`
	Note: <Seq#> and <LDEV#> are included using SCSI Inquiry command. For VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number.
	<*special file*>: This option is used to specify the special file name as argument of command. If no argument, this command makes mode that waits for STDIN. The input from the special file has to be waited.
	-findc: Uses the following options of the pairdisplay command, and displays with CLI format by editing an output of pairdisplay command. This option must be specified HORCMINST as command execution environment.
	For ShadowImage/Copy-on-Write Snapshot:
	`pairdisplay -d <Seq#> <LDEV#> <MU#> -fd -CLI 2>/dev/null`
	For TrueCopy/Universal Replicator/global-active device:
	`pairdisplay -d <Seq#> <LDEV#> -fd -CLI 2>/dev/null`

Option	Description
	Note: When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345. <special file>: Specifies a special file name as the argument of a command. If no argument, this command makes mode that waits for STDIN. The input from the special file has to be waited.
-CLI	Specifies the display of structured column output for command line interface (CLI) parsing. Also used for '-find' option. The delimiters between columns can be spaces and/or dashes (-).
-CLIWP, -CLIWN	Displays the WWN (world wide name for host adapter) with command line interface (CLI) format, also used for '-find' option.
-sort[CM]	Sorts the target devices by Serial#,LDEV# order. The serial number (Serial#) for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345). [CM] Searches command device from the specified special file (STDIN or argument) and displays the command device only in structure definition file image. This option is valid within '-sort' option.
-gvinf -gvinfex	Windows systems only. The -gvinfex option is for GPT disk only. Gets the signature and volume layout information of a raw device file provided via STDIN or arguments, and saves this information to the system disk with the following format: \WindowsDirectory\VOLssss_llll.ini where ssss = serial#, llll = LDEV# The serial number (ssss) for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345). Normally this option is used by the Windows Disk Management after setting the signature and volume layout information for S-VOL. You do not need to be aware of this file.
-svinf[=PTN] -svinfex[=PTN]	Windows systems only. The -svinfex[=PTN] option is for GPT disk only. Reconfigure the signature and volume layout information that was saved to the system disk to a device provided by STDIN or arguments. Gets the serial# and LDEV# for the target device issuing SCSI Inquiry, and sets the signature and volume layout information into VOLssss_llll.ini file to the readout device. This option will set correctly because the signature and volume layout information is managed by the serial# and LDEV# without depend on Harddisk#, even if Harddisk# is changed by the configuration changes. The serial number (ssss) for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345). [=PTN]: Specifies a strings pattern to interpret the strings provided by STDIN or argument as a raw device. \Device\HarddiskVolume#(number) is made in a sequential order executed -svinf to Harddisk, and its number will remain the same as long as the system configuration is not changed. If you want to make \Device\HarddiskVolume#(number) more absolutely, then make \Device\HarddiskVolume# in serial# and LDEV# order by using the '-sort' option as shown below: [VOL61459_451_5296A763] -> Harddisk3 [OPEN-3] [VOL61459_452_5296A760] -> Harddisk4 [OPEN-3]

Option	Description
	[VOL61459_453_5296A761] -> Harddisk5 [OPEN-3]

-gplba
-gplbaex
	Windows systems only. The -gplbaex option is for GPT disk only.
	Displays usable LBA on a physical drive in units of 512 bytes, and specifies [slba] [elba] options for raidvchkset command.
	Example:
	`C:\HORCM\etc>inqraid $Phys -CLI -gplba -sort`
	`Harddisk11 : SLBA = 0x00003f00 ELBA = 0x000620d9 PCNT = 7 [OPEN-3-CVS ]`
	`Harddisk12 : SLBA = 0x00003f00 ELBA = 0x00042ad1 PCNT = 4 [OPEN-3-CVS ]`
	`Harddisk13 : SLBA = 0x0000003f ELBA = 0x000620d9 PCNT = 1 [OPEN-3-CVS ]`
	SLBA: Displays usable starting LBA in units of 512 bytes.
	ELBA: Displays usable ending LBA (ELBA -1) in units of 512 bytes.
	PCNT: Displays the number of partitions.
	Example for setting of Harddisk11: `C:\HORCM\etc>raidvchkset -d hd11 -vs 16 0x00003f00 0x000620d9`

-fv	Windows systems only.
	Displays the Volume{GUID} via $Volume with wide format. The serial number (SERIAL) for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345).
	Example:
	`C:\HORCM\etc>inqraid -CLI $Vol -fv`
	`DEVICE_FILE PORT SERIAL LDEV CTG H/M/12 SSID R:Group PRODUCT_ID Volume{cec25efe-d3b8-11d4-aead-00c00d003b1e}`
	`\Vol3\Dsk0 CL2-D 62496 256 - - - - OPEN-3-CVS-CM`

-fp or -fl or
-pin
	If the target device file is set as a protection volume or PIN track volume is occurred by dual failure of the RAID, the device file name is shown by appending '*'. It is valid when specified with "-CLI" option. If the *-fp* option is specified, the data protection volume is a Database Validator volume. If the *-fl* option is specified, the data protection volume is a Data Retention Utility volume. If the *-pin* option is specified, shows that the volume is PIN track volume because of double drive failure and/or especially external connection disk failure. For VSP G1000, G1500, and VSP F1500, the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).
	`# ls /dev/rdsk/c57t4* | ./inqraid -CLI -fp`
	`DEVICE_FILE PORT SERIAL LDEV CTG H/M/12 SSID R:Group PRODUCT_ID`
	`c57t4d0* CL1-D 62496 32 - s/P/ss 0004 5:01-03 OPEN-3`
	`c57t4d3* CL1-D 62496 35 - s/P/ss 0004 5:01-03 OPEN-3`
	`c57t4d4 CL1-D 62496 36 - s/P/ss 0004 5:01-01 OPEN-3`
	`c57t4d5 CL1-D 62496 37 - s/P/ss 0004 5:01-02 OPEN-3`
	This example shows that c57t4d0 and c57t4d3 (marked by *) are set to enable Database Validator checking (-fp option). The *raidvchkset* command is used to enable/disable volume protection.

-fg	Shows a LUN on the host view by finding a host group.
-CLIB -sort [-fh | -fc]	Displays the number of the tables of the differential bitmap which are required on the shared memory. This option is used to find the number of pairs that can be created to a paired volume in the storage system. Specify this option with the -sort option to sort the specified special

Option	Description
	files (the standard input or the argument) in order of the following priority, Serial#, and then LDEV#. • When you specify -fh option: the number of tables of the differential bitmap for TrueCopy/Universal Replicator/global-active device is displayed. • When you specify -fc option: the number of tables of the differential bitmap in a cylinder size for TrueCopy/Universal Replicator/global-active device is displayed. • When you omit the -fh option and -fc option: the number of tables of the differential bitmap for ShadowImage is displayed.

	Example to display the number of tables of the differential bitmap for ShadowImage:
	`# ls /dev/rdsk/* | inqraid -CLIB -sort`
	`DEVICE_FILE PORT  SERIAL LDEV  SL CL +SI/SI UNUSED PRODUCT_ID`
	`c1t0d0      CL1-E 63516  0       0  0    -    -      OPEN-9-CM`
	`c1t0d1      CL1-E 63516  12288   0  0    1    30718  OPEN-3`
	`c1t0d2      CL1-E 63516  12403   0  0    4    30718  OPEN-9`
	`c1t0d3      CL1-E 63516  12405   0  0    9    30718  OPEN-E`
	`c1t0d4      CL1-E 63516  12800   0  0   12    30718  OPEN-8`
	`c1t0d5      CL1-E 63516  12801   0  0   18    30718  OPEN-8*2`
	`c1t0d6      CL1-E 63516  13057   0  0   31    30718  OPEN-L`
	`c2t0d6      CL2-E 63516  13057   0  0   31    30718  OPEN-L`
	Example to display the number of tables of the differential bitmap for TrueCopy:
	`# ls /dev/rdsk/* | inqraid -CLIB -sort -fh`
	`DEVICE_FILE PORT  SERIAL LDEV  SL CL +TC/UR UNUSED PRODUCT_ID`
	`c1t0d0      CL1-E 63516  0       0  0    -    -      OPEN-9-CM`
	`c1t0d1      CL1-E 63516  12288   0  0    1    11605  OPEN-3`
	`c1t0d2      CL1-E 63516  12403   0  0    3    11605  OPEN-9`
	`c1t0d3      CL1-E 63516  12405   0  0   10    11605  OPEN-E`
	`c1t0d4      CL1-E 63516  12800   0  0   11    11605  OPEN-8`
	`c1t0d5      CL1-E 63516  12801   0  0   13    11605  OPEN-8*2`
	`c1t0d6      CL1-E 63516  13057   0  0   21    11605  OPEN-L`
	`c2t0d6      CL2-E 63516  13057   0  0   21    11605  OPEN-L`
	SERIAL: Serial number. The serial number (SERIAL) for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345).
	SL: The SLPR number of LDEV.
	CL: The CLPR ID of LDEV.
	+SI/SI: Shows the accumulated total number of tables of the differential bitmap for ShadowImage. The increased number shows necessary tables of the differential bitmap for *one* ShadowImage *pair*.
	Note:
	The number of tables of the differential bitmap for the following LDEV are excepted from the accumulated total.
	∘ LDEVs whose Serial# and LDEV# are same (they are calculated as one LDEV if the multiple ports share the LDEV).
	∘ An LDEV which does not manage differential bitmap on a shared memory.
	∘ An LDEV which is used as a command device.
	+TC/UR: Shows the accumulated total number of tables of the differential bitmap for TrueCopy/Universal Replicator/global-active device. The increased number shows necessary tables of the differential bitmap for TrueCopy/Universal Replicator/global-active

Option	Description
	device. The '-fc' option displays the number of tables of differential bitmap in a cylinder size. *Note:* The number of tables of the differential bitmap for the following LDEV are excepted from the accumulated total. • LDEVs whose Serial# and LDEV# are same (they are calculated as one LDEV if the multiple ports share the LDEV). • An LDEV which does not manage differential bitmap on a shared memory. • An LDEV which is used as a command device. UNUSED: Shows the number of tables of unused differential bitmap for ShadowImage/TrueCopy/Universal Replicator/global-active device.

-CLI -fn	Displays the LDEV nickname in the PRODUCT ID. If the storage system does not support LDEV nickname, '-' is displayed. The serial number (SERIAL) for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345).
	Example:
	`# ls /dev/rdsk/c57t4* | ./inqraid -CLI -fn`
	`DEVICE_FILE PORT  SERIAL LDEV CTG C/B/12 SSID R:Group LDEV_NIC_NAME`
	`c57t4d0  CL1-D 62496  32  -  s/P/ss 0004 5:01-03 my_volume_1`
	`c57t4d3  CL1-D 62496  35  -  s/P/ss 0004 5:01-03 my_volume_2`
	`c57t4d4  CL1-D 62496  36  -  s/P/ss 0004 5:01-01 -`
	`c57t4d5  CL1-D 62496  37  -  s/P/ss 0004 5:01-02 -`

-CLI -export	This option outputs as export format after obtaining the storage system device information from the specified special file (STDIN or argument). The device information includes 'Keyword, Serial#, Ldev#, Device file name, ...'. The serial number (SERIAL) for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345). This export formatted file can import as STDIN of the raidscan -find verify or the raidscan -find inst. If the application server and CCI server are operated on different hosts, volume discovery can be operated with using this option among the hosts.
	Example:
	`# ls /dev/rdsk/c1t* | inqraid -CLI -export`
	`INQRAID:@CL4-G@64015@0@124@OPEN-V-CM@/dev/rdsk/c1t0d0s2`
	`INQRAID:@CL4-G@64015@1@124@OPEN-V-CM@/dev/rdsk/c1t0d1s2`
	`INQRAID:@CL4-G@64015@2@95@OPEN-V@/dev/rdsk/c1t0d2s2`
	`INQRAID:@CL4-G@64015@3@95@OPEN-V@/dev/rdsk/c1t0d3s2`
	`INQRAID:@CL4-G@64015@4@95@OPEN-V@/dev/rdsk/c1t0d4s2`
	`INQRAID:@CL4-G@64015@5@95@OPEN-V@/dev/rdsk/c1t0d5s2`
	`INQRAID:@CL4-G@64015@7@95@OPEN-V@/dev/rdsk/c1t0d7s2`

Restrictions on device naming	STDIN or special files are specified as follows: • HP-UX: /dev/rdsk/* or /dev/rdisk/disk* • Solaris: /dev/rdsk/*s2 or c*s2 • Linux: /dev/sd... or /dev/rd... ,/dev/raw/raw*. • zLinux: /dev/sd... or /dev/dasd… or /dev/rd... ,/dev/raw/raw*. • AIX: /dev/rhdisk* or /dev/hdisk* or hdisk*

Option	Description
	• DIGITAL or Tru64: /dev/rrz*c or /dev/rdisk/dsk*c or /dev/cport/scp* • DYNIX: /dev/rdsk/sd* or sd* for only unpartitioned raw device • IRIX64: /dev/rdsk/*vol or /dev/rdsk/node_wwn/*vol/* or /dev/dsk/*vol or /dev/dsk/node_wwn/*vol/* • OpenVMS: 1* or DK* or DG* or GK* • WindowsNT: hdX-Y, $LETALL, $Phys, D:\DskX\pY, \DskX\pY • Windows: hdX-Y,$LETALL,$Volume,$Phys, D:\Vol(Dms,Dmt,Dmr)X\DskY, \Vol(Dms,Dmt,Dmr)X\DskY. For information about LDM volumes for Windows systems, see *Remote Volume Discovery* in the *Command Control Interface User and Reference Guide*. Lines starting with '#' via STDIN are interpreted as comments.

Examples

Example 1: using inqraid and system command to display the connection between STDIN special file and actual physical drive of storage system

HP-UX system:

```
# ioscan -fun | grep rdsk | ./inqraid
/dev/rdsk/c0t2d1 -> [HP] CL2-D Ser = 30053 LDEV = 9 [HP  ]
          [ OPEN-3  ] HORC = P-VOL  HOMRCF[MU#0 = SMPL MU#1 = SMPL
         MU#2 = SMPL] RAID5[Group  2- 1] SSID = 0x0008 CTGID = 3
/dev/rdsk/c0t4d0 -> [HP] CL2-D Ser = 30053 LDEV = 14 [HP ]
         [OPEN-3-CM     ] RAID5[Group  2- 1] SSID = 0x0008
```

Linux and zLinux system:

```
# ls /dev/sd* | ./inqraid
/dev/sdh -> CHNO =   0 TID =   1 LUN =   7
            [HP] CL2-B Ser =   30053 LDEV =  23 [HP     ]
            [OPEN-3    ] HORC = P-VOL  HOMRCF[MU#0 = SMPL
            MU#1 = SMPL MU#2 = SMPL] RAID5[Group  1- 2]
            SSID = 0x0004 CTGID = 2
/dev/sdi -> CHNO =   0 TID =   4 LUN =   0
            [HP] CL2-B Ser =   30053 LDEV =  14 [HP     ]
            [OPEN-3-CM     ] RAID5[Group  1- 2] SSID = 0x0004
```

Solaris system:

```
# ls /dev/rdsk/* | ./inqraid
/dev/rdsk/c0t2d1 -> [HP] CL2-D Ser =   30053 LDEV =   9 [HP      ]
            [OPEN-3    ] CA = P-VOL  BC[MU#0 = SMPL MU#1 = SMPL
            MU#2 = SMPL] RAID5[Group  2- 1] SSID = 0x0008
            CTGID = 3
/dev/rdsk/c0t4d0 -> [HP] CL2-D Ser =   30053 LDEV =  14 [HP      ]
            [OPEN-3-CM    ] RAID5[Group  2- 1] SSID = 0x0008
```

AIX system:

```
# lsdev -C -c disk | grep hdisk | ./inqraid
hdisk1 -> [SQ] CL2-D Ser =  30053 LDEV =  9 [HITACHI ] [OPEN-3  ]
```

```
          HORC = P-VOL  HOMRCF[MU#0 = SMPL MU#1 = SMPL
          MU#2 = SMPL] RAID5[Group  2- 1] SSID = 0x0008 CTGID = 3
hdisk2 -> [SQ] CL2-D Ser = 30053 LDEV = 14 [HITACHI ] [OPEN-3-CM ]
          RAID5[Group  2- 1] SSID = 0x0008
```

Windows system:

```
C:\HORCM\etc> echo hd1-2 | inqraid ( or inqraid hd1-2 )
Harddisk 1 -> [SQ] CL2-D Ser = 30053 LDEV = 9 [HITACHI ] [OPEN-3 ]
              HORC = P-VOL  HOMRCF[MU#0 = SMPL MU#1 = SMPL
              MU#2 = SMPL] RAID5[Group  2- 1] SSID = 0x0008
              CTGID = 3
Harddisk 2 -> [SQ] CL2-D Ser = 30053
              LDEV = 14 [HITACHI ] [OPEN-3-CM ] RAID5[Group  2- 1]
              SSID = 0x0008
```

Tru64 UNIX system:

```
# ls /dev/rdisk/dsk* | ./inqraid
/dev/rdisk/dsk10c -> [SQ] CL2-D Ser = 30053 LDEV = 9 [HITACHI ]
                     [OPEN-3 ] HORC = P-VOL  HOMRCF[MU#0 = SMPL
                     MU#1 = SMPL MU#2 = SMPL] RAID5[Group  2- 1]
                     SSID = 0x0008 CTGID = 3
/dev/rdisk/dsk11c -> [SQ] CL2-D Ser = 30053 LDEV = 14 [HITACHI ]
                     [OPEN-3-CM  ] RAID5[Group 2- 1] SSID = 0x0008
```

IRIX system with FC_AL:

```
# ls /dev/rdsk/*vol | ./inqraid
/dev/rdsk/dks1d6vol -> [SQ] CL2-D Ser = 30053 LDEV = 9 [HITACHI ]
                       [OPEN-3 ] HORC = P-VOL
                       HOMRCF[MU#0 = SMPL MU#1 = SMPL MU#2 = SMPL]
                       RAID5[Group  2- 1] SSID = 0x0008 CTGID = 3
/dev/rdsk/dks1d7vol -> [SQ] CL2-D Ser = 30053 LDEV = 14 [HITACHI ]
                       [OPEN-3-CM  ]
                       RAID5[Group  2- 1] SSID = 0x0008
```

IRIX system with fabric:

```
# ls /dev/rdsk/*/*vol/* | ./inqraid
/dev/rdsk/50060e8000100262/lun3vol/c8p0 -> [SQ] CL2-D Ser = 30053
                  LDEV = 9 [HITACHI] [OPEN-3 ] HORC = P-VOL
                  HOMRCF[MU#0 = SMPL MU#1 = SMPL MU#2 = SMPL]
                  RAID5[Group  2- 1] SSID = 0x0008 CTGID = 3
/dev/rdsk/50060e8000100262/lun4vol/c8p0 -> [SQ] CL2-D Ser = 30053
                  LDEV = 14 [HITACHI] [OPEN-3-CM]
                  RAID5[Group  2- 1] SSID = 0x0008
```

OpenVMS system:

```
$ inqraid dka145-146
DKA145 -> [ST] CL2-D Ser = 30053 LDEV = 9 [HITACHI ] [OPEN-3 ]
          HORC = P-VOL  HOMRCF[MU#0 = SMPL MU#1 = SMPL
          MU#2 = SMPL] RAID5[Group  2- 1] SSID = 0x0008 CTGID = 3
DKA146 -> [ST] CL2-D Ser = 30053 LDEV = 14 [HITACHI ] [OPEN-3-CM ]
          RAID5[Group  2- 1] SSID = 0x0008
```

The following items are output for the *inqraid* command tool:

CL X - Y: Displays the port number on the RAID storage system.

Ser: Displays the production (serial#) number on the RAID storage system. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

LDEV: Displays the LDEV# in the RAID storage system.

HORC: Displays the attribute ('P-VOL/S-VOL/SMPL') of a volume in the RAID storage system.

HOMRCF: Displays the attribute ('P-VOL/S-VOL/SMPL') of a volume as MU#0-2 of ShadowImage or Copy-on-Write Snapshot in the RAID storage system.

Group: Displays the relation of the physical volume mapped to LDEV.

LDEV Mapping	Display Formats
RAID Group	RAID1[Group Group number - Sub number] RAID5[Group Group number - Sub number] RAID6[Group Group number - Sub number]
Copy-on-Write Snapshot S-VOL	SNAPS[PoolID poolID number]
Unmapped	UNMAP[Group 00000]
External LUN	E-LUN[Group External Group number]
Dynamic Provisioning volume	A-LUN[PoolID poolID number]

SSID: Displays the storage subsystem ID (hexadecimal) of the LDEV in the RAID storage system. The Unified Storage VM does not support SSID but displays the specified value.

CTGID: Displays the consistency group ID of TrueCopy Async and Universal Replicator when the LDEV has been defined as the P-VOL or S-VOL of the TrueCopy Async or Universal Replicator.

CHNO: Displays the channel number on the device adapter that recognizes on the Linux host. Displayed only for Linux systems.

TID: Displays target ID of the data drive that connects on the device adapter port. Displayed only for Linux systems.

LUN: Displays logical unit number of the data drive that connects on the device adapter port. Displayed only for Linux systems.

Note: The display of group, SSID, and CTG ID depends on the storage system microcode level. The *CHNO*, *TID*, and *LUN* items are displayed only for Linux systems.

Example 2: inqraid with -find option (Linux shown)

```
ls /dev/sd* | inqraid -find
/dev/sdb -> No such on the group
Group  PairVol (L/R) (Port#,TID,LU),Seq#,LDEV#.P/S, Status,Fence,
Seq#,P-LDEV# M
oradb  oradev2 (L)   (CL2-N , 3, 2) 8071   22..SMPL ----- ------,
-----  ----  -
->/dev/sdc
```

Example 3: inqraid with -find option (HP-UX shown)

```
# echo /dev/rdsk/c23t0d0 /dev/rdsk/c23t2d3 | ./inqraid -find
Group   PairVol(L/R) (Port#,TID,LU-M),Seq#,LDEV#.P/S,Status,
Seq#,P-LDEV# M
horc1   dev00(L)      (CL2-J, 0, 0-0) 61456  192..S-VOL SSUS,
-----   193  -
->/dev/rdsk/c23t0d0
Group   PairVol(L/R) (Port#,TID,LU-M),Seq#,LDEV#.P/S,Status,
Seq#,P-LDEV# M
horc1   dev10(L)     (CL2-J , 2,  3-0) 61456 209..S-VOL SSUS,
-----   206  -
->/dev/rdsk/c23t2d3
```

Example 4: inqraid with -findc option (HP-UX shown)

```
# echo /dev/rdsk/c23t0d0 /dev/rdsk/c23t2d3 | ./inqraid -findc
DEVICE_FILE M Group PairVol P/S   Stat R_DEVICE M P/S  Stat LK
c23t0d0     0 horc1   dev00 S-VOL SSUS  c23t0d1 0 P-VOL PSUS OK
/dev/rdsk/c23t0d0[1] -> No such on the group
/dev/rdsk/c23t0d0[2] -> No such on the group
DEVICE_FILE M Group  PairVol P/S  Stat  R_DEVICE M P/S   Stat LK
c23t2d3     0 horc1    dev10 S-VOL SSUS  c23t2d2 0 P-VOL PSUS OK
/dev/rdsk/c23t2d3[1] -> No such on the group
/dev/rdsk/c23t2d3[2] -> No such on the group

# echo /dev/rdsk/c23t0d0 /dev/rdsk/c23t2d3 | ./inqraid -findc -CLI
DEVICE_FILE  M Group PairVol P/S  Stat  R_DEVICE  M P/S  Stat LK
c23t0d0      0 horc1   dev00 S-VOL SSUS  c23t0d1  0 P-VOL PSUS OK
c23t2d3      0 horc1   dev10 S-VOL SSUS  c23t2d2  0 P-VOL PSUS OK
```

DEVICE_FILE: Device file name.

M: MU# of local and remote.

Group: Group name (dev_group) defined in the configuration file.

PairVol: Paired vol. name (dev_name) within the group defined in the configuration file.

P/S: Volume attribute (P-VOL or S-VOL or simplex).

Stat: Status of the paired volume.

R_DEVICE: Device file name of remote site.

LK: Check result of the paired volume connection path.

Example 5: inqraid with -cli option (Linux shown)

```
# ls /dev/sd* | ./inqraid -CLI
DEVICE_FILE PORT  SERIAL LDEV CTG  H/M/12 SSID R:Group PRODUCT_ID
sdh         CL2-B  30053   23   2  S/P/ss 0004 5:02-01 OPEN-3
sdi         CL1-A  64015   14   -  -      0004 E:00002 OPEN-3-CM
sdj             -      -    -   -  -         -       -         -
```

DEVICE_FILE: Displays the device file name only.

PORT: Displays the RAID storage system port number.

SERIAL: Displays the production (serial#) number of the storage system. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

LDEV: Displays the LDEV# within the storage system.

CTG: Displays the consistency group ID of TrueCopy Async and Universal Replicator when the LDEV has been defined as a TrueCopy Async or Universal Replicator P-VOL or S-VOL.

H/M/12: Displays the attribute (P = P-VOL, S = S-VOL, s = SMPL) of a remote copy volume (TC/UR/GAD), local copy volume (SI/HTI/Copy-on-Write Snapshot), or local copy MU#1,2 volume.

- H: Status of MU#0 for remote copy
- M: Status of MU#0 for local copy
- 1: Status of MU#1 for local copy
- 2: Status of MU#2 for local copy

SSID: Displays the storage subsystem ID of an LDEV in the storage system. The Unified Storage VM does not support SSID but displays the specified value.

R:Group: Displays the physical position of an LDEV according to mapping of LDEV in the storage system.

LDEV Mapping	R:	Group
RAID Group	RAID Level 1: RAID1 5: RAID5 6: RAID6	RAID Group number - Sub number
Copy-on-Write Snapshot S-VOL	S	Pool ID number
Unmapped	U	00000
External LUN	E	External group number
Dynamic Provisioning volume	A	Pool ID number

PRODUCT_ID: Displays product-id field in the STD inquiry page.

Note: For a command device, PORT/SERIAL/LDEV/PRODUCT_ID is the SCSI Inquiry information for the external command device, if the command device is mapped as ELUN(*R:* =E).

Example 6: inqraid with -cliwp and -cliwn options (HP-UX shown)

```
# echo /dev/rdsk/c23t0d0 /dev/rdsk/c23t0d1 | ./inqraid -CLIWP
DEVICE_FILE PWWN             AL PORT  LUN  SERIAL LDEV PRODUCT_ID
c23t0d0     500060e802f01018  - CL2-J   -   61456  192     OPEN-3
c23t0d1     500060e802f01018  - CL2-J   -   61456  193     OPEN-3

# echo /dev/rdsk/c0t2d3 | ./inqraid -CLIWN
```

```
DEVICE_FILE  NWWN             AL PORT  LUN  SERIAL LDEV PRODUCT_ID
c0t2d3       5000E000E0005000  - CL1-A   -  30015  2054 OPEN3-CVS
```

DEVICE_FILE: Displays the device file name only.

WWN: CLIWP option displays Port_WWN of the host adapter included in the STD inquiry page. CLIWN option displays Node_WWN of host adapter included in STD inquiry page.

AL: Always displays '-'.

PORT: Displays the RAID storage system port number.

LUN: Always displays '-'.

SERIAL: Displays the production (serial#) number of the storage system. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

LDEV: Displays the LDEV# within the storage system.

PRODUCT_ID: Displays product-id field in the STD inquiry page.

Example 7: inqraid with -sort[cm] option (HP-UX shown)

```
#ioscan -fun | grep rdsk | ./inqraid -sort -CM -CLI
HORCM_CMD
#dev_name               dev_name                dev_name
#UnitID 0 (Serial# 30012)
/dev/rdsk/c0t3d0        /dev/rdsk/c1t2d1
#UnitID 1 (Serial# 30013)
/dev/rdsk/c2t3d0
```

Example 8: inqraid with -gvinf option

```
D:\HORCM\etc>inqraid $Phys -gvinf -CLI
\\.\PhysicalDrive0:
# Harddisk0        -> [VOL61459_448_DA7C0D91] [OPEN-3    ]
\\.\PhysicalDrive1:
# Harddisk1        -> [VOL61459_449_DA7C0D92] [OPEN-3    ]
\\.\PhysicalDrive2:
# Harddisk2        -> [VOL61459_450_DA7C0D93] [OPEN-3    ]
                         -> S/N  LDEV  Signature
```

Example 9: inqraid with -svinf[=PTN] option

```
D:\HORCM\etc>pairdisplay -l -fd -g URA
Group PairVol(L/R) Device_File M ,Seq#,LDEV#.P/S,Status, Seq#,
   P-LDEV# M
URA   URA_000(L)   Harddisk3   0 61459  451..S-VOL SSUS,-----
   448     -
URA   URA_001(L)    Harddisk4  0 61459  452..S-VOL SSUS,-----
   449     -
URA   URA_002(L)    Harddisk5  0 61459  453..S-VOL SSUS,-----
   450     -

D:\HORCM\etc>pairdisplay -l -fd -g URA | inqraid -svinf=Harddisk
[VOL61459_451_5296A763] -> Harddisk3        [OPEN-3       ]
[VOL61459_452_5296A760] -> Harddisk4        [OPEN-3       ]
[VOL61459_453_5296A761] -> Harddisk5        [OPEN-3       ]
```

Caution: If the S-VOL is created with 'Noread' option (ShadowImage only) and the system is rebooted, the system cannot create a Device object (\Device\HarddiskVolume#) and Volume{guid} for S-VOL, but a Device object (\Device\HarddiskVolume#) and Volume{guid} is created by using -svinf option after splits the S-VOL.

mkconf

The *mkconf* command is a CCI command tool used to make a configuration file from a special file (raw device file) provided via STDIN.

Syntax

```
/HORCM/usr/bin/mkconf.sh     (UNIX systems)
\HORCM\Tool\mkconf.exe       (Windows and OpenVMS systems)
mkconf.sh  [ -g[g] <group> [-m <mu#>] [-i <inst#>] [-s <service>]
[-a] ]
mkconf.exe [ -g[g] <group> [-m <mu#>] [-i <inst#>] [-s <service>]
[-a] [-c <drive#>] ]
```

Options and parameters

Option	Description
No argument	No option displays help/usage and version information.
-g <group>	Specifies the 'dev_group' name for a configuration file. If not specified, 'VG' is used as default.
-gg	Shows a LUN on the host view by finding a host group.
-m <mu#>	Specifies the mirror descriptor for ShadowImage and Copy-on-Write Snapshot volumes. TrueCopy volume does not specify the mirror descriptor.
-i <inst#>	Specifies the instance number for HORCM.
-s <service>	Specifies the service name (port name) for a configuration file. If not specified, '52323' is used as default.
-a	Specifies an addition of the group to a configuration file.
-c <drive#>	Windows systems only. Specifies the range of drive numbers that should be examined in order to discover the command devices. If not specified, '$PhysicalDrive' is used as default.
-c <DKA#-#>	OpenVMS systems only. Specifies the range of drive numbers that should be examined to discover the command devices. If not specified, '1DGA0-10000 DKA0-10000 DGA0-10000' is used as default.

Examples

Example 1: mkconf command tool (HP-UX shown)

In this example, the configuration file is created as 'horcm*.conf' in the current directory. The log directory of HORCM is specified as 'log*' in the current directory. You must modify the 'ip_address & service' of an existing configuration file as needed.

```
# cd /tmp/test
# cat /etc/horcmperm.conf | /HORCM/usr/bin/mkconf.sh -g ORA -i 9
-m 0
starting HORCM inst 9
HORCM inst 9 starts successfully.
HORCM Shutdown inst 9 !!!
A CONFIG file was successfully completed.
starting HORCM inst 9
HORCM inst 9 starts successfully.
DEVICE_FILE        Group PairVol  PORT  TARG  LUN M  SERIAL  LDEV
/dev/rdsk/c23t0d0  ORA   ORA_000  CL2-J    0    0 0   61456   192
/dev/rdsk/c23t0d1  ORA   ORA_001  CL2-J    0    1 0   61456   193
/dev/rdsk/c23t0d2  ORA   ORA_002  CL2-J    0    2 0   61456   194
/dev/rdsk/c23t0d3  ORA   ORA_003  CL2-J    0    3 0   61456   195
/dev/rdsk/c23t0d4  ORA   ORA_004  CL2-J    0    4 0   61456   256
/dev/rdsk/c23t0d5  ORA   ORA_005  CL2-J    0    5 0   61456   257
/dev/rdsk/c23t0d6  ORA   ORA_006  CL2-J    0    6 0   61456   258
/dev/rdsk/c23t0d7    -         -      -    -    - 0   61456   259
HORCM Shutdown inst 9 !!!
Please check '/tmp/test/horcm9.conf','/tmp/test/log9/curlog/
horcm_*.log', and modify 'ip_address & service'.

# ls                        <=Verify configuration and log files.
horcm9.conf  log9
# vi *.conf      <=Verify config file, check ip address & service.

# Created by mkconf.sh on Mon Jan 22 17:59:11 JST 2001

HORCM_MON
#ip_address        service         poll(10ms)     timeout(10ms)
127.0.0.1          52323                1000              3000

HORCM_CMD
#dev_name              dev_name               dev_name
#UnitID 0 (Serial# 61456)
/dev/rdsk/c23t3d0
```

Example 2: mkconf command tool (HP-UX shown)

```
HORCM_DEV
#dev_group       dev_name     port#     TargetID     LU#     MU#
# /dev/rdsk/c23t0d0 SER = 61456 LDEV = 192 [FIBRE FCTBL = 4] ORA
ORA_000  CL2-J  0       0       0
# /dev/rdsk/c23t0d1 SER = 61456 LDEV = 193 [FIBRE FCTBL = 4] ORA
ORA_001  CL2-J  0       1       0
# /dev/rdsk/c23t0d2 SER = 61456 LDEV = 194 [FIBRE FCTBL = 4] ORA
ORA_002  CL2-J  0       2       0
# /dev/rdsk/c23t0d3 SER = 61456 LDEV = 195 [FIBRE FCTBL = 4] ORA
ORA_003  CL2-J  0       3       0
# /dev/rdsk/c23t0d4 SER = 61456 LDEV = 256 [FIBRE FCTBL = 4] ORA
```

```
ORA_004  CL2-J  0       4       0
# /dev/rdsk/c23t0d5 SER = 61456 LDEV = 257 [FIBRE FCTBL = 4] ORA
ORA_005  CL2-J  0       5       0
# /dev/rdsk/c23t0d6 SER = 61456 LDEV = 258 [FIBRE FCTBL = 4] ORA
ORA_006  CL2-J  0       6       0
# ERROR [CMDDEV] /dev/rdsk/c23t0d7 SER = 61456  LDEV = 259
[OPEN-3-CM]                                          <=See Notes.

HORCM_INST
#dev_group    ip_address   service
ORA           127.0.0.1    52323    <=Check and update as needed.
```

Notes on mkconf:

- A unitID is added to the Serial# order. If two or more command devices exist in the storage system, select the device file that is shared among the storage system ports on a priority basis, and treat as an alternate command device. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).
- If the STDIN device includes the command device, the target device is commented out as shown below:
  ```
  # ERROR [CMDDEV] /dev/rdsk/c23t0d7    SER =  61456  LDEV = 259
  [ OPEN-3-CM    ]
  ```
- If the STDIN device is shared among multiple device files and already displayed as a target device, the target device is commented out as shown below:
  ```
  # ERROR [LDEV LINK] /dev/rdsk/c24t0d3  SER =  61456  LDEV = 195
  [FIBREFCTBL = 4]
  ```
- If the STDIN device does not have appropriate mirror description (MU#), the target device is commented out as shown below:
  ```
  # ERROR [INVALID MUN (2 < 1)] /dev/rdsk/c24t0d3  SER = 61456
  LDEV = 195 [ OPEN-3 ]
  ```
- If the STDIN device is mixed among the storage systems of differential mirror control, the target device is commented out as shown below:
  ```
  # ERROR [MIXING RAID TYPE] /dev/rdsk/c24t0d3   SER = 61456  LDEV
  = 195 [ OPEN-3]
  ```

rmawk

The *rmawk* command is a scriptable command for associating with the pair operation commands and raidcom commands.

This command provides basically the following three functions:

- Outputs by filtering STDIN with the specified conditions.
  ```
  Command | rmawk @1-eq:PAIR -a @2-ne:0
  ```
- Performs the command with the variable parameter specified by interpreting STDIN with the specified conditions.
  ```
  Command | rmawk @3-eq:TAR exe="Command line @1"
  ```

- Tests by interpreting the output command with the specified conditions or waits until the conditions become TRUE, by performing the specified command.

```
rmawk exe="Command line" @2-eq:PAIR -o @2-eq:PSUS
rmawk exe="Command line" @2-eq:COPY timeout=300
```

Syntax

```
/HORCM/usr/bin/rmawk  [-h | exe="…" | sys="…" | timeout=value |
interval=value | -BL | -AT |  -EC[VAL] | @variable | operators ]
\HORCM\etc\rmawk  [-h | exe="…" | sys="…" | timeout=value |
interval=value | -BL | -AT | -EC[VAL] | @variable | operators ]
```

Options and parameters

Option	Description
No argument or -h	No option displays help/usage and version information.

exe="command_line"	Specifies the command line to be performed when the result of the specified formula and the conditions are TRUE. The testing/waiting specifies the command to be its target.
	"@variable" with the field variables of STDIN can be included in the command line.
	Example:
	`exe="raidcfg -a qry -o hgrp -pport @1"`
	`exe="raidcfg -a reg -o hgrp -pport @1-@2 -pname @3"`
	`exe="type map.txt | rmawk @@L-eq:@L exe=\"raidcfg -a map -o snap -pname @1 -pldev @5 @@1\""`

exe="print …."	Specifies printing (with Line Feed) when the result of the specified formula and the conditions are TRUE.
	"@variable" with the field variables of STDIN can be included in the command line. When "@variable" is specified as "@C#/C#*", the variable is interpreted as character string. When "@variable" is specified as "@C#?/C#+/L/C/R", the variable is interpreted as integer.
	The printing range is from "print" to the end including spaces.
	Example:
	`exe="print PORT=@1 LDEV=@3"`
	`exe="print PORT=@1 LDEV=@3 Total CAP = @4+"`

exe="printn…." or exe="prints…."	Specifies printing (without Line Feed) when the result of the specified formula and the conditions are TRUE. "@variable" with the field variables of STDIN can be included in the command line. When "@variable" is specified as "@C#/C#*", the variable is interpreted as character string. When "@variable" is specified as "@C#?/C#+/L/C/R", the variable is interpreted as integer. The printing range is from "print" to the end including spaces. *Example:* `exe="printn PORT=@1 LDEV=@3"` *Note:* "prints..." is used to print to the strings buffer of '@0*'.
exe=exit	Specifies to exit this command when the result of the specified formula and the conditions are TRUE. The return value of exit is "@R" variable.

Option	Description

sys="command_line"	Specifies the command line to be performed in the transparent mode when the result of the specified formula and the conditions are TRUE.
	"@variable" and "@expression" in the command line are not interpreted as variables but are filtered out as variables to path them to the specified command.
	Example: UNIX.
	`sys='rmawk exe="pairdisplay -g G1 -CLI -l" @6-eq:PAIR'`
	Example: Windows.
	`sys="rmawk exe=\"pairdisplay -g G1 -CLI -l\" @6-eq:PAIR"`
	Example: OpenVMS.
	`sys="rmawk exe=""pairdisplay -g G1 -CLI -l"" @6-eq:PAIR"`
	Exception: When "exe="..."" is specified in the command line and there is "@variable" as an argument in this command, it is interpreted as "@variable" that is including the field variables of STDIN.
	Example: UNIX.
	`sys='rmawk exe="pairdisplay -d @3 @5 -CLI -l" @6-eq:PAIR'`
	Example: Windows.
	`sys="rmawk exe=\"pairdisplay -d @3 @5 -CLI -l\" @6-eq:PAIR"`
	Example: OpenVMS.
	`sys="rmawk exe=""pairdisplay -d @3 @5 -CLI -l"" @6-eq:PAIR"`

timeout=value	Specifies the timeout time in seconds for waiting by interpreting this output command with the specified conditions when the specified command is performed.
interval=value	Specifies the interval time in seconds for waiting by interpreting this output command with the specified conditions when the specified command is performed.
-BL	Specifies to include blank lines from STDIN. This is used to detect the blank lines when there are in the STDIN.
-AT	• When "-AT" is specified (the default setting does not specify this option) Specifies to testing or waiting until the conditions become TRUE in all the command lines, by interpreting the output of the specified command with the specified conditions. Testing ends as an ERROR (1) if there is even one FALSE in the specified condition. And waiting waits until all the lines become TRUE by retrying the specified command until becoming timeout if there is even one FALSE in the lines of the specified conditions. If it becomes timeout, the command ends as an ERROR (1). • When "-AT" is not specified It tests or waits until at least one line becomes TRUE, by interpreting the output of the specified command with the specified conditions. If there is one TRUE at least in the specified conditions, the testing ends as NORMAL (0). If there is one TRUE at least in the specified conditions, the waiting ends as NORMAL (0). If all the lines are FALSE, it waits until at least one line become TRUE by retrying the specified command until becoming timeout. If it becomes timeout, the command ends as an ERROR (1).
-EC[VAL]	Performs only once with ending of lines or "exe=exit" as Line#0. If you need to perform something special at end of lines, specify this option that is called as Line#0. This is enabled in the run mode. If VAL(integer) is specified, @C#? variable for all are initialized to the specified VAL before starting. If VAL is invalid such as -ECM, then @C#? variable for all are initialized to the MAX value with 64-bit integer.

Option	Description
@variable	Specifies the following variables. The variables can be specified in both the left and right side of the formula. The variables can also be specified as arguments of the command to be performed or of printing. • @C# Field strings corresponding to the column number (Column#) from STDIN. If "C#" is specified in hexadecimal ("0x..."), then its field is treated as hexadecimal strings. • @C#* Strings from the field to the end corresponding to the column number from STDIN. • @C#? 64 bit variables corresponding to the column number from STDIN (initial value 0). • @C#+ 64 bit variables adding field variables corresponding to the column number from STDIN (initial value 0). • @0 A variable that indicates one line (This is used when printing or searching within the line.). • @L A variable that indicates the line number from STDIN. • @C A variable that indicates the number of column in each line of STDIN. • @R A return value of performing command. • @0* A string variable that can be memorized one line. • null A special variable that tests if the character string is null or not. • @C#?t A variable that can be specified within exe="…" to print the C#? variable as TOD (time of day). If the C#? variable is zero, the current time is printed. • @C#?x A variable that can be specified within exe="…" to print the C#? variable as hexadecimal strings by adding 0x. • @@ A variable that can be specified within exe="…" to print the @ character.
operators (-operator:)	Specifies the following comparison operation. Variables in the field are operated in 64-bit integers. The numerical values in the field strings are "1234..." or "0x1234..." format without octal code. • -eq: Treats the target as character strings or integers by comparing with "==". When "@C#/C#" is specified in the left side of an equation, this is treated as character strings. When "@C#?/C#+/L/C/R" is specified in it, this is treated as integers. • -ne:

Option	Description
	Treats the target as character strings or integers by comparing with "!=". When "@C#/C#" is specified in the left side of an equation, this is treated as character strings. When "@C#?/C#+/L/C/R" is specified in it, this is treated as integers. • -gt: Treats the target as integers by comparing with ">". • -ge: Treats the target as integers by comparing with ">=". • -lt: Treats the target as integers by comparing with "<". • -le: Treats the target as integers by comparing with "<=".
operators (=operator:)	Specifies the following arithmetical operation. Variables in the field are operated in 64-bit integers. The numerical values in the field strings are "1234..." or "0x1234..." format without octal code. • =ad: Treats the target as integers by operating with "+ (Addition)". • =sb: Treats the target as integers by operating with "- (Subtraction)". • =ml: Treats the target as integers by operating with "* (Multiplication)". • =dv: Treats the target as integers by operating with "/ (Division)". • =st: Treats the target as integers by substituting with "= (Setting)".
operators (-operator)	Specifies the following logical operation for the result of the comparison operation. • -o Judges the result of the comparison operation as the "Logical OR". • -a Judges the result of the comparison operation as the "Logical AND". • -n Inverts the result of the comparison operation. (TRUE becomes FALSE, FALSE becomes TRUE.)

Returned values

The **rmawk** command sets the following returned values during exit allowing you to check the execution results.

Normal termination:

0: The command ends normally with the specified condition.

1:

- Testing: The specified condition is FALSE.

- Waiting: The specified condition is Timeout.

Abnormal termination:

125: The command ends with a syntax error.

126: The command ends with a system error.

Examples

For examples of display, see rmawk command examples on page 5-102.

Examples of comparison expression

@20-eq:PAIR: Compares if the character string in Column #20 from STDIN matches "PAIR".

*@20-eq:PSU**: Compares if "PSU" is included in the character string in Column #20 from STDIN.

*@0-eq:PSU**: Compares if "PSU" is included in one line from STDIN. This is equivalent to "grep PSU".

@20-eq:@21: Compares if the character strings in Column #20 and Column #21 match.

@20-ge:50: Compares if it is "value >= 50" of Column #20 from STDIN.

@L-ge:20: Compares if it is the current "number of lines >= 20" from STDIN.

@C-ge:20: Compares if it is "number of columns >= 20" of the current lines from the STDIN.

@R-gt:0: Compares if it is "return value > 0" of the specified command.

Examples of arithmetic expression

@8?=ad:@8: Performs "@8? = @8? + @8". This is equivalent to "@8+".

@8=ad:@5: Performs "@8? = @8 + @5".

@8=ad:@5?: Performs "@8? = @8 + @5?".

@8=ad:30: Performs "@8? = @8 + 30?".

@8=st:30: Performs "@8? = 30".

@5=st:@5: Performs "@5? = @5" for converting to the integer.

Example:

```
Command | rmawk @8?=ad:@8 exe="print Total = @8?"
Command | rmawk exe="print Total = @8+"
```

Example of the command option format

Performs the operation by interpreting the specified option format and classifying them in the following three function formats.

- Performs the operation as a filter if there is no "exe="..."" in the specified option.

  ```
  Command | rmawk [@expression1] Logical operator [@expression2] …
  ```

  Example:

  ```
  Command | rmawk @1-eq:PAIR -a @2-ne:0
  ```

- Performs the operation as a testing if there is one "exe="..."" but no "@variable" in the specified option.

  ```
  rmawk exe="Command line" [@expression1] Logical operator
  [@expression2] …
  ```

  Example:

  ```
  rmawk exe="Command line" @2-eq:PAIR -o @2-eq:PSUS
  ```

  And performs as an waiting command if "timeout=value" is specified as an option.

  ```
  rmawk exe="Command line" [@expression1] Logical operator
  [@expression2] timeout=6
  ```

  Example:

  ```
  rmawk exe="Command line" @2-eq:COPY timeout=300
  ```

- Other than the above, it performs the multiple "exe="Command line"" commands that include contexts written in multiple formulas and the variable parameters by interpreting the STDIN.

  ```
  Command | rmawk [@expression1] Logical operator [@expression2]
  exe="Command line"
  ```

  Example:

  ```
  Command | rmawk @3-eq:TAR exe="Command line @1"
  Command | rmawk @3-eq:TAR exe="Command line(true) @1" -n
  exe="Command line(false) @1"
  ```

  Because the command runs with the result of TRUE, multiple command can be performed if you keep writing lines ("exe="command line2"", "exe="command line3"", and so on).

  ```
  Command | rmawk [@expression1] Logical operator [@expression2]
  exe="Command line1" exe="Command line2" exe="Command line3"
  ```

  Example:

  ```
  Command | rmawk @3-eq:TAR exe="Command line @1" exe="Command
  line2 @1"
  Command | rmawk @3-eq:TAR exe="Command line(true) @1"
  exe="Command line2(true) @1" -n exe="Command line(false) @1"
  ```

5

Configuration setting commands

This chapter provides the specifications for the CCI configuration setting (raidcom) commands.

- raidcom
- raidcom get clpr
- raidcom modify clpr
- raidcom get command_status
- raidcom reset command_status
- raidcom add copy_grp
- raidcom delete copy_grp
- raidcom get copy_grp
- raidcom add device_grp
- raidcom delete device_grp
- raidcom get device_grp
- raidcom get drive (VSP Gx00 models, VSP Fx00 models)
- raidcom modify drive (VSP Gx00 models, VSP Fx00 models)
- raidcom get error_message

- raidcom add external_grp
- raidcom check_ext_storage external_grp
- raidcom delete external_grp
- raidcom disconnect external_grp
- raidcom get external_grp
- raidcom modify external_grp
- raidcom discover external_storage
- raidcom add host_grp
- raidcom delete host_grp
- raidcom get host_grp
- raidcom modify host_grp
- raidcom add chap_user
- raidcom delete chap_user
- raidcom set chap_user
- raidcom reset chap_user
- raidcom get chap_user
- raidcom add hba_wwn
- raidcom delete hba_wwn
- raidcom get hba_wwn
- raidcom reset hba_wwn
- raidcom set hba_wwn
- raidcom add hba_iscsi

- raidcom delete hba_iscsi
- raidcom set hba_iscsi
- raidcom reset hba_iscsi
- raidcom get hba_iscsi
- raidcom add external_iscsi_name
- raidcom delete external_iscsi_name
- raidcom get external_iscsi_name
- raidcom get initiator_iscsi_name
- raidcom discover external_iscsi_name
- raidcom check external_iscsi_name
- raidcom modify external_chap_user
- raidcom modify initiator_chap_user
- raidcom add journal
- raidcom delete journal
- raidcom get journal
- raidcom modify journal
- raidcom add ldev
- raidcom delete ldev
- raidcom extend ldev
- raidcom get ldev
- raidcom initialize ldev
- raidcom modify ldev

- raidcom add license (VSP Gx00 models and VSP Fx00 models only)
- raidcom delete license (VSP Gx00 models and VSP Fx00 models only)
- raidcom modify license (VSP Gx00 models and VSP Fx00 models only)
- raidcom get license
- raidcom modify quorum
- raidcom get quorum
- raidcom modify local_replica_opt
- raidcom get local_replica_opt
- raidcom add lun
- raidcom delete lun
- raidcom discover lun
- raidcom get lun
- raidcom modify lun
- raidcom add path
- raidcom get path
- raidcom check_ext_storage path
- raidcom delete path
- raidcom disconnect path
- raidcom delete pool
- raidcom get pool
- raidcom modify pool
- raidcom monitor pool

- raidcom reallocate pool
- raidcom rename pool
- raidcom get port
- raidcom modify port
- raidcom add parity_grp (VSP Gx00 models and VSP Fx00 models)
- raidcom delete parity_grp (VSP Gx00 models and VSP Fx00 models)
- raidcom get parity_grp
- raidcom initialize parity_grp (VSP Gx00 models and VSP Fx00 models only)
- raidcom modify parity_grp
- raidcom add rcu
- raidcom delete rcu
- raidcom get rcu
- raidcom modify rcu
- raidcom add rcu_iscsi_port
- raidcom delete rcu_iscsi_port
- raidcom get rcu_iscsi_port
- raidcom add rcu_path
- raidcom delete rcu_path
- raidcom add ssid
- raidcom delete ssid
- raidcom add resource
- raidcom modify resource

- raidcom delete resource
- raidcom get resource
- raidcom lock resource
- raidcom unlock resource
- raidcom map resource
- raidcom unmap resource
- raidcom add snap_pool
- raidcom get snap_pool
- raidcom add snapshot
- raidcom map snapshot
- raidcom unmap snapshot
- raidcom delete snapshot
- raidcom modify snapshot
- raidcom get snapshot
- raidcom replace snapshot
- raidcom add spm_wwn
- raidcom delete spm_wwn
- raidcom modify spm_wwn
- raidcom get spm_wwn
- raidcom monitor spm_wwn
- raidcom add spm_group
- raidcom delete spm_group

- raidcom modify spm_group
- raidcom get spm_group
- raidcom monitor spm_group
- raidcom modify spm_ldev
- raidcom delete spm_ldev
- raidcom monitor spm_ldev
- raidcom get spm_ldev
- raidcom add dp_pool
- raidcom get dp_pool
- raidcom send ping
- raidcom initialize pool

raidcom

Specifies a configuration change.

Executes by specifying respective parameters and values that are expressed in raidcom add copy_grp on page 5-24 and later.

Syntax

Displaying help

```
raidcom { [-h]
```

Log-in and log-out

```
raidcom {-login [<user_name> <password>] | -logout] [-s <seq#>
     | -u <unit#>] [-I[H][M] <instance#>] [-I[TC][SI] <instance#>]
```

Configuration change: line-by-line mode

```
raidcom <action> <object> [<param> <value>…] [-fx] [-checkmode
<check mode>] [-store <filename>] [-nomsg] [-login [<user_name>
<password>] [-resource <resource_grp_id>…] | -logout] [-s <seq#> | -
u <unit#>] [-I[H][M] <instance#>] [-I[TC][SI] <instance#>]
```

Configuration change: transaction mode

```
raidcom -zt <filename> [-load <work_filename>]
     [-checkmode <check mode>]
```

Options and parameters

Option	Description
[-h]	Displays help of raidcom.
[-login [<user_name> <password>]]	Specifies user authentication for the storage system. Specifies user name and password. If no user authentication is done yet and the -login option is omitted, the input of the user name and the password is required. And, in case of omitting the user name and the password by specifying -login option, the input of the user name and the password is required. The maximum number of the user who can login at same time is 512.
[-logout]	Deletes the cache of the session control table in the storage system and logs out from the storage system (command device). Also deletes all the authentication files corresponding to the storage system. At the time of next login, the CCI command requires the user name and the password. If an application that uses the command device exists in the host, the application also requires the user name and the password. If the same user is set for multiple hosts, the session control table of each host is managed so that the logout is applied only to the relevant host.
[-s <seq#>]	Specifies the serial number. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <seq#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.

Option	Description
[-u <Unit#>]	Specifies the unit ID of command device as HORCM_CMD of configuration file.
[-I[H][M] <instance#>] or [-I[TC][SI] <instance#>]	Specifies CCI instance number by specifying the command as HORC/HOMRCF or TrueCopy/ShadowImage. If you specify only -I, the command refers to the setting of HORCC_MRCF environment variable.
<action> <object> [<param> <value>…]	Specifies each command name that is expressed in raidcom add copy_grp on page 5-24 and later section and the parameters and values that are required at each operation.
[-fx]	Displays the LDEV number in hexadecimal notation.
[-checkmode <check mode>]	Specifies when executing Precheck function (execute checking commands only). It specifies the following value. Precheck: When this option is specified, the actual process is not executed for the storage system even if the command is executed. This option is available to specify the setting of $HORCC_NO_EXEC environment variable and $HORCC_CTX_CHK environment variable.
[-store <file name>]	Specifies the file name of the configuration file to be created for implementation check.
[-nomsg]	Prevents displaying messages. This option is required to be defined on the beginning of the command parameter.
[-zt <file name>]	Specifies the script file.
[-load <file name>]	Specifies the file name of the file (Configuration file) that is created for implementation check.
[-resource <resource_grp_id>…]	Limits the operations coverage to the specified resource groups. When this option is specified in reference commands, objects that are in the specified resource groups are displayed. When the resource group specified by this option does not contain the resource specified for executing the command, the command is not executed because of the EX_EGPERM error.

Examples

Performing user authentication (login) by the user ID: USER01 and the password: PASS01.

```
# raidcom -login USER01 PASS01
```

Performing log-out.

```
# raidcom -logout
```

Performing user authentication (login) to instance 99 by the user ID: USER01 and the password: PASS01.

```
# raidcom -login USER01 PASS01 -I99
```

Performing syntax check and the context check of the script file (the actual processing is not executed).

```
# raidcom -zt <script file> -checkmode precheck
```

Performing syntax check, the context check, and the implementation check of the script file (the actual processing is not executed).

```
# raidcom -zt <script file> -load <work file> -checkmode precheck
```

Returned values

Unless otherwise stated, the raidcom commands set the following returned values:

- Normal termination: 0
- Abnormal termination: other than 0

For details, see the section describing Command error messages in *Command Control Interface User and Reference Guide*.

Method for specifying LDEV number

The methods for specifying LDEV numbers are shown in the following table.

Specification method	Example
Decimal number	-ldev_id 300
Hexadecimal number	-ldev_id 0x12C -ldev_id 01:2C

Methods for specifying multiple LDEVs

Methods for specifying multiple LDEVs by LDEV IDs

The methods for specifying multiple LDEV IDs in a single command are shown below. Some methods do not apply to some commands.

```
-ldev_id 300-305
-ldev_id 0x12C-0x131
-ldev_id 01:2C-01:31
-ldev_id 300 -cnt 6
-ldev_id 300 301 302 303 304 305
```

Method for specifying LDEVs by device group

When you configure multiple LDEVs for pools or journals (for example, changing the resource group), you must issue the command to each LDEV. However, if you define LDEVs that configure pools or journals, you can issue the command to all LDEVs defined as a device group by specifying each device group at a time.

If you issue the command to LDEVs by specifying a device group, the command is executed in each LDEV registered in the device group. If an error occurs in an LDEV while the command is being executed, the execution of command stops at the LDEV where the error occurred. The command is not executed in the remaining LDEVs. If an error occurs, solve the error. Then restore the LDEV and issue the command to all remaining LDEVs.

- Creating a pool by specifying a device group:

  ```
  # raidcom add device_grp -device_grp_name dg_pool1 data1
  -ldev_id 512 513 514 515
  # raidcom add dp_pool -pool_id 2 -grp_opt ldev -device_grp_name
  dg_pool1
  ```

- Creating a journal by specifying a device group:

  ```
  # raidcom add device_grp -device_grp_name dg_jnl1 data1
  -ldev_id 512 513 514 515
  # raidcom add journal -journal_id 2 -grp_opt ldev
  -device_grp_name dg_jnl1
  ```

Operations where multiple LDEVs can be specified

You can use "-ldev_id <ldev#>" to specify multiple LDEVs at the same time in the following operations only:

(a) Displaying LDEV information

```
# raidcom get ldev -ldev_id 100-103
```

```
# raidcom get ldev -ldev_id 100 -cnt 4
```

Note: Specifying multiple LDEV as follows cannot be performed: `#raidcom get ldev -ldev_id 100 101 103`

(b) Creating a journal

```
# raidcom add journal -journal_id 1 -ldev_id 265 266
```

```
# raidcom add journal -journal_id 1 -ldev_id 265-266
```

```
# raidcom add journal -journal_id 1 -ldev_id 265 -cnt 2
```

(c) Creating a pool

Creating a pool for Copy-on-Write Snapshot:

```
# raidcom add snap_pool -pool 1 -ldev_id 365 366 367
```

```
# raidcom add snap_pool -pool 1 -ldev_id 365-367
```

```
# raidcom add snap_pool -pool 1 -ldev_id 365 -cnt 3
```

Creating a pool for Dynamic Provisioning or Dynamic Provisioning for Mainframe:

```
# raidcom add dp_pool -pool 1 -ldev_id 465 466 467
# raidcom add dp_pool -pool 1 -ldev_id 465-470
# raidcom add dp_pool -pool 1 -ldev_id 465 -cnt 5
```

(d) Creating a device group

```
# raidcom add device_grp -device_grp_name DevG2 dev101 -ldev_id 101
105 201
```

```
# raidcom add device_grp -device_grp_name DevG2 dev101 -ldev_id
101-105
# raidcom add device_grp -device_grp_name DevG2 dev101 -ldev_id 101 -
cnt 5
```

(e) Deleting a device group

```
# raidcom delete device_grp -device_grp_name DevG3 -ldev_id 200 201
204
# raidcom delete device_grp -device_grp_name DevG3 -ldev_id 200-204
# raidcom delete device_grp -device_grp_name DevG3 -ldev_id 200 -cnt
5
```

Specifying and displaying the VSP G1000, G1500, and VSP F1500 serial number

When specifying <seq#> for VSP G1000, G1500, and VSP F1500 in CCI, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345. The serial number for VSP G1000, G1500, and VSP F1500 is displayed by CCI with a "3" added to the beginning (for example, "312345" = serial number 12345).

For GUI operations (Hitachi Command Suite, HDvM - SN) use the five-digit serial number for the VSP G1000, G1500, and VSP F1500 (do not add "3" in the GUI).

Resource group operation

When you have multiple resource group authorities, use the **-resource** option to see the resource group information.

Examples

```
# raidcom get resource
RS_GROUP       RGID   stat     Lock_owner  Lock_host   Serial#
meta_resource     0   Unlocked  -           -             64568
RSG_CLI1          1   Unlocked  -           -             64568
RSG_CLI2          2   Unlocked  -           -             64568
# raidcom get port
PORT  TYPE  ATTR SPD LPID FAB CONN SSW SL Serial# WWN     PHY_PORT
CL1-A FIBRE ELUN AUT   EF N   FCAL N   0  64568 50060e8006fc3800 -
CL1-B FIBRE TAR  AUT   EF N   FCAL N   0  64568 50060e8006fc3801 -
CL1-C FICON TAR    -   -  -   -    -   0  64568 50060e8006fc3802 -
CL1-D FICON TAR    -   -  -   -    -   0  64568 50060e8006fc3803 -

# raidcom get port -resource 1
PORT  TYPE  ATTR SPD LPID FAB CONN SSW SL Serial# WWN     PHY_PORT
CL1-B FIBRE TAR  AUT   EF N   FCAL N   0  64568 50060e8006fc3801 -
CL1-C FICON TAR    -   -  -   -    -   0  64568 50060e8006fc3802 -

# raidcom get port -resource 2
PORT  TYPE  ATTR SPD LPID FAB CONN SSW SL Serial# WWN     PHY_PORT
CL1-A FIBRE ELUN AUT   EF N   FCAL N   0  64568 50060e8006fc3800 -
CL1-D FICON TAR    -   -  -   -    -   0  64568 50060e8006fc3803 -
```

Resource lock operation

When you use the following commands, lock the resource that is allocated to resource groups before executing the command.

- add
- delete
- modify
- initialize
- check_ext_storage
- disconnect
- set
- reset
- reallocate
- monitor

The following examples show locking resource groups, executing commands, and then unlocking resource groups.

Examples

- Performing a user authentication by User ID: USER01, Password: PASS01.
  ```
  # raidcom -login USER01 PASS01
  ```
- Locking a resource group: rsg001.
  ```
  # raidcom lock resource -resource_name rsg001
  ```
- Creating LDEV#100 and #101.
  ```
  # raidcom add ldev -parity_grp_id 5-2 -ldev_id 100 -capacity 10g
  # raidcom add ldev -parity_grp_id 5-2 -ldev_id 101 -capacity 10g
  ```
- Unlocking resource group: rsg001
  ```
  # raidcom unlock resource -resource_name rsg001
  ```

Resource locking and CCI commands

If you execute a CCI command when the specified resource is locked, the specified resource groups cannot be used by other users. Commands can be executed when the specified resources are not locked. However, if another user locks the resource, CCI commands will result in error. The following table shows the relations between CCI commands and resources that need to be locked, except for the required options for the commands. In the following table:

- Res. group: resource group
- Lock/auth: Resource locking and resource authority are required.
- Auth: Only resource authority check is specified.

- (VSP only) Lock by user: If another user locks the applicable resource, the command execution fails. To execute the command, the applicable resource authority is not required.

Relation between commands and resources that need to be locked

Res. group	Port	Host group	Parity group	External volume/ VDEV	LDEV	Command	Option
-	-	-	-	-	Lock/auth	raidcom add copy_grp	-
-	-	-	-	-	Lock/auth	raidcom delete copy_grp	-
-	-	-	-	-	Auth	raidcom get copy_grp	-
-	-	-	-	-	Lock/auth	raidcom add device_grp	-
-	-	-	-	-	Lock/auth	raidcom delete device_grp	-
-	-	-	-	-	Auth	raidcom get device_grp	-
-	Lock/auth	-	-	-	-	raidcom add external_grp	-
-	-	-	-	Lock/auth	-	raidcom check_ext_storage external_grp	-
-	-	-	-	Lock/auth	Auth	raidcom check_ext_storage external_grp	-ldev_id <ldev#>
-	-	-	-	Lock/auth	-	raidcom delete external_grp	-
-	-	-	-	Lock/auth	-	raidcom disconnect external_grp	-
-	-	-	-	Lock/auth	Auth	raidcom disconnect external_grp	-ldev_id <ldev#>
-	-	-	-	Auth	-	raidcom get external_grp	-
-	-	-	-	Lock/auth	-	raidcom modify external_grp	-
-	Auth	-	-	-	-	raidcom discover external_storage	-
-	-	Lock/ auth	-	-	-	raidcom add host_grp	-
-	-	Lock/ auth	-	-	-	raidcom delete host_grp	-
-	Auth	Auth	-	-	-	raidcom get host_grp	-
-	-	Lock/ auth	-	-	-	raidcom modify host_grp	-

Res. group	Port	Host group	Parity group	External volume/ VDEV	LDEV	Command	Option
-	-	Lock/ auth	-	-	-	raidcom add hba_wwn	-
-	-	Lock/ auth	-	-	-	raidcom delete hba_wwn	-
-	Auth	Auth	-	-	-	raidcom get hba_wwn	-
-	-	-	-	-	Lock/auth	raidcom add journal	-
-	-	-	-	-	Lock/auth	raidcom delete journal	-
-	-	-	-	-	Auth	raidcom get journal	-
-	-	-	-	-	Lock/auth	raidcom modify journal	-
-	-	-	Lock/ auth	-	Lock/auth	raidcom add ldev	-parity_ grp_id <gno-sgno>
-	-	-	-	Lock/auth	Lock/auth	raidcom add ldev	-external_ grp_id <gno-sgno>
-	-	-	-	-	Lock/auth	raidcom add ldev	-
-	-	-	-	-	Lock/auth	raidcom delete ldev	-
-	-	-	-	-	Lock/auth	raidcom extend ldev	-
-	-	-	-	-	Auth	raidcom get ldev	-
-	-	-	-	-	Lock/auth	raidcom initialize ldev	-
-	-	-	-	-	Lock/auth	raidcom modify ldev	-
-	-	Lock/ auth	-	-	Lock/auth	raidcom add lun	-
-	-	Lock/ auth	-	-	Lock/auth	raidcom delete lun	-
-	Auth	-	-	-	-	raidcom discover lun	-
-	-	Auth	-	-	-	raidcom get lun	-
-	-	Lock/ auth	-	-	Lock/auth	raidcom modify lun	-
-	Lock/auth	-	-	-	-	raidcom add path	-
-	Lock/auth	-	-	-	-	raidcom check_ext_storage path	-
-	Lock/auth	-	-	-	-	raidcom delete path	-
-	Lock/auth	-	-	-	-	raidcom disconnect path	-
-	-	-	-	-	Auth	raidcom get path	-
-	-	-	-	-	Lock/auth	raidcom delete pool	-
-	-	-	-	-	Auth	raidcom get pool	-

Res. group	Port	Host group	Parity group	External volume/ VDEV	LDEV	Command	Option
-	-	-	-	-	Lock/auth	raidcom modify pool	-
-	Auth	-	-	-	-	raidcom get port	-
-	Lock/auth	-	-	-	-	raidcom modify port	-
-	-	-	Auth	-	-	raidcom get parity_grp	-
-	Lock/auth	-	-	-	-	raidcom add rcu	-
-	Lock/auth	-	-	-	-	raidcom delete rcu	-
-	Auth	-	-	-	-	raidcom get rcu	-
-	Lock/auth	-	-	-	-	raidcom modify rcu	-
-	Lock/auth	-	-	-	-	raidcom add rcu_path	-
-	Lock/auth	-	-	-	-	raidcom delete rcu_path	-
Auth	-	-	-	-	-	raidcom get resource	-
Auth	-	-	-	-	-	raidcom lock resource	-
Auth	-	-	-	-	-	raidcom unlock resource	-
-	-	-	-	-	Lock/auth	raidcom add snap_pool	-
-	-	-	-	-	Auth	raidcom get snap_pool	-
-	-	-	-	-	Lock/auth	raidcom add dp_pool	-
-	-	-	-	-	Auth	raidcom get dp_pool	-
-	-	Lock/ auth	-	-	-	raidcom set hba_wwn	-
-	-	Lock/ auth	-	-	-	raidcom reset hba_wwn	-
-	-	-	-	-	Lock/auth	raidcom monitor pool	-
-	-	-	-	-	Lock/auth	raidcom reallocate pool	-
-	-	-	-	-	-	raidcom get command_status	-
-	-	-	-	-	-	raidcom reset command_status	-
-	-	-	-	-	-	raidcom add resource	-
Lock/ auth	-	-	-	-	Lock/auth	raidcom add resource	-ldev_id <ldev#>
Lock/ auth	Lock/auth	-	-	-	-	raidcom add resource	-port <port#>
Lock/ auth	-	Lock/ auth	-	-	-	raidcom add resource	-port <port#> <host group name>

Res. group	Port	Host group	Parity group	External volume/ VDEV	LDEV	Command	Option
Lock/ auth	-	-	Lock/ auth	-	-	raidcom add resource	-parity_grp_id <gno-sgno>
Lock/ auth	-	-	-	Lock/auth	-	raidcom add resource	-external_ grp_id <gno-sgno>
Auth	-	-	-	-	-	raidcom delete resource	-
Lock/ auth	-	-	-	-	Lock/auth	raidcom delete resource	-ldev_id <ldev#>
Lock/ auth	Lock/auth	-	-	-	-	raidcom delete resource	-port <port#>
Lock/ auth	-	Lock/ auth	-	-	-	raidcom delete resource	-port <port#> <host group name>
Lock/ auth	-	-	Lock/ auth	-	-	raidcom delete resource	-parity_grp_id <gnosgno>
Lock/ auth	-	-	-	Lock/auth	-	raidcom delete resource	-external_ grp_id <gno-sgno>
Lock/ auth	-	-	-	-	-	raidcom modify resource	-
-	Lock/auth	-	-	-	Lock/auth	raidcom map resource	-
-	Lock/auth	-	-	-	Lock/auth	raidcom unmap resource	-
-	Auth	-	-	-	-	raidcom add spm_wwn	-port <port#>
-	Auth	-	-	-	-	raidcom add spm_group	-port <port#>
-	Auth	-	-	-	-	raidcom delete spm_wwn	-port <port#>
-	Auth	-	-	-	-	raidcom delete spm_group	-port <port#>
-	Auth	-	-	-	-	raidcom modify spm_wwn	-port <port#>
-	Auth	-	-	-	-	raidcom modify spm_group	-port <port#>
-	Auth	-	-	-	-	raidcom get spm_wwn	-port <port#>
-	Auth	-	-	-	-	raidcom get spm_group	-port <port#>
-	Auth	-	-	-	-	raidcom monitor spm_wwn	-
-	Auth	-	-	-	-	raidcom monitor spm_group	-

Res. group	Port	Host group	Parity group	External volume/ VDEV	LDEV	Command	Option
-	-	Lock/ auth	-	-	-	raidcom add hba_iscsi	-port <port#> [<host group name>]
-	-	Lock/ auth	-	-	-	raidcom delete hba_iscsi	-port <port#> [<host group name>]
-	-	Lock/ auth	-	-	-	raidcom set hba_iscsi	-port <port#> [<host group name>]
-	-	Lock/ auth	-	-	-	raidcom reset hba_iscsi	-port <port#> [<host group name>]
-	-	Auth	-	-	-	raidcom get hba_iscsi	-port <port#> [<host group name>]
-	-	Lock/ auth	-	-	-	raidcom add chap_user	-port <port#> [<host group name>]
-	-	Lock/ auth	-	-	-	raidcom delete chap_user	-port <port#> [<host group name>]
-	-	Lock/ auth	-	-	-	raidcom set chap_user	-port <port#> [<host group name>]
-	-	Lock/ auth	-	-	-	raidcom reset chap_user	-port <port#> [<host group name>]
-	-	Auth	-	-	-	raidcom get chap_user	-port <port#> [<host group name>]
-	Auth	-	-	-	-	raidcom send ping	-port <port#>
-	Lock/auth	-	-	-	-	raidcom add external_iscsi_name	-
-	Lock/auth	-	-	-	-	raidcom delete external_iscsi_name	-
-	Lock/auth	-	-	-	-	raidcom modify external_chap_user	-
-	Lock/auth	-	-	-	-	raidcom modify initiator_chap_user	-
-	Auth	-	-	-	-	raidcom get external_iscsi_name	-
-	Auth	-	-	-	-	raidcom get initiator_iscsi_name	-

Res. group	Port	Host group	Parity group	External volume/ VDEV	LDEV	Command	Option
-	Auth	-	-	-	-	raidcom discover external_iscsi_name	-
-	Auth	-	-	-	-	raidcom check external_iscsi_name	-
-	Lock/auth	-	-	-	-	raidcom add rcu_iscsi_port	-
-	Lock/auth	-	-	-	-	raidcom delete rcu_iscsi_port	-
-	Auth	-	-	-	-	raidcom get rcu_iscsi_port	-
-	-	-	Lock/ auth	-	-	raidcom modify parity_grp	-
-	-	-	-	-	-	raidcom modify local_replica_opt	-
-	-	-	-	-	-	raidcom get local_replica_opt	-
-	-	-	-	-	-	raidcom get license	-
-	-	-	-	-	Lock/auth	raidcom modify quorum	-quorum_id <quorum id>
-	-	-	-	-	Auth	raidcom get quorum	-quorum_id <quorum id>
-	-	-	-	-	Lock/auth	raidcom initialize pool	-ppid {<pool ID#> |<pool naming>}

Relation between commands supported only by VSP Gx00 models and VSP Fx00 models and resources that need to be locked

Res. group	Port	Host group	Parity group	External volume /VDEV	LDEV	Command	Option
-	-	-	-	-	-	raidcom add license	-
-	-	-	-	-	-	raidcom delete license	-
-	-	-	-	-	-	raidcom modify license	-
-	-	-	Lock/ auth	-	-	raidcom initialize parity_grp	-
-	-	-	Auth	-	-	raidcom get drive	-
-	-	-	-	-	-	raidcom modify drive*	-

Res. group	Port	Host group	Parity group	External volume /VDEV	LDEV	Command	Option
-	-	-	-	-	-	raidcom add partiy_grp	-
-	-	-	Lock/ auth	-	Lock/ auth	raidcom delete parity_grp	-
* If another user locks a resource, the command fails.							

Relation between commands supported only by VSP and resources that need to be locked

Res. group	Port	Host group	Parity group	External volume /VDEV	LDEV	Command	Option
-	Locked by user	Lock/ auth	-	-	-	raidcom add spm_group	-port <port#> [<host group name>] - spm_host_grp
-	Locked by user	Lock/ auth	-	-	-	raidcom delete spm_group	-port <port#> [<host group name>] - spm_host_grp
-	Locked by user	Lock/ auth	-	-	-	raidcom modify spm_group	-port <port#> [<hostgroup name>] - spm_host_grp
-	-	Auth	-	-	-	raidcom get spm_group	-port <port#> [<host group name>] - spm_host_grp

Ranges of command parameters for storage system types

The following table specifies the valid ranges of command parameters for the storage system types. CCI commands might be accepted even if the specified value is not within the valid range for the storage system type.

Parameter	Item	Storage system type		
		VSP	HUS VM	VSP G1000, G1500, and VSP F1500
-ldev_id	LDEV number	0 - 65279	0 - 16383	0 - 65279
-parity_grp_id	parity group number	gno: 1 - 32 sgno: 1 - 16	gno: 1 - 16 sgno: 1 - 32	gno: 1 - 24 sgno: 1 - 24

Parameter	Item	Storage system type		
		VSP	HUS VM	VSP G1000, G1500, and VSP F1500
-path_grp	external volume path group number	0 - 63232	0 - 14080	0 - 63232
-mp_blade_id	MP blade ID	0 - 7	0 - 3	0 - 15

raidcom get clpr

Displays the CLPR information for the storage system.

Syntax

```
raidcom get clpr
```

Options and parameters

None

Examples

```
# raidcom get clpr
CLPR CLPR_NAME    TC_CAP(MB) TU_CAP(MB) WP_CAP(MB) SF_CAP(MB) U(%)
W(%) S(%)
001  Oracle_DB_PROD   20000     10000       2000         0 50 10 0
003  Oracle_DB_BACK   10000      5000        500         0 50  5 0
```

CLPR: CLPR ID (decimal)

CLPR_NAME: nickname of the CLPR

TC_CAP(MB): capacity of cache memory of the CLPR

TU_CAP(MB): used capacity of cache memory of the CLPR

WP_CAP(MB): capacity of write pending data of the CLPR

SF_CAP(MB): capacity of sidefiles of the CLPR

U(%): usage rate of cache memory of the CLPR

W(%): rate of write pending data of the CLPR

S(%): usage rate of sidefiles of the CLPR

raidcom modify clpr

Modifies a CLPR.

Syntax

```
raidcom modify clpr -clpr <clpr#> { -ldev_id <ldev#> | -
parity_grp_id <gno-sgno> | -external_grp_id <gno-sgno>}
```

Options and parameters

Option	Description
-clpr <clpr#>	Specifies a CLPR ID (0-31). For example: • -clpr 2
-ldev_id <ldev#>	Specifies an LDEV number (0-65279). For example: • -ldev_id 200 You cannot specify the LDEV that configures a LUSE by using this command. For other notes, see the *Performance Guide*.
-parity_grp_id <gno-sgno>	Specifies a parity group number (gno: 1-52, sgno: 1-32). For example: • 3-1
-external_grp_id <gno-sgno>	Specifies an external volume group number (gno: 1-16384, sgno: 1-4096). For example: • 52-11

Examples

Moving the LDEV 02:00 to the CLPR ID 2.

```
# raidcom modify clpr -clpr 2 -ldev_id 0x0200
```

Moving the parity group 5-2 to the CLPR ID 2

```
# raidcom modify clpr -clpr 2 -parity_grp_id 5-2
```

Moving the external volume group 1-1 to the CLPR ID 2.

```
# raidcom modify clpr -clpr 2 -external_grp_id 01-01
```

raidcom get command_status

It displays an error information of the configuration setting command (asynchronous command) to be executed asynchronously.

When an error occurs with the execution of an asynchronous command, the total number of errors or error information such as error codes (SSB1 and SSB2) are stored in the storage system at the first occurrence. After executing asynchronous command, check the error information by executing this command.

However, an error from the second time occurrence, error codes of SSB1 and SSB2 are not stored. To be able to refer the error code when an error occurs,

reset the error information that is stored by the storage system by executing **raidcom reset command_status** before and after executing asynchronous command.

Syntax

```
raidcom get command_status [-time <time(sec)>]
```

Options and parameters

Option	Description
[-time <time(sec)>]	Specifies waiting time to complete the process of asynchronous command. If this option is omitted, the default waiting time (CMD_DEF_TMOUT: 7200 sec.) is set.

Examples

Displaying error information of the asynchronous command.

```
# raidcom get command_status
HANDLE SSB1 SSB2 ERR_CNT Serial# Description
7E30   2E20 6000       4  64034  The pool ID is not installed
```

Description of each column in output example:

HANDLE: handle number that uniquely identifies the user

SSB1: SSB1 error code. For details about error codes, see the *Command Control Interface User and Reference Guide*.

SSB2: SSB2 error code. For details about error codes, see the *Command Control Interface User and Reference Guide*.

ERR_CNT: total number of errors in this user handle

Serial#: serial number. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a “3” added to the beginning (for example, “312345” = serial number 12345).

Description: Error information. If no error occurred, a hyphen (-) is displayed.

Returned Value: Either of the following returned values is returned to exit (), which allows users to check the execution results using a user program or a script.

- 0: Normal Termination
- 1: One or more errors occurred.
  Abnormal termination
  EX_EWSTOT: Timeout while waiting the result of the command execution
  For details, see the section describing Command error messages in the *Command Control Interface User and Reference Guide*.

raidcom reset command_status

Resets the error information of the configuration setting command that is stored in the storage system and executed asynchronously (Asynchronous command).

Syntax

```
raidcom reset command_status
```

Options and parameters

None

Examples

Resetting the error information of the asynchronous command.

```
# raidcom reset command_status
```

raidcom add copy_grp

Creates a copy group.

Syntax

```
raidcom add copy_grp -copy_grp_name <copy group name>
     <device group name> [<device group name>] [-mirror_id <mu#>
     -journal_id <journal ID#>]
```

Options and parameters

Option	Description
-copy_grp_name <copy group name><device group name>[<device group name>]	Specifies the device group (maximum 32 characters) configuring a copy group (maximum 32 characters). You can specify up to two device group names. If you specify more than two, the option is ignored. For a copy group for an ShadowImage pair, specify two device groups. For a copy group for a TrueCopy pair, specify only one device group for the relevant storage system side (primary/main or secondary/remote).
[-mirror_id <mu#>]	Specifies the mirror ID. If this option is omitted (by raidcom get copy_grp), "-" is displayed.
[-journal_id <journal ID#>]	Specifies the journal number (0-255). If this option is omitted (by raidcom get copy_grp), "-" is displayed.

Example

Creating a copy group (ora) by device groups (grp1, grp2).

```
# raidcom add copy_grp -copy_grp_name ora grp1 grp2
```

raidcom delete copy_grp

Deletes the specified copy group.

Syntax

```
raidcom delete copy_grp -copy_grp_name <copy group name>
```

Options and parameters

Option	Description
-copy_grp_name <copy group name>	Specifies the name of the copy group (maximum 32 characters).

Example

Deleting the copy group: ora.

```
# raidcom delete copy_grp -copy_grp_name ora
```

raidcom get copy_grp

Displays the information of the specified copy group.

Syntax

```
raidcom get copy_grp
```

Options and parameters

None.

Examples

Displaying copy group information.

```
# raidcom get copy_grp
COPY_GROUP LDEV_GROUP MU# JID# Serial#
ora grp1            0   -        64034
ora grp2            0   -        64034
```

Description of each column in output example:

COPY_GROUP: Copy group name

LDEV_GROUP: Device group name that composes copy group

MU#: Mirror ID to which the device group belongs. If -mirror_id is not specified at the creation, "-" is displayed.

JID#: Journal number to which device group belongs. If -journal_id is not specified at the creation, "-" is displayed.

Serial#: Product serial number. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

raidcom add device_grp

Assigns a device name to the specified LDEV, and creates a device group. If the group already exists, the LDEV is added to the group. If the LDEV also already exists in the specified device group, the specified LDEV name is set.

Syntax

```
raidcom add device_grp -device_grp_name <ldev group name>
     <device name> -ldev_id <ldev#>… [-cnt <count>]
```

Options and parameters

Option	Description
device_grp_name <device group name><device name>	Specifies the device group name (maximum 32 characters) and the device name in the device group (maximum 32 characters). If multiple LDEVs are specified, the same device name is set for all of them.
-ldev_id <ldev#> …	Specifies the LDEV number (0-65279). When you specify an LDEV that is part of a LUSE volume, all LDEVs in the LUSE volume have the same name. For example: • -ldev_id 200 • -ldev_id 100-110 • -ldev_id 100 -cnt 10 Up to 64 of LDEVs can be specified. When you specify an LDEV in a LUSE volume, the number of LDEVs in the LUSE volume is included.
[-cnt <count>]	Specifies the count (2-64). If this option is omitted, the count is set to one.

Example

Assigning a device name: data1 to an LDEV: 400 and adding it to the device group: grp1.

```
# raidcom add device_grp -device_grp_name grp1 data1 -ldev_id 400
```

raidcom delete device_grp

Deletes the specified LDEV from the specified group. When the last LDEV is deleted, the device group is also deleted.

Syntax

```
raidcom delete device_grp -device_grp_name <device group name>
     -ldev_id <ldev#>… [-cnt <count>]
```

Options and parameters

Option	Description
-device_grp_name <device group name>	Specifies the device group name (maximum 32 characters)
-ldev_id <ldev#> …	Specifies the LDEV number (0-65279). For example: • -ldev_id 200 • -ldev_id 100-110 • -ldev_id 100 -cnt 10 Up to 64 of LDEVs can be specified. When you specify an LDEV in a LUSE volume, the number of LDEVs in the LUSE volume is included.
[-cnt <count>]	Specifies the count (2-64). If this option is omitted, the count is set to one.

Example

Deleting the LDEV400 from the device group: grp1.

```
# raidcom delete device_grp -device_grp_name grp1 -ldev_id 400
```

raidcom get device_grp

Displays the LDEV information for the specified device group, or lists all device groups.

Syntax

```
raidcom get device_grp [-device_grp_name <device group name>]
```

Options and parameters

Option	Description
[-device_grp_name <device group name>]	Displays the device (LDEV) information for the specified device group (maximum 32 characters).

Option	Description
	If this option is omitted, the list of the registered device groups is displayed.

Examples

Displaying device group information.

```
# raidcom get device_grp
LDEV_GROUP Serial#
grp1 64034
grp2 64034
grp3 64034
```

Displaying device group information: grp1.

```
# raidcom get device_grp -device_grp_name grp1
LDEV_GROUP LDEV_NAME LDEV# Serial#
grp1       data1     400   64034
grp1       data2     401   64034
```

Description of each column in output example:

LDEV_GROUP: Device group name

LDEV_NAME: Device name in the device group

LDEV#: LDEV number

Serial#: Product serial number. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

raidcom get drive (VSP Gx00 models, VSP Fx00 models)

Displays drive information.

Syntax

```
raidcom get drive [-parity_grp_id <gno-sgno> | -usage <usage>]
```

Options and parameters

Option	Description
-parity_grp_id <gno-sgno>	Specifies the parity group number (gno: 1 to 52, sgno: 1 to 32) Example: 3-1
-usage <usage>	Specifies the drive usage. Specify the following character strings for <usage>: • data: Data drive • spare: Spare drive

Option	Description
	• free: Unused drive

Example

Displaying drive information.

```
#raidcom get drive
LOCATION    TYPE    RPM    TOTAL_CAP(GB)    CODE         USAGE
STS    GROUP
1-1         SAS    15000         300    DKS5C-K300SS    DATA    NML
1-1
```

Description of each column in output example:

LOCATION: Displays the location of the drive in the xx-yy format. In Device Manager - Storage Navigator, the drive location is displayed in the HDDxx-yy format.

TYPE: Displays the drive type.

RPM: Displays the number of revolutions of a drive in rpm. For SSD, a hyphen (-) is displayed.

TOTAL_CAP(GB): Displays the capacity of a drive in gigabytes.

CODE: Displays the drive type code.

USAGE: Displays the drive usage.

- DATA: Data drive
- SPARE: Spare drive
- FREE: Unused drive

STS: Displays the drive status.

- NML: Normal.
- WAR: A blocked part exists.
- CPY: Drive copy is in process.
- CPI: Copy is incomplete.
- RSV: Spare disk is unusable.
- FAI: Blocked due to a failure.
- BLK: Blocked due to maintenance.
- UNK: The status is unknown.

GROUP: Displays the parity group number of the drive if it is contained in a parity group. If the drive is not contained in a parity group, a hyphen (-) is displayed.

raidcom modify drive (VSP Gx00 models, VSP Fx00 models)

Configures spare drives or cancels the settings.

This command is executed asynchronously with the command input. Use the **raidcom get command_status** command to check if the command is completed.

Syntax

```
raidcom modify drive -drive_location <drive location> -spare {enable|
disable}
```

Options and parameters

Option	Description
-drive_location <drive location>	Specifies the drive location. Example: When the drive location is HDD00-01: 0-1
-spare {enable|disable}	Sets a spare drive or cancels the setting. • enable: Sets a drive as a spare drive. • disable: Cancels the spare drive setting.

Example

Setting a drive whose drive location is HDD00-01 as a spare drive.

```
# raidcom modify drive -drive_location 0-1 -spare enable
```

raidcom get error_message

Displays the error message for the specified error code.

Syntax

```
raidcom get error_message -ssb <ssb1> <ssb2>
```

Options and parameters

Option	Description
-ssb <ssb1> <ssb2>	Specifies the error code as a hexadecimal number (add the 0x prefix). <ssb1>: Specifies SSB1 of the error code. <ssb2>: Specifies SSB2 of the error code.

Example

Displaying the error message for the error code whose SSB1 is 0x2E00 and SSB2 is 0x0023.

```
# raidcom get error_message -ssb 0x2E00 0x0023
CAUSE : Volume capacity is too small.
```

raidcom add external_grp

Adds an external volume to the specified external volume group, and connects to an external LUN on the specified external port/wwn. Only one external VOL is added in each operation. If the external volume group already exists, the external volume is added to the external volume group.

This command is executed asynchronously with the command input. Check the completion of this process using the **raidcom get command_status** command.

Syntax

```
raidcom add external_grp -path_grp <path group#>
   -external_grp_id <gno-sgno> -port <port#> {-external_wwn
   <wwn strings> | -external_iscsi_name <external iscsi name>
   -external_address <IP address>} -lun_id <lun#>
   [-emulation <emulation type>] [-clpr <clpr#>]
   [-external_attribute migration][-data_direct_mapping enable]
```

Options and parameters

Option	Description
-path_grp <path group#>	Specifies the external VOL path group number (0-63231).
-external_grp_id <gno-sgno>	Specifies the external volume group number (gno:1-16384, sgno: 1-4096). For example: • 52-11
-port <port#>	Specifies the port number. Specifies the port number whose attribute is External. For example: • CL1-A Displays an external port.
-external_wwn <wwn strings>	Specifies the WWN (16-digit hexadecimal value) of the external storage system. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8
-external_iscsi_name <external iscsi name>*	Specifies the iSCSI name of the iSCSI target on the external storage system in an iqn format or an eui format. • An iqn format: `iqn.` and the subsequent maximum 219 characters.

Option	Description
	• An eui format: `eui.` and the subsequent 16 characters in hexadecimal notation.
-external_address <IP address>*	Specifies the IP address of the iSCSI target on the external storage system. An IPv4 address or an IPv6 address can be specified. Note that the following addresses cannot be specified when you specify the IPv4 address: • Network address (for example: 192.168.10.*0*, *0*.120.10.1) • Broadcast address (for example: 255.255.255.*255*, 10.1.255.*255*) • Loop back address (for example: *127*.0.0.1) Note that the following addresses cannot be specified when you specify the IPv6 address: • Unspecified address (for example: *::*) • Multicast address (for example: *ff*:1024:1215::01) • Loop back address (for example: *::1*)
-lun_id <lun#>	Displays LUN (0-2047) of the external storage system port.
[-emulation <emulation type>]	Specifies the emulation type. If this option is omitted, OPEN-V is used. The valid values for <emulation type> are: • OPEN-3, OPEN-8, OPEN-9, OPEN-E, OPEN-K, OPEN-L, OPEN-V • 3390-1, 3390-2, 3390-3, 3390-A, 3390-3A, 3390-3B, 3390-3C, 3390-3R, 3390-9, 3390-9A, 3390-9B, 3390-9C, 3390-L, 3390-LA, 3390-LB, 3390-LC, 3390-M, 3390-MA, 3390-MB, 3390-MC, 3390-V • 3380-3, 3380-3A, 3380-3B, 3380-3C • Some emulation types cannot be specified according to the type of device. ***Caution:*** You can specify 3390-3 or 3390-3R as the emulation type, but these are unable to be mixed. You can specify the 3380 series or the 3390 series as the emulation type for each parity group, but they are unable to be mixed for each 32 address boundary because of the OS restriction.
[-clpr <clpr#>]	Specifies the CLPR ID.
[-external_attribute migration]	Specifies if an attribute of NDM functions is set.
[-data_direct_mapping enable]	(VSP G1000, G1500, and VSP F1500 and VSP Gx00 models only) Specifies to set the data direct mapping attribute. The data direct mapping attribute is automatically set to an LDEV which is created in the external volume group having the data direct mapping attribute.
* You can specify the pseudo WWN of the iSCSI target to the -external_wwn option instead of specifying the iSCSI target by using the -external_iscsi_name option and the -external_address option. The pseudo WWN corresponds to the iSCSI name and IP address of the iSCSI target on the external storage system. By executing the raidcom get external_iscsi_name command, you can confirm the suitability between the pseudo	

Option	Description
WWN and the iSCSI name and IP address of the iSCSI target on the external storage system.	

Example

Mapping an LU: 0 defined to the external storage system port: 50060e80,05fa0f36 connected to the port: CL1-A (External port) by the External Volume Group#1-1 and the path group#1.

```
# raidcom add external_grp -path_grp 1 -external_grp_id 1-1
-port CL1-A -external_wwn 50060e80,05fa0f36 -lun_id 0
```

Mapping an LU:0 defined to the external storage system iSCSI target (iSCSI name: iqn.z2, IP address: 158.214.135.100) which is connected to the port: CL1-A (iSCSI port) of the local storage system by the External Volume Group#1-1 and the path group#1.

```
# raidcom add external_grp -path_grp 1 -external_grp_id 1-1 -port
CL1-A -external_iscsi_name iqn.z2 -external_address 158.214.135.100 -
lun_id 0
```

Mapping an LU: 0 defined to the external storage system port: 50060e80,05fa0f36 connected to the port: CL1-A (External port) by the External Volume Group#1-1 and the path group#1, and setting the attribute for the NDM function and the data direct mapping attribute.

```
# raidcom add external_grp -path_grp 1 -external_grp_id 1-1 -port
CL1-A -external_wwn 50060e80,05fa0f36 -lun_id 0 -external_attribute
migration -data_direct_mapping enable
```

raidcom check_ext_storage external_grp

Specifies the external volume group, check the connection for the external VOL, and then restart using. Only one external VOL is operated in each operation.

An LDEV or device group can be specified instead of an external volume group:

- If an LDEV is specified, CCI finds the external volume groups to which the specified LDEV belongs and displays the result.
- If a device group is specified, CCI finds the external volume groups to which the specified device group belongs and displays the result.

If no LDEV exists in the external volume, the command is rejected with EX_ENOOBJ.

Syntax

```
raidcom check_ext_storage external_grp {-external_grp_id
   <gno-sgno> | -ldev_id <ldev#>} | -grp_opt <group option>
   -device_grp_name <device group name> [<device name>]}
```

Options and parameters

Option	Description
-external_grp_id <gno-sgno>	Specifies the external volume group number (gno:1-16384, sgno: 1-4096). For example: • 52-11
-ldev_id <ldev#>	Specifies the LDEV number (0-65279). For example: • -ldev_id 200
-grp_opt <group option>	Specifies the device information extracted from the LDEV belonging to the device group. Specify "ldev" (fixed). The information about LDEV belonging to the device group is used.
-device_grp_name <device group name> [<device name>]	Specifies the name of device group (maximum 32 characters) to be operated. To operate an LDEV in the device group, specify the device name of LDEV (maximum 32 characters) within the device group. If the device name is omitted, all of the LDEVs in the device group are operated.

Examples

Executing the confirmation of existence and the LDEV recovery for the external volume group #1-1.

```
# raidcom check_ext_storage external_grp -external_grp_id 1-1
```

Executing the confirmation of connection and the LDEV recovery for the external volume group including the external volume (LDEV:200).

```
# raidcom check_ext_storage external_grp  -ldev_id 200
```

Executing the confirmation of connection and the LDEV recovery for the external volume group including the LDEV belonging to the device group: grp1.

```
# raidcom check_ext_storage external_grp -grp_opt ldev -
device_grp_name grp1
```

raidcom delete external_grp

Releases the mapping of the external volume to delete the registered external VOLs from the configuration. Only one external VOL is deleted in each operation. When the last external volume is deleted, the path group is also deleted.

This command is executed asynchronously with the command input. Check the completion of this process using the **raidcom get command_status** command.

Syntax

```
raidcom delete external_grp -external_grp_id <gno-sgno> [-forcible]
```

Options and parameters

Option	Description
-external_grp_id <gno-sgno>	Specifies the external volume group number (gno:1-16384, sgno: 1-4096). For example: • 52-11
[-forcible]	Specify this option to delete external volumes whose connection is not disconnected. Specifying this option deletes an external volume without writing data on cache to the external volume.

Example

Deleting the external volume group #1-1.

```
# raidcom delete external_grp -external_grp_id 1-1
```

Deleting external volume 1-1 whose connection is not disconnected without writing data on cache to the external volume.

```
# raidcom delete external_grp -external_grp_id 1-1 -forcible
```

raidcom disconnect external_grp

Disconnects the connection to the external volumes. Only one external VOL is operated in each operation.

You can specify an LDEV defined for the external volume group or a device group to which the LDEV in the external volume group belongs instead of the external volume group.

- If an LDEV is specified, CCI finds the external volume groups to which the specified LDEV belongs and displays the result.
- If a device group is specified, CCI finds the external volume groups to which the LDEV in the specified device group belongs and displays the result.

If no LDEV exists in the external volume group, the command is rejected with EX_ENOOBJ.

Before finishing the write processing from the cache to the external volume, the processing of `raidcom disconnect external_grp` command ends. Check the status (STS) using the `raidcom get path` command, and confirm the finishing of the write processing (destaging). (destaging). The following are the statuses (**STS**) after executing the `raidcom disconnect external_grp` command.

- **NML:** It means the previous status of receiving the request by the `raidcom disconnect external_grp` command.
- **SYN:** Write processing (destaging) is in process.
- **DSC:** Write processing (destaging) has finished.
- **BLK:** Write processing (destaging) has failed.

For details, see raidcom get path on page 5-126.

Syntax

```
raidcom disconnect external_grp {-external_grp_id <gno-sgno>
     | -ldev_id <ldev#>} | -grp_opt <group option>
     -device_grp_name <device group name> [<device name>]}
```

Options and parameters

Option	Description
-external_grp_id <gno-sgno>	Specifies the external volume group number (gno:1-16384, sgno: 1-4096). For example: • 52-11
-ldev_id <ldev#>	Specifies the LDEV number (0-65279). For example: • -ldev_id 200
-grp_opt <group option>	Specifies the device information extracted from the LDEV belonging to the device group. Specify "ldev" (fixed). The information of LDEV belonging to the device group is used.
-device_grp_name <device group name> [<device name>]	Specifies the name of device group (maximum 32 characters) to be operated. To operate an LDEV in the device group, specify the device name of LDEV (maximum 32 characters) within the device group. If the device name is omitted, all of the LDEVs belonging in the device group are operated.

Examples

Disconnect the connection to the external volume group #1-1.

```
# raidcom disconnect external_grp -external_grp_id 1-1
```

Disconnect the connection to the external volume group including the external volume (LDEV:200) to "blocked".

```
# raidcom disconnect external_grp -ldev_id 200
```

Disconnect the connection to the external volume group including the LDEV belonging to the device group: grp1.

```
# raidcom disconnect external_grp -grp_opt ldev -device_grp_name grp1
```

raidcom get external_grp

Displays the information of registered external volumes.

Syntax

```
raidcom get external_grp [-external_grp_id <gno-sgno>]
```

Options and parameters

Option	Description
[-external_grp_id <gno-sgno>]	Specifies the external volume group number (gno:1-16384, sgno: 1-4096). If this option is omitted, the list of the registered external volumes is displayed. If this option is specified. the LDEV information defined for the specified external volume group is displayed. For example: 52-11

Examples

Displaying external volume information (The display might not be in ascending order.).

```
#raidcom get external_grp
T GROUP Num_LDEV U(%) AV_CAP(GB) R_LVL  E_TYPE  SL  CL  DRIVE_TYPE
E 1-1    0        0       100     -     OPEN-V   0   0  OPEN-V
E 1-2    0        0        30     -     OPEN-V   0   0  OPEN-V
```

Description of each column in output example:

T: Type of the volume group

R: Parity group, E: External volume group

GROUP: External volume group number

Num_LDEV: number of LDEV assigned to the external volume group

U(%): usage rate of the external volume group

AV_CAP(GB): available capacity (free space) for the external volume group

R_LVL: RAID level of the parity group. As the external volume group is not relevant, "-" (bar) is displayed.

E_TYPE: base emulation type of the external volume group

SL: SLPR to which the external volume group belongs (always displays 0)

CL: CLPR to which the external volume group belongs

DRIVE_TYPE: Product ID included in the SCSI Inquiry command of the external volume group

Displaying the external volume information by specifying the external volume group:

```
# raidcom get external_grp -external_grp_id 01-01
T GROUP P_NO LDEV# STS LOC_LBA SIZE_LBA Serial#
E 1-1 0 - NML 0x000000000000 0x000000003f00 64034
E 1-1 1 200 NML 0x000000003f00 0x000000010000 64034
E 1-1 2 201 REG 0x000000013f00 0x000000010000 64034
E 1-1 3 - DEL 0x000000023f00 0x0000f0000000 64034
```

Description of each column in output example:

T: type of the volume group

R: Parity group, E: External volume group

GROUP: external volume group number.

P_NO: partition number in this external volume group.

LDEV#: LDEV number assigned to this external volume group.

STS: displays the following status.

- NML: an LDEV is installed.

- REG: an LDEV is being created.

- DEL: an LDEV is being deleted.

LOC_LBA: starting point of LBA for this partition on this external volume group, in blocks (512 bytes).

SIZE_LBA: partition size of this external volume group, in blocks (512 bytes).

Serial#: Product serial number. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

raidcom modify external_grp

Changes the attribute of external volume options (cache mode, cache inflow control mode, and MP blade ID setting).

Syntax

```
raidcom modify external_grp -external_grp_id <gno-sgno>
     {-cache_mode {y | n} | -cache_inflow {y | n}
     | -mp_blade_id <mp#>} | -load_balance <mode>
     |-alua_switch <y|n>
```

Options and parameters

Option	Description
-external_grp_id <gno-sgno>	Specifies the external volume group number (gno:1-16384, sgno: 1-4096). For example: • 52-11
-cache_mode {y | n}	Specifies whether to use the cache mode for an external volume. If the relevant external volume group is split into the multiple LDEVs and these LDEVs are allocated to the pools, you cannot change the setting for the cache mode. • y: Write cache enabled (E) • n: Write cache disabled (D) • through: Cache through (T). Available only when the attribute of the relevant external volume is NDM.

Option	Description
	• sync: Write Sync mode (S). Available only when the attribute of the relevant external volume is NDM.
-cache_inflow {y | n}	Specifies whether to use the Cache Inflow Control mode for an external volume. If the external volume group consists of multiple LDEVs and these LDEVs are allocated to the pool, you cannot change this parameter. • y: Cache Inflow Control mode enabled (E) • n: Cache Inflow Control mode disabled (D)
-mp_blade_id <mp#>	Specifies the MP blade ID (0-7). For example: -mp_blade_id 2
-load_balance <mode>	Specifies load distribution mode of the alternate paths. • normal: normal round robin • extended: extended round robin • disable: disables the alternate paths
-alua_switch <y|n>	Specifies whether the ALUA mode is used.

Examples

Turning the cache mode of the external volume group #01-01 ON.

```
# raidcom modify external_grp -external_grp_id 01-01 -cache_mode y
```

Enabling the Cache Inflow Control mode of the external volume group #01-01 ON.

```
# raidcom modify external_grp -external_grp_id 01-01 -cache_inflow y
```

Changing the MP blade ID of the external volume group #01-01 to "3".

```
# raidcom modify external_grp -external_grp_id 01-01 -mp_blade_id 3
```

raidcom discover external_storage

Searches the port information on the external storage system connected to the external port.

Syntax

```
raidcom discover external_storage -port <port#>
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number. Specifies the port number where the attribute is "ELUN(External)". For example: • CL1-A

Option	Description
	Displays an external port.

Example

Displaying the external storage system ports from the port: CL1-A.

```
# raidcom discover external_storage -port CL1-A
PORT WWN PM USED Serial# VENDOR_ID PRODUCT_ID
CL1-A 50060e8005fa0f36 M YES 60010 HITACHI VSP
CL1-A 50060e8005fa0f38 M YES 60010 HITACHI VSP
```

Description of each column in output example:

PORT: Displays the external port number of the storage system.

WWN: Displays the WWN which can be referred to from the port.

PM: Displays the path mode for external path.

- M: Multi
- S: Single
- A: APLB

USED: Displays whether this target WWN is used.

- YES: Used
- NO: Not used

Serial#: Product serial number of the external storage system. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a “3” added to the beginning (for example, “312345” = serial number 12345).

VENDOR_ID: Displays the vendor name of the external storage system. "OTHER" is displayed if an unsupported external storage system is connected.

PRODUCT_ID: Displays the system name of the external storage system. "OTHER" is displayed if an unsupported external storage system is connected.

raidcom add host_grp

Creates a host group or an iSCSI target on the specified port.

- If the port type is not iSCSI, this command creates a host group.
- If the port type is iSCSI, this command creates the iSCSI target (equivalent of a host group) and the iSCSI name.

If the specified port does not exist, the command is rejected with EX_ENOOBJ.

If the specified port/host group already exists, the existing host group name is changed to the specified host group name.

If the specified port, iSCSI target, and iSCSI name already exist, the existing information is changed to the specified information.

The specified host group name must be unique in a port.

Syntax

```
raidcom add host_grp -port <port#> -host_grp_name <host group name>
[-iscsi_name <target iscsi name>]
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number and the host group ID. For example: CL1-A-g (g is from 0 to 254)
-host_grp_name <host group name>	If the port type is other than iSCSI, specifies the HOST group name. Up to 64 characters can be set by CCI. If more than 64 characters are set, commands that specify host group name by CCI cannot be executed. If the port type is iSCSI, specifies the iSCSI target name. Up to 32 English one-byte characters can be set by CCI.

-iscsi_name <target iscsi name>	Specifies the iSCSI name by using either one of two formats, iqn or eui.
	• iqn format: "iqn." followed by up to 219 English one-byte characters. The permitted characters are:
	  ◦ Alphabet (A-Z, a-z)
	  ◦ Number (0-9)
	  ◦ Period (.)
	  ◦ Hyphen (-)
	  ◦ Colon (:)
	• eui format: "eui." followed by a 16-digit hexadecimal value.
	If this option is omitted, the default settings are specified. The default value depends on the serial number, the port number, or the target ID.

Examples

Creating a host group ID: 3, the host group name: a host group of Win_export, to the port: CL4-E.

```
# raidcom add host_grp -port CL4-E-3 -host_grp_name Win_export
```

Creating a host group ID: allocated automatically, the host group name: a host group of Win_export, to the port: CL4-E.

```
# raidcom add host_grp -port CL4-E -host_grp_name Win_export
```

Creating an iSCSI name: iqn.2014-04.jp.co.hitachi:xxx.h70.i.62510.1A.FF, iSCSI target name: Target00, to the port: CL4-E.

```
# raidcom add host_grp -port CL4-E -host_grp_name Target00
-iscsi_name iqn.2014-04.jp.co.hitachi:xxx.h70.i.62510.1A.FF
```

raidcom delete host_grp

(VSP G1000, G1500, and VSP F1500, VSP Gx00 models, VSP Fx00 models, and HUS VM) Deletes the specified host group or iSCSI target. This command also deletes the WWN/IQN or LUNs settings of the host registered for the host group or iSCSI target. If the port type of the port with the specified host group is not iSCSI, this command deletes the host group, and WWN and LUNs settings of the host registered to the host group. If the port type of the port with the specified iSCSI target is iSCSI, this command deletes the iSCSI target, and WWN and LUNs settings of the host (initiator) registered to the iSCSI target. However, if the host group ID of the host group or the target ID of the iSCSI target is 0, this command changes the settings back to the default.

(VSP only) Deletes the host groups on the specified port, and all WWN or LUN settings. If the LUSE configuration is defined, releases the LUSE.

When the specified host group is associated with an SPM group, the following information is deleted after the host group is deleted:

- Association between the SPM group and the host group
- SPM settings of the WWN registered in the host group
- Registration of the WWN in the SPM group

If no WWN is registered in the SPM group, the SPM group itself is also deleted.

If the specified port does not exist, the command is rejected with EX_ENOOBJ.

Syntax

```
raidcom delete host_grp -port <port#> [<host group name>]
```

Options and parameters

Option	Description
-port <port#> [<host group name>]	Specifies the port number, host group ID, and host group name (iSCSI target name for iSCSI). If the host group name or the iSCSI target name is more than 64 characters, use the host group ID or the iSCSI target ID. For example: • CL1-A-g (g is from 0 to 254) • CL1-A Linux_X86 • CL1-A Target00

Examples

Deleting the host group of port CL4-E, host group #7.

```
# raidcom delete host_grp -port CL4-E-7
```

Deleting the host group of port CL4-E, host group name: host group of Win_export.

```
# raidcom delete host_grp -port CL4-E Win_export
```

Deleting the target of port CL4-E, iSCSI target name: Target01.

```
# raidcom delete host_grp -port CL4-E Target01
```

raidcom get host_grp

Displays the information about all host groups or an iSCSI target that are defined on the specified port.

Syntax

```
raidcom get host_grp {-port <port#> [<host group name>]| -allports}
[-key <keyword>]
```

Options and parameters

Option	Description
-port <port#> [<host group name>]	Specifies the port number, host group ID, and host group name (iSCSI target name for iSCSI). If the host group name or the iSCSI target name is more than 64 characters, use the host group ID or the iSCSI target ID. For example: • CLI-A • CL1-A-g (g is from 0 to 254) • CL1-A Linux_X86 • CL1-A Target00 If you specified the above settings, the information about all host groups that are defined on the specified port is displayed regardless of the examples.
-allports	Displays the information about the host groups or the iSCSI target that is set to all ports.
[-key <keyword>]	Displays unavailable host group IDs. Specify host_grp in <keyword>.

Examples

Displaying the host group information set for the port: CL4-E (in case of other than iSCSI).

```
# raidcom get host_grp -port CL4-E
PORT   GID  GROUP_NAME      Serial#    HMD          HMO_BITs
CL4-E    0  Linux_x86       63528      LINUX/IRIX    2 13
CL4-E    1  Solaris         63528      SOLARIS       2 22
CL4-E    2  HP-UX           63528      HP-UX         40
CL4-E    3  Win_export      63528      WIN_EX        7
CL4-E    5  DEC             63528      TRU64         14
```

```
CL4-E    6  OpenVMS         63528      OVMS
CL4-E  254  RMTEST          63528      LINUX         7
# raidcom get host_grp -port CL4-E -key host_grp
PORT   GID  GROUP_NAME      Serial#    HMD          HMO_BITs
CL4-E  0    Linux_x86       63528      LINUX/IRIX   2 13
CL4-E  1    Solaris         63528      SOLARIS      2 22
CL4-E  2    HP-UX           63528      HP-UX        40
CL4-E  3    Win_export      63528      WIN_EX       7
CL4-E  5    DEC             63528      TRU64        14
CL4-E  6    OpenVMS         63528      OVMS
CL4-E  10   -               63528      -
CL4-E  11   -               63528      -
CL4-E  12   -               63528      -
CL4-E  13   -               63528      -
CL4-E  254  RMTEST          63528      LINUX         7
```

Displaying the iSCSI target information set for the port: CL4-E (in case of iSCSI).

```
# raidcom get host_grp -port CL4-E
PORT  GID  GROUP_NAME IQN      AMD  D Serial# HMD        HMO_BITs
CL4-E   0  Linux_x86  iqn.z1… CHAP S 63528   LINUX/IRIX 2 13
CL4-E   1  Solaris    iqn.z2… CHAP S 63528   SOLARIS    2 22
CL4-E   2  HP-UX      iqn.z3… CHAP S 63528   HP-UX      40
```

Displaying the information about the host groups or the iSCSI targets that are set to all ports.

```
# raidcom get host_grp -allports
PORT   GID   GROUP_NAME     Serial# HMD
CL1-A  0     Linux_x86        63528 LINUX/IRIX
CL1-A  1     Solaris          63528 SOLARIS
CL1-A  2     HP-UX            63528 HP-UX
CL1-A  3     Win_export       63528 WIN_EX
CL1-A  5     DEC              63528 TRU64
CL1-A  6     OpenVMS          63528 OVMS
CL1-A  254   RMTEST           63528 LINUX
CL1-B  0     Linux_x86        63528 LINUX/IRIX
CL1-B  1     Solaris          63528 SOLARIS
CL1-B  2     HP-UX            63528 HP-UX
CL1-B  3     Win_export       63528 WIN_EX
CL1-B  5     DEC              63528 TRU64
CL1-B  6     OpenVMS          63528 OVMS
CL1-B  254   RMTEST           63528 LINUX
# raidcom get host_grp -allports -key host_grp
PORT   GID   GROUP_NAME     Serial# HMD
CL1-A  0     Linux_x86        63528 LINUX/IRIX
CL1-A  1     Solaris          63528 SOLARIS
CL1-A  2     HP-UX            63528 HP-UX
CL1-A  3     Win_export       63528 WIN_EX
CL1-A  5     DEC              63528 TRU64
CL1-A  6     OpenVMS          63528 OVMS
CL1-A  10    -                63528 -
CL1-A  11    -                63528 -
CL1-A  12    -                63528 -
CL1-A  13    -                63528 -
CL1-A  254   RMTEST           63528 LINUX
CL1-B  0     Linux_x86        63528 LINUX/IRIX
CL1-B  1     Solaris          63528 SOLARIS
CL1-B  2     HP-UX            63528 HP-UX
CL1-B  3     Win_export       63528 WIN_EX
```

```
CL1-B  5     DEC              63528 TRU64
CL1-B  6     OpenVMS          63528 OVMS
CL1-B  10    -                63528 -
CL1-B  11    -                63528 -
CL1-B  12    -                63528 -
CL1-B  13    -                63528 -
CL1-B  254   RMTEST           63528 LINUX
```

Displaying only the host group IDs that are allocated to available resource groups for users.

PORT: Displays the port number.

GID: Displays the host group ID of a port.

GROUP_NAME: Displays the host group name of a port.

IQN: Displays the iSCSI Qualified Name of the port.

AMD: Displays the authentication mode of the iSCSI target.

- CHAP: CHAP authentication is enabled.
- NONE: Authentication is disabled.
- BOTH: Both CHAP authentication and connection by no-authentication are enabled.

D: Displays the direction of the authentication mode of the iSCSI target.

- S: Unidirectional (An initiator is recognized from the target side)
- D: Bidirectional (An initiator is recognized from the target side, and a target is recognized from the initiator)

Serial#: Product serial number. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

HMD: Displays the following HOST MODE for the host adapter setting on host group.

- HP-UX, SOLARIS, AIX, WIN, LINUX/IRIX, TRU64, DYNIX, OVMS, NETWARE, HI-UX
- VMWARE, HP-XP, VMWARE_EX, WIN_EX, UVM

HMO_BITs: Displays the host mode options of the host group. For details, see the *Provisioning Guide* for the storage system.

raidcom modify host_grp

Sets a host mode to the host group or an iSCSI target on the specified port.

If the specified host group does not exist, the command is ignored.

In case of iSCSI, set the CHAP authentication (enable/disable, or unidirectional/bidirectional).

Syntax

```
raidcom modify host_grp -port <port#> [<host group name>]
   -host_mode <host mode> [-host_mode_opt <host mode option>... |
   -set_host_mode_opt <host mode option>... | -reset_host_mode_opt]
   [-authmethod {CHAP|NONE|BOTH}] [-mutual {enable|disable}]
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number, host group ID, and host group name (iSCSI target name for iSCSI). If the host group name or the iSCSI target name is more than 64 characters, use the host group ID or the iSCSI target name. • CL1-A-g (g is from 0 to 254) • CL1-A Linux_X86 • CL1-A Target00
-host_mode <host mode>	Specifies the host mode using the following strings. For details, see the *Provisioning Guide* for the storage system. • LINUX or IRIX • VMWARE • HP-UX • OVMS • TRU64 • SOLARIS • NETWARE • WIN • AIX • VMWARE_EX • WIN_EX • UVM
[-host_mode_opt <host mode option>...]	This parameter remains for the compatibility with the old version. Use the -set_host_mode_opt option and -reset_host_mode_opt option.
[-set_host_mode_opt <host mode option> ...]	Specifies the host mode option. The other host mode options which you do not specify is cleared. For details about the host mode option, see the *Provisioning Guide* for the storage system.
[-reset_host_mode_opt]	Resets all host mode options. For details about the host mode option, see the *Provisioning Guide* for the storage system.
[-authmethod {CHAP|NONE|BOTH}]	Specifies the CHAP authentication mode. Even if the CHAP user name has not been specified yet, the CHAP authentication mode can be specified. This option must be specified in parallel with specifying the host mode. • CHAP: CHAP authentication is enabled. • NONE: Authentication is disabled.

Option	Description
	• BOTH: Both CHAP authentication and connection by no-authentication are enabled.
[-mutual {enable|disable}]	Specifies the CHAP authentication mode: unidirectional authentication, or bidirectional authentication. Even if the CHAP authentication mode is specified to NONE, CHAP authentication can be specified (when the authentication mode will be changed to CHAP, or BOTH, the specified mode will be enabled). This option must be specified in parallel with specifying the host mode. • enable: specifies bidirectional CHAP authentication (an initiator is recognized from the target side, and a target is recognized from the initiator). • disable: specifies unidirectional CHAP authentication (an initiator is recognized from the target).

Examples

Setting the host mode: HP-UX for the port: CL4-E, the host group: #2.

```
# raidcom modify host_grp -port CL4-E-2 -host_mode HP-UX
```

Setting the host mode: HP-UX and the host mode option: 2, 13 for the port: CL4-E, the host group: #2.

```
# raidcom modify host_grp -port CL4-E-2 -host_mode HP-UX -
set_host_mode_opt 2 13
```

Clearing the host mode options of the host mode: HP-UX of the port: CL4-E, the host group: #2.

```
# raidcom modify host_grp -port CL4-E-2 -host_mode HP-UX -
reset_host_mode_opt
```

Setting the host mode: HP-UX and the bidirectional CHAP authentication enabled for the port: CL4-E, the host group: #2.

```
# raidcom modify host_grp -port CL4-E-2 -host_mode HP-UX -authmethod
CHAP -mutual enable
```

raidcom add chap_user

This command sets the CHAP user name for the specified iSCSI target. Also this command registers the CHAP user name of the host on the initiator set in the specified iSCSI target. If the specified CHAP user name of the host on the initiator already exists, the registration is ignored.

Syntax

```
raidcom add chap_user -port <port#> [<host group name>]
     {-target_chap_user <user name>|-initiator_chap_user
     <user name>}
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number, target ID, or iSCSI target name. For example: • CL1-A-g (g is from 0 to 254) • CL1-A Target00
-target_chap_user <user name>	Specifies the CHAP user name for the iSCSI target. You can specify up to 223 characters. The maximum number of CHAP user names of the iSCSI target is 1 for each iSCSI target. For example: storage01
-initiator_chap_user <user name>	Specifies the CHAP user name on the initiator that is set as the iSCSI target. You can specify up to 223 characters. For example: Linux-abc

Examples

To set the CHAP user name "storage01" to the iSCSI target whose port is CL4-E and the host group ID is 0:

```
# raidcom add chap_user -port CL4-E-0 -target_chap_user storage01
```

To set the CHAP user name "storage02" to the host whose iSCSI target name is target00 and port is CL4-E:

```
# raidcom add chap_user -port CL4-E Target00 -target_chap_user
storage02
```

To register the CHAP user name "Linux-abc" to the host on the initiator whose iSCSI target name is target00 and port is CL4-E:

```
# raidcom add chap_user -port CL4-E Target00 -initiator_chap_user
Linux-abc
```

raidcom delete chap_user

This command deletes the CHAP user name from the specified iSCSI target. Also this command deletes the CHAP user name from the host on the initiator set in the specified iSCSI target. If the specified CHAP user name does not exist, the command is ignored.

Syntax

```
raidcom delete chap_user -port <port#> [<host group name>]
     {-target_chap_user <user name>|-initiator_chap_user
     <user name>}
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number, target ID, or iSCSI target name. For example: • CL1-A-g (g is from 0 to 254) • CL1-A Target00
-target_chap_user <user name>	Specifies the CHAP user name of the iSCSI target. For example: storage01
-initiator_chap_user <user name>	Specifies the CHAP user name of the host on the initiator. For example: Linux-abc

Examples

To delete the CHAP user name "storage01" from the iSCSI target whose port is CL4-E and the host group ID is 0:

```
# raidcom delete chap_user -port CL4-E-0 -target_chap_user storage01
```

To delete the CHAP user name "storage02" from the host whose iSCSI target name is target00 and port is CL4-E:

```
# raidcom delete chap_user -port CL4-E Target00 -target_chap_user
storage02
```

To delete the CHAP user name "Linux-abc" from the host on the initiator whose iSCSI target name is target00 and port is CL4-E:

```
# raidcom delete chap_user -port CL4-E Target00 -initiator_chap_user
Linux-abc
```

raidcom set chap_user

This command sets the password, called "secret", for the specified CHAP user. Both the host on the initiator and the host on the target are set by this command. To avoid a secret is given as an argument directly, the proper prompt is displayed to enter the secret. If the secret already exists for the specified CHAP user, the secret is overwritten.

Syntax

```
raidcom set chap_user -port <port#> [<host group name>] {-
target_chap_user <user name> -secret |-initiator_chap_user <user
name> -secret}
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number, target ID, or iSCSI target name. For example: • CL1-A-g (g is from 0 to 254) • CL1-A Target00
-target_chap_user <user name>	Specifies the CHAP user name of the iSCSI target. For example: storage01
-initiator_chap_user <user name>	Specifies the CHAP user name of the host on the initiator. For example: Linux-abc
-secret	Displays the prompt for entering a secret. Input characters as "secret", within the range of 12 characters to 32 characters, or an error occurs.

Examples

To set the "iSCSI-secret" for the "secret" to the user whose CHAP user name is storage01, port is CL4-E, and the target ID of the iSCSI target is 0:

```
# raidcom set chap_user -port CL4-E-0 -target_chap_user storage01 -
secret
Enter Secret :
(Enter "iSCSI-secret" after the "Enter secret: " above. The entered
characters are not displayed on the screen.)
```

To register the secret: Linux-secret for the CHAP user name "Linux-abc" from the host on the initiator whose iSCSI target name is target00 and port is CL4-E:

```
# raidcom set chap_user -port CL4-E Target00 -initiator_chap_user
Linux-abc -secret
Enter Secret :
(Enter "Linux-secret" after the "Enter secret: " above. The entered
characters are not displayed on the screen.)
```

raidcom reset chap_user

This command removes the secret from the specified CHAP user. Both the host on the initiator and the host on the target are set by this command.

Syntax

```
raidcom reset chap_user -port <port#> [<host group name>]
     {-target_chap_user <user name>|-initiator_chap_user
     <user name>}
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number, target ID, or iSCSI target name. For example: • CL1-A-g (g is from 0 to 254) • CL1-A Target00
-target_chap_user <user name>	Specifies the CHAP user name of the iSCSI target. For example: storage01
-initiator_chap_user <user name>	Specifies the CHAP user name of the host on the initiator. For example: Linux-abc

Examples

To delete the secret for the CHAP user name "storage01" from the iSCSI target whose port is CL4-E and the target ID is 0:

```
# raidcom reset chap_user -port CL4-E-0 -target_chap_user storage01
```

To delete the secret for the CHAP user name "Linux-abc" from the initiator host whose port is CL4-E:

```
# raidcom reset chap_user -port CL4-E Target00 -initiator_chap_user
Linux-abc
```

raidcom get chap_user

This command indicates the CHAP user name of the iSCSI target on the specified port and the CHAP user name of the host bus adapter on the initiator that is registered in the iSCSI target.

Syntax

```
raidcom get chap_user -port <port#> [<host group name>]
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number, target ID, or iSCSI target name. For example: • CL1-A-g (g is from 0 to 254) • CL1-A Target00

Examples

To display the CHAP user name whose port is CL4-E and whose host group ID is 0:

```
# raidcom get chap_user -port CL4-E-0
PORT  GID GROUP_NAME       CHAP_user           Serial# WAY Sec
CL4-E   0  Linux_x86       raidmanager         63528   INI *
CL4-E   0  Linux_x86       raidmanager1        63528   INI *
CL4-E   0  Linux_x86       raidmanager2        63528   INI *
CL4-E   0  Linux_x86       oracle              63528   TAR *
```

Description of each column in the output example:

- PORT: Displays the port.
- GID: Displays the host group ID of the port.
- GROUP_NAME: Displays the iSCSI target name of the port.
- CHAP_user: It indicates the CHAP user name of the iSCSI target and the CHAP user name of the host bath adapter which is registered in the iSCSI target.
- Serial#: Displays the Seq#.
- WAY: Indicates whether the CHAP user name on the iSCSI target or the CHAP user name on the host bus adapter (initiator).
  - TAR: iSCSI target side
  - INI: Host bus adapter (initiator) side
- Sec: An asterisk (*) is always displayed.

raidcom add hba_wwn

Registers the WWN of the host adapter to the host group on the specified port to add a host.

If the specified WWN already exists, this command is ignored. (VSP only) If the specified host group is associated with an SPM group, the WWN of the host adapter is registered. After that, the WWN is registered in the SPM group, and then the SPM information is set for the WWN.

Syntax

```
raidcom add hba_wwn -port <port#> [<host group name>]
     -hba_wwn <WWN strings>
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number, host group ID, and host group name. If the host group name is more than 64 characters, use the host group ID. For example: • CL1-A-g (g is from 0 to 254)

Option	Description
	• CL1-A Linux_X86
-hba_wwn <WWN strings>	Specifies the WWN (16-digit hexadecimal value) of the host adapter. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8

Example

Setting the WWN of host adapter: 210000e0,8b0256f8 to the port: CL4-E, the host group #0.

```
# raidcom add hba_wwn -port CL4-E-0 -hba_wwn 210000e0,8b0256f8
```

raidcom delete hba_wwn

Deletes the specified host (WWN) from the host group.

If the specified WWN does not exist, this command is ignored. (VSP only) If the specified host group is associated with an SPM group, the WWN of the host adapter is deleted, and then the SPM settings of the WWN and the registration of the WWN in the SPM group are deleted.

Syntax

```
raidcom delete hba_wwn -port <port#> [<host group name>]
     -hba_wwn <WWN strings>
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number, host group ID, and host group name. If the host group name is more than 64 characters, use the host group ID. For example: • CL1-A-g (g is from 0 to 254) • CL1-A Linux_X86
-hba_wwn <WWN strings>	Specifies the WWN (16-digit hexadecimal value) of the host adapter. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8

Example

Deleting the WWN of host adapter: 210000e0,8b039800 set for the port: CL4-E, the host group #0.

```
# raidcom delete hba_wwn -port CL4-E-0 -hba_wwn 210000e0,8b039800
```

raidcom get hba_wwn

Displays the WWN of the HBA registered to the host group.

Syntax

```
raidcom get hba_wwn -port <port#> [<host group name>]
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies s a port number, a host group ID, and a host group name. It cannot be specified when more than 64 characters is set for the host group name. Use the host group ID. If setting the host group ID or the host group name is omitted, the information about host group ID 0 is displayed. For example, • CLI-A • CL1-A-g (g is from 0 to 254) • CL1-A Linux_X86

Example

Displaying the WWN of host adapter set for the port: CL4-E, the host group 0.

```
# raidcom get hba_wwn -port CL4-E-0
PORT  GID GROUP_NAME             HWWN Serial#       NICK_NAME
CL4-E   0  Linux_x86 210000e08b0256f8   63528 ORA_NODE0_CTL_0
CL4-E   0  Linux_x86 210000e08b039c15   63528 ORA_NODE1_CTL_0
```

Description of each column in output example:

PORT: Displays the port number.

GID: Displays the host group ID of a port.

GROUP_NAME: Displays the host group name of a port.

HWWN: Displays the WWN of registered host adapter.

Serial#: Product serial number. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

NICK_NAME: Displays the Nick Name of the WWN of host adapter.

raidcom reset hba_wwn

Deletes the nickname from the specified WWN on the specified port.

If there is no specified port, the command is rejected with EX_ENOOBJ.

syntax

```
raidcom reset hba_wwn -port <port#>[<host group name>]
     -hba_wwn <WWN strings>
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number. For example: • CL1-A-g (g: 0-254) • CL1-A Linux_X86
-hba_wwn <WWN strings>	Specifies the WWN (16-digit hexadecimal value) of the host adapter. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8

Examples

Deleting the nickname that is given to the connection host "WWN: 210000e0,8b0256f8" to which the port: CL4-E and host group #0 are set.

```
# raidcom reset hba_wwn -port CL4-E-0 -hba_wwn 210000e0,8b0256f8
```

raidcom set hba_wwn

Sets a nickname (maximum 64 characters) to the specified WWN on the specified port.

If the specified port does not exist, the command is rejected with EX_ENOOBJ.

If a nickname exists for the specified WWN, it is changed as NEW.

Syntax

```
raidcom set hba_wwn -port <port#>[<host group name>]
     -hba_wwn <WWN strings> -wwn_nickname <WWN Nickname>
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number. For example: • CL1-A-g (g: 0-254) • CL1-A Linux_X86

Option	Description
-hba_wwn <WWN strings>	Specifies the WWN (16-digit hexadecimal value) of the host adapter. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8
-wwn_nickname <WWN Nickname>	Specifies the nickname (maximum 64 characters) to be assigned to the WWN of a specific port. You cannot specify the same nickname to another WWN in the same port.

Examples

Giving the nickname of "ORA_NODE0_CTL_0" to the connection host "WWN: 210000e0,8b0256f8" to which the port: CL4-E and host group #0 are set.

```
# raidcom set hba_wwn -port CL4-E-0 -hba_wwn 210000e0,8b0256f8
-wwn_nickname ORA_NODE0_CTL_0
```

raidcom add hba_iscsi

This command registers the iSCSI name (on the initiator) of the host bus adapter on the iSCSI target of the specified port in order to add hosts. If the specified iSCSI name already exists, the command is ignored.

Syntax

```
raidcom add hba_iscsi -port <port#> [<host group name>]
     -hba_iscsi_name <initiator iscsi name>
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number, target ID, or iSCSI target name. For example: • CL1-A-g (g is from 0 to 254) • CL1-A Target00
-hba_iscsi_name <initiator iscsi name>	Specifies the iSCSI name of the host bus adapter (initiator). You can specify within 223 characters. The maximum number of the host bus adapter is 255 for each port. For example: • iqn.win2k8.example.of.iqn.form • eui.0123456789ABCDEF

Examples

To set the iSCSI name "iqn.win2k8.example.of.iqn.form" of the host bus adapter whose port is CL4-E and whose target ID is 0:

```
# raidcom add hba_iscsi -port CL4-E-0 -hba_iscsi_name
iqn.win2k8.example.of.iqn.form
```

To set the iSCSI name "eui.0123456789ABCDEF" of the host bus adapter whose port is CL4-E and whose iSCSI target name is Target00:

```
# raidcom add hba_iscsi -port CL4-E Target00 -hba_iscsi_name eui.
0123456789ABCDEF
```

raidcom delete hba_iscsi

This command deletes the host (initiator iSCSI name) from the host group. If the specified initiator iSCSI name does not exist, the command is ignored.

Syntax

```
raidcom delete hba_iscsi -port <port#> [<host group name>]
     -hba_iscsi_name <initiator iscsi name>
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number, target ID, or iSCSI target name. For example: • CL1-A-g (g is from 0 to 254) • CL1-A Target00
-hba_iscsi_name <initiator iscsi name>	Specifies the iSCSI name of the host bus adapter (initiator). For example: • iqn.win2k8.example.of.iqn.form • eui.0123456789ABCDEF

Examples

To delete the iSCSI name "iqn.win2k8.example.of.iqn.form" of the host bus adapter from the host group whose port is CL4-E and the target ID is 0:

```
# raidcom delete hba_iscsi -port CL4-E-0 -hba_iscsi_name
iqn.win2k8.example.of.iqn.form
```

To delete the iSCSI name "eui.0123456789ABCDEF" of the host bus adapter from the host group whose port is CL4-E and the iSCSI target name is Target00:

```
# raidcom delete hba_iscsi -port CL4-E Target00 -hba_iscsi_name eui.
0123456789ABCDEF
```

raidcom set hba_iscsi

This command sets a nickname for the iSCSI name of the initiator on the specified port. If the specified port does not exist, the command is rejected

with EX_ENOOBJ. If the nickname already exists for the specified initiator iSCSI name, the existing nickname is overwritten.

Syntax

```
raidcom set hba_iscsi -port <port#>[<host group name>]
     -hba_iscsi _name <initiator iscsi name>
     -iscsi_nickname <initiator iscsi Nickname>
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number, target ID, or iSCSI target name. For example: • CL1-A-g g is from 0 to 254) • CL1-A Target00
-hba_iscsi_name <initiator iscsi name>	Specifies the iSCSI name of the host bus adapter (initiator). For example: • iqn.win2k8.example.of.iqn.form • eui.0123456789ABCDEF
-iscsi_nickname <initiator iscsi Nickname>	Specifies the nickname given to the iSCSI name of the initiator. You can specify up to 32 characters.

Examples

This command sets the nickname: ORA_NODE0_CTL_0 for the connection host iSCSI name: iqn.win2k8.example.of.iqn.form whose port is CL4-E and the target ID is 0.

```
# raidcom set hba_iscsi -port CL4-E-0 -hba_iscsi_name
iqn.win2k8.example.of.iqn.form -iscsi_nickname ORA_NODE0_CTL_0
```

raidcom reset hba_iscsi

This command removes the nickname from the iSCSI name of the initiator on the specified port. When the specified port does not exist, the command will be rejected with EX_ENOOBJ.

Syntax

```
raidcom reset hba_iscsi -port <port#> [<host group name>] -
hba_iscsi_name <initiator iscsi name>
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number, target ID, or iSCSI target name. For example: • CL1-A-g g is from 0 to 254) • CL1-A Linux_X86
-hba_iscsi_name <initiator iscsi name>	Specifies the iSCSI name of the host bus adapter (initiator). For example: • iqn.win2k8.example.of.iqn.form • eui.0123456789ABCDEF

Examples

This command removes the nickname from the connection host iSCSI name: iqn.win2k8.example.of.iqn.form whose port ID is CL4-E and the host group is 0.

```
# raidcom reset hba_iscsi -port CL4-E-0 -hba_iscsi_name
iqn.win2k8.example.of.iqn.form
```

raidcom get hba_iscsi

This command displays the iSCSI name of the host bus adapter on the initiator for each iSCSI target, which is registered as an iSCSI target.

Syntax

```
raidcom get hba_iscsi -port <port#> [<host group name>]
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number, target ID, or iSCSI target name. For example: • CL1-A-g (g is from 0 to 254) • CL1-A Target00

Examples

To display the iSCSI name of the host bus adapter whose port is CL4-E and the iSCSI target ID is 0:

```
# raidcom get hba_iscsi -port CL4-E-0
PORT  GID GROUP_NAME        IQN               Serial# NICK_NAME
CL4-E    0  Linux_x86       iqn.z1…            63528  ORA_NODE0_CTL_0
CL4-E    0  Linux_x86       iqn.z2…            63528  ORA_NODE1_CTL_0
```

Description of each column in the output example:

- PORT: Displays the port.
- GID: Displays the target ID of the port.
- GROUP_NAME: Displays the iSCSI target name of the port.
- IQN: Displays the iSCSI name of the registered host bus adapter.
- Serial#: Displays the Seq#.
- NICK_NAME: Displays the nickname of the iSCSI name for the host bus adapter.

raidcom add external_iscsi_name

This command registers the iSCSI name of the iSCSI target on the external storage system to the iSCSI port of the local storage system.

When the iSCSI name has been registered in the iSCSI port of the specified local storage system, this command sets the CHAP authentication mode, and enables or disables the mutual CHAP authentication mode. When the iSCSI name has been registered in the port other than the iSCSI port of the specified local storage system, the command registers the iSCSI name to the iSCSI port of the specified local storage system. In this case, the information about the CHAP authentication mode and the mutual CHAP authentication which have been set to the iSCSI target is used by the local storage system.

If the specified iSCSI port does not exist, the command is rejected with EX_ENOOBJ.

Syntax

```
raidcom add external_iscsi_name -port <port#> -iscsi_name
   <external iscsi name> -address <external IP address>
   [-authmethod {CHAP|NONE}] [-mutual {enable|disable}]
   [-tcp_port <value>]
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number of the local storage system. For example: • CL1-A
-iscsi_name <external iscsi name>	Specifies the iSCSI name of the iSCSI target on the external storage system in an iqn format or an eui format. • An iqn format: `iqn.` and the subsequent maximum 219 characters. • An eui format: `eui.` and the subsequent 16 characters in hexadecimal notation.
-address <external IP address>	Specifies the IP address of the iSCSI target on the external storage system. An IPv4 address or an IPv6 address can be specified. Note that the following addresses cannot be specified when you specify the IPv4 address: • Network address (for example: 192.168.10.*0*, *0*.120.10.1)

Option	Description
	• Broadcast address (for example: 255.255.255.*255*, 10.1.255.*255*) • Loop back address (for example: *127*.0.0.1) Note that the following addresses cannot be specified when you specify the IPv6 address: • Unspecified address (for example: *::*) • Multicast address (for example: *ff*:1024:1215::01) • Loop back address (for example: *::1*)
[-authmethod {CHAP|NONE}]	Can configure the CHAP authentication mode. Even if the CHAP user name has not been specified yet, the CHAP authentication mode can be configured. • CHAP: CHAP authentication mode is enabled. • NONE: The authentication mode is not configured. If this option is omitted, the current setting value is maintained. The initial value is "NONE".
[-mutual {enable| disable}]	Enables or disables the mutual CHAP authentication mode. Even if -authmethod option is configured to NONE, the mutual CHAP authentication mode can be enabled or disabled. When -authmethod option changes to CHAP from NONE, this option setting becomes to be enabled. • enable: The mutual CHAP authentication is enabled. An iSCSI target recognizes the iSCSI initiator and vice versa. • disable: The mutual CHAP authentication is disabled. An iSCSI target recognizes the iSCSI target. If this option is omitted, the current setting value is maintained. The initial value is "disable".
[-tcp_port <value>]	Specifies the TCP port number of the iSCSI target on the external storage system. If this option is omitted, the TCP port number of the iSCSI target port which is specified with -port option is configured.

Examples

When you register the iSCSI name of the iSCSI target (iSCSI name: iqn.z1, IP address: 158.214.135.100) on the external storage system to the iSCSI port: CL4-E of the local storage system:

```
# raidcom add external_iscsi_name -port CL4-E -iscsi_name iqn.z1 -
address 158.214.135.100
```

When you change the CHAP authentication mode of the iSCSI target (iSCSI name: iqn.z1, IP address: 158.214.135.100) on the external storage system which is registered in the iSCSI port: CL4-E of the local storage system to "CHAP" and the mutual CHAP authentication mode to "enable":

```
# raidcom add external_iscsi_name -port CL4-E -iscsi_name iqn.z1 -
address 158.214.135.100 -authmethod CHAP -mutual enable
```

When you register all iSCSI names of the iSCSI target on the external storage system which is registered in the port: CL2-E of the local storage system to the port: CL4-E:

```
# raidcom get external_iscsi_name | rmawk @1-eq:CL2-E exe="raidcom
add external_iscsi_name -port CL4-E -address @3 -iscsi_name @4"
```

When you register all iSCSI names of the iSCSI target on the external storage system which is registered in the port: CL2-E of the local storage system to the port: CL4-E. At this time, configure whether to enable the CHAP authentication mode and the mutual CHAP authentication mode:

```
# raidcom get external_iscsi_name | rmawk @1-eq:CL2-E | @7-eq:D
exe="raidcom add external_iscsi_name -port CL4-E -address @3 -
iscsi_name @4 -authmethod @6!u -mutual enable" -n exe="raidcom add
external_iscsi_name -port @1 -address @3 -iscsi_name @4 -authmethod
@6!u -mutual disable"
```

When you search the iSCSI name of the iSCSI target which exists in the iSCSI port (IP address: 10.213.60.111) on the external storage system, and register the detected iSCSI name to the iSCSI port: CL4-E of the local storage system.

```
# raidcom discover external_iscsi_name -port CL4-E -address
10.213.60.111 | rmawk @5-eq:N exe="raidcom add external_iscsi_name -
port @1 -address @3 -iscsi_name @6"
```

raidcom delete external_iscsi_name

This command deletes the iSCSI name of the iSCSI target on the external storage system which is registered in the specified iSCSI port of the local storage system.

If the specified iSCSI port of the local storage system does not exist, the command is rejected with EX_ENOOBJ. If the iSCSI name of the iSCSI target on the specified external storage system does not registered in the iSCSI port of the specified local storage system, this command is ignored.

Syntax

```
raidcom delete external_iscsi_name -port <port#> -iscsi_name
   <external iscsi name> -address <external IP address>
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number of the local storage system. For example: • CL1-A
-iscsi_name <external iscsi name>	Specifies the iSCSI name of the iSCSI target on the external storage system in an iqn format or an eui format. • An iqn format: `iqn.` and the subsequent maximum 219 characters. • An eui format: `eui.` and the subsequent 16 characters in hexadecimal notation.
-address <external IP address>	Specifies the IP address of the iSCSI target on the external storage system. An IPv4 address or an IPv6 address can be specified.

Option	Description
	Note that the following addresses cannot be specified when you specify the IPv4 address: • Network address (for example: 192.168.10.*0*, *0*.120.10.1) • Broadcast address (for example: 255.255.255.*255*, 10.1.255.*255*) • Loop back address (for example: *127*.0.0.1) Note that the following addresses cannot be specified when you specify the IPv6 address: • Unspecified address (for example: *::*) • Multicast address (for example: *ff*:1024:1215::01) • Loop back address (for example: *::1*)

Examples

When you delete the iSCSI name: iqn.z1 of the iSCSI target (IP address: 158.214.135.100) on the external storage system from the iSCSI port: CL4-E of the local storage system:

```
# raidcom delete external_iscsi_name -port CL4-E -iscsi_name iqn.z1 -
address 158.214.135.100
```

When you delete all iSCSI names of the iSCSI target on the external storage system which are registered in the iSCSI port: CL4-E of the local storage system:

```
# raidcom get external_iscsi_name | rmawk @1-eq:CL4-E exe="raidcom
delete external_iscsi_name -port @1 -address @3 -iscsi_name @4"
```

When you delete all iSCSI names of the iSCSI target which exists on the iSCSI port (IP address: 158.214.135.100) of the external storage system from the iSCSI port of the local storage system:

```
# raidcom get external_iscsi_name | rmawk @3-eq:158.214.135.100
exe="raidcom delete external_iscsi_name -port @1 -address @3 -
iscsi_name @4"
```

raidcom get external_iscsi_name

This command displays the iSCSI name of the iSCSI target on the external storage system which is registered in the iSCSI port of the specified local storage system.

If the iSCSI port does not exist in the specified local storage system, the command is rejected with EX_ENOOBJ.

Only the iSCSI names registered in the port to which the user who executes the command can refer are output. For details about the port to which the user can refer, see the descriptions of the relationship of the resource group and the command operation in the *Command Control Interface User and Reference Guide*.

Syntax

```
raidcom get external_iscsi_name [-port <port#>]
```

Options and parameters

Option	Description
[-port <port#>]	Specifies the port number of the local storage system. For example: • CL1-A

Examples

Displays all iSCSI targets of the external storage system which are registered in all iSCSI ports of the local storage system.

```
# raidcom get external_iscsi_name
PORT   Serial# IP_ADDR         IQN       WWN(pseudo)      AMD  D
CHAP_user    Sec
CL4-E    63528 158.214.135.100 iqn.z1    50060e80070a3640 CHAP D
Win_SQL_EX   *
CL2-E    63528 158.214.135.100 iqn.z2    50060e80070a3641 CHAP S
-            -
CL2-E    63528 158.214.135.102 iqn.z3    50060e80070a3642 CHAP S
-            -
CL4-E    63528 158.214.135.100 iqn.z2    50060e80070a3643 CHAP S
-            -
CL4-E    63528 158.214.135.102 iqn.z3    50060e80070a3644 CHAP S
-            -
CL4-E    63528 158.214.135.102 iqn.z4    50060e80070a3645 NONE S
-            -
CL4-E    63528 158.214.135.102 iqn.z5    50060e80070a3646 NONE S
-            -
```

Displays all iSCSI names of the iSCSI target on the external storage system which are registered in iSCSI port: CL4-E of the local storage system.

```
# raidcom get external_iscsi_name -port CL4-E
PORT   Serial# IP_ADDR         IQN       WWN(pseudo)      AMD  D
CHAP_user    Sec
CL4-E    63528 158.214.135.100 iqn.z1    50060e80070a3640 CHAP D
Win_SQL_EX   *
CL4-E    63528 158.214.135.100 iqn.z2    50060e80070a3643 CHAP S
-            -
CL4-E    63528 158.214.135.102 iqn.z3    50060e80070a3644 CHAP S
-            -
CL4-E    63528 158.214.135.102 iqn.z4    50060e80070a3645 NONE S
-            -
CL4-E    63528 158.214.135.102 iqn.z5    50060e80070a3646 NONE S
-            -
```

Description of each column in output example:

PORT

Displays the port number.

Serial#

Displays the product serial number.

IP_ADDR

Displays the IP address of the iSCSI target on the external storage system.

IQN

Displays the iSCSI name of the iSCSI target on the external storage system.

WWN(pseudo)

Displays the pseudo WWN of the iSCSI target on the external storage system. The pseudo WWN matches the iSCSI name of the iSCSI target and the IP address on the external storage system. The pseudo WWN is managed by each storage system. Therefore, if the iSCSI target on an external storage is shared within multiple storage systems, the pseudo WWN which is corresponded with an iSCSI target depends on the storage system.

AMD

Displays the authentication mode of the iSCSI target on the external storage system.

- CHAP: CHAP authentication is enabled.
- NONE: The authentication mode is not configured.

D

Displays the direction of the authentication mode of the iSCSI target.

- S: single directional (An iSCSI target recognizes the iSCSI target.)
- D: dual-directional (An iSCSI target recognizes the iSCSI initiator and vice versa.)

CHAP_user

Displays the CHAP user name of the iSCSI target on the external storage system. If the CHAP user name is not set, a hyphen (-) is displayed.

Sec

Displays an asterisk (*) when the secret is set to the iSCSI target on the external storage system. Otherwise, a hyphen (-) is displayed.

raidcom get initiator_iscsi_name

This command displays the iSCSI initiator of the iSCSI port on the specified local storage system.

If the iSCSI port does not exist in the specified local storage system, the command is rejected with EX_ENOOBJ.

Only iSCSI initiators of the port to which the user who executes the command can refer are output. For details about the port to which the user can refer, see the descriptions of the relationship of the resource group and the command operation in the *Command Control Interface User and Reference Guide*.

Syntax

```
raidcom get initiator_iscsi_name -port <port#>
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number of the local storage system. For example: • CL1-A

Examples

Displays the iSCSI initiator of the iSCSI port: CL4-E on the local storage system.

```
# raidcom get initiator_iscsi_name -port CL4-E
PORT   Serial# IP_ADDR         IQN       IP_PORT#  CHAP_user    Sec
CL4-E    63528 158.214.197.100 iqn.z1        3260  Elun_INI_4E  *
```

Displays the iSCSI initiator of the iSCSI port: CL2-E on the local storage system.

```
# raidcom get initiator_iscsi_name -port CL2-E
PORT   Serial# IP_ADDR         IQN       IP_PORT#  CHAP_user    Sec
CL2-E    63528 158.214.197.101 iqn.zx        3260  Elun_INI_2E  *
```

Description of each column in output example:

PORT

Displays the port number.

Serial#

Displays the product serial number.

IP_ADDR

Displays the IP address which is set to the iSCSI initiator of the iSCSI port on the local storage system.

IQN

Displays the iSCSI name which is set to the iSCSI initiator of the iSCSI port on the local storage system.

IP_PORT#

Displays the TCP port number of the iSCSI target which is registered in the iSCSI port on the local storage system.

CHAP_user

Displays the CHAP user name which is set in the iSCSI initiator of the iSCSI port on the local storage system. If the CHAP user name is not set, a hyphen (-) is displayed.

Sec

Displays an asterisk (*) when the secret is set to the iSCSI initiator of the iSCSI port on the local storage system. Otherwise, a hyphen (-) is displayed.

raidcom discover external_iscsi_name

From the iSCSI port of the local storage system, this command searches the iSCSI targets which is registered in the port of the external storage system, and then displays the iSCSI name of the iSCSI target.

To execute this command, the host which executes the command has to support IPv6. If the host does not support an IPv6, the command is rejected with EX_ENOSUP.

Syntax

```
raidcom discover external_iscsi_name -port <port#>
   -address <external IP address> [-tcp_port <value>]
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number of the local storage system. For example: • CL1-A
-address <external IP address>	Specifies the IP address of the iSCSI target on the external storage system. An IPv4 address or an IPv6 address can be specified. Note that the following addresses cannot be specified when you specify the IPv4 address: • Network address (for example: 192.168.10.*0*, *0*.120.10.1) • Broadcast address (for example: 255.255.255.*255*, 10.1.255.*255*) • Loop back address (for example: *127*.0.0.1)

Option	Description
	Note that the following addresses cannot be specified when you specify the IPv6 address: • Unspecified address (for example: *::*) • Multicast address (for example: *ff*:1024:1215::01) • Loop back address (for example: *::1*)
[-tcp_port <value>]	Specifies the TCP port number of the iSCSI target on the external storage system. If this option is omitted, the TCP port number of the iSCSI target port which is specified with -port option is configured.

Examples

Searches the iSCSI name of the iSCSI target which is registered in the iSCSI port (IP address: 10.213.60.111) on the external storage system from the iSCSI port: CL4-E of the local storage system, and then displays the iSCSI name:

```
# raidcom discover external_iscsi_name -port CL4-E -address
10.213.60.111
PORT   Serial# IP_ADDR         IP_PORT# R  IQN
CL4-E    63528 10.213.60.111       3260  N  iqn.z1
CL4-E    63528 10.213.60.111       3260  N  iqn.z2
```

Description of each column in output example:

PORT

Displays the port number.

Serial#

Displays the product serial number.

IP_ADDR

Displays the IP address of the iSCSI target on the external storage system.

IP_PORT#

Displays the TCP port number of the iSCSI target on the external storage system.

R

Displays whether or not the searched iSCSI target of the external storage system has been registered in the iSCSI port of the local storage system.

- Y: The iSCSI target has been registered in the iSCSI port.
- N: The iSCSI target has not been registered in the iSCSI port.

IQN

Displays the searched iSCSI name of the iSCSI target on the external storage system.

raidcom check external_iscsi_name

This command attempts to login to the iSCSI target on the external storage system which has been registered in the local storage system, and then displays the result of the login.

To execute this command, the host which executes the command has to support IPv6. If the host does not support an IPv6, the command is rejected with EX_ENOSUP.

Syntax

```
raidcom check external_iscsi_name [-port <port#>]
```

Options and parameters

Option	Description
[-port <port#>]	Specifies the port number of the local storage system. For example: • CL1-A

Examples

Attempts to login to the iSCSI target of all external storage system which are registered in the iSCSI port of the local storage system, and then display the result of login:

```
# raidcom check external_iscsi_name
PORT   Serial# IP_ADDR         IQN       IP_PORT# AMD  D
CHAP_user    Sec LOGIN
CL4-E    63528 158.214.135.100 iqn.z1        3260 CHAP D
Win_SQL_EX   *   OK
CL2-E    63528 158.214.135.100 iqn.z2        3260 CHAP S
-            -   OK
CL2-E    63528 158.214.135.102 iqn.z3        3260 CHAP S
-            -   OK
CL4-E    63528 158.214.135.100 iqn.z2        3260 CHAP S
-            -   OK
CL4-E    63528 158.214.135.102 iqn.z3        3260 CHAP S
-            -   OK
CL4-E    63528 158.214.135.102 iqn.z4        3260 NONE S
-            -   NG
CL4-E    63528 158.214.135.102 iqn.z5        3260 NONE S
-            -   NG
```

Attempts to login to the iSCSI target of the external storage system which is registered in the iSCSI port: CL4-E of the local storage system, and then display the result of login:

```
# raidcom check external_iscsi_name -port CL4-E
PORT   Serial# IP_ADDR         IQN       IP_PORT# AMD  D
CHAP_user    Sec LOGIN
CL4-E    63528 158.214.135.100 iqn.z1        3260 CHAP D
Win_SQL_EX   *   OK
CL4-E    63528 158.214.135.100 iqn.z2        3260 CHAP S
-            -   OK
CL4-E    63528 158.214.135.102 iqn.z3        3260 CHAP S
-            -   OK
CL4-E    63528 158.214.135.102 iqn.z4        3260 NONE S
-            -   NG
CL4-E    63528 158.214.135.102 iqn.z5        3260 NONE S
-            -   NG
```

Description of each column in output example:

PORT

Displays the port number.

Serial#

Displays the product serial number.

IP_ADDR

Displays the IP address of the iSCSI target on the external storage system.

IQN

Displays the iSCSI name of the iSCSI target on the external storage system.

IP_PORT#

Displays the TCP port number of the iSCSI target on the external storage system.

AMD

Displays the authentication mode of the iSCSI target on the external storage system.

- CHAP: CHAP authentication is enabled.
- NONE: The authentication mode is not configured.

D

Displays the direction of the authentication mode of the iSCSI target.

- S: single directional (An iSCSI target recognizes the iSCSI target.)
- D: dual-directional (An iSCSI target recognizes the iSCSI initiator and vice versa.)

CHAP_user

Displays the CHAP user name of the iSCSI target on the external storage system. If the CHAP user name is not set, a hyphen (-) is displayed.

Sec

Displays an asterisk (*) when the secret is set to the iSCSI target of the external storage system. Otherwise, a hyphen (-) is displayed.

LOGIN

Displays the result of the login.

raidcom modify external_chap_user

This command sets the CHAP user name and the secret (password) to the iSCSI target of the specified external storage system.

When you omit both the CHAP user name and secret, the CHAP user name and the secret which are set in the iSCSI target are deleted. If the iSCSI target of the specified external storage system has been registered in multiple iSCSI ports of the local storage system, the settings are applied to all iSCSI ports of the local storage system.

Syntax

```
raidcom modify external_chap_user -port <port#> -iscsi_name
   <external iscsi name> -address <external IP address>
   [-chap_user <user name> ] [-secret]
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number of the local storage system. For example: • CL1-A
-iscsi_name <external iscsi name>	Specifies the iSCSI name of the iSCSI target on the external storage system in an iqn format or an eui format. • An iqn format: `iqn.` and the subsequent maximum 219 characters. • An eui format: `eui.` and the subsequent 16 characters in hexadecimal notation.
-address <external IP address>	Specifies the IP address of the iSCSI target on the external storage system. An IPv4 address or an IPv6 address can be specified. Note that the following addresses cannot be specified when you specify the IPv4 address: • Network address (for example: 192.168.10.*0*, *0*.120.10.1) • Broadcast address (for example: 255.255.255.*255*, 10.1.255.*255*) • Loop back address (for example: *127*.0.0.1)

Option	Description
	Note that the following addresses cannot be specified when you specify the IPv6 address: • Unspecified address (for example: *::*) • Multicast address (for example: *ff*:1024:1215::01) • Loop back address (for example: *::1*)
[-chap_user <user name>]	Specifies the CHAP user name of the iSCSI target on the external storage system. You can input up to 223 characters for the name. For example: storage01
[-secret]	Displays the prompt for entering a secret. You can specify the secret within the range of 12 to 32 characters. If the characters you input for the secret are less than 12 characters, an error occurs. If the characters you input for the secret are more than 32 characters, the first 32 characters are valid. For the details of available characters for the secret when you use CCI, see Supported characters on page 1-12. Note that the space and back slash cannot be used.

Examples

When you set the CHAP user name: Elun_TAR_4E and the secret to the iSCSI target (iSCSI name: iqn.z1, IP address: 158.214.135.100) on the external storage system which is registered in the port: CL1-A of the local storage system:

```
# raidcom modify external_chap_user -port CL1-A -iscsi_name iqn.z1 -
address 158.214.135.100 -chap_user Elun_TAR_4E -secret
Enter Secret :
```

When you set the secret to the iSCSI target (iSCSI name: iqn.z1, IP address: 158.214.135.100) on the external storage system which is registered in the port: CL1-A of the local storage system:

```
# raidcom modify external_chap_user -port CL1-A -iscsi_name iqn.z1 -
address 158.214.135.100 -secret
Enter Secret :
```

When you delete the registered CHAP user name and the secret from the iSCSI target (iSCSI name: iqn.z1, IP address: 158.214.135.100) on the external storage system which is registered in the port: CL1-A of the local storage system:

```
# raidcom modify external_chap_user -port CL1-A -iscsi_name iqn.z1 -
address 158.214.135.100
```

raidcom modify initiator_chap_user

This command sets the CHAP user name and the secret to the iSCSI initiator of the specified local storage system. When you omit both the CHAP user name and secret, the CHAP user name and the secret which are set in the iSCSI initiator are deleted.

syntax

```
raidcom modify initiator_chap_user -port <port#>
   [-chap_user  <user name> ] [-secret]
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number of the local storage system. For example: • CL1-A
[-chap_user <user name>]	Specifies the CHAP user name of the iSCSI initiator on the external storage system. You can input up to 223 characters for the name. For example: storage01
[-secret]	Displays the prompt for entering a secret. You can specify the secret within the range of 12 to 32 characters. If the characters you input for the secret are less than 12 characters, an error occurs. If the characters you input for the secret are more than 32 characters, the first 32 characters are valid. For the details of available characters for the secret when you use CCI, see Supported characters on page 1-12. Note that the space and back slash cannot be used.

Examples

When you set the CHAP user name: Elun_INI_4E of the iSCSI initiator and the secret to the iSCSI port: CL4-E of the local storage system:

```
# raidcom modify initiator_chap_user -port CL4-E -chap_user
Elun_INI_4E -secret
Enter Secret :
```

When you set the secret of the iSCSI initiator to the iSCSI port: CL4-E of the local storage system:

```
# raidcom modify initiator_chap_user -port CL4-E -secret
Enter Secret :
```

When you delete the CHAP user name and the secret of the iSCSI initiator from the iSCSI port: CL4-E of the local storage system:

```
# raidcom modify initiator_chap_user -port CL4-E
```

raidcom add journal

Registers (adds) a volume to a journal.

This makes a journal for open systems (Open System) or mainframe (M/F System) according to the specified LDEVs.

If the journal already exists, the specified LDEV is added to the journal.

If the journal does not exist, you must create it first, and then add an LDEV.

If the **-timer_type** option is specified, this command makes the journal as "M/F System". If not, this command makes the journal as "Open System".

A device group can also be specified instead of an LDEV.

This command is executed asynchronously with the command input. Check the completion of this process using the `raidcom get command_status` command.

Syntax

```
raidcom add journal -journal_id <journal ID#> {-ldev_id <ldev#> …
     [-cnt <count>] | -grp_opt <group option>
     -device_grp_name <device group name> [<device name>]}
     [-mp_blade_id <mp#> | -timer_type <timer type> ]
```

Options and parameters

Option	Description
-journal_id <journal ID#>	Specifies the journal number (0-255).
-ldev_id <ldev#> …	Specifies the LDEV number (0-65279). Up to 64 LDEVs can be specified at a time. For example: • -ldev_id 200 • -ldev_id 100-110 • -ldev_id 100 -cnt 10
[-cnt <count>]	Specifies the count (2-64). If this option is omitted, "1" is used as the count.
-grp_opt <group option>	Specifies the device information extracted from the LDEV belonging to the device group. Specify "ldev" (fixed). The information of LDEV belonging to the device group is used.
-device_grp_name <device group name> [<device name>]	Specifies the name of device group (maximum 32 characters) to be operated. To operate an LDEV in the device group, specify the device name of LDEV (maximum 32 characters) within the device group. If the device name is omitted, all of the LDEVs belonging in the device group are operated.
[-mp_blade_id <mp#>]	Specifies the MP blade ID number (0-7). If this option is omitted, the device automatically allocates an MP blade ID number. For example: • -mp_blade_id 2
[-timer_type <timer type>]	Specifies the timer type: system, local, or None. For example: • -timer_type system • -timer_type local For details, see the Universal Replicator manual for the storage system.

Examples

Examples for open systems:

Creating a journal #1 of LDEVs: 265, 266.

```
# raidcom add journal -journal_id 1 -ldev_id 265 266
```

Creating a journal #1 with an LDEV belonging to the device group: grp1.

```
# raidcom add journal -journal_id 1 -grp_opt ldev -device_grp_name
grp1
```

Example for mainframe:

Creating a journal #1 with LDEVs: 265, 266. As a timer type, the system clock of the mainframe host is used. (When LDEV is added to the journal of M/F, it is required to specify the system clock of the mainframe host to the timer type.)

```
# raidcom add journal -journal_id 1 -ldev_id 265 266
-timer_type system
```

raidcom delete journal

Deletes a journal from the specified journal.

A device group can also be specified instead of an LDEV. If the LDEV and device group are not specified, a journal is deleted.

This command is executed asynchronously with the command input. Check the completion of this process using the `raidcom get command_status` command.

Syntax

```
raidcom delete journal -journal_id <journal ID#> [-ldev_id
   <ldev#> | -grp_opt <group option> -device_grp_name
   <device group name> [<device name>]]
```

Options and parameters

Option	Description
-journal <journal ID#>	Specifies the journal number (0-255).
[-ldev_id <ldev#>]	Specifies the LDEV number (0-65279). If the both LDEV and device group are not specified, journal is deleted. For example: • -ldev_id 200
-grp_opt <group option>	Specifies the device information extracted from the LDEV belonging to the device group. Specify "ldev" (fixed). The information of LDEV belonging to the device group is used.
-device_grp_name <device group	Specifies the name of device group (maximum 32 characters) to be operated.

Option	Description
name> [<device name>]	To operate an LDEV in the device group, specify the device name of LDEV (maximum 32 characters) within the device group. If the device name is omitted, all of the LDEVs belonging in the device group are operated. If the both LDEV and device group are not specified, journal is deleted.

Examples

Deleting the specified journal.

```
# raidcom delete journal -journal_id 6
```

Deleting the specified LDEV from the journal.

```
# raidcom delete journal -journal_id 6 -ldev_id 265
```

Deleting the LDEV belonging to the device group: grp1 from the journal.

```
# raidcom delete journal -journal_id 6 -grp_opt ldev
-device_grp_name grp1
```

raidcom get journal

Displays the information of registered journal.

Syntax

Displaying journal information

```
raidcom get journal [-key <keyword>]
```

Displaying timer-related information

```
raidcom get journalt
```

Options and parameters

Option	Description
[-key <keyword>]	Specifies the display keyword. Specify opt as <keyword>.

Examples

Displaying journal information.

```
# raidcom get journal
JID MU CTG JNLS AP U(%) Q-Marker Q-CNT D-SZ(BLK) Seq# Num LDEV#
001 0  1   PJNN 4  21   43216fde 30    512345    62500 4  265
002 1  2   PJNF 4  95   3459fd43 52000 512345    62500 3  270
002 2  2   SJNS 4  95   3459fd43 52000 512345    62500 3  270
003 0  3   PJSN 4  0    -        -     512345    62500 1  275
004 0  4   PJSF 4  45   1234f432 78    512345    62500 1  276
005 0  5   PJSE 0  0    -        -     512345    62500 1  277
```

Displaying Timer related information of the journal.

```
# raidcom get journalt
JID MU CTG JNLS AP U(%) Q-Marker Q-CNT D-SZ(BLK) Seq# DOW PBW APW
001 0  1   PJNN 4  21   43216fde 30    512345    63528 20 300 40
002 1  2   PJNF 4  95   3459fd43 52000 512345    63528 20 300 40
003 0  3   PJSN 4  0    -        -     512345    63528 20 300 40
```

Displaying option information of the journal.

```
# raidcom get journal -key opt
JID MU CTG JNLS TYPE TTYPE  MODE IF DOW(S) PBW(M) CR CS(bps) DM MP#
Seq#
001 0  1   PJNN OPEN -      HDD   E 30     5      M  256     Y  2
64034
002 1  2   PJNF M/F  system CACHE D 30     5      H  256     Y  2
64034
```

Description of each column in output example:

JID: Journal number.

MU: Mirror ID on Universal Replicator.

CTG: Consistency group ID.

JNLS: Status in the journal:

- SMPL: a journal volume that does not have a pair, or is being deleted.
- P(S)JNN: "P(S)vol Journal Normal Normal".
- P(S)JNS: "P(S)vol Journal Normal Suspend" created with **-nocsus** option.
- P(S)JSN: "P(S)vol Journal Suspend Normal".
- P(S)JNF: "P(S)vol Journal Normal Full".
- P(S)JSF: "P(S)vol Journal Suspend Full".
- P(S)JSE: "P(S)vol Journal Suspend Error" including link failure.
- P(S)JES: "P(S)vol Journal Error Suspend" created with **-nocsus** option.

AP: Number of active link paths of Universal Replicator.

U(%): Usage rate of journal volumes assuming the entire relevant volume is 100%.

Q-Marker: The P-VOL journal volume shows the newest sequential number (Q-marker) at the time of receiving WRITE data. The S-VOL journal volume shows the newest sequential number (Q-marker) written to the cache.

Q-CNT: Number of Q-markers remaining in the P-VOL journal volume.

D-SZ(BLK): Capacity of the data block size of the journal volume in units of 512 bytes.

For details about the displayed capacity, see *Hitachi Universal Replicator User Guide*.

Seq#: Serial number.

The serial number (Seq#) for VSP G1000, G1500, and VSP F1500 is displayed with a “3” at the beginning (“312345” = serial # 12345).

Num: Number of LDEVs configuring the journal volume.

LDEV#: LDEV number of the first LDEV which is belongs to the journal.

DOW: Data Overflow Watch timer setting (in seconds) per the Journal.

PBW: Path Blockade Watch timer setting (in seconds) per the Journal. If the setting is more than 3600 seconds, it displays 6000 seconds.

APW: Active Path Watch timer setting (in seconds) to detect any link failures.

TYPE: Open or M/F system.

TTYPE: Timer type for mainframe: System or Local.

MODE: Status of the journal:

- HDD: Store the journal data to the journal volume (cache mode disabled).
- CACHE: Store the journal data to the cache (cache mode enabled).

IF: Inflow control for journal:

- E: Enable
- D: Disable

DOW(S): Data Overflow Watch timer setting (in seconds) per the Journal.

PBW(M): Path Blockade Watch timer setting (in minutes) per the Journal. If the setting is more than 60 minutes, it displays 100 minutes.

CR: Copy rate: L (Low), M (Medium), or H (High).

CS(bps): Copy speed in Mbps: 3 (3 Mbps), 10 (10 Mbps), 100 (100 Mbps), or 256 (256 Mbps).

DM: Copy mode "Y" or "N" under failure of the delta resync:

- Y: copying ALL data.
- N: No copying.

MP#: MP blade ID.

raidcom modify journal

Changes the option of Universal Replicator to be used at journal, and sets the specified control parameter to the journal.

If you specify the **-mp_blade_id** option, you cannot specify the other options (-data_overflow_watch, -path_blocked_watch, -cache_mode, or -timer_type).

The **-timer_type** option must be specified to the journal on mainframe systems. This means that this option cannot be used for changing from "Open System" to "M/F System".

Syntax

When changing the data overflow watching time of journal data area, path blocked watch or the timer type, specify more than one option.

```
# raidcom modify journal -journal_id <journal ID#>
     {[-data_overflow_watch <time>][-cache_mode (y | n}]
     [-timer_type <timer type>][-copy_size <size>]}
```

When changing the path blocked watch.

```
# raidcom modify journal -journal_id <journal ID#>
     -path_blocked_watch <time> [-mirror_id <mu#>]
```

When changing the MP blade ID.

```
# raidcom modify journal -journal_id <journal ID#>
     -mp_blade_id <mp#>
```

Options and parameters

Option	Description
-journal_id <journal ID#>	Specifies the journal number (0-255).
-data_overflow_watch <time(sec)>	The data overflow watch timer (0-600) (second). Specifies the watch time for the journal data area being full. If 0 is specified, the setting of the data overflow watch timer is changed and the inflow control for journals is set to disabled.
-path_blocked_watch <time(min)>	The watch for the path blockage (1-60) (minute). Use Storage Navigator or Device Manager - Storage Navigator to set the value with more than 60 minutes. If 0 is specified, the time of the watch for the path blockage does not change, and the watch for the path blockage is invalid.
-cache_mode (y | n}	Specifies whether to use the cache mode. • y: Cache mode enabled (E) • n: Cache mode disabled (D)
[-timer_type <timer type>]	Specifies the timer type: system, local, or None. For example: • -timer_type system • -timer_type local For details, see the Universal Replicator manual for the storage system.
-mp_blade_id <mp#>	Specifies the MP blade ID (0-7). Changing MP blade ID should be executed during off-peak hours of I/O loading. Do not change the MP blade ID during initial copying of Universal Replicator (on-peak hours of I/O loading). To change the MP blade ID again for the same journal, wait for more than 30 minutes after changing the MP blade ID. For example:

Option	Description
	• -mp_blade_id 2
[-mirror_id <mu#>]	Specifies the Mirror ID. If the setting is omitted, "0" is used.
[-copy_size <size>]	Specify the <size> from 1 to 15 as follows. If you specify the large value as this option, the copy time shortens, but the I/O performance might deteriorate. If you do not use this option, the copy is performed at medium-speed. • 1 or 2: low-speed • 3: medium-speed • More than 4: high-speed

Examples

Changing the data overflow watch time for journal "6" to 15 seconds.

```
# raidcom modify journal -journal_id 6 -data_overflow_watch 15
```

Changing the settings for journal 6: data overflow watch time to 15 seconds, and the timer type to the system clock of the mainframe host.

```
# raidcom modify journal -journal_id 6 -data_overflow_watch 15
-timer_type system
```

Changing the the MP blade ID for journal "6" to 2.

```
# raidcom modify journal -journal_id 6 -mp_blade_id 2
```

Changing the setting for journal "6" to store journal data in the secondary journal to the cache.

```
# raidcom modify journal -journal_id 6 -cache_mode y
```

Changing the path block monitoring time of mirror ID 1 for journal "6" to 59 minutes.

```
# raidcom modify journal -journal_id 6 -path_blocked_watch 59
-mirror_id 1
```

raidcom add ldev

Adds an LDEV to the specified parity group or the external volume group. Or this adds V-VOL for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, active flash for mainframe, Thin Image, or Copy-on-Write Snapshot to the specified pool.

Alternatively, this command creates V-VOL for Dynamic Provisioning associated with a pool volume having the data direct mapping attribute.

This command is executed asynchronously with the command input. Check the completion of this process on the raidcom get command_status command.

Syntax

When creating an LDEV or V-VOL in the specified parity group, external volume group, or pool.

```
raidcom add ldev {-parity_grp_id <gno-sgno>|
   -external_grp_id <gno-sgno> | -pool {<pool ID#> |
    <pool naming> | snap}} {-ldev_id <ldev#> |
   -tse_ldev_id <ldev#>} {-capacity <size> |
   -offset_capacity <size> | -cylinder <size>}
   [-emulation <emulation type>][-location <lba>]
   [-mp_blade_id <mp#>][-clpr <clpr#>]
   [-status {enable_fullallocation | disable_fullallocation}] [-
t10pi_enable][-capacity_saving <capacity saving>]
```

When creating a V-VOL for Dynamic Provisioning associated with a pool volume having the data direct mapping attribute.

```
raidcom add ldev -ldev_id <ldev#> -mapping_ldev_id <ldev id>
```

Options and parameters

Option	Description
-parity_grp_id <gno-sgno>	Specifies the parity group number (gno:1-52, sgno:1-32) (for example, 3-1). Specifies one of the following options: -raid_grp, -external_grp_id, or -pool_id.
-external_grp_id <gno-sgno>	Specifies the external volume group number (gno:1-16384, sgno: 1-4096) (for example, 52-11 ("E" is not required)). Specifies one of the following options: -raid_grp, -external_grp_id, or -pool_id.
-pool {<pool ID#> | <pool naming> | snap}	Specifies a Pool ID or Pool name for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe when V-VOL is created to Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe pool. When only a number is specified, it is recognized as a pool ID. Therefore, when you specify a pool that the pool name is only a number, specify the pool ID instead of the pool name. When creating V-VOL for a Thin Image or Copy-on-Write Snapshot pool, specify "snap".
-ldev_id <ldev#> | -tse_ldev_id <ldev#>	Specifies the LDEV number (0-65279). If you specify -tse_ldev_id option, the volume is the same as the volume used by FlashCopy SE. When using -tse_ldev_id option, you must create the virtual volumes in Dynamic Provisioning for Mainframe. For example: • -ldev_id 200 • -tse_ldev_id 400

Option	Description
-capacity <size>	Specifies the capacity. The size can be specified in bytes or blocks. When specifying in bytes, the unit is t/T (terabyte), g/G (gigabyte), m/M (megabyte), or k/K (kilobyte). If this unit is omitted, block (512 bytes) is used. When specifying in bytes, note the following: • There is no size correction. • If the capacity of LDEVs that are created by GUI and by CLI are the same, a copy pair might not be created. To create a pair with an LDEV that was created by GUI, create the LDEV by specifying blocks. Example of specification: 1GB (gigabyte) is: -capacity 1G, -capacity 1g, -capacity 1024M, -capacity 1024m, -capacity 1048576K, -capacity 1048576k, -capacity 2097152 In the case of volumes other than OPEN-V, more free space than the capacity that was actually specified is required. For details, see the *Provisioning Guide* for the storage system. When you specify "all" instead of digits to create an OPEN-V LDEV and no LDEV has been created in the specified parity group* or the external volume group, the system allocates all empty space for the LDEV. If the empty space is larger than the maximum capacity of an LDEV, the system creates the LDEV with the maximum capacity and leaves the rest of the space as an empty space. *: "all" cannot be specified depending on the combination of the drive type and drive level because of the LDEV control area allocation, and so on. In this case specify bytes or blocks.
-offset_capacity <size>	Specifies capacity. Corrects the size as well as GUI for the specified capacity. The capacity can be specified in bytes or blocks. When specifying byte, the unit is t/T (terabyte), g/G (gigabyte), m/M (megabyte), or k/K (kilobyte).
-cylinder <size>	Specifies the size in cylinder unit. When specifying, the unit is t/T (teracylinder), g/G (gigacylinder), m/M (megacylinder), or k/K (kilocylinder). Cylinder is applied if you do not specify the unit. When an open-systems emulation type is specified, this option cannot be specified.
[-location <lba>]	Specifies the Location (the starting point of the LDEV to be created in the parity group/external volume group). If this specification is omitted, create a LDEV and close up in the free space.
[-emulation <emulation type>]	Specifies the emulation type (for example, OPEN-V). If this specification is omitted, OPEN-V is specified. If this specification is omitted when the virtual volume is crated, the following emulation type is specified. • OPEN-V: Dynamic Provisioning, Dynamic Tiering, or active flash • 3390-A: Dynamic Provisioning for Mainframe, Dynamic Tiering for Mainframe, or active flash for mainframe The values that can be specified for <emulation type> are:

Option	Description
	• OPEN-3, OPEN-8, OPEN-9, OPEN-E, OPEN-L, OPEN-V • 3380-3, 3380-3A, 3380-3B, 3380-3C • 3390-1, 3390-2, 3390-3, 3390-A, 3390-3A, 3390-3B, 3390-3C, 3390-3R, 3390-9, 3390-9A, 3390-9B, 3390-9C, 3390-L, 3390-LA, 3390-LB, 3390-LC, 3390-M, 3390-MA, 3390-MB, 3390-MC, 3390-V Some emulation types cannot be specified depending on the emulation type. ***Caution:*** You can specify 3390-3 or 3390-3R as the emulation type, but these are unable to be mixed. You can specify the 3380 series or the 3390 series as the emulation type for each parity group, but they are unable to be mixed for each 32 address boundary because of the OS restriction.
[-mp_blade_id <mp#>]	Specifies the MP blade ID (0-7). If this specification is omitted, it is allocated automatically.
[-clpr <clpr#>]	When you create virtual volumes by specifying the **-pool_id <pool#>** option, specify the CLPR ID. If you omit this option, the ID number of CLPR to which the pool is allocated is used.
[-status {enable_fullallocation | disable_fullallocation}]	Specifies an availability of Full Allocation when the virtual volume is used for Dynamic Provisioning, Dynamic Tiering, or active flash. If this specification is omitted, Full Allocation is disabled. • enable_fullallocation: Enables Full Allocation. If all areas equivalent to the sum of the pool capacities the specified volume requires can be reserved, it is guaranteed that all areas of DP-VOL are writable. • disable_fullallocation: Disables Full Allocation.
[-t10pi_enable]	Enables the T10 PI attribute.
-mapping_ldev_id <ldev id>	Creates the V-VOL for Dynamic Provisioning associated with the pool volume having the data direct mapping attribute. When you specify this option, the data direct mapping attribute is automatically set to the V-VOL to be created.
[-capacity_saving <capacity saving>]	Specifies the capacity saving setting. If you omit this option, a volume is created with the capacity saving function disabled. • disable: Capacity saving is disabled. • compression: Compression is enabled. • deduplication_compression: Deduplication and compression are enabled.

Examples

Creating an LDEV: 100 of size 10 GB in a parity group: 5-2.

Location in the parity group: automatic allocation, LDEV Emulation type: OPEN-V

```
# raidcom add ldev -parity_grp_id 5-2 -ldev_id 100 -capacity 10G
```

Creating an LDEV with the following conditions: Parity group: 5-3, location of the parity group: automatic allocation, Emulation type: 3390-3, Size: 10 M cylinder (Cylinder specification), LDEV: 120.

```
# raidcom add ldev -parity_grp_id 5-3 -ldev_id 120 -cylinder 10m -
emulation 3390-3
```

Creating an LDEV of position in the external volume: allocated automatically, emulation type: OPEN-V, External volume: 01-02, Capacity: 200 MB, and LDEV number: 200.

```
# raidcom add ldev -external_grp_id 01-02 -ldev_id 200 -capacity 200m
```

Creating an LDEV of external volume group: 01-03, position in the external volume: allocated automatically, emulation type: OPEN-V, External volume size: takeover, and LDEV number: 220.

```
# raidcom add ldev -external_grp_id 01-03 -ldev_id 220 -capacity all
```

Creating a V-VOL of Capacity: 300 MB and number: 300, to a pool for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe.

```
# raidcom add ldev -pool 4 -ldev_id 300 -capacity 300m
```

Creating a V-VOL of Capacity: 300 MB and LDEV number: 400, to a pool for Thin Image or Copy-on-Write Snapshot.

```
# raidcom add ldev -pool snap -ldev_id 400 -capacity 300m
```

Creating a V-VOL of Capacity: 300 MB, LDEV number: 300, and Full Allocation: enable, to the pool ID: 4 for Dynamic Provisioning.

```
# raidcom add ldev -pool 4 -ldev_id 300 -capacity 300m -status
enable_fullallocation
```

Creating a V-VOL (LDEV ID: 44:44) for Dynamic Provisioning associated with the pool volume (LDEV ID: 22:22) that has the data direct mapping attribute in the Dynamic Provisioning pool.

```
#raidcom add ldev -ldev_id 44:44 -mapping_ldev_id 22:22
```

Creating a V-VOL of Capacity: 300 MB, LDEV number: 300, and the T10 PI attribute: valid, in a pool (pool ID: 4) for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe.

```
# raidcom add ldev -pool 4 -ldev_id 300 -capacity 300m -t10pi_enable
```

Creating a V-VOL of Capacity: 300 MB, LDEV number: 300, and capacity saving setting: compression, in the pool (ID: 4) for Dynamic Provisioning.

```
# raidcom add ldev -pool 4 -ldev_id 300 -capacity 300m -
capacity_saving compression
```

raidcom delete ldev

Deletes the specified LDEVs or the V-VOLs. A device group can also be specified instead of an LDEV.

This command is executed asynchronously with the command input. Check the completion of this process on the raidcom get command_status command.

Syntax

```
raidcom delete ldev {-ldev_id <ldev#> | -grp_opt <group option>
     -device_grp_name <device group name>  [<device name>]}
```

Options and parameters

Option	Description
-ldev_id <ldev#> (0-65279)	Specifies the LDEV number (0-65279). For example: • -ldev_id 200
-grp_opt <group option>	Specifies the device information extracted from the LDEV belonging to the device group. Specify "ldev" (fixed). The information of LDEV belonging to the device group is used.
-device_grp_name <device group name> [<device name>]	Specifies the name of device group (maximum 32 characters) to be operated. To operate an LDEV in the device group, specify the device name of LDEV (maximum 32 characters) within the device group. If the device name is omitted, all the LDEVs belonging in the device group are operated.

Examples

Deleting an LDEV: 200.

```
raidcom delete ldev -ldev_id 200
```

Deleting an LDEV belonging to the device group: grp1.

```
raidcom delete ldev -grp_opt ldev -device_grp_name grp1
```

raidcom extend ldev

Extends the capacity of a V-VOL for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe.

If the specified LDEV is not a V-VOL of Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe, the command is rejected with EX_ENOOBJ.

A device group can also be specified instead of an LDEV.

Syntax

```
raidcom extend ldev {-ldev_id <ldev#> | -grp_opt <group option>
     -device_grp_name <device group name> [<device name>]}
     -capacity <size> | -offset_capacity <size> | -cylinder <size>
```

Options and parameters

Option	Description
-ldev_id <ldev#> (0-65279)	Specifies the LDEV number (0-65279). Specify LDEVs for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe. For example: • -ldev_id 200
-grp_opt <group option>	Specifies the device information extracted from the LDEV belonging to the device group. Specify "ldev" (fixed). The information of LDEV belonging to the device group is used.
-device_grp_name <device group name> [<device name>]	Specifies the name of device group (maximum 32 characters) to be operated. To operate an LDEV in the device group, specify the device name of LDEV (maximum 32 characters) within the device group. If the device name is omitted, all the LDEVs belonging in the device group are operated.
-capacity <size>	The increment size of capacity can be specified in bytes or blocks. When specifying in bytes, the unit is t/T (terabyte), g/G (gigabyte), m/M (megabyte), or k/K (kilobyte). If this unit is omitted, block (512 bytes) is used. Example of specification: 1GB (gigabyte) is: -capacity 1G, -capacity 1g, -capacity 1024M, -capacity 1024m, -capacity 1048576K, -capacity 1048576k, -capacity 2097152
-offset_capacity <size>	Specifies capacity. Corrects the size as well as GUI for the specified capacity. The capacity can be specified in bytes or blocks.
-cylinder <size>	Specifies the size in cylinder unit. When specifying, the unit is g/G (gigabyte), m/M (megabyte), or k/K (kilobyte). Cylinder is applied if you do not specify the unit. When the emulation type for the Open System is specified, this option cannot be specified.

Examples

Extending the capacity of a Dynamic Provisioning or Dynamic Provisioning for Mainframe V-VOL: 200 by 10 GB.

```
# raidcom extend ldev -ldev_id 200 -capacity 10G
```

Extending the capacity of a Dynamic Provisioning or Dynamic Provisioning for Mainframe V-VOL: 201 by 200 MB.

```
# raidcom extend ldev -ldev_id 201 -capacity 200M
```

Extending the capacity of Dynamic Provisioning or Dynamic Provisioning for Mainframe V-VOL belonging to the device group: grp1 by 200 MB.

```
# raidcom extend ldev -grp_opt ldev -device_grp_name grp1 -capacity
200M
```

raidcom get ldev

Displays the information of the specified LDEV or the device file. A device group can also be specified instead of an LDEV.

Syntax

```
raidcom get ldev {-ldev_id <ldev#> … [-cnt <count>] |
   -grp_opt <group option> -device_grp_name <device group
   name> [<device name>] | -ldev_list <ldev list option>}
   [-key <keyword>][{-check_status | -check_status_not}
   <string>... [-time <time>]]
```

Options and parameters

Option	Description
-ldev_id <ldev#> …	Specifies the LDEV number (0-65279). For example: • -ldev_id 200 • -ldev_id 100-110 • -ldev_id 100 -cnt 10
[-cnt <count>]	Specifies the count (2-65280). If this option is omitted, the count is set to one.
-grp_opt <group option>	Specifies the device information extracted from the LDEV belonging to the device group. Specify "ldev" (fixed). The information of LDEV belonging to the device group is used.
-device_grp_name <device group name> [<device name>]	Specifies the name of device group (maximum 32 characters) to be operated. To operate an LDEV in the device group, specify the device name of LDEV (maximum 32 characters) within the device group. If the device name is omitted, all the LDEVs belonging in the device group are operated.
-ldev_list <ldev list option>	Specifies the type of LDEVs to display. Specify one of the following LDEV list options. • defined: Displays all implemented LDEVs. • dp_volume: Displays LDEVs that have Dynamic Provisioning attributes. Combining this with -pool_id <pool id> specification displays LDEVs that have Dynamic Provisioning attributes related to the specified POOL. • external_volume: Displays external volumes. • undefined: Displays all LDEV numbers that are not implemented. • mapped: Displays all LDEVs to which LU paths are defined. Combining this with -pool_id <pool id> specification displays LDEVs (defined the LU path) relate to the specified POOL. • unmapped: Displays all LDEVs to which LU paths are defined. However, LDEVs that are not implemented are not displayed because they cannot specify the LU path.

Option	Description
	Combining this with -pool_id <pool id> specification displays LDEVs (not defined the LU path) relate to the specified POOL. • journal -journal_id <journal id>: Displays LDEVs that belong to the specified journal. • pool -pool_id <pool id>: Displays LDEVs that belong to the specified pool. If a -pool_id option is non-numeric, the specified value is recognized as a pool name to identify the pool ID. • parity_grp -parity_grp_id <parity group id>: Displays LDEVs that belong to the specified parity group. • mp_blade -mp_blade_id <mp#>: Displays LDEVs that are set to the specified MP blades. • quorum: Displays LDEVs set for the quorum disks. If the LDEV that meets the specified condition does not exist, `[EX_ENODEV] No such device` is displayed.
[-key <keyword>]	Specifies a display keyword. If this option is omitted, basic LDEV information is displayed. If this option is specified, the following information is displayed. The following display keywords can be specified: front_end: Front-end information parity_grp: Parity group information external: External volume information tier: Tier information for the Dynamic Tiering or active flash V-VOL.

[-check_status <string>... [-time <time>]]	Check if the LDEV is in the same state as the specified in <string>. If the option contains multiple states, the OR condition check is performed and verifies that the LDEV is in one of the states contained in the option.
	The following strings are specified in the <string>.
	• STS
	  ◦ NML: Normal
	  ◦ BLK: Blocked
	  ◦ BSY: Status is changing
	• OPE_TYPE
	  ◦ FMT: Formatting
	  ◦ QFMT: Quick formatting
	  ◦ CCOPY: Data copying (Correction copy / Copy back / Drive copy / Dynamic sparing)
	  ◦ CACCS: Accessing to collections
	  ◦ NONE: Not in operation
	  ◦ SHRD: Shredding
	  ◦ ZPD: Page discarding
	  ◦ SHRPL: Deleting from the pool
	  ◦ RLC: Pool relocating
	  ◦ RBL: Pool rebalancing

Option	Description

	• VOL_TYPE
	  ◦ NOT DEFINED: An LDEV is not installed
	  ◦ DEFINING: An LDEV is being created
	  ◦ REMOVING: An LDEV is being deleted
	If "-time" is specified, the status of the LDEV is checked every three seconds until the end of the specified <time> (seconds).
	When this option is specified, the returned values are as follows.
	• The LDEV is in one of the specified states: 0
	• The LDEV is in none of the specified states (without -time option): 1
	• The LDEV is in none of the specified states (when the specified <time> passed): EX_EWSTOT

[-check_status_not <string>... [-time <time>]]	Check that the LDEV is not in the same state as the specified in <string>. If the option contains multiple states, the NOR condition check is performed and verifies that the LDEV is not in any of the states contained in the option.
	The following strings are specified in the <string>.
	• STS
	  ◦ NML: Normal
	  ◦ BLK: Blocked
	  ◦ BSY: Status is changing
	• OPE_TYPE
	  ◦ FMT: Formatting
	  ◦ QFMT: Quick formatting
	  ◦ CCOPY: Data copying (Correction copy / Copy back / Drive copy / Dynamic sparing)
	  ◦ CACCS: Accessing to collections
	  ◦ NONE: Not in operation
	  ◦ SHRD: Shredding
	  ◦ ZPD: Page discarding
	  ◦ SHRPL: Deleting from the pool
	  ◦ RLC: Pool relocating
	  ◦ RBL: Pool rebalancing
	• VOL_TYPE
	  ◦ NOT DEFINED: An LDEV is not installed
	  ◦ DEFINING: An LDEV is being created
	  ◦ REMOVING: An LDEV is being deleted
	If "-time" is specified, the status of the LDEV is checked every three seconds until the end of the specified <time> (seconds).
	When this option is specified, the returned values are as follows.
	• The LDEV is not in any of the specified states: 0
	• The LDEV is in one of the specified states (without -time option): 1

Option	Description
	• The LDEV is in one of the specified states (when the specified <time> passed): EX_EWSTOT

Some keywords might not be displayed depending on the LDEV attribute as shown below.

LDEV attribute		Front end	Parity group	External	Tier
Normal volume	Internal volume	Y	Y	N	Y
	External volume	Y	N	Y	Y
POOL Volume for Thin Image, Copy-on-Write Snapshot, Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe	Internal volume	N	Y	N	N
	External volume	N	N	Y	N
Journal volume	Internal volume	N	Y	N	N
	External volume	N	N	Y	N

Legend Y: Displayed, N: Not displayed

Examples

Internal volume examples

Displaying the information of the LDEV number 577 (internal VOL)

```
# raidcom get ldev -ldev_id 577
Serial# : 63502 PHY_Serial#  : 302594
LDEV : 577 PHY_LDEV : 600
SL : 0
CL : 0
VOL_TYPE : OPEN-V-CVS
VOL_Capacity(BLK) : 2181120
NUM_LDEV : 1
LDEVs : 577
NUM_PORT : 2
PORTs : CL2-E-0 1 Linux_X86 : CL2-E-1 1 Solaris
F_POOLID : NONE
VOL_ATTR : CVS
RAID_LEVEL : RAID1
```

```
RAID_TYPE : 2D+2D
NUM_GROUP : 1
RAID_GROUPs : 02-01
DRIVE_TYPE : DKS2C-K072FC
DRIVE_Capa : 141822798
LDEV_NAMING : Oracle_data_1
STS : NML
OPE_TYPE : QFMT
OPE_RATE : 100
MP# : 2
SSID:001F
ALUA : Enable
RSGID : 0
```

Description of each column in output example:

Serial#: Product serial number. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

The virtual serial number is displayed when you specify a volume that is virtualized by the global storage virtualization function using the virtual LDEV number.

PHY_Serial#: If you specify a volume that is virtualized by the global storage virtualization function using the virtual LDEV number, the serial number of VSP G1000, G1500, and VSP F1500 or VSP Gx00 models is displayed. In other cases, this item is not displayed.

LDEV: LDEV number.

PHY_LDEV:

- LDEV number of VSP G1000, G1500, and VSP F1500 or VSP Gx00 models. This item is displayed only when you specify a volume that was virtualized by the global storage virtualization function using the virtual LDEV number.
- LDEV number of VSP or HUS VM. This item is displayed only when you specify a volume that was virtualized by the Resource ID takeover function using the virtual LDEV number when you input the raidcom get ldev command. This item and VIR_LDEV are not displayed at the same time.

VIR_LDEV:

- Virtual LDEV number. This item is displayed only when you specify a volume that was virtualized by the global storage virtualization function using the LDEV number (VSP G1000, G1500, and VSP F1500 or VSP Gx00 models) and it is different from the virtual LDEV number. When the virtual LDEV number is not given to the volume, "FF:FE(65534)" is displayed. When you set the reserve attribute of global-active device to the volume, "FF:FF(65535)" is displayed. This item is displayed only when the volume is virtualized by global storage virtualization, and this item is displayed on the place where PHY_LDEV is displayed in the example (Displaying the information of the LDEV number 577 (internal VOL)). This item and PHY_LDEV are not displayed at the same time.

- Virtual LDEV number of VSP or HUS VM. This item is displayed only when you specify a volume that was virtualized by the Resource ID takeover function using the LDEV number when you input the raidcom get ldev command. If the virtual LDEV number is not given, "FF:FE(65534)" is displayed. This item is displayed in the same position as PHY_LDEV. This item and PHY_LDEV are not displayed at the same time.

SL: SLPR information ("0" is displayed for storage systems other than USP V/VM).

CL: CLPR information.

VOL_TYPE: Emulation type of the relevant LDEV. Displays the same name as the product ID of the Inquiry command. For open-systems LDEVs, a string is appended to the emulation type to indicate the LDEV attribute:

- *n: LUN Expansion (LUSE)
- -CVS: Virtual LVI/LUN
- -A: ALU
- -S: SLU
- -CM: command device

If the LDEV is not installed or is in the process of being created or deleted, the status is one of the following:

- NOT DEFINED: An LDEV is not installed.
- DEFINING: An LDEV is being created.
- REMOVING: An LDEV is being deleted.

VOL_Capacity (BLK): capacity of LDEV in block size.

VOL_Capacity(cyl): capacity of LDEV in cylinder size. Displayed only when the attribute is MF-VOL.

NUM_LDEV: number of LDEVs that configures the LU where the specified LDEV is belongs to.

LDEVs: number of LDEV in the LU.

NUM_PORT: number of ports defined to the paths for relevant LDEV. When the relevant LDEV is a mainframe volume or a multiplatform volume without the LU path definition, the number of ports for the dummy LU is displayed. For details about the dummy LU, see the *Command Control Interface User and Reference Guide*.

PORTs: ports defined to the paths for the relevant LDEV. It lists up the ports defined to the paths for the relevant LDEV. When the relevant LDEV is a mainframe volume or a multiplatform volume without the LU path definition, the port number of the dummy LU is displayed.

F_POOLID: pool ID if the LDEV is a component of the pool. In other cases, "NONE" is displayed.

VOL_ATTR: attributes of the LDEV.

- CMD: Command device (open-systems only)
- CLUN: Cache LUN (DCR)
- CVS: CVS volume
- LUSE: LUSE volume
- ALUN: Volume Migration volume
- ELUN: External volume
- OLG: Open LDEV Guard volume
- VVOL: V-VOL
- HORC: The remote copy pair volumes:
    - TrueCopy/TrueCopy for Mainframe, Universal Replicator/Universal Replicator for Mainframe, global-active device: P-VOL or S-VOL
- MRCF: ShadowImage volume (P-VOL or S-VOL)
- QS: Thin Image or Copy-on-Write Snapshot volume (P-VOL or S-VOL)
- JNL: JNL volume
- HDP: volume for Dynamic Provisioning or Dynamic Provisioning for Mainframe
- HDT: volume for Dynamic Tiering (HDT), Dynamic Tiering for Mainframe, active flash, or active flash for mainframe
- POOL: POOL volume
- QRD: Quorum disk
- ENCD: Encryption disk
- SYSD: System disk
- TSE: Dynamic Provisioning for Mainframe volumes that are used in FlashCopy SE.
- GAD: Global-active device volume
- HNASS: a volume used as the system LU of Hitachi NAS
- HNASU: a volume used as a user LU of Hitachi NAS
- MG: a volume for the data migration
- T10PI: a volume of which T10 PI is enabled
- DSD: Deduplication system data volume

RAID_LEVEL: RAID level (RAID1, RAID5, or RAID6).

RAID_TYPE: configuration of the drives.

NUM_GROUP: number of parity groups where the relevant LDEV is belongs to.

RAID_GROUPs: parity groups where the relevant LDEVs are belong to.

DRIVE_TYPE: type of HDD drive where the relevant LDEV is configured.

DRIVE_Capa: capacity of relevant HDD in the number of block (512 bytes) (decimal number).

LDEV_NAMING: nickname of the LDEV.

STS: status of the LDEV:

- NML: Normal
- BLK: Blocked
- BSY: Status is changing
- NONE: unknown state (not supported)

OPE_TYPE: current operation.

- FMT: Formatting
- QFMT: Quick formatting
- CCOPY: Data copying (Correction copy / Copy back / Drive copy / Dynamic sparing)
- CACCS: Accessing to collections
- NONE: Not in operation
- SHRD: Shredding
- ZPD: Page Discarding
- SHRPL: Deleting from the pool
- RLC: Pool relocating
- RBL: Pool rebalancing

OPE_RATE: progress of the format or shred operation. When the status is other than formatting or shredding, 100 is displayed. If the process ended abnormally, "BSY" is displayed on the "STS".

MP#: MP blade ID.

SSID: storage subsystem ID number (hexadecimal). The Unified Storage VM does not support SSID but displays the specified value.

ALUA: ALUA mode

- Enable: The ALUA mode is enabled.
- Disable: The ALUA mode is disabled.

RSGID: Displays the resource group ID of the resource group to which the LDEV belongs.

Displaying front-end information of the LDEV number 577

```
# raidcom get ldev -ldev_id 577 -key front_end
 Serial# LDEV# SL CL VOL_TYPE  VOL_Cap(BLK) PID ATTRIBUTE Ports
  PORT_No:LU#:GRPNAME …
63502    577   0  0 OPEN-V-CVS 2181120     -         CVS 2
  CL2-E-0:1:Linux_X86 CL2-E-1:1:Solaris
```

Description of each column in output example:

PID: pool ID for a virtual volume. If the volume is not a virtual volume, a hyphen (-) is displayed.

ATTRIBUTE: LDEV attribute. Same as VOL_ATTR.

Displaying back-end (parity group) information of the LDEV number 577

```
# raidcom get ldev -ldev_id 577 -key parity_grp
 Serial# LDEV# SL CL PID ATTRIBUTE R_LVL RAID_TYPE DRV_TYPE DRV_Cap
GRPs RAID_GRP …
   63502 577 0 0 - CVS RAID1 2D+2D DKS2C-K072FC 141822798 1 02-01
```

Check if the LDEV number 577 is in normal status

```
# raidcom get ldev -ldev_id 577 -check_status NML
```

Check if the LDEV number 577 is in blocked status

```
# raidcom get ldev -ldev_id 577 -check_status BLK
```

Set in wait status for 30 seconds until the formatting process of LDEV number 577 is complete

```
# raidcom get ldev -ldev_id 577 -check_status_not FMT -time 30
raidcom:[EX_EWSTOT]Timeout waiting for specified status
Refer to the command log(/HORCM/log0/horcc_rmhost.log) for details.
# raidcom get ldev -ldev_id 577 -check_status_not FMT -time 30
raidcom:[EX_EWSTOT]Timeout waiting for specified status
```

(The command fails if the FMT does not change (is not complete) in 30 seconds.)

External volume examples

Displaying the information of the LDEV number 160 (external VOL)

```
# raidcom get ldev -ldev_id 160
Serial#  : 63502
LDEV : 160
SL : 0
CL : 0
VOL_TYPE : OPEN-V
VOL_Capacity(BLK) : 4385280
NUM_PORT : 0
PORTs :
F_POOLID : NONE
VOL_ATTR : ELUN
E_VendorID : HITACHI
E_ProductID : OPEN-V
E_VOLID :
484954414348492052353030463830453030364100000000000000000000000000
000000
E_VOLID_C : HITACHI R500F80E006A.................
NUM_E_PORT : 1
E_PORTs : CL2-G-0 0 50060e8004f80e34
LDEV_NAMING : Oracle_data_1
STS : NML
OPE_TYPE : QFMT
OPE_RATE : 70
MP# : 2
SSID:001F
ALUA : Enable
RSGID : 0
```

Description of columns in output example

E_VendorID: Vendor name that the external storage system's volume notifies to the host.

E_ProductID: System name that the external storage system's volume notifies to the host.

E_VOLID: Number to identify the external volume (hexadecimal).

E_VOLID_C: Number to identify the external volume (ASCII display).

NUM_E_PORT: Number of alternate paths.

E_PORTs: List of defined alternate paths.

If the LDEV number 160 is an external volume, its back-end (RAID group) information is displayed

```
# raidcom get ldev -ldev_id 160 -key external
Serial#  LDEV#  SL CL PID ATTRIBUTE  E_VendorID  E_ProductID
E_VOLID
    "E_VOLID_C"                              E_PORTs
PORT_NO:LU#:WWN ...
  63502    160   0  0   - ELUN          HITACHI     OPEN-V
484954414348492052353030463830453030364100000000000000000000000000000
000 "HITACHI R500F80E006A................."       1 CL2-
G-0:0:50060e8004f80e34
```

Displaying the information of the LDEV number 39320 (quorum disk)

```
# raidcom get ldev -ldev_id 39320
Serial#  : 302656
LDEV : 39320
SL : 0
CL : 0
VOL_TYPE : OPEN-V-CVS
VOL_Capacity(BLK) : 31457280
NUM_PORT : 0
PORTs :
F_POOLID : NONE
VOL_ATTR : CVS : ELUN : QRD
E_VendorID : HITACHI
E_ProductID : OPEN-V
E_VOLID :
484954414348492035303330304135363132303000000000000000000000000000000
000
E_VOLID_C : HITACHI 50300A561200.................
NUM_E_PORT : 1
E_PORTs : CL1-B-0 0 50060e80070a5630
LDEV_NAMING :
STS : BLK
OPE_TYPE : NONE
OPE_RATE : 100
MP# : 0
SSID : 004D
QRDID : 31
QRP_Serial# : 302646
```

```
QRP_ID : R8
ALUA : Disable
RSGID : 0
```

Description of a column in output example

QRDID: ID of the quorum disk for HAM or GAD.

QRP_Serial#: Shows the serial number of the storage system when the external volume is the quorum disk for HAM or GAD.

QRP_ID: Shows the ID for identifying storage systems when the external volume is the quorum disk for HAM or GAD.

- R5: TagmaStore USP/TagmaStore NSC
- R6: USP V/VM
- R7: VSP
- R8: VSP G1000, G1500, and VSP F1500
- M7: HUS VM
- M8: VSP Gx00 models, VSP Fx00 models

Dynamic Provisioning V-VOL example

Displaying the information of the LDEV number 4368 (V-VOL of Dynamic Provisioning)

```
# raidcom get ldev -ldev_id 4368
Serial#  : 302614
LDEV : 4368
SL : 0
CL : 0
VOL_TYPE : OPEN-V-CVS
VOL_Capacity(BLK) : 16777216
NUM_PORT : 0
PORTs :
F_POOLID : NONE
VOL_ATTR : CVS : HDP
B_POOLID : 0
S_POOLID : 6
LDEV_NAMING :
STS : BLK
OPE_TYPE : NONE
OPE_RATE : 100
MP# : 0
SSID : 0006
Used_Block(BLK) : 0
FLA(MB) : Disable
RSV(MB) : 0
CSV_Status : ENABLING
CSV_PROGRESS(%): 60
CSV_Mode : DEDUP+COMPRESS
ALUA : Disable
RSGID : 0
DM_LDEV : 4096
```

Description of columns in output example:

B_POOL ID: Pool ID to which the LDEV is associated.

S_POOLID: Snapshot pool ID to which the LDEV is associated. This item is displayed only for the S-VOL whose LDEV attribute is HDP and QS. When S_POOLID is displayed, B_POOL ID indicates the ID of the pool for Dynamic Provisioning, Dynamic Tiering, or active flash.

Used_Block(BLK): Number of blocks used in the pool. This number of blocks includes the reserved blocks by Full Allocation. When Full Allocation is changed to enabled from disabled, the value of the Used_Block(BLK) will be increased by an amount equal to the number of blocks which are reserved by Full Allocation.

FLA(MB): Shows the capacity which is reserved by Full Allocation or Proprietary Anchor. When Full Allocation is disabled, "Disable" is displayed.

RSV(MB): Shows the capacity that is reserved by Full Allocation or Proprietary Anchor.

CSV_Status: Shows the status of capacity saving:

- DISABLED: Capacity saving is disabled.
- ENABLED: Capacity saving is enabled.
- ENABLING: Capacity saving is being enabled.
- REHYDRATING: Capacity saving is being disabled.
- DELETING: A volume which has capacity saving enabled is being deleted.
- FAILED: Consistency of the data in the deduplication system data volume cannot be guaranteed.

CSV_PROGRESS(%): Shows the progress rate when the capacity saving status is ENABLING, REHYDRATING, or DELETING. For other statuses, a hyphen (-) is displayed.

CSV_Mode: Shows the capacity saving setting.

- DISABLED: Capacity saving is disabled.
- COMPRESS: Compression is enabled.
- DEDUP+COMPRESS: Deduplication and compression are enabled.

DM_LDEV: (VSP G1000, G1500, and VSP F1500 and VSP Gx00 models only) Shows the LDEV number of the pool volume associated with a V-VOL for Dynamic Provisioning that has the data direct mapping attribute. All LBAs of the V-VOL for Dynamic Provisioning are mapped to LBAs of the pool volume one-on-one. DM_LDEV is displayed only when the LDEV has the data direct mapping attribute.

Deduplication system data volume example

Displaying the information of the LDEV number 4368 (deduplication system data volume)

```
# raidcom get ldev -ldev_id 4368
Serial#  : 302614
LDEV : 4368
```

```
SL : 0
CL : 0
VOL_TYPE : OPEN-V-CVS
VOL_Capacity(BLK) : 16777216
NUM_PORT : 0
PORTs :
F_POOLID : NONE
VOL_ATTR : CVS : HDP : DSD
B_POOLID : 0
LDEV_NAMING :
STS : BLK
OPE_TYPE : NONE
OPE_RATE : 100
MP# : 0
SSID : 0006
Used_Block(BLK) : 0
FLA(MB) : Disable
RSV(MB) : 0
CSV_Status : DISABLED
CSV_PROGRESS(%): -
CSV_Mode : DISABLED
ALUA : Disable
RSGID : 0
```

Dynamic Tiering V-VOL examples

Displaying the information of the LDEV number 640 (V-VOL of Dynamic Tiering)

```
# raidcom get ldev -ldev_id 640
Serial# : 63502
LDEV : 640
SL : 0
CL : 0
VOL_TYPE : OPEN-V-CVS
VOL_Capacity(BLK) : 2181120
NUM_LDEV : 1
LDEVs : 640
NUM_PORT : 1
PORTs : CL2-E-0 14 Linux_X86
F_POOLID : NONE
VOL_ATTR : CVS : HDP : HDT
B_POOLID : 5
LDEV_NAMING : Oracle_data_1
STS : NML
OPE_TYPE : NONE
OPE_RATE : 100
MP# : 2
SSID : 001F
Used_Block(BLK) : 218112
TIER_Relocation : Enable
TIER_LEVEL: 6
TIER#1(MB) : 1120
TIER#2(MB) : 3000
   :
   :
TIER_Alloc_level : H
TIER#1_Alloc_rate : MAX : 50 : MIN : 30
TIER#3_Alloc_rate : MAX : 50 : MIN : 30
```

```
FLA(MB) : 980
RSV(MB) : 980
CSV_Status : DISABLED
CSV_PROGRESS(%): -
CSV_Mode : DISABLED
ALUA : Enable
RSGID : 0
```

Description of columns in output example:

TIER_Relocation: Status of the relocation setting:

- Enable: The status where the relocation is enabled
- Disable: The status where the relocation is disabled

TIER_LEVEL: Shows the level of tiering policy that is used for reallocation.

- all: Shows that all tiers of the pool to which the relevant LDEV is allocated are being used.
- 1-5: Shows the tiering policy level that is configured to the relevant LDEV.
- 6-31: Shows the tiering policy (customized policy (1-26)) that is configured to the relevant LDEV. For details, see the *Provisioning Guide* or *LUN Manager User Guide* for the storage system.

TIER#n(MB): Shows the capacity (in MB) allocated to each tier.

TIER_Alloc_level: Shows the tier level of the new mapped page.

- H: High
- M: Middle
- L: Low

TIER#1_Alloc_rate: Shows the Tier1 Max or Min value that is set in the tiering policy.

TIER#3_Alloc_rate: Shows the Tier3 Max or Min value that is set in the tiering policy.

FLA(MB): Shows the capacity that is reserved by Full Allocation. When Full Allocation is disabled, "Disable" is displayed.

Displays the tier information about the LDEV number 640 (V-VOL of Dynamic Tiering)

```
# raidcom get ldev -ldev_id 640 -key tier
Serial# LDEV#  SL  CL VOL_TYPE VOL_Cap(BLK) PID ATTRIBUTE
VOL_Used(BLK) TR TL T#1(MB) T#2(MB) ...
63502 640 0 0 OPEN-V-CVS 204800 13 CVS|HDP|HDT 4720 E 0 3000 1120
600 0 0
```

Description of each column in output example:

TR: Displays the enabled or disabled of the tier relocation.

- E: Enabled
- D: Disabled

TL: Displays the tier level.

- 0: ALL
- 1-5: Level (1-5)
- 6-31: Customized policy (1-26)

T#x(MB): Displays the allocated volume of the relevant LDEV for Tier x. Displays up to 5 tiers. If there is no tier, "0" is displayed.

Thin Image primary volume example

Displays the information about the LDEV number 1000 (primary volume of Thin Image)

```
# raidcom get ldev -ldev_id 1000
Serial#  : 64568
LDEV : 1000
SL : 0
CL : 0
VOL_TYPE : OPEN-V-CVS
VOL_Capacity(BLK) : 204800
NUM_PORT : 2
PORTs : CL1-A-0 0 1A-G00 : CL5-B-0 1 5B-G00
F_POOLID : NONE
VOL_ATTR : CVS : QS
RAID_LEVEL  : RAID1
RAID_TYPE   : 2D+2D
NUM_GROUP : 1
RAID_GROUPs : 01-02
DRIVE_TYPE  : DKR2G-K146SS
DRIVE_Capa : 285177528
LDEV_NAMING :
STS : NML
OPE_TYPE : NONE
OPE_RATE : 100
MP# : 2
SSID : 0009
ALUA : Enable
RSGID : 0
Snap_Used_Pool(MB) : 100
```

Description of column in output example:

Snap_Used_Pool(MB): For the Thin Image root volume, displays the capacity (in MB) in the root volume used for the snapshot data out of the snapshot capacity assigned from the pool. If the used capacity is less than 1 MB, the displayed value is rounded up.

Pool volume example

Displays the information about the LDEV number 4096 (pool volume)

```
# raidcom get ldev -ldev_id 4096
Serial#  : 64568
LDEV : 4096
SL : 0
```

```
CL : 0
VOL_TYPE : OPEN-V-CVS
VOL_Capacity(BLK) : 16777216
NUM_LDEV : 1
LDEVs : 4096
NUM_PORT : 0
PORTs :
F_POOLID : 127
VOL_ATTR : CVS : POOL
RAID_LEVEL  : RAID5
RAID_TYPE   : 3D+1P
NUM_GROUP : 1
RAID_GROUPs : 01-01
DRIVE_TYPE  : DKR2G-K146SS
DRIVE_Capa : 285177528
LDEV_NAMING :
STS : BLK
OPE_TYPE : NONE
OPE_RATE : 100
MP# : 0
SSID : 0005
ALUA : Disable
RSGID : 0
DM_LDEV : 640
```

DM_LDEV: (VSP G1000, G1500, and VSP F1500 and VSP Gx00 models only) Shows the LDEV number of the V-VOL for Dynamic Provisioning associated with a pool volume that has the data direct mapping attribute. When any V-VOL for Dynamic Provisioning is not associated with the pool volume, "NONE" is displayed. DM_LDEV is displayed only when the LDEV has the data direct mapping attribute.

rmawk command examples

For the rmawk command, see rmawk on page 4-15.

Displays the information of the used Tier 1 capacity for the pool ID 73 of the HDT volume (using the rmawk command)

```
# raidcom get ldev -ldev_list dp_volume -pool_id 73 -key tier |rmawk
-EC @L-ne:0 @12?=ad:@12 -n  exe="print Total = @12?"

Total = 8064
```

Displays the information of each used Tier capacity for the pool ID 73 of the HDT volume (using the rmawk command)

```
# raidcom get ldev -ldev_list dp_volume -pool_id 73 -key tier |rmawk
-EC @L-ne:0 @12=ad:@12? @13=ad:@13? @14=ad:@14? exe="print @0" -n
exe="print " exe="print Total = T#1(MB): @12? T#2(MB): @13? T#3(MB):
@14?"

Serial# LDEV# SL CL VOL_TYPE   VOL_Cap(BLK) PID ATTRIBUTE      VOL_
Used(BLK) TR TL T#1(MB) T#2(MB)...
64558   29440 0  0  OPEN-V-CVS 4042752      73  CVS|HDP|HDT     404
2752      E  5  0       0       1974    0       0
64558   29441 0  0  OPEN-V-CVS 10924032     73  CVS|HDP|HDT    1092
4032      E  6  5334    0       0       0       0
```

```
64558   29442 0  0  OPEN-V-CVS 10924032     73  CVS|HDP|HDT    1092
4032      E  13 1596    1638    2100    0       0
64558   29443 0  0  OPEN-V-CVS 10924032     73  CVS|HDP|HDT    1092
4032      E  18 1134    3654    546     0       0

Total = T#1(MB):8064 T#2(MB):5292 T#3(MB):4620
```

raidcom initialize ldev

Formats LDEVs. You can specify Quick Format, Normal Format, or Shredding.

A device group can also be specified instead of an LDEV.

This command is executed asynchronously with the command input. Check the completion of this process on the raidcom get command_status command.

Syntax

```
raidcom initialize ldev {-ldev_id <ldev#>
     | -grp_opt <group option> -device_grp_name <device group
     name> [<device name>]} -operation <type>
```

Options and parameters

Option	Description
-ldev_id <ldev#>	Specifies the LDEV number (0-65279). For example: • -ldev_id 200
-grp_opt <group option>	Specifies the device information extracted from the LDEV belonging to the device group. Specify "ldev" (fixed). The information of LDEV belonging to the device group is used.
-device_grp_name <device group name> [<device name>]	Specifies the name of device group (maximum 32 characters) to be operated. To operate an LDEV in the device group, specify the device name of LDEV (maximum 32 characters) within the device group. If the device name is omitted, all the LDEVs belonging in the device group are operated.
-operation <type>	Instructs the operation. The following operations can be specified. • fmt: Normal Format • qfmt: Quick Format • shrd [<pattern>]: Shredding Formats the LDEV three times according to the shredding pattern which is specified to "pattern". If <pattern> is specified, format the LDEV three times according to the following order. ◦ 0x00000000 ◦ The specified shredding pattern ◦ 0x00000000

Option	Description
	If <pattern> is omitted, format the LDEV three times according to the following order. ◦ 0x00000000 ◦ 0xFFFFFFFF ◦ 0x00000000 • stop: Stops shredding. The processing for all LDEVs stops. However, normal and quick format processing cannot be stopped.

Examples

Performing Quick Format for an LDEV: 200.

```
# raidcom initialize ldev -operation qfmt -ldev_id 200
```

Performing Quick Format for an LDEV belonging to the device group: grp1.

```
# raidcom initialize ldev -operation qfmt -grp_opt ldev
-device_grp_name grp1
```

Performing Normal Format for an LDEV: 200.

```
# raidcom initialize ldev -operation fmt -ldev_id 200
```

Performing Shredding (Pattern: 0x55aa55aa) for an LDEV: 200.

```
# raidcom initialize ldev -operation shrd 0x55aa55aa -ldev_id 200
```

Stopping Shredding.

```
# raidcom initialize ldev -operation stop -ldev_id 200
```

raidcom modify ldev

Changes the following LDEV attributes:

- Blocking LDEV and restoring LDEV.
- Setting LDEV nickname.
- Setting MP blade ID of LDEV.
- Setting the Tiering policy, the new page assignment tier, or enabling or disabling of the tier relocation for the Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe V-VOL.
- Instructing the page discarding of V-VOL for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe.
- Setting the command device attribute.
- Setting the quorum disk and releasing setting of the quorum disk.
- Setting capacity saving.

When blocking LDEV, restoring LDEV, setting the quorum disk, releasing setting of the quorum disk, or setting capacity saving, this command is

executed asynchronously with the command input. Check the completion of this process using the `raidcom get command_status` command.

Syntax

```
raidcom modify ldev -ldev_id <ldev#> {-status <status> [<level>] |
   -ldev_name <ldev naming> | -mp_blade_id <mp#> | -ssid <value> |
   -command_device {y | n} [Security value] | -quorum_enable
<serial#>
   <id> -quorum_id <quorum id> | -quorum_disable |
   -alua {enable|disable} | -capacity_saving <capacity saving>}
```

Options and parameters

Option	Description
-ldev_id <ldev#>	Specifies the LDEV number (0-65279). For example: • -ldev_id 200
-status <status> [<level>]	Specifies the LDEV status. The following LDEV statuses can be specified. nml: Changes the LDEV status to Normal blk: Changes the LDEV status to Blockade {enable_reallocation [<level>]|enable_relocation [<level>]}: Relocation of LDEV (V-VOL for Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe) enabled. Defines the tier that is used for reallocation depending on the value of the level. • all: Uses all tiers in the pool. • 1-5: Specifies the level of the tier for use. For details, see the *Provisioning Guide* for the storage system. disable_reallocation | disable_relocation: Relocation of LDEV (V-VOL for Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe) disabled discard_zero_page: Discarding 0 page of LDEV(V-VOL) for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe. enable_relocation_policy <policy_id>: Enables the LDEV relocation for Dynamic Tiering or active flash, and sets the level or customized policy of the Tier to be used for the relocation by Policy ID. <policy_id>: • all: Uses all tiers in the pool. • 1-5: Specifies the level of the tier for use. • 6-31: Specifies the customized policy of the tier for use. new_page_allocation: Sets the Tier when new page is allocated to the LDEV for Dynamic Tiering or active flash (V-VOL). The value is one of high/middle/low. enable_fullallocation: Enables Full Allocation. If all areas equivalent to the sum of the pool capacities the specified volume requires can be reserved, it is guaranteed that all areas of DP-VOL are writable. disable_fullallocation: Disables Full Allocation.

Option	Description
	For example: • -status nml
-ldev_name <ldev naming>	Specifies the LDEV nickname (maximum 32 characters).
-mp_blade_id <mp#>	Specifies the MP blade ID (0-7). Changing MP blade ID should be executed during off-peak hours of I/O loading. Do not change the MP blade ID during initial copying of TrueCopy, ShadowImage, Universal Replicator, or global-active device (on-peak hours of I/O loading). To change the MP blade ID again for the same LDEV, wait for more than 30 minutes after changing the MP blade ID. For example: -mp_blade_id 2 When you change the MP blade ID where the LDEV is allocated, both before and after the changing should be executed during as off-peak hours for the rate of write pending data of the MP blade as possible. It is recommended to execute when the rate of write pending data of all CLPRs is less than 50%. Do not change the MP blade ID in regard to a lot of LDEVs at the same time. The number of LDEVs and I/O workload for which you can change the MP blade ID at the same time is lower than 10% of the total number of LDEVs where the same MP blade ID is allocated as a guideline.
-ssid <value>	Specifies SSID (hexadecimal number). When specifying SSID, specify not only unallocated SSID but also LDEV ID. In this case, LDEV ID must be ID for the undefined LDEV in the area where SSID is not allocated. For example: -ssid 0x1234 -ldev_id 200 **Note:** This option is for storage systems that support mainframe host attachment. You need not specify the -ssid option when you use Unified Storage VM, but this option is enabled.
-command_device {y | n} [Security value]	Configures command device attribute. y: Command device attribute enabled. n: Command device attribute disabled. Specifies the value of command device security (0-7). You can specify 0-7 to Security value as the command device security setting: • 0: Security: OFF, User authentication: OFF, Group information acquisition: OFF • 1: Security: OFF, User authentication: OFF, Group information acquisition: ON • 2: Security: OFF, User authentication: ON, Group information acquisition: OFF • 3: Security: OFF, User authentication: ON, Group information acquisition: ON • 4: Security: ON, User authentication: OFF, Group information acquisition: OFF • 5: Security: ON, User authentication: OFF, Group information acquisition: ON

Option	Description
	• 6: Security: ON, User authentication: ON, Group information acquisition: OFF • 7: Security: ON, User authentication: ON, Group information acquisition: ON
-quorum_enable <serial#> <id>	Sets quorum disk for global-active device configuration. You must also set the -quorum_id parameter. serial#: Serial number (of the migration source storage system) id: The identifier of the source storage system • R600: USP V • R700: VSP • R800: VSP G1000, G1500, and VSP F1500 • RK600: USP VM • M800: VSP Gx00 models and VSP Fx00 models
-quorum_id <quorum id>	Specifies the quorum ID for setting the quorum disk.
-quorum_disable	Releases setting of the quorum disk.
-alua {enable|disable}	Specifies the ALUA mode. You must enable ALUA mode only when you use ALUA by global-active device. • enable: The ALUA mode is enabled. • disable: The ALUA mode is disabled.
[-capacity_saving <capacity saving>]	Specifies the capacity saving setting: • disable: Capacity saving is disabled. • compression: Compression is enabled. • deduplication_compression: Deduplication and compression are enabled.

Examples

Restoring the LDEV: 200.

```
# raidcom modify ldev -status nml -ldev_id 200
```

Blocking the LDEV: 200.

```
# raidcom modify ldev -status blk -ldev_id 200
```

Assigning an LDEV nickname: my_volume to LDEV: 200

```
# raidcom modify ldev -ldev_id 200 -ldev_name my_volume
```

Setting the LDEV owner MP blade ID of LDEV: 200 to 2

```
# raidcom modify ldev -ldev_id 200 -mp_blade_id 2
```

Enabling relocation of LDEV (Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe V-VOL): 200

```
# raidcom modify ldev -ldev_id 200 -status enable_reallocation
```

Disabling relocation of LDEV (Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe V-VOL): 200

```
# raidcom modify ldev -ldev_id 200 -status disable_reallocation
```

Discarding of the 0 page of LDEV (Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe V-VOL): 200

```
# raidcom modify ldev -ldev_id 200 -status discard_zero_page
```

Specifies 0x1234 to LDEV SSID of LDEV: 200.

Note: Specify undefined LDEV number: 200 in the area that is not allocated SSID, and assign new SSID: 0x1234. If you specify LDEV number that is already defined or SSID that is already registered, an error occurs.

```
# raidcom modify ldev -ssid 0x1234 -ldev_id 200
```

Enables LDEV command device attribute of LDEV: 200. Specifies 2 to the value of command device security.

```
# raidcom modify ldev -command_device y 2 -ldev_id 200
```

Disables LDEV command device attribute of LDEV: 200.

```
# raidcom modify ldev -command_device n -ldev_id 200
```

Set the relocation of LDEV for LDEV:200 by the customized policy 6.

```
# raidcom modify ldev -ldev_id 200 -status enable_relocation_policy 6
```

Set the tier from which the new mapped page of LDEV: 200 is allocated to High.

```
# raidcom modify ldev -ldev_id 200 -status new_page_allocation high
```

Set LDEV: 200 as the quorum disk whose quorum ID is 10.

```
# raidcom modify ldev -ldev_id 200 -quorum_enable 65384 R700 -
quorum_id 10
```

Enables the ALUA mode for LDEV: 200.

```
# raidcom modify ldev -ldev_id 200 -alua enable
```

Sets the capacity saving setting to compression for LDEV: 200.

```
# raidcom modify ldev -ldev_id 200 -capacity_saving compression
```

raidcom add license (VSP Gx00 models and VSP Fx00 models only)

This command installs the license.

Syntax

```
raidcom add license -keycode <key code>
```

Options and parameters

Option	Description
-keycode <key code>	Specify the key code of the license.

Example

Specify PXPQRS275WMYZ as the key code of the license, and then install the license key.

```
#raidcom add license -keycode PXPQRS275WMYZ
```

raidcom delete license (VSP Gx00 models and VSP Fx00 models only)

This command removes the license.

Syntax

```
raidcom delete license -product_id <product ID>
```

Options and parameters

Option	Description
-product_id <product ID>	Specify the software ID.

Example

Remove the license of ID: 4102.

```
#raidcom delete license -product_id 4102
```

raidcom modify license (VSP Gx00 models and VSP Fx00 models only)

This command changes the term license status.

Syntax

```
raidcom modify license -product_id <product ID> -license_status
<status>
```

Options and parameters

Option	Description
-product_id <product ID>	Specify the software ID.
-license_status <status>	Specify the term license status. • enable: Enables the term license. • disable: Disables the term license.

Example

Enable the term license of ID: 4102.

```
#raidcom modify license -product_id 4102 -license_status enable
```

raidcom get license

This command acquires the license information.

Syntax

```
raidcom get license [-key opt]
```

Options and parameters

Option	Description
[-key opt]	Displays the capacity of the internal and external volumes created in the storage system in GB, and the serial number.

Example

Display the license information.

```
#raidcom get license
PRO_ID  STS Type L Cap_Perm(TB) Cap_Used(GB) - Term  Name
34049   INS PER  L           50           10  -     -  "Cache
Residency Manager"
34055   INS TEM  U           -            -  -     -  "Dynamic
Provisioning"

#raidcom get license -key opt
Serial# : 302656
Cap_Mounted(GB) : 1229000
```

Description of each column in output example:

PRO_ID: Displays the software ID.

STS: Displays the installation status of the software. For details about installation statuses, see the *System Administrator Guide*.

- INS: Installed
- DIS: Installed but the license is disabled
- NIN: Not installed
- NEL: Installed but the license capacity is insufficient
- GRP: The license capacity is insufficient because an LDEV was added, a copy pair was created, or a pool volume was added. The license will expire in 30 days.
- EXT: The temporary key is expired

Type: Displays the license key type. For details about license key types, see the *System Administrator Guide*.

- PER: Permanent
- TER: Term
- TEM: Temporary
- EME: Emergency
- - (hyphen): License is not installed. But if the license period is still available and you removed temporary key, TEM is displayed.

L: Displays if there is an upper limit for the installed permitted capacity.

- U: There is no upper limit
- L: There is an upper limit
- T: There is no upper limit. Displayed only when the license key type is temporary or emergency and the license key does not overwrite the installed license key.

Cap_Perm(TB): Displays the installed permitted capacity in TB. If the software does not have the capacity limit, or if the license is not installed, a hyphen is displayed.

Cap_Used(GB): Displays the size of the volume used by the software in GB. If the licensed capacity type is other than Used capacity, or if the license is not installed, a hyphen is displayed. For details about the license capacity, see the *System Administrator Guide*.

Term: Displays the remaining days until the term key, temporary key, or emergency key expires. If the license period is still available and you removed the temporary key, Term displays the remaining days of the license period. After the temporary key expires, Term displays the remaining days until the license can be installed again. If the term is unlimited and the license is not installed, a hyphen (-) is displayed.

Name: Displays the product name. Double quotation marks (") are added at the beginning and end of the product name.

Serial#: Displays the serial number of the unit.

Cap_Mounted(GB): Displays the capacity of the internal and external volumes created in the storage system in GB.

raidcom modify quorum

For the quorum disk, this command sets the period of Read Response Guaranteed Time When Quorum Disk Blocked.

Syntax

```
raidcom modify quorum -quorum_id <quorum id> -timeout <timeout>
```

Options and parameters

Option	Description
-quorum_id <quorum id>	Specifies a quorum ID (0 to 31) in decimal or hexadecimal. For hexadecimal IDs, prefix 0x. Example: • -quorum_id 10 • -quorum_id 0x0a
-timeout <timeout>	Specifies the period of time in seconds (5 to 100) for Read Response Guaranteed Time When Quorum Disk Blocked.

Examples

For the quorum disk (quorum ID: 1), specify 40 seconds as the period of Read Response Guaranteed Time When Quorum Disk Blocked.

```
#raidcom modify quorum -quorum_id 1 -timeout 40
```

raidcom get quorum

This command displays information about the quorum disk.

Syntax

```
raidcom get quorum -quorum_id <quorum id> [-fx]
```

Options and parameters

Option	Description
-quorum_id <quorum id>	Specifies a quorum ID (0 to 31) in decimal or hexadecimal. For hexadecimal IDs, prefix 0x. Example: • -quorum_id 10 • -quorum_id 0x0a
[-fx]	Specifies this option to display an LDEV number in hexadecimal.

Examples

Displays the information of the quorum disk (quorum ID: 1).

```
#raidcom get quorum -quorum_id 1
QRDID : 1
LDEV : 2045
QRP_Serial# : 302646
QRP_ID : R8
Timeout(s) : 30
```

QRDID

Displays the quorum disk ID for GAD device.

LDEV

Displays the LDEV number of a quorum disk for GAD device.

QRP_Serial#

Displays the serial number of a remote storage system assigned to serve as a quorum disk of GAD devices.

When the storage system is VSP G1000, G1500, and VSP F1500, 30,000 is added to the original serial number.

QRP_ID

Displays the identifier of a remote storage system assigned to serve as a quorum disk of GAD device.

When the storage system is VSP G1000, G1500, and VSP F1500, "R8" is displayed.

When the storage system is VSP Gx00 models, "M8" is displayed.

Timeout(s)

Displays the time in seconds for Read Response Guaranteed Time When Quorum Disk Blocked set for the quorum disk of GAD device.

raidcom modify local_replica_opt

This command sets the local replica option. For details about the local replica option, see the user manuals for ShadowImage, ShadowImage for Mainframe, Thin Image, Compatible FlashCopy®, Volume Migration, and nondisruptive migration.

Syntax

```
raidcom modify local_replica_opt -opt_type <option type>
   {-set_system_opt <system option> | -reset_system_opt <system
option>}
```

Options and parameters

Option	Description
-opt_type <option type>	Specifies the local replica option type that you are going to set: • open: Local replication option for ShadowImage, Thin Image, Volume Migration, and nondisruptive migration.

Option	Description
	• mainframe: Local replication option for ShadowImage for Mainframe, Compatible FlashCopy®, and Volume Migration.
-set_system_opt <system option>	Specifies the local replica option ID that you are enabling. For details about the local replica option ID, see the applicable user manual.
-reset_system_opt <system option>	Specifies the local replica option ID that you are disabling. For details about the local replica option ID, see the applicable user manual.

Examples

Enable local replica option: 1

```
raidcom modify local_replica_opt -opt_type open -set_system_opt 1
```

Disable local replica option: 1

```
raidcom modify local_replica_opt -opt_type open -reset_system_opt 1
```

raidcom get local_replica_opt

This command lets you view the local replica option.

Syntax

```
raidcom get local_replica_opt -opt_type <option type>
```

Options and parameters

Option	Description
-opt_type <option type>	Specifies the local replica option type that you are going to view: • open: Local replication option for ShadowImage, Thin Image, Volume Migration, and nondisruptive migration. • mainframe: Local replication option for ShadowImage for Mainframe, Compatible FlashCopy®, and Volume Migration.

Example

View the local replica option of ShadowImage, Thin Image, Volume Migration, and nondisruptive migration.

```
#raidcom get local_replica_opt -opt_type open
Serial# : 3063528
Type : open
Option : 1 14
```

View the local replica option of ShadowImage for Mainframe, Compatible FlashCopy®, and Volume Migration.

```
#raidcom get local_replica_opt -opt_type mainframe
Serial# : 3063528
```

```
Type : mainframe
Option : 1 14
```

Description of each column in output example:

- Serial#: Displays the serial number.
- Type: Displays the local replica option type.
- Option: Displays the local replica option that is set to enable.

raidcom add lun

To set the LU path, this maps the specified LDEV to a LUN on a host group on the specified port and creates an LU path or alternate path. A device group can also be specified instead of an LDEV.

If the specified port or host group does not exist, this command is rejected with EX_ENOOBJ(EX_CMDRJE).

If the specified LUN or LDEV already exists, this command is ignored.

If a LUN is not specified, an empty LUN is assigned automatically.

Not allowed:

- Mapping the same LDEV to another LUN in the same host group.
- Overwriting the same LUN to another LDEV.



Caution:

- LDEVs in LUSE volumes cannot be configured with this command.
- If you execute this command on an LDEV with the command device attribute already set and the LDEV already has a defined/configured path, the command device attribute will be released.

Syntax

To set LU path with specifying the LDEV:

```
raidcom add lun -port <port#> [<host group name>]
   -ldev_id <ldev#> [-lun_id <lun#>]
```

To set LU path with specifying the device group:

```
raidcom add lun -port <port#> [<host group name>]
   -grp_opt ldev -device_grp_name <device group name> [<device name>]
```

To set LU path with specifying the multiple port numbers simultaneously (VSP Gx00 models and VSP Fx00 models only):

```
raidcom add lun -port <port#> [<host group name>]
   -ldev_id <ldev#> -lun_id <lun#>
   -additional_port <additional port>...
```

Options and parameters

Option	Description
-port <port#> [<host group name>]	Specifies the Port number and the host group. You can specify the host group ID or the host group name for the host group. If you specify neither the host group ID nor the host group name, the host group 0 is used. For example: • CL1-A-g (g is from 0 to 254) • CL1-A Linux_X86
-ldev_id <ldev#>	Specifies the LDEV number (0-65279). For example: • -ldev_id 200
[-lun_id <lun#>]	Specifies the LU number (0-2047). If this option is omitted, a free LU number is assigned automatically. This is unavailable to specify when the device group is specified. This option cannot be omitted, when the -additional_port option is specified.
-grp_opt ldev	The information of LDEV belonging to the device group is used. Specify 'ldev' whenever.
-device_grp_name <device group name> [<device name>]	Specifies the name of device group (maximum 32 characters) to be operated. To operate an LDEV in the device group, specify the device name of LDEV (maximum 32 characters) within the device group. If the device name is omitted, all the LDEVs belonging in the device group are operated.
-additional_port <additional port>...	This option can be specified only for VSP Gx00 models and VSP Fx00 models. Up to 5 port numbers can be specified to set the LU path additionally. The LU path is set to the host group that you specified into -port <port#> option. When you add ports, you cannot specify the host group name by using [<host group name>] option.

Examples

Map the LDEV: 200 to the LU numbers: 1 for the port: CL1-A, the host group #0.

```
# raidcom add lun -port CL1-A-0 -lun_id 1 -ldev_id 200
```

Map the LDEV: 200 for the port: CL1-A, the host group #0. The LU numbers are automatically assigned.

```
# raidcom add lun -port CL1-A-0 -ldev_id 200
```

Map the LDEV for the port: CL1-A, the host group #0, and the one belonging to the device group: grp1. The LU numbers are automatically assigned.

```
# raidcom add lun -port CL1-A-0 -grp_opt ldev -device_grp_name grp1
```

Map the LDEV: 200 for the port: CL1-A, CL2-A, CL3-A, the hosts group #0, and the LU number 1.

```
# raidcom add lun -port CL1-A-0 -ldev_id 200 -lun_id 1 -
additional_port CL2-A CL3-A
```

raidcom delete lun

Deletes the LU path on the host group on the specified port.

An LDEV or a device group can also be specified instead of a LUN.

If an LDEV does not exist on the specified port /host group/LUN, this command is rejected with EX_ENLDEV or EX_ENOOBJ.

When deleting the LU path, stop the I/O for the LU path to be deleted.

In the last one path, LDEV must be specified as SMPL volume.

Note: LDEVs in LUSE volumes cannot be configured with this command. Do not execute this command to an LDEV whose command device attribute is set. If the command is executed, the command device attribute is released.

Syntax

To delete LU path with specifying the LUN:

```
raidcom delete lun -port <port#> [<host group name>]
   -lun_id <lun#>
```

To delete LU path with specifying the LDEV:

```
raidcom delete lun -port <port#> [<host group name>]
   -ldev_id <ldev#>
```

To delete LU path with specifying the device group:

```
raidcom delete lun -port <port#> [<host group name>]
   -grp_opt <group option> -device_grp_name <device group
   name> [<device name>]
```

To delete LU path with specifying the multiple port numbers simultaneously (VSP Gx00 models and VSP Fx00 models only):

```
raidcom delete lun -port <port#> [<host group name>]
   {-lun_id <lun#> | -ldev_id <ldev#>}
   -additional_port <additional port>...
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the Port number and the host group. You can specify the host group ID or the host group name for the host group. If you specify neither the host group ID nor the host group name, the host group 0 is used. For example: • CL1-A-g (g is from 0 to 254)

Option	Description
	• CL1-A Linux_X86
-lun_id <lun#>	Specifies the LUN number (0-2047).
-ldev_id <ldev#>	Specifies the LDEV number (0-65279). For example: • -ldev_id 200
-grp_opt ldev	The information of LDEV belonging to the device group is used. Specify 'ldev' whenever.
-device_grp_name <device group name> [<device name>]	Specifies the name of device group (maximum 32 characters) to be operated. To operate an LDEV in the device group, specify the device name of LDEV (maximum 32 characters) within the device group. If the device name is omitted, all of the LDEVs belonging in the device group are operated.
-additional_port <additional port>...	This option can be specified only for VSP Gx00 models and VSP Fx00 models. Up to 5 port numbers can be specified to delete the LU path additionally. The LU path is deleted from the host group that you specified into -port <port#> [<host group name>] option. If you use this option, you cannot specify the host group name by using the -port <port#> [<host group name>] option. If you use this option with the -ldev_id <ldev#> option, all LUNs of the LU path which you delete must be the same. If you use this option with the -lun_id <lun#> option, all LU path which you delete must be set to the same LDEV.

Examples

Deleting LUN: 1(LDEV number 200) on the port: CL1-A-0

```
# raidcom delete lun -port CL1-A-0 -lun 1
# raidcom delete lun -port CL1-A-0 -ldev_id 200
```

Deleting LDEV belonging to the device group: grp1 on the port: CL1-A-0

```
# raidcom delete lun -port CL1-A-0 -grp_opt ldev -device_grp_name
grp1
```

Deleting LUN: 1(LDEV number 200) on the port CL1-A, CL2-A, CL3-A of the host group number #0

```
# raidcom delete lun -port CL1-A-0 -lun_id 1 -additional_port CL2-A
CL3-A
# raidcom delete lun -port CL1-A-0 -ldev_id 200 -additional_port CL2-
A CL3-A
```

raidcom discover lun

Searches external volumes. Displays a list of LUs which can be referred to from the External port of a specific external storage system.

Syntax

```
raidcom discover lun -port <port#> {-external_wwn <wwn strings>
   | -external_iscsi_name <external iscsi name>
   -external_address <IP address>}
```

Options and parameters

Option	Description
-port <port#>	Specifies the Port number. It specifies a port of which attribute is External. For example: • CL1-A
-external_wwn <wwn strings>	Specifies the WWN (16-digit hexadecimal value) of the external storage system. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8
-external_iscsi_name <external iscsi name>*	Specifies the iSCSI name of the iSCSI target on the external storage system in an iqn format or an eui format. • An iqn format: `iqn.` and the subsequent maximum 219 characters. • An eui format: `eui.` and the subsequent 16 characters in hexadecimal notation.
-external_address <IP address>*	Specifies the IP address of the iSCSI target on the external storage system. An IPv4 address or an IPv6 address can be specified. Note that the following addresses cannot be specified when you specify the IPv4 address: • Network address (for example: 192.168.10.*0*, *0*.120.10.1) • Broadcast address (for example: 255.255.255.*255*, 10.1.255.*255*) • Loop back address (for example: *127*.0.0.1) Note that the following addresses cannot be specified when you specify the IPv6 address: • Unspecified address (for example: *::*) • Multicast address (for example: *ff*:1024:1215::01) • Loop back address (for example: *::1*)
* You can specify the pseudo WWN of the iSCSI target to the -external_wwn option instead of specifying the iSCSI target by using the -external_iscsi_name option and the -external_address option. The pseudo WWN corresponds to the iSCSI name and IP address of the iSCSI target on the external storage system. By executing the raidcom get external_iscsi_name command, you can confirm the suitability between the pseudo WWN and the iSCSI name and IP address of the iSCSI target on the external storage system.	

Examples

Displaying LUs defined to the external storage system port: 50060e80, 06fc3850 connected to port: CL5-A (External port) when the external storage system is connected to a FIBRE port.

```
# raidcom discover lun -port CL5-A -external_wwn 50060e8006fc3850
PORT  WWN             LUN VOL_Cap(BLK) PRODUCT_ID E_VOL_ID_C
CL5-A 50060e8006fc3850  0 102400       OPEN-V     HITACHI R500FC381000
CL5-A 50060e8006fc3850  1 102400       OPEN-V     HITACHI R500FC381001
CL5-A 50060e8006fc3850  2 102400       OPEN-V     HITACHI R500FC381002
CL5-A 50060e8006fc3850  3 102400       OPEN-V     HITACHI R500FC381003
CL5-A 50060e8006fc3850  4 102400       OPEN-V     HITACHI R500FC381004
CL5-A 50060e8006fc3850  5 102400       OPEN-V     HITACHI R500FC381005
CL5-A 50060e8006fc3850  6 102400       OPEN-V     HITACHI R500FC381006
CL5-A 50060e8006fc3850  7 102400       OPEN-V     HITACHI R500FC381007
CL5-A 50060e8006fc3850  8 102400       OPEN-V     HITACHI R500FC381008
CL5-A 50060e8006fc3850  9 102400       OPEN-V     HITACHI R500FC381009
CL5-A 50060e8006fc3850 10 102400       OPEN-V     HITACHI R500FC38100A
```

PORT: External port number.

WWN: WWN on the external storage system. When the external storage system is connected to an iSCSI port, this item displays the pseudo WWN of the external storage system.

LUN: LUN of the port on external storage system.

VOL_Cap (BLK): Capacity of the external volume in units of block (1 block = 512 bytes).

PRODUCT_ID: Product_ID included in the SCSI Inquiry command response of the external volume. The displayed contents and format depend on the connected external volume.

E_VOL_ID_C: Volume identifier included in the SCSI inquiry command of the external volume. The displayed contents and format depend on the connected external volume.

Displaying LUs defined to the iSCSI target of the external storage system (iSCSI name: iqn.z2, IP address: 158.214.135.100) connected to port: CL5-A when the external storage system is connected to an iSCSI port.

```
# raidcom discover lun -port CL5-A -external_iscsi_name iqn.z2
-external_address 158.214.135.100
PORT     WWN              LUN  VOL_Cap(BLK)  PRODUCT_ID  E_VOL_ID_C
CL1-B    50060e8006fc3d60  16        545280  OPEN-V      HITACHI
R500FC3D0210
CL1-B    50060e8006fc3d60  17        545280  OPEN-V      HITACHI
R500FC3D0211
CL1-B    50060e8006fc3d60  18        545280  OPEN-V      HITACHI
R500FC3D0212
CL1-B    50060e8006fc3d60  19        545280  OPEN-V      HITACHI
R500FC3D0213
```

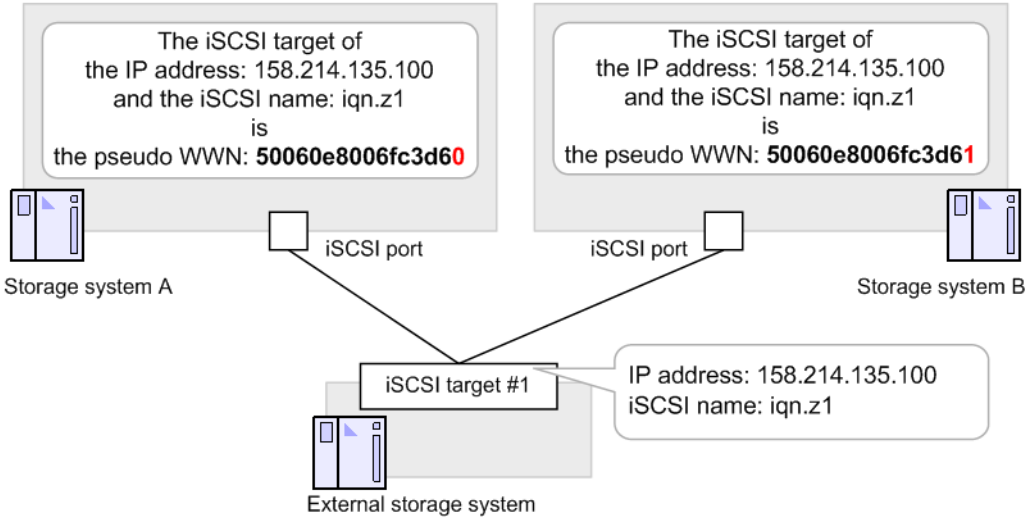
Getting the external storage system's iSCSI target information corresponding to the pseudo WWN (VSP Gx00 and Fx00 only)

To get the iSCSI name and IP address of the iSCSI target of the external storage system which corresponds to the pseudo WWN, execute the `raidcom get external_iscsi_name` command.

```
# raidcom get external_iscsi_name
PORT   Serial# IP_ADDR         IQN       WWN(pseudo)      AMD  D
CHAP_user    Sec
```

```
CL4-E     63528 158.214.135.100 iqn.z1     50060e80070a3640 CHAP D
Win_SQL_EX    *
CL2-E     63528 158.214.135.102 iqn.z3     50060e80070a3642 CHAP S
-             -
CL1-B     63528 158.214.135.100 iqn.z2     50060e8006fc3d60 CHAP S
-             -
```

The pseudo WWN is managed by each storage system. Therefore, when two storage systems share the iSCSI target of an external storage system as shown in the following figure, the pseudo WWN corresponding to iSCSI target 1 of the storage system A is different from the pseudo WWN corresponding to iSCSI target 1 of the storage system B.



The following example shows, in the configuration shown in above, how to get the iSCSI name and the IP address of the external storage system, and how to display the list of LUNs, by specifying the pseudo WWN which is managed by the storage system A.

```
# raidcom get external_iscsi_name -s 64562 | rmawk @5-eq:
50060e8006fc3d60 exe="raidcom discover lun -s 34562 -port CL1-b -
external_address@3 -iscsi_name @4"
```

The following examples show how to display the list of LUNs by the storage system B by getting the pseudo WWN of the storage system B which corresponds to the pseudo WWN managed by the storage system A.

Windows example

```
C:\horcm\etc>raidcom get external_iscsi_name -s 64562 | rmawk @5-eq:
50060e8006fc3d60 exe="raidcom get external_iscsi_name -s 34562 |
rmawk @@3-eq:@3 -a @@4-eq:@4 exe=\"raidcom discovery lun -s 34562 -
port CL1-b -external_wwn @@5\""
```

UNIX example

```
# raidcom get external_iscsi_name -s 64562 | rmawk @5-eq:
50060e8006fc3d60 exe="raidcom get external_iscsi_name -s 34562 |
rmawk @@3-eq:@3 -a @@4-eq:@4 exe="raidcom discovery lun -s 34562 -
port CL1-b -external_wwn @@5""
```

raidcom get lun

Displays the LU path information defined in the specified port and host group.

If the specified port does not exist, this command is rejected with EX_ENOOBJ. If an external port is specified, it is rejected with EX_REQARG.

Syntax

```
raidcom get lun -port <port#> <host group name>
   [-key <keyword>]
```

Options and parameters

Option	Description
-port <port#>[<host group name>]	Specifies the port number, host group ID, and host group name. If the host group name is more than 64 characters, use the host group ID. If the host group ID and host group name are omitted, the LU path information for host group ID 0 is displayed. For example, • CLI-A • CL1-A-g (g: 0-254) • CL1-A Linux_X86
-key <keyword>]	Specifies the information about the LU to be displayed. • opt: Displays the status of the host reservation. • opt_page1: Displays the information about the specified ALUA mode.

Examples

Displaying the LU information defined to the port CL4-E, the host group #0.

```
# raidcom get lun -port CL4-E-0
PORT GID       HMD LUN NUM LDEV CM Serial# HMO_BITs
CL4-E 0 LINUX/IRIX   0   1    0 CM   63528     2 13
CL4-E 0 LINUX/IRIX   2   1    2  -   63528     2 13
CL4-E 0 LINUX/IRIX   3   1    3  -   63528     2 13
CL4-E 0 LINUX/IRIX   4   1    4  -   63528     2 13
CL4-E 0 LINUX/IRIX   5   1  992  -   63528     2 13
CL4-E 0 LINUX/IRIX   6   1  993  -   63528     2 13
#raidcom get lun -port CL4-E-0 -key opt
PORT GID HMD        LUN NUM LDEV CM Serial# OPKMA HMO_BITs
CL4-E  0 LINUX/IRIX 0     1    0 CM  63528  -Y---   2 13
CL4-E  0 LINUX/IRIX 2     1    2  -  63528  -Y---   2 13
CL4-E  0 LINUX/IRIX 3     1    3  -  63528  -Y---   2 13
CL4-E  0 LINUX/IRIX 6     1  993  -  63528  -Y---   2 13
# raidcom get lun -port CL4-E-0 -key opt_page1
PORT   GID  HMD            LUN  NUM     LDEV  CM    Serial#  AL AAS
CL4-E    0  LINUX/IRIX       0    1        0  CM      63528  E  AO
CL4-E    0  LINUX/IRIX       2    1        2   -      63528  D  AO
CL4-E    0  LINUX/IRIX       3    1        3   -      63528  E  AO
```

Description of each column in output example:

PORT: Displays the port number.

GID: Displays the host group ID on the port.

HMD: Displays the following HOST MODE for the host adapter setting on host group.

- HP-UX, SOLARIS, AIX, WIN, LINUX/IRIX, TRU64, DYNIX, OVMS, NETWARE, HI-UX
- VMWARE, HP-XP, VMWARE_EX, WIN_EX, UVM

LUN: Displays LUN number on host group mapping LDEV.

NUM: Displays the number of LDEV configured an LUSE.

LDEV: Displays the LDEV number.

CM: Displays the command device.

Serial#: Product serial number.

The serial number (Serial#) for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345).

OPKMA: Displays the host-reserved LU.

- O: The LU is reserved by an open system.
- P: The LU is reserved by a persistent group.
- K: The LU is reserved by a PGR key.
- M: The LU is reserved by a mainframe.
- A: The LU is reserved by ACA.

If Y is displayed under each character, the LU is reserved. If a hyphen (-) is displayed, the LU is not reserved.

HMO_BITs: Displays the host mode options of the host groups.

For details, see the *Provisioning Guide* for the storage system.

AL: Displays the information about the ALUA mode.

- E: The ALUA mode is enabled.
- D: The ALUA mode is disabled.

AAS: Displays the setting value of the asymmetric access state for ALUA. The displayed setting value shows whether or not the LU is accessed from the host preferentially. If the ALUA mode is enabled, the setting value displayed under AAS is reported to the host as the value of the asymmetric access state.

- AO: Active and optimized LU. The host accesses the LU preferentially.
- AN: Active and non-optimized LU. When an LU whose setting value of the asymmetric access state is AO cannot be used, the host accesses the LU.
- Hyphen (-): The setting for the asymmetric access state is not supported.

raidcom modify lun

Modifies the LU attribute.

Syntax

```
raidcom modify lun -port <port#> [<host group name>]
   -lun_id all -asymmetric_access_state {optimized | non_optimized}
```

Options and parameters

Option	Description
-port <port#> [<host group name>]	Specifies the port number, and host group ID or host group name (iSCSI target alias if iSCSI is used). If the number of characters for the host group name is more than 64, specify the host group ID or the iSCSI target alias. For example, • CL1-A-g (g is from 0 to 254) • CL1-A Linux_X86 • CL1-A Target00
-lun_id all	All LUs on the specified host group are specified. The user who execute the command must have the authority to the specified host group and all LDEVs mapped to the LUs on the host group.
-asymmetric_access_state {optimized | non_optimized}	Specifies the asymmetric access state for the LU. For the LU mapped to an LDEV whose ALUA mode is enabled, the value specified by the -asymmetric_access_state option is reported to the host as the value of the asymmetric access state. • optimized: Active and optimized LU. The host accesses the LU preferentially. • non_optimized: Active and non-optimized LU. When an LU whose asymmetric access state is "optimized" cannot be used, the host accesses the LU.

Examples

Set the asymmetric access state for all LU on the host group (host group ID: 2) on the port (port ID: CL4-E) to optimized.

```
# raidcom modify lun -port CL4-E-2 -lun_id all -
asymmetric_access_state optimized
```

raidcom add path

Adds and changes an external path to an external volume. Only one path is operated in one operation.

The order of priority for the path is allocated in accordance with the order of adding paths.

This command is executed asynchronously with the command input. Check the completion of this process on the raidcom get command_status command.

Syntax

```
raidcom add path -path_grp <path group#> -port <port#>
   {-external_wwn <wwn strings> | -external_iscsi_name
   <external iscsi name> -external_address <IP address>}
```

Options and parameters

Option	Description
-path_grp <path group#>	Specifies the external VOL path group number (0-63231).
-port <port#>	Specifies the Port number. Specifies the number of the port whose attribute is External. For example: • CL1-A
-external_wwn <wwn strings>	Specifies the WWN (16-digit hexadecimal value) of the external storage system. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8
-external_iscsi_name <external iscsi name>*	Specifies the iSCSI name of the iSCSI target on the external storage system in an iqn format or an eui format. • An iqn format: `iqn.` and the subsequent maximum 219 characters. • An eui format: `eui.` and the subsequent 16 characters in hexadecimal notation.
-external_address <IP address>*	Specifies the IP address of the iSCSI target on the external storage system. An IPv4 address or an IPv6 address can be specified. Note that the following addresses cannot be specified when you specify the IPv4 address: • Network address (for example: 192.168.10.*0*, *0*.120.10.1) • Broadcast address (for example: 255.255.255.*255*, 10.1.255.*255*) • Loop back address (for example: *127*.0.0.1) Note that the following addresses cannot be specified when you specify the IPv6 address: • Unspecified address (for example: *::*) • Multicast address (for example: *ff*:1024:1215::01) • Loop back address (for example: *::1*)
* You can specify the pseudo WWN of the iSCSI target to the -external_wwn option instead of specifying the iSCSI target by using the -external_iscsi_name option and the -external_address option. The pseudo WWN corresponds to the iSCSI name and IP address of the iSCSI target on the external storage system. By executing the raidcom get external_iscsi_name command, you can confirm the suitability between the pseudo WWN and the iSCSI name and IP address of the iSCSI target on the external storage system.	

Examples

Adding a path of External port CL1-A, external storage system port 50060e80,05fa0f36 to an external volume path group number: 1.

```
# raidcom add path -path_grp 1 -port CL1-A -external_wwn
50060e80,05fa0f36
```

Adding the path between the external storage system iSCSI target (iSCSI name: iqn.z2, IP address: 158.214.135.100) and the iSCSI port: CL1-A of the local storage system to the external volume path group number: 1.

```
# raidcom add path -path_grp 1 -port CL1-A -external_iscsi_name
iqn.z2 -external_address 158.214.135.100
```

raidcom get path

Displays the external path information to an external volume.

Syntax

```
raidcom get path [-path_grp <path group#> |
   -external_grp_id <gno-sgno> | -ldev_id <ldev#>]
   [{-check_status | -check_status_not}  <string>...
   [-time <time>]]
```

Options and parameters

Option	Description
[-path_grp <path group#>]	Specifies the external VOL path group number (0-63231). If it is omitted, all groups are displayed.
[-external_grp_id <gno-sgno>]	Specifies the external volume group number (gno:1-16384, sgno: 1-4096). For example: • 52-11 When you specify this option, only the external path information of the specified external volume group is displayed.
[-ldev_id<ldev#>]	Specifies the LDEV number (0-65279). For example: • -ldev_id 200 When you specify this option, only the external path information to the external volume of the specified LDEV is displayed.
[-check_status <string>... [-time <time>]]	Check if the external volume is in the same state as specified in <string>. If the option contains multiple states, the OR condition check is performed and verifies that the external volume is in one of the states contained in the option. You can check the state of the external volume displayed at the beginning when executing the raidcom get path command without specifying the -check_status option. The following strings are specified in the <string>: • NML: "Normal" • CHK: "Checking" • SYN: "Cache Destage"

Option	Description
	• DSC: "Disconnect" • BLK: "Blockading" in the external path for the external volume • UNK: "Unknown" • WAR: "Warning" If you specify the -time option, this command checks the status of the external volume every three seconds until the end of the specified <time> (seconds). When this option is specified, the returned values are as follows: • The external volume is not in any of the specified states: 0 • The external volume is in one of the specified states (without -time option): 1 • The external volume is in one of the specified states (when the specified <time> passed): EX_EWSTOT
[-check_status_not <string> [-time <time>]]	Check if the external volume is not in the same state as specified in <string>. If the option contains multiple states, the NOR condition check is performed and verifies that the external volume is not in any of the states contained in the option. You can check the state of the external volume displayed at the beginning when executing the raidcom get path command without specifying the -check_status_not option. The following strings are specified in the <string>. • NML: "Normal" • CHK: "Checking" • SYN: "Cache Destage" • DSC: "Disconnect" • BLK: "Blockading" in the external path for the external volume • UNK: "Unknown" • WAR: "Warning" If you specify the -time option, this command checks the status of the external volume every three seconds until the end of the specified <time> (seconds). When this option is specified, the returned values are as follows: • The external volume is in one of the specified states: 0 • The external volume is in none of the specified states (without -time option): 1 • The external volume is in none of the specified states (when the specified <time> passed): EX_EWSTOT

Examples

Displaying the external path (group) information to the external volume

```
# raidcom get path
PHG GROUP STS CM IF MP# PORT WWN              PR LUN PHS Serial#
PRODUCT_ID LB PM DM
1   1-1   NML E  D  2  CL1-A 50060e8005fa0f36 1  3  NML 60010
```

```
VSP         N  M  E
1   1-1   NML E  D  2  CL2-A 50060e8005fa0f38 2  3  NML 60010
VSP         N  M  D
5   2-1   NML E  D  0  CL3-B 50060e8006fc3222 1  0  NML 64562
VSP         N  M  E
5   2-1   NML E  D  0  CL5-A 50060e8006fc4150 -  -  UNK 64562
VSP         N  M  E
5   2-2   NML E  D  2  CL3-B 50060e8006fc3222 -  -  UNK 64562
VSP         N  A  D
5   2-2   NML E  D  2  CL5-A 50060e8006fc4150 1  0  NML 64562
VSP         N  A  D
```

Displaying the information of the external volume path group number: 1

```
# raidcom get path -path_grp 1
PHG GROUP STS CM IF MP# PORT WWN             PR LUN PHS Serial#
PRODUCT_ID LB PM DM
1   1-1   NML E  D  2  CL1-A 50060e8005fa0f36 1  3  NML 60010
VSP         N  M  E
1   1-1   NML E  D  2  CL2-A 50060e8005fa0f38 2  3  NML 60010
VSP         N  M  D
```

Displaying the information of the external volume path group number: 5

```
# raidcom get path -path_grp 5
PHG GROUP STS CM IF MP# PORT WWN             PR LUN PHS Serial#
PRODUCT_ID LB PM DM
5   1-1   NML E  D  0  CL3-B 50060e8006fc3222 1  0  NML 64562
VSP         N  M  E
5   1-1   NML E  D  0  CL5-A 50060e8006fc4150 -  -  UNK 64562
VSP         N  M  E
5   1-2   NML E  D  2  CL3-B 50060e8006fc3222 -  -  UNK 64562
VSP         N  A  D
5   1-2   NML E  D  2  CL5-A 50060e8006fc4150 1  0  NML 64562
VSP         N  A  D
```

Description of each column in output example:

PHG: Displays the path group number for the external volume.

GROUP: Displays the external volume group number.

STS: Displays the following status of the external volume.

- NML: "Normal"
- CHK: "Checking"
- SYN: "Cache Destage"
- DSC: "Disconnect"
- BLK: "Blockading" in the external path for the external volume.
- UNK: "Unknown"
- WAR: "Warning"

CM: Displays the cache mode for external volume.

- E: Write cache enabled.

- D: Write cache disabled.

- EM: NDM attribute and Write cache enabled.

- DM: NDM attribute and Write cache disabled.

- TM: NDM attribute and cache through mode.

- SM: NDM attribute and Write sync mode.

IF: Displays the cache inflow control for external volume.

E: Enable, D: Disable

MP#: Displays the MP blade ID for the external volume owner.

PORT: Displays the port number.

WWN: Displays the target wwn on the external storage system. For VSP Gx00 models and VSP Fx00 models, when the external storage system is connected by iSCSI, this item displays the pseudo WWN of the external storage system.

PR: Displays the priority number in the external volume path group.

LUN: Displays the LUN in the port on the external storage system side.

PHS: Displays the following status of the external path.

- NML: "Normal" status in external path.

- CHK: "temporary blockading " status in external path.

- BLK: "blockading" status in external path.

- DSC: "disconnected" status in external path.

- UNK: "Unknown" status in external path.

Serial#: Displays the serial number of external storage system.

The serial number (Serial#) for VSP G1000, G1500, and VSP F1500 is displayed with a “3” at the beginning (“312345” = serial # 12345).

PRODUCT_ID: Displays the PRODUCT_ID of the external storage system.

LB: Displays the following I/O load balance mode for the external storage system.

- N: "normal round robin" mode.

- E: "extended round robin" mode.

- D: Executes with one path without load balance mode.

If Single is used for the path mode or the load balance mode is not supported, a hyphen (-) is displayed.

PM: Displays the path mode for the external storage system.

- M: Multiple path mode

- S: Single path mode

- A: APLB mode

- AL: ALUA mode

- MA: Multiple path mode (changeable to ALUA mode)

- SA: Single path mode (changeable to ALUA mode)

DM: Displays whether the data direct mapping attribute is set to the external volume group.

- E: The data direct mapping attribute is set.

- D: The data direct mapping attribute is not set.

Waiting until the status of the external volume #1-1 changes to DSC

When the status has changed to DSC, the command ends with the return value 0. If the status does not change to DSC within 30 minutes, the command times out, and ends with the return value EX_EWSTOT.

```
# raidcom get path -external_grp_id 1-1 -check_status DSC -time 1800
```

Waiting until the status of the LDEV #0x10 of the external volume changes to DSC

When the status has changed to DSC, the command ends with the return value 0. If the status does not change to DSC within 30 minutes, the command times out, and ends with the return value EX_EWSTOT.

```
# raidcom get path -ldev_id 0x10 -check_status DSC -time 1800
```

Checking if the external volume#1-1 is in DSC status

When the status is in DSC, the command ends with the return value 0. If the status is not in DSC, the command ends with the return value 1.

```
# raidcom get path -external_grp_id 1-1 -check_status DSC
```

Executing the raidcom disconnect external_grp command to the external volume #1-1, and then waiting until the status of the external volume #1-1 changes to DSC

```
# raidcom disconnect external_grp -external_grp_id 1-1
# raidcom get path -external_grp_id 1-1 -check_status DSC -time 1800
```

raidcom check_ext_storage path

Restores an external path to external VOLs. Only one path is operated in one operation.

This command is executed asynchronously with the command input. Check the completion of this process on the raidcom get command_status command.

Syntax

```
raidcom check_ext_storage path -path_grp <path group#>
   -port <port#> {-external_wwn <wwn strings> |
   -external_iscsi_name <external iscsi name>
   -external_address <IP address>}
```

Options and parameters

Option	Description
-path_grp <path group#>	Specifies the external VOL (0-63231) path group number.
-port <port#>	Specifies the port number. Specifies the number of the port whose attribute is ELUN (External). For example: • CL1-A
-external_wwn <wwn strings>	Specifies the WWN (16-digit hexadecimal value) of the external storage system. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8
-external_iscsi_name <external iscsi name>*	Specifies the iSCSI name of the iSCSI target on the external storage system in an iqn format or an eui format. • An iqn format: `iqn.` and the subsequent maximum 219 characters. • An eui format: `eui.` and the subsequent 16 characters in hexadecimal notation.
-external_address <IP address>*	Specifies the IP address of the iSCSI target on the external storage system. An IPv4 address or an IPv6 address can be specified. Note that the following addresses cannot be specified when you specify the IPv4 address: • Network address (for example: 192.168.10.*0*, *0*.120.10.1) • Broadcast address (for example: 255.255.255.*255*, 10.1.255.*255*) • Loop back address (for example: *127*.0.0.1) Note that the following addresses cannot be specified when you specify the IPv6 address: • Unspecified address (for example: *::*) • Multicast address (for example: *ff*:1024:1215::01) • Loop back address (for example: *::1*)
* You can specify the pseudo WWN of the iSCSI target to the -external_wwn option instead of specifying the iSCSI target by using the -external_iscsi_name option and the -external_address option. The pseudo WWN corresponds to the iSCSI name and IP address of the iSCSI target on the external storage system. By executing the raidcom get external_iscsi_name command, you can confirm the suitability between the pseudo WWN and the iSCSI name and IP address of the iSCSI target on the external storage system.	

Examples

Restoring a path of external volume path group number: 1, External port CL1-A, and external storage system port 50060e80,05fa0f36.

```
# raidcom check_ext_storage path -path_grp 1 -port CL1-A
     -external_wwn 50060e80,05fa0f36
```

Restoring the path between the external storage system iSCSI target (iSCSI name: iqn.z2, IP address: 158.214.135.100) and the iSCSI port: CL1-A in the external volume path group number: 1.

```
# raidcom check_ext_storage path -path_grp 1 -port CL1-A -
external_iscsi_name iqn.z2 -external_address 158.214.135.100
```

raidcom delete path

Deletes the external path or alternative path to an external volume. Only one path is operated in one operation.

This command is executed asynchronously with the command input. Check the completion of this process on the raidcom get command_status command.

Syntax

```
raidcom delete path -path_grp <path group#> -port <port#>
   {-external_wwn <wwn strings> | -external_iscsi_name
   <external iscsi name> -external_address <IP address>}
```

Options and parameters

Option	Description
-path_grp <path group#>	Specifies the external VOL path group number (0-63231).
-port <port#>	Specifies the Port number. Specifies the number of the port whose attribute is ELUN (External). For example: • CL1-A
-external_wwn <wwn strings>	Specifies the WWN (16-digit hexadecimal value) of the external storage system. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8
-external_iscsi_name <external iscsi name>*	Specifies the iSCSI name of the iSCSI target on the external storage system in an iqn format or an eui format. • An iqn format: `iqn.` and the subsequent maximum 219 characters. • An eui format: `eui.` and the subsequent 16 characters in hexadecimal notation.

Option	Description
-external_address <IP address>*	Specifies the IP address of the iSCSI target on the external storage system. An IPv4 address or an IPv6 address can be specified. Note that the following addresses cannot be specified when you specify the IPv4 address: • Network address (for example: 192.168.10.*0*, *0*.120.10.1) • Broadcast address (for example: 255.255.255.*255*, 10.1.255.*255*) • Loop back address (for example: *127*.0.0.1) Note that the following addresses cannot be specified when you specify the IPv6 address: • Unspecified address (for example: *::*) • Multicast address (for example: *ff*:1024:1215::01) • Loop back address (for example: *::1*)
* You can specify the pseudo WWN of the iSCSI target to the -external_wwn option instead of specifying the iSCSI target by using the -external_iscsi_name option and the -external_address option. The pseudo WWN corresponds to the iSCSI name and IP address of the iSCSI target on the external storage system. By executing the raidcom get external_iscsi_name command, you can confirm the suitability between the pseudo WWN and the iSCSI name and IP address of the iSCSI target on the external storage system.	

Examples

Deleting a path of External port CL1-A, and external storage system port 50060e80,05fa0f36 from the external volume path group number: 1.

```
# raidcom delete path -path_grp 1 -port CL1-A -external_wwn
50060e80,05fa0f36
```

Deleting the path of the external storage system iSCSI target (iSCSI name: iqn.z2, IP address: 158.214.135.100) and the iSCSI port: CL1-A of the local storage system from the external volume path group number: 1.

```
# raidcom delete path -path_grp 1 -port CL1-A -external_iscsi_name
iqn.z2 -external_address 158.214.135.100
```

raidcom disconnect path

Blocks the usage of external paths to external VOLs. Only one path is operated in one operation.

This command is executed asynchronously with the command input. Check the completion of this process on the raidcom get command_status command.

Syntax

```
raidcom disconnect path -path_grp <path group#>
   -port <port#> {-external_wwn <wwn strings> |
   -external_iscsi_name <external iscsi name>
   -external_address <IP address>}
```

Options and parameters

Option	Description
-path_grp <path group#>	Specifies the external VOL path group number (0-63231).
-port <port#>	Specifies the port number. Specifies the number of the port whose attribute is ELUN (External). For example: • CL1-A
-external_wwn <wwn strings>	Specifies the WWN (16-digit hexadecimal value) of the external storage system. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8
-external_iscsi_name <external iscsi name>*	Specifies the iSCSI name of the iSCSI target on the external storage system in an iqn format or an eui format. • An iqn format: `iqn.` and the subsequent maximum 219 characters. • An eui format: `eui.` and the subsequent 16 characters in hexadecimal notation.
-external_address <IP address>*	Specifies the IP address of the iSCSI target on the external storage system. An IPv4 address or an IPv6 address can be specified. Note that the following addresses cannot be specified when you specify the IPv4 address: • Network address (for example: 192.168.10.*0*, *0*.120.10.1) • Broadcast address (for example: 255.255.255.*255*, 10.1.255.*255*) • Loop back address (for example: *127*.0.0.1) Note that the following addresses cannot be specified when you specify the IPv6 address: • Unspecified address (for example: *::*) • Multicast address (for example: *ff*:1024:1215::01) • Loop back address (for example: *::1*)
* You can specify the pseudo WWN of the iSCSI target to the -external_wwn option instead of specifying the iSCSI target by using the -external_iscsi_name option and the -external_address option. The pseudo WWN corresponds to the iSCSI name and IP address of the iSCSI target on the external storage system. By executing the raidcom get external_iscsi_name command, you can confirm the suitability between the pseudo WWN and the iSCSI name and IP address of the iSCSI target on the external storage system.	

Examples

Blocks the usage of a path of the external volume path group number: 1, the External port CL1-A, and the external storage port 50060e80,05fa0f36.

```
# raidcom disconnect path -path_grp 1 -port CL1-A -external_wwn
50060e80,05fa0f36
```

Blocks the usage of the path between the external storage system iSCSI target (iSCSI name: iqn.z2, IP address: 158.214.135.100), and the iSCSI

port: CL1-A of the local storage system, and the external volume path group number: 1.

```
# raidcom disconnect path -path_grp 1 -port CL1-A -
external_iscsi_name iqn.z2 -external_address 158.214.135.100
```

raidcom delete pool

Deletes the specified Pool for Thin Image, Copy-on-Write Snapshot, Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe.

When LDEVs or device groups are specified, LDEVs are deleted from the specified pools.

This command is executed asynchronously with the command input. Check the completion of this process on the raidcom get command_status command.

Syntax

```
raidcom delete pool -pool {<pool ID#> | <pool naming>}
 [-ldev_id <ldev#> |-grp_opt <group option> -device_grp_name <device
group name> [<device name>]]
```

Options and parameters

Option	Description
-pool {<pool ID#> | <pool naming>}	Specifies the Pool ID (0-127) or pool name for Copy-on-Write Snapshot, Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe. When you specify only a number, it is recognized as a pool ID. Therefore, to specify a pool whose name is a number, use the pool ID instead of the pool name.
-ldev_id <ldev#>	Specifies the LDEV number (0-65279), for example: • -ldev_id 200
-grp_opt <group option>	Specifies the device information extracted from the LDEV belonging to the device group. Specify "ldev" (fixed). The information of LDEV belonging to the device group is used.
-device_grp_name <device group name> [<device name>]	Specifies the name of device group (maximum 32 characters) to be operated. To operate an LDEV in the device group, specify the device name of the LDEV (maximum 32 characters). If the device name is omitted, all the LDEVs belonging in the device group are operated.

Examples

Deleting a pool of pool ID 5:

```
# raidcom delete pool -pool_id 5
```

Deleting a pool of pool name "my_aou_pool":

```
# raidcom delete pool -pool my_aou_pool
```

Note: "Aou" (allocation on use) refers to dynamic provisioning.

raidcom get pool

Displays pool information for Thin Image, Copy-on-Write Snapshot, Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, and active flash for mainframe.

Syntax

```
raidcom get pool [-key <keyword>] [-fx]
```

Options and parameters

Option	Description
[-key <keyword>]	Specify this option to display the following keywords that can be specified for <keyword>: • opt: Pool name • fmc: Information on parity groups of FMC contained in a pool • saving: Information on the amount of saved data **Note:** *FMC* stands for *flash module compression* (a drive in a parity group that supports accelerated compression).
[-fx]	Displays the LDEV number in hexadecimal.

Examples

Displaying pool information.

```
# raidcom get pool
PID POLS U(%) SSCNT Available(MB) Capacity(MB) Seq# Num LDEV# H(%)
001 POLN 10   330   10000000      1000000000   62500 2   365  80
002 POLF 95   9900  100000        1000000000   62500 3   370  70
003 POLS 100  10000 100           1000000000   62500 1   375  70
004 POLE 0    0     0             0            62500 0   0    80
```

Displaying pool name.

```
# raidcom get pool -key opt
PID  POLS U(%) POOL_NAME   Seq#   Num LDEV# H(%) VCAP(%) TYPE PM PT
001  POLN  10  my_aou_pool 62500   2   265  80   65500   OPEN S  HDP
002  POLF  95  New_Pool_2  62500   3   270  70   65534   OPEN S  HDP
003  POLS 100  my_ss_pool  62500   1   275  70     -     OPEN N  TI
004  POLN   0  New_Pool_4  62500   2   280  80     - 0   M/F  N  CW
005  POLE   0  New_Pool_5  62500   4    0   80     100   M/F  S  DM
```

Description of each column in output example:

PID: Displays the pool ID.

POLS: Displays the following status in the pool:

- POLN: "Pool Normal" (The pool is in the normal status.)

- POLF: "Pool Full" (The pool is in the overflow status exceeding the threshold.)

- POLS: "Pool Suspend" (The pool is in the overflow status exceeding the threshold and is suspended.)

- POLE: "Pool failure" (The pool is suspended in the failure status.) In this status, the pool information cannot be displayed.

U(%): Displays the usage rate of the pool.

SSCNT: Displays the number of volumes in the pool.

POOL_NAME: Displays the pool name.

Available (MB): Displays the capacity available to the volume data in the pool.

Capacity (MB): Displays the total capacity of the pool.

Seq#: Displays the product serial number.

The serial number (Seq#) for VSP G1000, G1500, and VSP F1500 is displayed with a “3” at the beginning (“312345” = serial # 12345).

Num: Displays the number of LDEVs configured the pool.

LDEV#: Displays the first number of LDEV configured the pool. 65535(ffff) is displayed if the pool is being created.

H(%): Displays threshold for the pool.

VCAP (%): Displays the subscription threshold %. "-" indicates unlimited.

TYPE: Displays the platform type of pools.

- Open: Shows that it is a Dynamic Provisioning pool.
- M/F: Shows that it is a Dynamic Provisioning for Mainframe pool.

PM: Displays the pool status.

- N: Normal status.
- S: Shrinking or rebalancing.
- NT: The pool for Thin Image is in the normal status.
- ST: (VSP G1000, G1500, and VSP F1500, VSP Gx00 models, and VSP Fx00 models only) The pool for Thin Image is shrinking or rebalancing.

PT: Displays the pool type. Any one of the following types is displayed.

- HDP: Pool for Dynamic Provisioning
- HDT: Pool for Dynamic Tiering
- RT: Pool for active flash
- TI: Pool for Thin Image

- CW: Pool for Hitachi Copy-on-Write Snapshot software
- DM: Pool for Dynamic Provisioning that has the data direct mapping attribute

Displaying information on the parity group for FMC that configures a pool. However, this information is not displayed if the functionality to show the information on a parity group of FMC is not supported.

```
# raidcom get pool -key fmc
PID U(%)   ACT_AV(MB)  ACT_TP(MB)  FR(%)  FMC_LOG_USED(BLK)
FMC_ACT_USED(BLK)
001   90     10000000   100000000      0
0                  0
002   99           10000   100000000  200  100000000  100000000
004   90     10000000   100000000  150  100000000  100000000
```

Description of each column in output example:

- PID: Displays the pool ID.
- U(%): Displays the usage rate of the pool.
- ACT_AV(MB): Displays the available actual capacity of the volume mapped to this pool for Dynamic Provisioning, Dynamic Provisioning for Mainframe, and Dynamic Tiering.
- ACT_TP(MB): Displays the total actual capacity of the pool.
- FR(%): Displays the percentage of the logical capacity against the actual capacity of the parity group for FMC that configures the pool. 0 is displayed if the pool does not contain the parity group of FMC.
- FMC_LOG_USED(BLK): Displays the logically used capacity of the parity group for FMC that configures the pool in the unit of 512 bytes. 0 is displayed if the pool does not contain the parity group of FMC.
- FMC_ACT_USED(BLK): Displays the actually used capacity of the parity group for FMC that configures the pool in the unit of 512 bytes. 0 is displayed if the pool does not contain the parity group of FMC.

Displaying information about the reduced capacity of data in a pool.

```
# raidcom get pool -key saving
PID    SE_SAVING(BLK)    PL_SAVING(BLK)    PL_PRE_USED(BLK)
SES(%)    DDP(%)    CMP(%)    PLS(%)    Num    LDEV#
000    12582912    9437184    28311552    20    15    5    33
1    0
001            0        0        -    -    -    -    0    -
```

Description of each column in output example:

- PID: Displays the pool ID.
- SE_SAVING(BLK): Displays the capacity reduced by deduplication and compression, or accelerated compression by the number of blocks.
- PL_SAVING(BLK): Displays the capacity reduced by deduplication and compression by the number of blocks.
- PL_PRE_USED(BLK): Displays the capacity of data (prior to reduction) to be reduced by deduplication and compression by the number of blocks.

- SES(%): Displays the percentage of capacity reduced by deduplication and compression, or accelerated compression against the capacity used by the virtual volume mapped to this pool before the reduction.
- DDP(%): Displays the percentage of capacity reduced by deduplication against the capacity used by the virtual volume mapped to this pool before the reduction.
- CMP(%): Displays the percentage of capacity reduced by deduplication and compression or accelerated compression against the capacity used by the virtual volume mapped to this pool before the reduction.



Note: The capacity used by the virtual volume before reduction, which is the denominator for calculating SES(%), DDP(%), and CMP(%), does not contain the capacity used by or reserved for the deduplication system data volume.

- PLS(%): Displays the percentage of capacity reduced by deduplication and compression against the amount before the reduction, which is calculated as follows:
  `PL_SAVING(BLK) / PL_PRE_USED(BLK) × 100[%]`
- Num: Displays the number of deduplication system data volumes in a pool.
- LDEV#: Displays the LDEV number of the deduplication system data volume in a pool. A hyphen (-) is displayed if the number of volumes is zero.

raidcom modify pool

Sets the options of a pool for Thin Image, Copy-on-Write Snapshot, Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe. This option also changes the setting of the data direct mapping attribute of the pool for Dynamic Provisioning.

When the **-status** or **-deduplication** option is specified, the operation is executed asynchronously with the command input. Check the completion of this process on the **raidcom get command_status** command.

Syntax

```
raidcom modify pool -pool {<pool ID#> | <pool naming>}
   { -status <status> | -user_threshold <threshold_1>
[<threshold_2>] |
   -tier <Tier number> [<ratio>][-tier_buffer_rate <%>] |
   -subscription <%> | -pool_attribute <pool_attribute> |
   -monitor_mode <Monitor mode> |
   -blocking_mode <IO blocking mode> |
   -data_direct_mapping {enable|disable}  | -deduplication yes -
ldev_id <ldev#>… [-ssids <ssid> …] | -deduplication no}
```

Options and parameters

Option	Description
-pool {<pool ID#> | <pool naming>}	Specifies the Pool ID (0-127) or pool name for Copy-on-Write Snapshot, Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe. When only a number is specified, it is recognized as a pool ID. Therefore, to specify a pool whose name is a number, use the pool ID instead of the pool name.
-status <status>	Specifies the status of the pool. "nml" must be specified as the status.
-user_threshold <threshold_1> [<threshold_2>]	Sets a user-defined threshold. • For Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, and active flash for mainframe, you may specify two user-defined thresholds, and their valid ranges are 1-100%, respectively. If you specify <threshold_1> and <threshold_2>: the value of <threshold_1> is set as the threshold for *WARNING* specified to a pool. the value of <threshold_2> is set as the threshold for *High water mark* specified to a pool. If you specify only <threshold_1>, your specified value and the system default value (80%) are applied. The setting in which you specify only <threshold_1> is supported to maintain backward compatibility with microcode before 70-02-0x-xx/xx. Once you specify two user-defined thresholds, you must continue to specify two user-defined thresholds thereafter. • The valid range for Thin Image or Copy-on-Write Snapshot is 20-95%. You may specify only <threshold_1>. Even if you specify the value for <threshold_2>, the value is ignored.
-tier <Tier number> [<ratio>]	Specifies the pool information for Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe. This is specified when changing the free space percentage for a new allocation by each tier. When this option is specified, pool attribute changes into manual relocation. <Tier number>:Tier number (1-3) <ratio>: Free space percentage for new allocation(0-50) [%]
[-tier_buffer_rate <%>]	Specifies the pool information for Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe. Specifies the amount of reallocation buffer (2-40) for each tier in percent (%).
-subscription < %>	Sets the maximum reserved V-VOL capacity rate (0-65535) to the pool capacity. 0-65534: Specified percentage 65535: Unlimited
-pool_attribute <pool_attribute>	Specifies when changing the pool from Dynamic Provisioning/ Dynamic Provisioning for Mainframe to Dynamic Tiering/Dynamic Tiering for Mainframe, or from Dynamic Tiering/Dynamic Tiering for

Option	Description
	Mainframe to Dynamic Provisioning/Dynamic Provisioning for Mainframe. Specifies the following value depend on the type of pool desired to be changed. • dt_manual: Changes the pool from Dynamic Provisioning/ Dynamic Provisioning for Mainframe to Dynamic Tiering/Dynamic Tiering for Mainframe. It is changed to manual relocation. • dp: Changes the pool from Dynamic Tiering/Dynamic Tiering for Mainframe to Dynamic Provisioning/Dynamic Provisioning for Mainframe.
-monitor_mode <monitor mode>	Specifies the monitoring mode for a Dynamic Tiering/Dynamic Tiering for Mainframe pool. Or specifies the availability of active flash. • period: Performs monitoring periodically. • continuous: Performs monitoring continuously. • realtime_tiering: Enables active flash. • non_realtime_tiering: Disables active flash.
-blocking_mode <IO blocking mode>	Sets the I/O activity (availability for read/write access) when the pool for Dynamic Provisioning, Dynamic Tiering, or active flash is full and when the pool for Dynamic Provisioning, Dynamic Tiering, or active flash is blocked. This option is ignored when the microcode version does not support the option*. • pool_full: If the pool is full, read/write access for the target DP-VOL is disabled. If the pool is blocked, read/write access for the target DP-VOL is enabled. • pool_vol_blockade: If the pool-VOL is blocked, read/write access for the target DP-VOL is disabled. If the pool-VOL is full, read/ write access for the target DP-VOL is enabled. • full_or_blockade: If the pool is full or blocked, read/write access for the target DP-VOL is disabled. • no_blocking: If the pool is full and/or blocked, read/write access for the target DP-VOL is enabled.
-data_direct_mapping {enable| disable}	(VSP G1000, G1500, and VSP F1500 and VSP Gx00 models only) Changes the setting of the data direct mapping attribute of the pool for Dynamic Provisioning. • enable: Changes a pool for Dynamic Provisioning to a pool for Dynamic Provisioning that has the data direct mapping attribute. • disable: Changes a pool for Dynamic Provisioning that has the data direct mapping attribute to a pool for Dynamic Provisioning.
-deduplication yes -ldev_id <ldev#> … [-ssids <ssid> …]	Enables deduplication of the pool. When this option is specified, a deduplication system data volume that has an LDEV number (0 to 65279) specified for "-ldev_id <ldev#> …" is created. If you want to assign an SSID to the deduplication system data volume to be created, specify "-ssids <ssid> …" in hexadecimal. SSIDs specified by "-ssids <ssid> …" are assigned to deduplication system data volumes specified for "-ldev_id <ldev#> …" in the order they were specified. If you omit this option, or specify auto for <ssid>, SSIDs are assigned automatically to the corresponding deduplication system data volumes.

Option	Description
	If you specify multiple LDEVs, an error occurs because the current microcode does not support this function. If this happens, deduplication of the pool is not enabled.
-deduplication no	Disables deduplication of the pool. When this option is specified, a deduplication system data volume in this pool is deleted.
* The microcode is displayed "-" in the BM column when you execute the raidcom get dp_pool command.	

Examples

Restoring the status of a pool ID: 6.

```
# raidcom modify pool -pool 6 -status nml
```

Restoring the status of a pool name: my_ss_pool.

```
# raidcom modify pool -pool my_ss_pool -status nml
```

Changing the user-defined thresholds of the pool ID:6 of the pool for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe, *WARNING* to 70% and *High water mark* to 80%.

```
# raidcom modify pool -pool 6 -user_threshold 70 80
```

Changing the user-defined threshold of the pool ID: 6 of the pool for Thin Image or Copy-on-Write Snapshot to 80%.

```
# raidcom modify pool -pool 6 -user_threshold 80
```

Changing the free space percentage for a new allocation to the tier number 1 of the pool ID:6 for Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe to 30%.

```
# raidcom modify pool -pool 6 -tier 1 30
```

Changing the amount of reallocation buffer to the tier number 1 of the pool ID:6 for Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe to 20%.

```
# raidcom modify pool -pool 6 -tier 1 -tier_buffer_rate 20
```

Changing a Dynamic Provisioning/Dynamic Provisioning for Mainframe pool of the pool ID:6 to a Dynamic Tiering/Dynamic Tiering for Mainframe pool.

```
# raidcom modify pool -pool 6 -pool_attribute dt_manual
```

Changing a Dynamic Tiering/Dynamic Tiering for Mainframe pool of the pool ID:6 to a Dynamic Provisioning/Dynamic Provisioning for Mainframe pool.

```
# raidcom modify pool -pool 6 -pool_attribute dp
```

Changing the automatic relocation of the pool (Pool name: my_pool) for Dynamic Provisioning to manual relocation.

```
# raidcom modify pool -pool my_pool -pool_attribute dt_manual
```

Changing the monitoring mode of Dynamic Tiering/Dynamic Tiering for Mainframe pool of the pool ID: 6 to continuous.

```
# raidcom modify pool -pool 6 -monitor_mode continuous
```

When the pool is full, changing read/write of Dynamic Provisioning pool ID: 6 to rejected.

```
# raidcom modify pool -pool 6 -blocking_mode pool_full
```

Enabling active flash of Dynamic Tiering pool ID: 6.

```
# raidcom modify pool -pool 6 -monitor_mode realtime_tiering
```

(VSP G1000, G1500, and VSP F1500 and VSP Gx00 models only) Changing a pool (pool ID: 6) for Dynamic Provisioning to a pool for Dynamic Provisioning that has the data direct mapping attribute.

```
# raidcom modify pool -pool 6 -data_direct_mapping enable
```

Enabling deduplication of the pool (pool ID: 6) for Dynamic Provisioning to create a deduplication system data volume of LDEV: 400.

```
# raidcom modify pool -pool 6 –deduplication yes –ldev_id 400
```

Enabling deduplication of the pool (pool ID: 6) for Dynamic Provisioning to create a deduplication system data volume of LDEV: 400, and assigning SSID: 0x0004 to the deduplication system data volume.

```
# raidcom modify pool -pool 6 –deduplication yes –ldev_id 400 –ssids
0x0004
```

Disabling deduplication of the pool (pool ID: 6) for Dynamic Provisioning to delete a deduplication system data volume.

```
# raidcom modify pool -pool 6 –deduplication no
```

raidcom monitor pool

Sets the start or stop of performance monitoring of a pool for Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe.

Syntax

```
raidcom monitor pool -pool {<pool ID#> | <pool naming>}
     -operation <type>
```

Options and parameters

Option	Description
-pool {<pool ID#> | <pool naming>}	Specifies the pool ID (0-127) or pool name of a pool for Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe. When specifying just a number, it is recognized as a pool ID. Therefore, when you specify a pool that the pool name is only a number, operate by specifying pool ID instead of specifying pool name.
-operation <type>	Instructs the operation of performance monitoring. The operational types that can be specified are shown below. start: Start the performance monitoring. stop: Stop the performance monitoring.

Examples

Starting the performance monitoring of a pool for Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe with Pool ID: 20.

```
# raidcom monitor pool -pool 20 -operation start
```

Starting the performance monitoring of a pool for Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe with Pool Name: my_tier_pool.

```
# raidcom monitor pool -pool my_tier_pool -operation start
```

Stopping the performance monitoring of a pool for Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe with Pool ID: 20.

```
# raidcom monitor pool -pool 20 -operation stop
```

Stopping the performance monitoring of a pool for Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe with Pool Name: my_tier_pool.

```
# raidcom monitor pool -pool my_tier_pool -operation stop
```

raidcom reallocate pool

Sets the start or stop of tier relocation of a pool for Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe.

Syntax

```
raidcom reallocate pool -pool {<pool ID#> | <pool naming>}
     -operation <type>
```

Options and parameters

Option	Description
-pool {<pool ID#> | <pool naming>}	Specifies the pool ID (0-127) or pool name of a Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe pool. When only a number is specified, it is recognized as a pool ID. Therefore, when you specify a pool whose name is only a number, use the pool ID instead of the pool name.
-operation <type>	Relocation operation instruction: start: Start the tier relocation. stop: Stop the tier relocation.

Examples

Starting the tier relocation of a pool for Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe with Pool: 20.

```
# raidcom reallocate pool -pool 20 -operation start
```

Starting the tier relocation of a pool for Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe with Pool Name: my_tier_pool.

```
# raidcom reallocate pool -pool my_tier_pool -operation start
```

Stopping the relocation of a pool for Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe with Pool: 20.

```
# raidcom reallocate pool -pool 20 -operation stop
```

Stopping the relocation of a pool for Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe with Pool Name: my_tier_pool.

```
# raidcom reallocate pool -pool my_tier_pool -operation stop
```

raidcom rename pool

Changes the pool name of a pool for Thin Image, Copy-on-Write Snapshot, Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe.

Syntax

```
raidcom rename pool -pool_id <pool ID#> -pool_name <pool naming>
```

Options and parameters

Option	Description
-pool_id <pool ID#>	Specifies a pool ID (0-127). If a -pool_id option is non-numeric, the specified value is recognized as a pool name to identify the pool ID.
-pool_name <pool naming>	Specifies a new pool name. You can specify up to 32 characters. The -pool_name option cannot be specified by configuring only in numeric because numeric values are preferentially identified as a pool ID. Specifies a pool ID with the '-pool_id<pool ID#>' option.

Examples

Changing the pool name of the pool (ID: 1) to my_pool.

```
# raidcom rename pool -pool_id 1 -pool_name my_pool
```

raidcom get port

Displays port information.

This queries the setting information on all ports.

Syntax

```
raidcom get port [-port <port#> [-key opt]]
```

Options and parameters

Option	Description
[-port <port#>]	Specifies the port number (for example, CL1-A). The port type you specify must be FIBRE, FCoE, or iSCSI. If you specify a port for which LUN security is enabled, the following items are displayed: • If the target port type is FIBRE or FCoE: LOGIN_WWN • If the target port type is iSCSI: LOGIN_ISCSI_NAME
[-key opt]	Specify this option to see the detailed information of FIBRE, FCoE, or iSCSI.

Examples

Displaying port information.

For a mainframe port (ESCON, FICON), "-" is displayed for the values from SPD to SSW.

For a port used for Hitachi NAS (HNASS or HNASU), "-" is displayed for the values from ATTR to SSW and for WWN.

```
# raidcom get port
PORT  TYPE ATTR SPD LPID FAB CONN SSW SL Serial# WWN      PHY_PORT
CL1-A FIBRE TAR AUT  EF  N   FCAL  N   0 64568  50060e8006fc3800 -
CL1-B FIBRE TAR AUT  EF  N   FCAL  N   0 64568  50060e8006fc3801 -
CL1-C FICON TAR  -   -   -   -     -   0 64568  50060e8006fc3802 -
CL1-D FICON TAR  -   -   -   -     -   0 64568  50060e8006fc3803 -
CL2-A FIBRE TAR AUT  D9  N   FCAL  N   0 64568  50060e8006fc3810 -
CL2-B FIBRE TAR AUT  D3  N   FCAL  Y   0 64568  50060e8006fc3811 -
CL2-C FICON TAR  -   -   -   -     -   0 64568  50060e8006fc3812 -
CL2-D FICON TAR  -   -   -   -     -   0 64568  50060e8006fc3813 -
CL3-A FIBRE MCU AUT  E8  N   FCAL  N   0 64568  50060e8006fc3820 -
CL3-B FIBRE TAR AUT  E0  N   FCAL  Y   0 64568  50060e8006fc3821 -
CL3-J ISCSI TAR AUT  00  N   UNKN  N   0 64015  -                -
CL4-A HNASS -   -    -   -   -     -   0 64568  -                -
CL4-B HNASU -   -    -   -   -     -   0 64568  -                -
```

Description of each column in output example:

PORT: Displays the port numbers.

TYPE: Displays the following port type: FIBRE, SCSI, ISCSI, ENAS, ESCON, FICON, FCoE, HNASS, HNASU

- HNASS means the port is for the system LU of Hitachi NAS.
- HNASU means the port is for a user LU of Hitachi NAS.

ATTR: Displays the following attribute setting on a port. One of the following items is displayed. If the port is a bidirectional port, the following four attributes are all displayed for each port.

- TAR: Fibre target port (target port)
- MCU: MCU initiator port (initiator port)
- RCU: RCU target port (RCU target port)

- ELUN: External initiator port (External port)

SPD: Displays the transfer rate setting on a port. One of the following values is displayed: AUT(AUTO), 1G, 2G, 4G, 8G, 10G…

LPID: Displays the Loop ID(AL_PA) setting on a port.

FAB: Displays the fabric mode setting on a port as Y(YES) or N(NO).

CONN: Displays the following topology setting on a port: FCAL/PtoP/UNKN/-. If the port does not support the topology setting, UNKN or a hyphen is displayed.

SSW: Displays the LUN security setting on a port as Y (enabled) or N (disabled).

SL: Displays the SLPR number to which the port belongs.

Serial#: Product serial number.

The serial number (Serial#) for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345).

WWN: Displays the external WWN.

PHY_PORT: Displays the port number of the physical port in a resource ID takeover configuration.

Displaying the information of the port CL4-E (in case of TYPE is other than ISCSI).

```
# raidcom get port -port CL4-E
PORT  LOGIN_WWN        Serial# -
CL4-E 210000e08b0256f8 63528   OLA_NODE0_CTL_0
CL4-E 210000e08b039c15 63528   OLA_NODE1_CTL_0
```

Description of each column in output example:

PORT: Displays the port numbers.

LOGIN_WWN: Displays the WWN of the host adapter login to this port.

Note: Only the currently connected WWN is displayed unlike the display on Device Manager - Storage Navigator.

Serial#: Product serial number.

The serial number (Serial#) for VSP G1000, G1500, and VSP F1500 is displayed with a "3" at the beginning ("312345" = serial # 12345).

Displaying the information of the port CL4-E (in case of TYPE is ISCSI)

```
# raidcom get port -port CL4-E
PORT   LOGIN_IQN   Serial#   -
CL4-E  iqn.z1…     63528     OLA_NODE0_CTL_0
CL4-E  iqn.z2…     63528     OLA_NODE1_CTL_0
```

Description of each column in output example:

PORT: Displays the port numbers.

LOGIN_IQN: Displays the iSCSI name for the host adapter log-in to this port that is currently being connected.

CCI displays only the iSCSI name of the port that is currently being connected, differently from Storage Navigator.

Serial#: Product serial number.

For example, for getting information on FCoE option:

```
# raidcom get port -port CL4-E -key opt
PORT  ENMA              VLAN_ID FPMA              VPS  VP_I FCF_I
CL4-E e3:00:00:e0:8b:02 0x03fe  e2:00:00:e0:8b:02 DWN  0x00 0x0000
```

Description of each column in output example:

PORT: Displays the port number.

ENMA: Displays Enode MAC address setting to this port.

VLAN_ID: Displays the VLAN identifier.

FPMA: Displays FP MAC address setting to this port.

VPS: Displays the virtual port status.

- DWN: the Link status is in Link Down.
- LOT: the Link status is in Link Up and Log-Out.
- LIN: the Link status is in Link Up and Log-In.

VP_I: Displays the virtual port index (zero is currently displayed).

FCF_I: Displays the FCoE index (zero is currently displayed).

Displaying the example of iSCSI

```
# raidcom get port -port CL4-E -key opt
PORT : CL4-E
TCP_OPT : IPV6_E : SACK_E : DACK_E : INS_E : VTAG_E
TCP_MTU : 1500
WSZ : 64KB
KA_TIMER : 30
TCP_PORT : 3260
IPV4_ADDR : 158.214.135.100
IPV4_SMSK : 255.255.255.255
IPV4_GWAD : 158.214.135.101
IPV6_ADDR_INF : STS : AM : fe80::209:6bff:febe:3c17
IPV6_GADR_INF : STS : AM : fe80::209:6bff:febe:3c17
IPV6_GWAD_INF : STS : fe80::209:6bff:febe:3c17 : fe80::209:6bff:febe:
3c17
ISNS_PORT : 3260
ISNS_ADDR : 158.214.135.101
VLAN_ID : 0001
```

Description of each column in output example:

PORT: Displays the port numbers.

TCP_OPT: Displays whether each option for iSCSI communication (IPv6 mode, Selective Ack mode, delayed ACK mode, iSNS mode, and Tag VLAN) is enabled or disabled. The meanings of the displayed value are as follows.

- IPV6_E: IPv6 mode is enabled.
- IPV6_D: IPv6 mode is disabled.
- SACK_E: Selective ACK mode is enabled.
- SACK_D: Selective ACK mode is disabled.
- DACK_E: Delayed ACK mode is enabled.
- DACK_D: Delayed ACK mode is disabled.
- INS_E: iSNS service is enabled.
- INS_D: iSNS service is disabled.
- VTAG_E: Tag VLAN is enabled.
- VTAG_D: Tag VLAN is disabled.

TCP_MTU: Displays the MTU value for iSCSI communication.

WSZ: Displays the window size for iSCSI communication.

KA_TIMER: Displays the Keep Alive Timer value for iSCSI communication.

TCP_PORT: Displays the TCP port number for iSCSI communication.

IPV4_ADDR: Displays IPv4 address.

IPV4_SMSK: Displays IPv4 subnet mask.

IPV4_GWAD: Displays IPv4 address of the gateway to use for iSCSI communication.

IPV6_ADDR_INF: Displays the status of IPv6 link local address, and the value of address acquiring mode and address. The details of STS and AM in the displayed example are described in the table below.

Item in the displayed example	Meanings of the item	Displayed value	Meanings of the value
STS	Status	INV	Invalid
		VAL	Valid
		ACQ	acquiring
		DUP	duplicated
AM	address acquiring mode	AM	Automatic acquiring
		MM	Manual acquiring

IPV6_GADR_INF: Displays the status of IPv6 Global address, and the value of address acquiring mode and address. The details of STS and AM in the displayed example are described in the table below.

Item in the displayed example	Meanings of the item	Displayed value	Meanings of the value
STS	Status	INV	Invalid
		VAL	Valid
		ACQ	acquiring
		DUP	duplicated
AM	address acquiring mode	AM	Automatic acquiring
		MM	Manual acquiring

IPV6_GWAD_INF: Displays the IPv6 Global address of the gateway to use for the iSCSI communication. The values of address are displayed in order of address and current address. The details of STS in the displayed example are described in the table below.

Item in the displayed example	Meanings of the item	Displayed value	Meanings of the value
STS	Status	INV	Invalid
		VAL	Valid
		ACQ	acquiring
		DUP	duplicated

ISNS_PORT: Displays the TCP port number of iSNS server. If iSNS is invalid, this item is not displayed.

ISNS_ADDR: Displays the address of iSNS server. If iSNS is invalid, this item is not displayed.

VLAN_ID: Displays VLAN ID if Tab VLAN is valid. If Tag VLAN is invalid, "-" is displayed.

Displaying the example of FIBRE

```
# raidcom get port -port CL4-E -key opt
PORT   S  LKNSPD  CURADR  T
CL4-E  U      16  821A00  D
```

Description of each column in output example:

PORT: Displays the port numbers.

S: Displays the link status of the port.

- U: The port is link up status.
- D: The port is not link up status.
- - (hyphen): The port does not support to display the link status.

The link status display is supported only on VSP Gx00 models and VSP Fx00 models).

LNKSPD: Displays the present transfer speed of the port by Gbps. If the port does not support to display the present transfer speed or the port is not link up status, a hyphen is displayed.

CURADR: Displays the present port address of the port by hexadecimal number. If the port does not support to display the present port address or the port is not link up status, a hyphen is displayed.

T: Displays the setting of the T10 PI mode of the port.

- E: T10 PI mode is enabled.
- D: T10 PI mode is disabled.
- - (hyphen): T10 PI is not supported.

raidcom modify port

Sets the attribute of the specified port.

When you set a port attribute by options other than a -port_attribute option, the port type of the specified port must be one of the following:

- FIBRE
- FCoE
- iSCSI

If these conditions are not satisfied, this command is rejected with EX_ENOOBJ.

When using an FCoE package, specify Port speed: 10G, Port topology: f_port. In this case, the port attribute cannot be changed.

When you set the T10 PI mode, this command is executed asynchronously with the command input. Check the completion of this process using the **raidcom get command_status** command.

The syntax is separated into 3 groups as follows. Syntax 2 and syntax 3 can be used only for iSCSI ports. If you execute a command that includes options written in both syntax 2 and syntax 3, an error occurs.

Syntax

Syntax 1

```
raidcom modify port -port <port#>{[-port_speed <value>]
   [-loop_id <value>][-topology <topology>][-security_switch
   {y | n}] | -port_attribute <port attribute> | -t10pi {enable|
disable}}
```

Syntax 2

```
raidcom modify port -port <port#> [-mtu <value>]
   [-vlan_tagging_mode {enable|disable}][-add_vlan_id <value>]
   [-delete_vlan_id <value>][-ipv4_address <address>]
   [-ipv4_subnetmask <subnet mask>][-ipv4_gateway_address <address>]
```

```
   [-ipv6_mode {enable|disable}][-ipv6_local_address {auto|
<address>}]
   [-ipv6_global_address {auto|<address>}][-ipv6_gateway_address
<address>]
   [-tcp_port <value>][-selective_ack_mode {enable|disable}]
   [-delayed_ack_mode {enable|disable}][-window_size <size>]
   [-keep_alive_timer <value>]
```

Syntax 3

```
raidcom modify port -port <port#> [-isns_mode {enable|disable}]
   [-isns_server_address <IPv4 address|IPv6 address>]
   [-isns_port <iSNS TCP Port number>]
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number. For example: • CL1-A
[-port_speed <value>]	Specifies the HOST speed (0, 1, 2, 4, 8, 10, 16, 32) as follows. • 0: AUTO • 1: 1G • 2: 2G • 4: 4G • 8: 8G • 10: 10G • 16: 16G • 32: 32G (for VSP Gx00 models or VSP Fx00 models)
[-loop_id <alpa value>]	Specifies the Loop ID (0x01-0xEF) of the Port.
[-topology <topology>]	Specifies the topology of the Port as follows: • fl_port: fabric on and fcal • f_port: fabric on and PtoP • nl_port: fabric off and fcal • n_port: fabric off and PtoP
[-security _switch {y | n}]	Specifies whether to use the security switch or not.
-port_attribute <port attribute>	Specifies the Port attribute as follows: • TAR: Fibre target port (target port) • MCU: MCU initiator port (initiator port) • RCU: RCU target port (RCU target port) • ELUN: External initiator port (External port) If the port is a bidirectional port, a user cannot change the port attribute. The storage system detects the appropriate attribute of the port, and then operates the port with the detected attribute.

Option	Description
	If this port attribute is changed from Target or RCU Target to Initiator or External, the host group belonging to this port belongs to meta_resource.
-t10pi {enable|disable}	Specifies the T10 PI mode as follows: • enable: T10 PI mode is enable • disable: T10 PI mode is disable When you change the T10 PI mode, the T10 PI mode of the ports which share the settings with the port are also changed. The user who executes the command must have authority of the specified port and the ports which share the settings with the port. Details about the ports which share the settings with the specified port, see the *Provisioning Guide* for the storage system.
[-mtu <value>]	Specifies the MTU value (1500/4500/9000) used during iSCSI communication. When you omit the specification, the MTU value is not changed. **Note:** If this option is specified, the communications through the port are interrupted.*
[-vlan_tagging_mode {enable|disable}]	Specifies the availability of tag VLAN. When you omit the specification, the settings for the availability of the tag VLAN is not changed. • enable: enable tag VLAN • disable: disable tag VLAN **Note:** If this option is specified, the communications through the port are interrupted.*
[-add_vlan_id <value>]	Specifies the adding VLAN ID (1-4094). When you omit the specification, the VLAN ID is not added. **Note:** If this option is specified, the communications through the port are interrupted.*
[-delete_vlan_id <value>]	Specifies the deleting VLAN ID (1-4094). When you omit the specification, the VLAN ID is not deleted. **Note:** If this option is specified, the communications through the port are interrupted.*
[-ipv4_address <address>]	Specifies the IPv4 address. When you omit the specification, the IPv4 address is not changed. You cannot specify following IPv4 addresses: • Network address (For example 192.168.10.0 or 0.120.10.1) • Broadcast address (For example 255.255.255.255 or 10.1.255.255) • Loopback address (For example 127.0.0.1) **Note:** If this option is specified, the communications through the port are interrupted.*
[-ipv4_subnetmask <subnet mask>]	Specifies the IPv4 subnet mask. When you omit the specification, the IPv4 subnet mask is not changed. **Note:** If this option is specified, the communications through the port are interrupted.*

Option	Description
[-ipv4_gateway_address <address>]	Specifies the IPv4 default gateway address. When you omit the specification, the IPv4 default gateway address is not changed. **Note:** If this option is specified, the communications through the port are interrupted.*
[-ipv6_mode {enable|disable}]	Specifies the availability of IPv6 mode. When you omit the specification, the settings for the availability of IPv6 mode is not changed. • enable: enable IPv6 mode • disable: disable IPv6 mode **Note:** If this option is specified, the communications through the port are interrupted.*
[-ipv6_local_address {auto|<address>}]	Specifies the IPv6 link local address. When you omit the specification, the IPv6 link local address is not changed. When you specify "auto", the address is set automatically. When you set the address manually, enter the IPv6 address for <address>. You cannot specify following IPv6 addresses: • Not set (For example ::) • Multicast address (For example ff00:1024:1215::01) • Loopback address (For example ::1) **Note:** If this option is specified, the communications through the port are interrupted.*
[-ipv6_global_address {auto|<address>}]	Specifies the IPv6 global address. When you omit the specification, the IPv6 global address is not changed. When you specify "auto", the address is set automatically. When you set the address manually, enter the IPv6 address for <address>. You cannot specify following IPv6 addresses: • Multicast address (For example ff00:1024:1215::01) • Loopback address (For example ::1) **Note:** If this option is specified, the communications through the port are interrupted.*
[-ipv6_gateway_address <address>]	Specifies the IPv6 gateway address. When you omit the specification, the IPv6 gateway address is not changed. You cannot specify following IPv6 addresses: • Multicast address (For example ff00:1024:1215::01) • Loopback address (For example ::1) **Note:** If this option is specified, the communications through the port are interrupted.*
[-tcp_port <value>]	Specifies the TCP port number (1 - 65535) during iSCSI communication. When you omit the specification, the TCP port number is not changed. **Note:** If this option is specified, the communications through the port are interrupted.*

Option	Description
[-selective_ack_mode {enable|disable}]	Specifies the availability of selective ACK. When you omit the specification, the settings of the selective ACK is not changed. • enable: enable selective ACK • disable: disable selective ACK **Note:** If this option is specified, the communications through the port are interrupted.*
[-delayed_ack_mode {enable|disable}]	Specifies the availability of delayed ACK. When you omit the specification, the settings of the delayed ACK is not changed. • enable: enable delayed ACK • disable: disable delayed ACK **Note:** If this option is specified, the communications through the port are interrupted.*

[-window_size <size>]	Specifies the size of window. You can specify 64KB, 128KB, 256KB, 512KB, or 1024KB. The specifiable unit is m or M for mega byte, and k or K for kilo byte. When you omit the unit, Block (512 byte) is used. For example:
	• When you specify 1,024KB:
	`-window_size 1M, -window_size 1m, -window_size 1024K, -window_size 1024k, or -window_size 2048`
	• When you specify 256KB:
	`-window_size 256K, -window_size 256k, -window_size 512`
	Note: If this option is specified, the communications through the port are interrupted.*

[-keep_alive_timer <value>]	Specifies the value of the Keep Alive Timer (30 - 64800 seconds) during iSCSI communication. When you omit the specification, the value of the Keep Alive Timer is not changed.
[-isns_mode {enable|disable}]	Specifies the availability of iSNS service. • enable: enable iSNS service • disable: disable iSNS service When you omit the specification, the settings of the iSNS service is not changed.
[-isns_server_address <IPv4 address|IPv6 address>]	Specifies the IP address of the iSNS server. You can specify both IPv4 and IPv6 address. You cannot specify following IPv4 addresses: • Broadcast address (For example 255.255.255.255 or 10.1.255.255) • Loopback address (For example 127.0.0.1) You cannot specify following IPv6 addresses: • Not set (For example ::) • Multicast address (For example ff00:1024:1215::01) • Loopback address (For example ::1) When you omit the specification, the IP address of the iSNS server is not changed.

Option	Description
[-isns_port <iSNS TCP Port number>]	Specifies the value of the TCP port in the iSNS server (1 - 65535). When you omit the specification, the value of the TCP port in the iSNS server is not changed.
* When you set the attribute value related to iSCSI, the communications through the specified port are interrupted, and an I/O error is reported to the iSCSI command which is being executed. Therefore, if the attribute value related to iSCSI is set more than once continuously, troubles on I/O, for example the decreasing I/O throughput, and the failure in reading and writing, might occur. We recommend that you set the attribute value for iSCSI only when the I/O from the hosts does not exist.	

Returned values

One of the values shown below is returned to exit() so that you can check the execution results using a user program or a script.

- Normal termination: 0.
- The host does not support IPv6: EX_ENOSUP.
  For details, see the *Command Control Interface Installation and Configuration Guide*.
- Abnormal termination: other than 0 and EX_ENOSUP.
  For details, see the *Command Control Interface User and Reference Guide*.

Examples

Changing the port attributes (the Loop ID and the topology of the port) of a port CL3-E.

```
# raidcom modify port -port CL3-E -loop_id 0xAB -topology fl_port
```

Changing the port attributes of the port CL3-E to the External initiator port (ELUN).

```
# raidcom modify port -port CL3-E -port_attribute ELUN
```

When you enable the IPv6 of the port CL3-E, and automate the settings of the Global address.

```
# raidcom modify port -port CL3-E -ipv6_mode enable
-ipv6_global_address auto
```

When you enable the iSNS service of the port CL3-E, and set the IP address to the iSNS server:

```
# raidcom modify port -port CL3-E -isns_mode enable
-isns_server_address fe80::209:6bff:febe:3c17
```

When you enable the T10 PI mode of the port CL3-E:

```
# raidcom modify port -port CL3-E -t10pi enable
```

raidcom add parity_grp (VSP Gx00 models and VSP Fx00 models)

Creates parity groups.

This command is executed asynchronously with the command input. Use the **raidcom get command_status** command to check if the command is completed.

Syntax

```
raidcom add parity_grp {-parity_grp_id <gno-sgno> |
-concatenated_parity_grp_id <gno-sgno>... } -drive_location <drive
location>...
-raid_type <raid type> [-encryption {enable|disable}]
[-copy_back {enable|disable}] [-accelerated_compression {enable|
disable}]
[-clpr <clpr#>]
```

Options and parameters

Option	Description
-parity_grp_id <gno-sgno>	Specifies the parity group number (gno: 1-52, sgno: 1-32). Example: 3-1
-concatenated_parity_grp_id <gno-sgno>…	Specifies the number of the parity group to be concatenated if a distributed parity group is created. Drives specified by **-drive_location <drive location>**… are used in the order they were specified to create parity groups to be concatenated. Parity group numbers specified by **-concatenated_parity_grp_id <gno-sgno>**… are assigned in the order they were specified to parity groups to be created.
-drive_location <drive location>…	Specifies the drive location. Example: When specifying drive location HDD00-01: 0-1
-raid_type <raid type>	Specifies the RAID type. The following types can be specified: • For RAID type 2D+2D: 2D2D • For RAID type 2D+1P: 2D1P • For RAID type 3D+1P: 3D1P • For RAID type 4D+1P: 4D1P • For RAID type 5D+1P: 5D1P • For RAID type 6D+1P: 6D1P • For RAID type 7D+1P: 7D1P • For RAID type 8D+1P: 8D1P • For RAID type 4D+2P: 4D2P

Option	Description
	• For RAID type 6D+2P: 6D2P • For RAID type 8D+2P: 8D2P • For RAID type 10D+2P: 10D2P • For RAID type 12D+2P: 12D2P • For RAID type 14D+2P: 14D2P
[-encryption {enable|disable}]	Enables or disables encryption. If you omit this option, disable is set. • enable: Encryption is enabled. • disable: Encryption is disabled.
[-copy_back {enable|disable}]	Enables or disables the copy back mode. If you omit this option, enable is set. • enable: Copy back is enabled. • disable: Copy back is disabled.
[-accelerated_compression {enable|disable}]	Enables or disables accelerated compression of parity groups. If you omit this option, disable is set. • enable: accelerated compression is enabled. • disable: accelerated compression is disabled.
[-clpr <clpr#>]	Specifies the CLPR number (0 to 31). If you omit this option, 0 is set. Example: -clpr 2

Examples

Creating parity group 1-1 with RAID type 3D+1P using drives of which drive locations are HDD00-00, HDD00-01, HDD00-02, HDD00-03.

```
# raidcom add parity_grp -parity_grp_id 1-1 -drive_location 0-0 0-1
0-2 0-3 -raid_type 3D1P
```

Creating parity groups 1-1, 1-2, 1-3, 1-4 with RAID type 7D+1P using drives of which drive locations are from HDD00-00 to HDD00-31, and configuring distributed parity groups. This command uses HDD00-00 to HDD00-07 to create parity group 1-1, HDD00-08 to HDD00-15 to create parity group 1-2, HDD00-16 to HDD00-023 to create parity group 1-3, and HDD00-24 to HDD00-31 to create parity group 1-4.

```
# raidcom add parity_grp -concatenated_parity_grp_id 1-1 1-2 1-3 1-4
-drive_location 0-0 0-1 0-2 0-3 0-4 0-5 0-6 0-7 0-8 0-9 0-10 0-11
0-12 0-13 0-14
0-15 0-16 0-17 0-18 0-19 0-20 0-21 0-22 0-23 0-24 0-25 0-26 0-27
0-28 0-29 0-30
0-31 -raid_type 7D1P
```

raidcom delete parity_grp (VSP Gx00 models and VSP Fx00 models)

Deletes parity groups.

This command is executed asynchronously with the command input. Use the **raidcom get command_status** command to check if the command is completed.

Syntax

```
raidcom delete parity_grp -parity_grp_id <gno-sgno>
```

Options and parameters

Option	Description
-parity_grp_id <gno-sgno>	Specifies the parity group number (gno: 1 to 52, sgno: 1 to 32). If the specified parity group is concatenated with other parity groups, all the concatenated parity groups are deleted. Example: 3-1

Examples

Deleting parity group 1-1.

```
# raidcom delete parity_grp -parity_grp_id 1-1
```

raidcom get parity_grp

Displays parity group information.

Syntax

```
raidcom get parity_grp [-parity_grp_id <gno-sgno> | -key opt]
```

Options and parameters

Option	Description
[-parity_grp_id <gno-sgno>]*	Specifies the parity group number (gno: 1-52, sgno: 1-32). If this option is specified, the LDEV and free space information defined in the specified parity group is displayed. For example: • 3-1
[-key opt]*	When this option is specified, the following information is displayed: • Total capacity of the parity group • Information whether accelerated compression is enabled or disabled • Information whether copy back mode is enabled or disabled • Information whether encryption is enabled or disabled • When a parity group is contained in a distributed parity group, the number of the parity group that has the smallest number.

Option	Description
* If this option is omitted, the list of parity groups defined in the storage system is displayed.	

Examples

Displaying parity group information.

```
# raidcom get parity_grp
T GROUP  Num_LDEV  U(%) AV_CAP(GB) R_LVL R_TYPE SL CL DRIVE_TYPE
R 5-2          4   45     140000  RAID1  2D+2D  0  0 DKS2C-K072FC
R 5-3          4   45     140000  RAID1  2D+2D  0  0 DKS2C-K072FC
# raidcom get parity_grp -key opt
T    GROUP    TOTAL_CAP(GB)    V    C    E    C_GROUP
R    1-1    300         D    E    E    1-1
R    1-2    300         D    E    E    1-1
R    1-3    300         D    E    E    1-1
R    1-4    300         D    E    E    1-1
R    2-16      500         E    D    D    -
```

Description of each column in output example:

T: Displays the type of the volume group.

- R: Parity group

GROUP: Displays the parity group number.

Num_LDEV: Displays the number of LDEVs assigned to this parity group.

U(%): Displays the usage rate of this parity group.

AV_CAP(GB): Displays the available capacity (free space) for this parity group. A value less than 1 GB is rounded down and 0 is displayed.

R_LVL: Displays the RAID level of the parity group.

R_TYPE: Displays the RAID type of the parity group.

SL: Displays the SLPR number to which the parity group belongs.

CL: Displays the CLPR ID to which the parity group belongs.

DRIVE_TYPE: Displays the PRODUCT_ID of the drives in the parity group.

TOTAL_CAP(GB): Displays the total capacity of the parity group.

V: Displays whether accelerated compression of the parity group is enabled or disabled.

- E: Accelerated compression is enabled.
- D: Accelerated compression is disabled.

C: Displays whether the copy back mode is enabled or disabled.

- E: Copy back mode is enabled.
- D: Copy back mode is disabled.

- - (hyphen): Displaying copy back mode is not supported.

E: Displays whether encryption is enabled or disabled.

- E: Encryption is enabled.
- D: Encryption is disabled.
- - (hyphen): Displaying the encryption status is not supported.

C_GROUP: When a parity group is contained in a distributed parity group, displays the smallest parity group number in the distributed parity group. If parity groups are not contained in distributed parity groups, or the function for displaying the parity group numbers is not supported, a hyphen (-) is displayed.

Displaying information on LDEVs and the free space defined in the parity group.

```
# raidcom get parity_grp -parity_grp_id 5-2
T GROUP P_NO LDEV#  STS         LOC_LBA        SIZE_LBA Serial# SP
R 5-2      0     -  NML  0x000000000000  0x000000003f00   64034  -
R 5-2      1   100  NML  0x000000003f00  0x000000010000   64034  R
R 5-2      2   101  REG  0x000000013f00  0x000000010000   64034  V
R 5-2      3     -  DEL  0x000000023f00  0x0000f0000000   64034  -
```

Description of each column in output example:

T: Displays the type of the volume group.

- R: Parity group

GROUP: Displays the parity group number.

P_NO: Displays the partition number partitioning this parity group.

LDEV#: Displays LDEV number.

STS: Displays the following status.

- NML: LDEV is installed or free space is settled.
- REG: LDEV is being created.
- DEL: LDEV is being deleted.

LOC_LBA: Displays the Start of LBA for this partition on this parity group, in blocks (512 bytes).

SIZE_LBA: Displays the size for this partition on this parity group, in blocks (512 bytes).

Serial#: Product serial number. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a “3” added to the beginning (for example, “312345” = serial number 12345).

SP: Displays whether the LDEV uses the expanded space of the parity group.

- V: LDEV uses the expanded space.
- R: LDEV does not use the expanded space.
- -: LDEVs are not mounted.

raidcom initialize parity_grp (VSP Gx00 models and VSP Fx00 models only)

This command formats all areas in the drives of the specified parity group.

This command is executed asynchronously with the command input. Check the completion of this process using the **raidcom get command_status** command.

WARNING: This is a destructive operation. Verify the correct parity group ID before issuing this command. The user is responsible for backing up the data in the parity group, if necessary, before issuing this command.

Syntax

```
raidcom initialize parity_grp -parity_grp_id <gno-sgno> -operation
<type>
```

Options and parameters

Option	Description
-parity_grp_id <gno-sgno>	Specifies the parity group ID of the drives to be formatted (gno: 1-52, sgno:1-32). Example: • 3-1 You can see the progress of the format by OPE_RATE of the **raidcom get ldev** command.
-operation <type>	Specifies "fmt" in <type> to format all areas in the drives of the specified parity group.

Example

Formats all areas in the drives of parity group: 1-1:

```
# raidcom initialize parity_grp -parity_grp_id 1-1 -operation fmt
```

raidcom modify parity_grp

Enables or disables accelerated compression of a parity group.

This command is executed asynchronously with the command input. Check the completion of this process using the `raidcom get command_status` command.

Syntax

```
raidcom modify parity_grp -parity_grp_id <gno-sgno>
   -accelerated_compression <accelerated compression>
```

Options and parameters

Option	Description
-parity_grp_id <gno-sgno>	Specifies the parity group number (gno:1-52, sgno: 1-32) (for example, 3-1).
-accelerated_compression <accelerated compression>	Enables or disables accelerated compression of the specified parity group. • enable: Enables accelerated compression. • disable: Disables accelerated compression.

Examples

Enables accelerated compression of parity group: 1-1:

```
# raidcom modify parity_grp -parity_grp_id 1-1 -
accelerated_compression enable
```

raidcom add rcu

Registers RCUs.

This command is executed asynchronously with the command input. Check the completion of this process on the raidcom get command_status command.

Syntax

```
raidcom add rcu {-rcu <serial#> <mcu#> <rcu#> <id> -ssid <ssid>
     | -cu_free <serial#> <id> <pid> -mcu_port <port#>
     -rcu_port <port#>
```

Options and parameters

Option	Description
-rcu <serial#> <mcu#> <rcu#> <id>	Specifies the CU specified by serial number, <mcu#>, <rcu#>, and <id>. You can use hexadecimal numbers (add "0x" prefix) or decimal numbers for <mcu#> and <rcu#>. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <serial#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345. <id> specifies the storage system type as follows: • For VSP G1000, G1500, and VSP F1500, use R800. • For VSP, use R700. • For VSP Gx00 models and VSP Fx00 models, use M800. • For HUS VM, use M700. • For USP V/VM, use R600. • For TagmaStore USP/TagmaStore NSC, use R500.

Option	Description
-ssid <ssid>	Specifies storage subsystem IDs. Up to 4 SSIDs can be specified. You can use hexadecimal numbers (add "0x" prefix) or decimal numbers for <ssid>. Note: This option is for enterprise storage systems. You need not specify the -ssid option for the Unified Storage VM, but this option is enabled.
-cu_free <serial#> <id> <pid>	Specifies the CU free specified by serial#, id#, pid#. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <serial#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345. <id> specifies the storage system type as follows: • For VSP G1000, G1500, and VSP F1500, use R800. • For VSP, use R700. • For VSP Gx00 models and VSP Fx00 models, use M800. • For HUS VM, use M700. • For USP V/VM, use R600. • For TagmaStore USP/TagmaStore NSC, use R500. <pid> specifies the path group ID (0-255). ***Note:*** The RCU registered by specifying "0" for <pid> is displayed by default or "0" on the GUI of TrueCopy, Universal Replicator, or Universal Replicator for Mainframe.
-mcu_port <port#>	Specifies the port number of the MCU.
-rcu_port <port#>	Specifies the port number on the RCU (storage system port on the remote side). Specify the port that the attribute is MCU Initiator port (MCU) or RCU Target port (RCU).

Example

Register VSP of serial number: 64034 with CU free. Sets the path group ID: 0, the port on MCU: CL1-A, and the port on RCU: CL1-B.

```
# raidcom add rcu -cu_free 64034 R700 0 -mcu_port CL1-A -rcu_port
CL1-B
```

raidcom delete rcu

Deletes the RCU.

This command is executed asynchronously with the command input. Check the completion of this process on the raidcom get command_status command.

Syntax

```
raidcom delete rcu {-rcu <serial#> <mcu#> <rcu#> -ssid <ssid> |
   -cu_free <serial#> <id> <pid>
```

Options and parameters

Option	Description
-rcu <serial#> <mcu#> <rcu#>	Specifies the CU specified by serial number, <mcu#>, <rcu#>. You can use hexadecimal numbers (add "0x" prefix) or decimal numbers for <mcu#> and <rcu#>. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <serial#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-ssid <ssid>	Specifies the storage subsystem ID. You can use hexadecimal numbers (add "0x" prefix) or decimal numbers for <ssid>. Note: This option is for enterprise storage systems. You need not specify the -ssid option for the Unified Storage VM, but this option is enabled.
-cu_free <serial#><id><pid>	Specifies the CU free specified by serial#, id#, pid# for setting the RCU to be deleted. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <serial#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345. <id> specifies the storage system type as follows: • For VSP G1000, G1500, and VSP F1500, use R800. • For VSP, use R700. • For VSP Gx00 models and VSP Fx00 models, use M800. • For HUS VM, use M700. • For USP V/VM, use R600. • For TagmaStore USP/TagmaStore NSC, use R500. <pid> specifies the path group ID (0-255). ***Note:*** Deleting the RCU registered by specifying "0" for <pid> causes removal of the display as shown by default on the GUI of TrueCopy, Universal Replicator, or Universal Replicator for Mainframe.

Examples

Deleting the VSP for which the product number: 64034, the RAID type: R700 and the path group ID: 1 are set.

```
# raidcom delete rcu -cu_free 64034 R700 1
```

raidcom get rcu

Displays MCU/RCU information.

Syntax

```
raidcom get rcu [-rcu <serial#> <mcu#> <rcu#> -ssid <ssid> |
   -cu_free <serial#> <id> <pid>
```

Options and parameters

Option	Description
-rcu <serial#> <mcu#> <rcu#>	Specifies the CU specified by serial number, <mcu#>, <rcu#>. You can use hexadecimal numbers (add "0x" prefix) or decimal numbers for <mcu#> and <rcu#>. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <serial#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-ssid <ssid>	Specifies the storage subsystem ID. You can use hexadecimal numbers (add "0x" prefix) or decimal numbers for <ssid>. Note: This option is for enterprise storage systems. You need not specify the -ssid option when you use Unified Storage VM, but this option is enabled.
[-cu_free <serial#><id><pid>]	Specifies the CU free specified by serial#, id#, pid# for setting MCU or RCU which shows the information. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <serial#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345. <id> specifies the storage system type as follows: • For VSP G1000, G1500, and VSP F1500, use R800. • For VSP, use R700. • For VSP Gx00 models and VSP Fx00 models, use M800. • For HUS VM, use M700. • For USP V/VM, use R600. • For TagmaStore USP/TagmaStore NSC, use R500. <pid> specifies the path group ID (0-255). ***Note:*** The RCU registered by specifying "0" for <pid> is displayed its information by default on the GUI of TrueCopy, Universal Replicator, or Universal Replicator for Mainframe.

Examples

Displaying RCU information.

```
# raidcom get rcu
Serial# ID PID MCU RCU M/R T STS MP NP IM FZ RTO(s) RTT(ms)
  64034 R7 - 1C 23 RCU F NML 4 8 MR D 15 20
```

```
64034 R7 - 1C 23 RCU F NML 4 8 RO E 15 20
64034 R7 1  -  - MCU E NML 4 8  - - 15 20
```

Description of each column in output example:

Serial#: Product serial number. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a “3” added to the beginning (for example, “312345” = serial number 12345).

ID: Displays the ID for identifying RAID type: R8 = VSP G1000, G1500, and VSP F1500, R7 = VSP, R6 = USP V/VM, R5 = TagmaStore USP/TagmaStore NSC, M8 = VSP Gx00 models and VSP Fx00 models, M7 = HUS VM.

PID: Displays a path group ID. If CU is specified for RCU, "-" is displayed.

MCU: Displays the CU number (hexadecimal) as MCU. If CU free is specified for RCU, "-" is displayed.

RCU: Displays the CU number (hexadecimal) as RCU. If CU free is specified for RCU, "-" is displayed.

M/R: Displays the CU type as MCU/RCU.

T: Displays the type of physical path:

- F: Fibre
- E: ESCON
- I: iSCSI
- M: path types are mixed
- - (hyphen): cannot identify the path type

For VSP Gx00 models and VSP Fx00 models, a hyphen is always displayed if M/R is MCU. For other storage systems, a hyphen (-) is displayed if M/R is MCU and MCU might be connected via a path other than the Fibre Channel. To determine if MCU is connected via a path other than Fibre Channel, check the existence of an RCU target port other than FIBRE in the storage system.

STS: Displays the following status of the CU.

- NML: Normal
- WAR: Warning
- ERR: Failing
- UNK: Unknown, displayed when the target of the pair is MCU.

MP: Displays the number of path as minimum.

NP: Displays the number of path setting between MCU and RCU.

IM: Displays the incident mode setting to RCU.

- MR: it sends incident to MCU host and RCU host
- RO: it sends incident only to RCU host
- If CU free is specified for RCU, "-" is displayed.

FZ: Displays the freeze option.

- D: the freeze option is disabled.
- E: the freeze option is enabled.
- -: "-" is displayed when CU free is specified for RCU.

RTO (s): Displays the timeout value for RIO (Remote IO) setting between MCU and RCU.

RTT (ms): Displays the round trip time value between MCU and RCU.

```
# raidcom get rcu -cu_free 64034 R700 1
Serial# ID PID MCU RCU M/R T PNO MPORT RPORT STS_CD SSIDs …
64034   R7   1   -   - RCU F   1 CL1-A CL1-B NML_01     -
64034   R7   1   -   - RCU F   2 CL1-A CL1-B NML_01     -
64034   R7   1   -   - RCU F   3 CL1-A CL1-B NML_01     -
```

Description of each column in output example:

Serial#: Product serial number. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

ID: Displays the ID for identifying RAID type: R8 = VSP G1000, G1500, and VSP F1500, R7 = VSP, R6 = USP V/VM, R5 = TagmaStore USP/TagmaStore NSC, M8 = VSP Gx00 models and VSP Fx00 models, M7 = HUS VM.

PID: Displays the path group ID. If CU is specified for RCU, "-" is displayed.

MCU: Displays the CU number (hexadecimal) as MCU. If CU free is specified for RCU, "-" is displayed.

RCU: Displays the CU number (hexadecimal) as RCU. If CU free is specified for RCU, "-" is displayed.

M/R: Displays the CU type as MCU/RCU.

T: Displays the type of physical path:

- F: Fibre
- E: ESCON
- I: iSCSI
- M: path types are mixed
- - (hyphen): cannot identify the path type

For VSP Gx00 models and VSP Fx00 models, a hyphen is always displayed if M/R is MCU. For other storage systems, a hyphen (-) is displayed if M/R is MCU and MCU might be connected via a path other than the Fibre Channel. To determine if MCU is connected via a path other than Fibre Channel, check the existence of an RCU target port other than FIBRE in the storage system.

PNO: Displays the path number.

MPORT: Displays the MCU port number.

RPORT: Displays the RCU port number.

STS_CD: Displays the following path status:

- NML_01: Normal
- ERR_02: Initialization failed
- ERR_03: Communication timeout
- ERR_04: Logical blockade
- ERR_05: Resource Shortage
- ERR_06: Serial Number Mismatch
- ERR_10: Invalid Port
- ERR_80: RCU Port Number Mismatch
- ERR_81: RCU Port Type Mismatch
- ERR_82: Communication Failed.
- If path creation or path deletion is in progress, "-" is displayed.

SSIDs: Displays the SSIDs (hexadecimal) setting to RCU. If CU free is specified for RCU, "-" is displayed.

raidcom modify rcu

This sets the control parameters to specified CU that is specified using two way.

Syntax

```
raidcom modify rcu {-rcu <serial#> <mcu#> <rcu#> -ssid <ssid> |
    -cu_free <serial#> <id> <pid>} -rcu_option <mpth> <rto>
    <rtt> [fzd | fze]
```

Options and parameters

Option	Description
-rcu <serial#> <mcu#> <rcu#>	Specifies the CU specified by serial number, <mcu#>, and <rcu#>. You can use hexadecimal numbers (add 0x prefix) or decimal numbers for the <mcu#> and <rcu#>. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <serial#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-ssid <ssid>	Specifies the storage subsystem ID. You can use hexadecimal numbers (add 0x prefix) or decimal numbers for the <ssid>. Note: This option is for enterprise storage systems. You need not specify the -ssid option for the Unified Storage VM, but this option is enabled.
-cu_free <serial#><id><pid>	Specifies CU free specified by serial#, id#, pid# for setting CU for the operational object. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <serial#> for VSP G1000, G1500, and VSP F1500, add

Option	Description
	a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345. <id> specifies the storage system type as follows: • For VSP G1000, G1500, and VSP F1500, use R800. • For VSP, use R700. • For VSP Gx00 models and VSP Fx00 models, use M800. • For HUS VM, use M700. • For USP V/VM, use R600. • For TagmaStore USP/TagmaStore NSC, use R500. <pid> specifies the path group ID (1-255). ***Note:*** The RCU is displayed by default on the GUI of TrueCopy, Universal Replicator, or Universal Replicator for Mainframe when "0" is specified for <pid>.
-rcu_option <mpth> <rto> <rtt> [fzd | fze]	Specifies CU control parameters: • <mpth>: minimum number of paths (1-8) • <rto>: RIO timeout value (10-100) (second) for RIO (Remote IO) setting between MCU and RCU. • <rtt> is used to set the round trip time value (1-500) (millisecond) between MCU and RCU. • [fzd | fze]: Specify `fze` to enable the freeze option, or `fzd` to disable it. If the freeze option is not specified to the RCU with CU units, the freeze option is disabled.

Examples

For the RCU for which the product number: 64034, the RAID type: R700 and the path ID: 1 are set, setting the options: the minimum number of paths <mpth>4, RIO MIH time<rto>15 seconds, and round trip time 20 milliseconds are set.

```
# raidcom modify rcu -cu_free 64034 R700 1 -rcu_option 4 15 20
```

raidcom add rcu_iscsi_port

This command registers the RCU-side iSCSI port of the remote storage system to the MCU-side iSCSI port of the local storage system. If the iSCSI port of the specified local storage system does not exist, the command is rejected with EX_ENOOBJ.

Note:

- To create an iSCSI path between the local storage system and a remote storage system, you must register the iSCSI target port on the MCU-side iSCSI port of the local storage system first.

- If you register an RCU port connected via iSCSI to the MCU-side iSCSI port, you cannot perform TCz or URz remote copy using iSCSI path connection.

Syntax

```
raidcom add rcu_iscsi_port -port <port#> -rcu_port <port#>
   -rcu_id <serial#> <id> -rcu_address <IP address>
   [-tcp_port <value>]
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number of the local storage system. For example: • CL1-A
-rcu_port <port#>	Specifies the iSCSI port number of the remote storage system.
-rcu_id <serial#> <id>	Specifies the product serial number or the model of the remote storage system. The following values of the model can be specified for <id>. • R800: VSP G1000, G1500, and VSP F1500 • M800: VSP Gx00 models and VSP Fx00 models
-rcu_address <IP address>	Specifies the IP address of the iSCSI target on the remote storage system. An IPv4 address or an IPv6 address can be specified. Note that the following addresses cannot be specified when you specify the IPv4 address: • Network address (for example: 192.168.10.*0*, *0*.120.10.1) • Broadcast address (for example: 255.255.255.*255*, 10.1.255.*255*) • Loop back address (for example: *127*.0.0.1) Note that the following addresses cannot be specified when you specify the IPv6 address: • Unspecified address (for example: *::*) • Multicast address (for example: *ff*:1024:1215::01) • Loop back address (for example: *::1*)
[-tcp_port <value>]	Specifies the TCP port number of the iSCSI target on the remote storage system. If this option is omitted, the TCP port number of the iSCSI target port which is specified with -port option is configured.

Examples

Registers the iSCSI port: CL1-A (IP address: 158.214.135.100) of the remote storage system (the product serial number: 400031, the model: VSP G200, G400, G600, G800) in the iSCSI port: CL4-E of the local storage system:

```
# raidcom add rcu_iscsi_port -port CL4-E -rcu_port CL1-A -rcu_id
400031 M800 -rcu_address 158.214.135.100
```

Registers iSCSI ports of the remote strage system which is registered in the iSCSI port: CL1-E of the local storage system to the iSCSI port: CL4-E of the local storage system:

```
# raidcom get rcu_iscsi_port | rmawk @1-eq:CL1-E exe="raidcom add
rcu_iscsi_port -port CL4-E -rcu_port @4 -rcu_id @2 @3 -rcu_address
@5"
```

raidcom delete rcu_iscsi_port

This command deletes the iSCSI port of the remote storage system that is registered as the RCU side port from MCU-side iSCSI port of the local storage system.

If the specified iSCSI port does not exist in the local storage system, the command is rejected with EX_ENOOBJ. If the specified port of the remote storage system does not exist, the command is ignored.

Syntax

```
raidcom delete rcu_iscsi_port -port <port#> -rcu_port <port#>
   -rcu_id <serial#> <id>
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number of the local storage system. For example: • CL1-A
-rcu_port <port#>	Specifies the iSCSI port number of the remote storage system.
-rcu_id <serial#> <id>	Specifies the product serial number or the model of the remote storage system. The following values of the model can be specified for <id>. • R800: VSP G1000, G1500, and VSP F1500 • M800: VSP Gx00 models and VSP Fx00 models

Examples

Deletes the iSCSI port: CL1-A (IP address: 158.214.135.100) of the remote storage system (the product serial number: 400031, the model: VSP G200, G400, G600, G800) from the iSCSI port: CL4-E of the local storage system:

```
# raidcom delete rcu_iscsi_port -port CL4-E -rcu_port CL1-A -rcu_id
400031 M800
```

Deletes the iSCSI port of the remote storage system which is registered in the iSCSI port: CL1-E of the local storage system from the iSCSI port: CL4-E of the local storage system.

```
# raidcom get rcu_iscsi_port | rmawk @1-eq:CL1-E exe="raidcom delete
rcu_iscsi_port -port CL4-E -rcu_port @4 -rcu_id @2 @3"
```

raidcom get rcu_iscsi_port

This command displays the RCU-side iSCSI port of the remote storage system which is registered in the MCU-side iSCSI port of the local storage system.

If the specified iSCSI port does not exist in the local storage system, the command is rejected with EX_ENOOBJ.

Only the remote storage port registered in the port to which the user who executes the command can refer are output. For details about the port to which the user can refer, see the descriptions of the relationship of the resource group and the command operation in the *Command Control Interface User and Reference Guide*.

Syntax

```
raidcom get rcu_iscsi_port
```

Options and parameters

None.

Examples

Displays the port of the remote storage system which are registered in the iSCSI port of the local storage system:

```
#raidcom get rcu_iscsi_port
PORT   Serial# ID RPORT   IP_ADDR           IP_PORT#
CL4-E   400031 M8 CL1-A   158.214.135.100       3260
CL2-E   400031 M8 CL1-A   158.214.135.100       3260
CL1-E   400031 M8 CL1-A   158.214.135.100       3260
```

Description of each column in output example:

PORT

Displays the port number.

Serial#

Displays the product serial number of the remote storage system.

ID

Displays the model of the remote storage system.

- R800: VSP G1000, G1500, and VSP F1500
- M800: VSP Gx00 models and VSP Fx00 models

RPORT

Displays the port number of the remote storage system.

IP_ADDR

Displays the IP address of the remote storage system.

IP_PORT#

Displays the TCP port number of the port of the remote storage system.

raidcom add rcu_path

Adds logical paths to RCUs.

This command is executed asynchronously with the command input. Check the completion of this process on the raidcom get command_status command.

Syntax

```
raidcom add rcu_path {-rcu <serial#> <mcu#> <rcu#> -ssid <ssid>
     | -cu_free <serial#> <id> <pid>} -mcu_port <port#>
     -rcu_port <port#>
```

Options and parameters

Option	Description
-rcu <serial#> <mcu#> <rcu#>	Specifies the CU specified by serial number, <mcu#>, and <rcu#>. You can use hexadecimal numbers (add 0x prefix) or decimal numbers for the <mcu#> and <rcu#>. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <serial#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-ssid <ssid>	Specifies the storage subsystem ID. You can use hexadecimal numbers (add 0x prefix) or decimal numbers for the <ssid>. Note: This option is for enterprise storage systems. You need not specify the -ssid option for the Unified Storage VM, but this option is enabled.
-cu_free <serial#><id><pid>	This parameter is used to specify CU free specified by serial#, id#, pid#. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <serial#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345. <id> specifies the storage system type as follows: • For VSP G1000, G1500, and VSP F1500, use R800. • For VSP, use R700. • For VSP Gx00 models and VSP Fx00 models, use M800. • For HUS VM, use M700. • For USP V/VM, use R600.

Option	Description
	• For TagmaStore USP/TagmaStore NSC, use R500. <pid> specifies the path group ID (1-255). ***Note:*** The RCU is displayed by default on the GUI of TrueCopy, Universal Replicator, or Universal Replicator for Mainframe when "0" is specified for <pid>.
-mcu_port <port#>	Specifies the port number on the MCU.
-rcu_port <port#>	Specifies the port number on the RCU (storage system port on the remote side). Specify the port that the attribute is MCU initiator port (MCU) or RCU target port (RCU).

Examples

To the RCU for which the product number: 64034, the RAID type: R700 and the path ID: 1 are set, adding RCU path (MCU port: CL1-A and RCU port: CL1-B).

```
# raidcom add rcu_path -cu_free 64034 R700 1 -mcu_port CL1-A
-rcu_port CL1-B
```

raidcom delete rcu_path

Deletes logical paths from a specified RCU.

This command is executed asynchronously with the command input. Check the completion of this process on the raidcom get command_status command.

Syntax

```
raidcom delete rcu_path {-rcu <serial#> <mcu#> <rcu#>
     -ssid <ssid>  | -cu_free <serial#> <id> <pid>} -mcu_port
     <port#> -rcu_port <port#>
```

Options and parameters

Option	Description
-rcu <serial#> <mcu#> <rcu#>	Specifies the CU specified by serial number, <mcu#>, and <rcu#>. You can use hexadecimal numbers (add 0x prefix) or decimal numbers for the <mcu#> and <rcu#>. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <serial#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-ssid <ssid>	Specifies the storage subsystem ID. You can use hexadecimal numbers (add 0x prefix) or decimal numbers for the <ssid>.

Option	Description
	Note: This option is for enterprise storage systems. You need not specify the -ssid option for the Unified Storage VM, but this option is enabled.
-cu_free <serial#><id><pid>	This parameter is used to specify CU free specified by serial#, id#, pid#. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <serial#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345. <id> specifies the storage system type as follows: • For VSP G1000, G1500, and VSP F1500, use R800. • For VSP, use R700. • For VSP Gx00 models and VSP Fx00 models, use M800. • For HUS VM, use M700. • For USP V/VM, use R600. • For TagmaStore USP/TagmaStore NSC, use R500. <pid> specifies the path group ID (1-255). ***Note:*** The RCU is displayed by default on the GUI of TrueCopy, Universal Replicator, or Universal Replicator for Mainframe when "0" is specified for <pid>.
-mcu_port <port#>	Specifies the port number on the MCU.
-rcu_port <port#>	Specifies the port number on the RCU (storage system port on the remote side). Specifies the port that the attribute is MCU initiator port (MCU) or RCU target port (RCU).

Examples

From the RCU for which the product number: 64034, the RAID type: R700 and the path ID: 1 are set, deleting RCU path (MCU port: CL1-A and RCU port: CL1-B).

```
# raidcom delete rcu_path -cu_free 64034 R700 1 -mcu_port CL1-A
-rcu_port CL1-B
```

raidcom add ssid

Adds the specified SSID to the RCU that is specified by serial number, <mcu#>, and <rcu#>.

Syntax

```
raidcom add ssid -rcu <serial#> <mcu#> <rcu#> <id> -ssid <ssid>
```

Options and parameters

Option	Description
-rcu <serial#> <mcu#> <rcu#> <id>	Specifies the CU specified by serial number, <mcu#>, <rcu#>, and <id>. You can use hexadecimal (add the prefix 0x) or decimal for the <mcu#> and <rcu#> numbers. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <serial#> for VSP G1000, G1500, and VSP F1500, add a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345. Use the following strings for <id> to specify the RAID storage system type: • For VSP G1000, G1500, and VSP F1500 use R800. • For VSP, use "R700". • For USP V/VM, use "R600". • For TagmaStore USP/TagmaStore NSC, use "R500".
-ssid <ssid>	Specifies the storage subsystem ID (SSID) to add to the RCU. You can use hexadecimal (add the 0x prefix) or decimal for the <ssid> number. Note: This option is for enterprise storage systems. You need not specify the -ssid option for the Unified Storage VM, but this option is enabled.

Examples

Adding SSID:345 to the RCU with serial number: 64034, RAID type: R700, MCU#:0, and RCU#:1 are set.

```
raidcom add ssid -rcu 64034 0 1 R700 -ssid 345
```

raidcom delete ssid

Deletes the specified SSID from the RCU that is specified by a serial number, <mcu#>, and <rcu#>.

Syntax

```
raidcom delete ssid -rcu <serial#> <mcu#> <rcu#> -ssid <ssid>
```

Options and parameters

Option	Description
-rcu <serial#> <mcu#> <rcu#>	This parameter is used to specify a CU that is specified by a serial number, <mcu#>, and <rcu#>. This option specifies <mcu#> and <rcu#> with hexadecimal numbers (adding 0x) or decimal numbers. **Note for VSP G1000, G1500, and VSP F1500:** When specifying <serial#> for VSP G1000, G1500, and VSP F1500, add

Option	Description
	a "3" at the beginning of the serial number. For example, for serial number 12345, enter 312345.
-ssid <ssid>	Specifies the storage subsystem ID to be deleted from the RCU. You can specify the ssid as a hexadecimal number (add the 0x prefix) or a decimal number. Note: This option is for enterprise storage systems. You need not specify the -ssid option for the Unified Storage VM, but this option is enabled.

Examples

Deleting SSID:345 from the RCU where the serial number: 64034, MCU#:0, and RCU#:1 are set.

```
raidcom delete ssid -rcu 64034 0 1 -ssid 345
```

raidcom add resource

Creating resource groups. If you specify only the resource group name, an empty resource group is created. If you specify the resource group name and the information on the virtual storage machine, an empty resource group that corresponds to the virtual storage machine is created.

When you input a resource group name and a resource group ID, the current name of the resource group whose ID you specify is changed to the new resource group name.

When you specify resource group name, LDEV number, port number, host group number, parity group ID or an external group ID, the specified resource is registered to the specified resource group.If the specified resource group does not exist, an error occurs. When the resource group is already created, the specified resource is added to the resource group. You can specify a device group name instead of an LDEV number.

When the relevant LDEVs configure the pool, journal, and LUSE, all LDEVs must be added to the same resource group.

Syntax

When creating a blank resource group

```
raidcom add resource -resource_name <resource group name>
```

When creating a virtual storage machine and a blank resource group which correspond to the virtual storage machine

```
raidcom add resource -resource_name <resource group name> -
virtual_type<serial#> <id>
```

When changing the resource group name of the specified resource group ID

```
raidcom add resource -resource_name <resource group name> -
resource_id<resource group_id >
```

When registering a resource (LDEV, port, host group, parity group, or external volume group) to the resource group (An error occurs if the specified resource group is not available)

```
raidcom add resource -resource_name <resource group name> [-
ldev_id<ldev#> | -port <port#> [<host group name>] | -parity_grp_id
<gno-sgno>| -external_grp_id <gno-sgno>]
```

When registering an LDEV which belongs to the device group, to the resource group (An error occurs if the specified resource group is not available)

```
raidcom add resource -resource_name <resource group name> -grp_opt
ldev -device_grp_name <device group name> [<device name>]
```



Note: If the corresponding LDEV is a volume that includes pool, journal, or LUSE, all LDEVs need to be assigned to the same resource group.

Options and parameters

Option	Description
-resource_name <resource group name>	Specifies the resource group name. Up to 32 characters can be specified.

[-virtual_type <serial#> <id>]	Specifies the information about the virtual storage machine.
	• serial#: Serial ID of the source DKC.
	• id: The type identifier of the source DKC
	  ◦ R800: VSP G1000, G1500, and VSP F1500
	  ◦ R700: VSP
	  ◦ R600: USP V
	  ◦ RK600: USP VM
	  ◦ R500: TagmaStore USP
	  ◦ RK500: TagmaStore NSC
	  ◦ M800S: VSP G200
	  ◦ M800M: VSP G400, VSP G600, VSP F400, VSP F600
	  ◦ M800H: VSP G800, VSP F800
	  ◦ M700: HUS VM

-resource_id <resource group_id	Specifies the resource group ID (1-1023) (for example, 5).
-ldev_id <ldev#>	Specifies the LDEV number (0-65279) (for example, -ldev_id 200).

Option	Description
-port <port#> [<host group name>]	Specifies the port number, host group ID, and host group name. If the host group name is more than 64 characters, use the host group ID instead of the host group name (for example, CL1-A or CL1-A-g, where g is from 0 to 255).
-parity_grp_id <gno-sgno>	Specifies the parity group number (gno:1-52, sgno:1-32) (for example, 3-1).
-external_grp_id <gno-sgno>	Specifies the external volume group number (gno:1-16384, sgno: 1-4096) (for example, 52-11, "E" is not required).
-grp_opt ldev -device_grp_name <device group name> [<device name>]	Specifies the name of the device group (maximum 32 characters). To specify an LDEV in the device group, use the device name of the LDEV (maximum 32 characters). If the device name is omitted, this command is applied to all LDEVs in the specified device group.

Examples

Creating a resource group of resource group name: sql_srv.

```
# raidcom add resource -resource_name sql_srv
```

Creating a virtual storage machine: rsg_vir, and the serial number of the virtual storage machine: 1000.

```
# raidcom add resource -resource_name rsg_vir -virtual_type 1000 R700
```

Changing the resource group name of the resource group ID:5 to sql_srv.

```
# raidcom add resource -resource_name sql_srv -resource_id 5
```

Add LDEV: 400 to the resource group: sql_srv.

```
# raidcom add resource -resource_name sql_srv -ldev_id 400
```

Adding a port of CL1-A to a resource group: sql_srv.

```
# raidcom add resource -resource_name sql_srv -port CL1-A
```

Adding a host group of CL1-A-0 to a resource group: sql_srv.

```
# raidcom add resource -resource_name sql_srv -port CL1-A-0
```

Adding a parity group:5-2 to a resource group: sql_srv.

```
# raidcom add resource -resource_name sql_srv -parity_grp_id 5-2
```

Adding an external volume group:01-02 to a resource group: sql_srv.

```
# raidcom add resource -resource_name sql_srv -external_grp_id 01-02
```

raidcom modify resource

Sets the virtual storage mode of a resource group. This is an asynchronous command.

Syntax

```
raidcom modify resource -resource_name <resource group name>
     -virtual_switch <y/n>
```

Options and parameters

Option	Description
-resource_name <resource group name>	Specifies the resource group name. Up to 32 characters can be specified.
-virtual_switch <y/n>	Sets the virtual storage mode of the resource group to ON/OFF. • y: Enable the virtual storage mode • n: Disable the virtual storage mode

Example

Resource group: Enable the virtual storage mode of sql_srv.

```
# raidcom modify resource -resource_name sql_srv -virtual_switch y
```

raidcom delete resource

Deletes resource groups. You can delete a resource group only after all resources that are registered to that resource group have been deleted.

LDEV number, port number, host group number, parity group, and external group are deleted from the specified resource groups. The deleted resources are moved to resource group 0. You can specify a device group name instead of a LDEV number.

If an LDEV is a volume that configures a pool, journal, or LUSE, all LDEVs of the pool, journal, or LUSE must be assigned to the same resource group.

Syntax

```
raidcom delete resource -resource_name <resource group name>
     [-ldev_id <ldev#> | -port <port#> [<host group name>] | -
parity_grp <gno-sgno> | -external_grp_id
     <gno-sgno> | -grp_opt <group option> -device_grp_name <device
group name> [<device name>]]
```

Options and parameters

Option	Description
-resource_name <resource group name>	Specifies the resource group name. Up to 32 characters can be specified.
-ldev_id <ldev#>	Specifies the LDEV number (0-65279). For example:

Option	Description
	• -ldev_id 200
-port <port#> [<host group name>]	Specifies the port number, host group ID, and host group name. If the host group name is more than 64 characters, use the host group ID instead of the host group name. For example: • CL1-A or CL1-A-g (g is from 0 to 255)
-parity_grp_id <gno-sgno>	Specifies the parity group number (gno:1-52, sgno:1-32). For example: • 3-1
-external_grp_id <gno-sgno>	Specifies the external volume group number (gno:1-16384, sgno: 1-4096). For example: • 52-11 ("E" is not required)
-grp_opt <group option>	Specifies the device information about the LDEV in the device group. Specify "ldev" (fixed). The information about the LDEV in the device group is used.
-device_grp_name <device group name> [<device name>]	Specifies the name of device group (maximum 32 characters) to be deleted. To specify the specific LDEV in the device group, specify the device name of the LDEV (maximum 32 characters) in the device group. If the device name is omitted, the command is applied to all LDEVs in the device group.

Examples

Deleting the LDEV: 400 from the resource group: sql_srv.

```
# raidcom delete resource -resource_name sql_srv -ldev_id 400
```

Deleting a port of CL1-A from the resource group: sql_srv.

```
# raidcom delete resource -resource_name sql_srv -port CL1-A
```

Deleting a host group of CL1-A-0 from the resource group: sql_srv.

```
# raidcom delete resource -resource_name sql_srv -port CL1-A-0
```

Deleting a parity group: 5-2 from the resource group: sql_srv.

```
# raidcom delete resource -resource_name sql_srv -parity_grp_id 5-2
```

Deleting an external volume group: 01-02 from the resource group: sql_srv.

```
# raidcom delete resource -resource_name sql_srv -external_grp_id
01-02
```

Deleting the resource group: sql_srv.

```
# raidcom delete resource -resource_name sql_srv
```

raidcom get resource

Displays resource group information.

Syntax

```
raidcom get resource -key <option>
```

Options and parameters

Option	Description
-key <option>	Specify "opt" as the option to display resource group information on the virtual mode.

Examples

Displaying a resource group and resource group lock information.

```
# raidcom get resource
RS_GROUP      RGID       stat Lock_owner  Lock_host  Serial#
meta_resource    0   Unlocked          -          -   64556
```

Displaying a resource group status on the virtual mode.

```
#raidcom get resource -key opt
RS_GROUP      RGID    V_Serial#   V_ID   V_IF   Serial#
meta_resource    0       302624     R8      Y    302624
USP_002          1        64035     R5      Y    302624
```

Description of each column in output example:

RS_GROUP: Resource group name.

RGID: resource group ID. RGID=0 is used for meta resource group.

stat: locking status of the resource group name on HUS VM and VSP.

Lock_owner: owner (authorized user) who locks the resource group name.

Lock_host: host name of a user who locks the resource group name.

Serial#: Product serial number. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a “3” added to the beginning (for example, “312345” = serial number 12345).

V_Serial#: Product serial number on the virtual mode.

V_ID: Storage system type:

- VSP G200: M8S
- VSP G400, VSP G600, VSP F400, VSP F600: M8M
- VSP G800, VSP F800: M8H
- Virtual Storage Platform G1000: R8
- Unified Storage VM: M7
- Virtual Storage Platform: R7
- Universal Storage Platform V: R6
- Universal Storage Platform VM: RK6
- TagmaStore USP: R5

- TagmaStore NSC: RK5

V_IF: Status of the virtual mode:

- Y: The virtual mode is enabled.
- N: The virtual mode is disabled.

raidcom lock resource

This locks the specified resource group name.

When you perform these commands, lock the resource group to which resource is allocated before executing the command.

- add
- delete
- modify
- initialize
- check_ext_storage
- disconnect
- set
- reset
- reallocate
- monitor

If the specified resource group name does not exist, this command is rejected with EX_ENOOBJ.

In authentication mode, the user executing this command must have a permission for the resource group name.

Syntax

```
raidcom lock resource [-resource_name <resource group name>]
     [-time <time(sec)>]
```

Options and parameters

Option	Description
[-resource_name <resource group name>]	Specifies the name of resource group (maximum 32 characters). Specify defined resource group names. If this parameter is not specified, all resource groups that are assigned to the user are locked.
[-time <time(sec)>]	This parameter is used for specifying the latency until the specified resource is locked. The TOV time of the lock instruction is specified. When <time> is specified as "0", it is executed as "nowait (no waiting time)" mode.

Option	Description
	If this parameter is not specified, the default waiting time (7200 seconds) is used.

Examples

Resource group: Locking the resource of the meta_resource.

```
# raidcom lock resource -resource_name meta_resource
```

raidcom unlock resource

This unlocks the specified resource group name.

If the specified resource group name does not exist, this command is rejected with EX_ENOOBJ.

In authentication mode, A user executing this command must have a permission for the resource group name.

Syntax

```
raidcom unlock resource [-resource_name <resource group name>]
```

Options and parameters

Option	Description
[-resource_name <resource group name>]	Specifies the name of resource group (maximum 32 characters). Specify defined resource group names. If this parameter is not specified, all resource groups that are assigned to the user are unlocked.

Examples

Resource group: Unlocking the resource of the meta_resource.

```
# raidcom unlock resource -resource_name meta_resource
```

raidcom map resource

Arrange a resource to the virtual storage machine. This is a synchronous command.

Syntax

```
raidcom map resource {-ldev_id <ldev#> -virtual_ldev_id
     {<ldev#>|reserve} [-ssid<ssid> -emulation <emulation type>]
     | -port <port#> -virtual_port <port#>}
```

Options and parameters

Option	Description
-ldev_id <ldev#>	Specify an LDEV ID (0-65279). Example: • -ldev_id 400
-virtual_ldev_id {<ldev#>| reserve}	Specify an LDEV ID (0-65279) to be used in the virtual storage machine. If you specify "reserve" instead of the LDEV ID, the reserve attribute of global-active device is set. Example: • -virtual_ldev_id 100 • -virtual_ldev_id reserve
-ssid <ssid>	Specify an SSID related to an LDEV in the virtual storage machine.
[-emulation <emulation type>]	Specify the emulation type of a relevant LDEV on the virtual storage machine. This setting is reflected in the inquiry response. Specify the emulation type by adding "*n" in the LUSE configuration or by adding "-CVS" in the CVS configuration. ("n" shows the number of LUSE components.) Apply in order from "*n" (LUSE configuration) to "-CVS" (CVS configuration) when it is LUSE configuration and CVS configuration. Example: • -emulation OPEN-3-CVS • -emulation OPEN-3*6 • -emulation OPEN-3*6-CVS
-port <port#>	Specify a port number. Specify the port number whose attribute is Target. Example: • CL1-A
-virtual_port <port#>	Specify a port number to be used in the virtual storage machine. Example: • CL3-B

Examples

Create the virtual LDEV100 in the LDEV400.

```
# raidcom map resource -ldev_id 400 -virtual_ldev_id 100
```

Set the global-active device reserve attribute to the LDEV400.

```
# raidcom map resource -ldev_id 400 -virtual_ldev_id reserve
```

Create the virtual port CL2-B in port CL1-A.

```
# raidcom map resource -port CL1-A -virtual_port CL2-B
```

raidcom unmap resource

Cancel the resource arrangement in the virtual storage machine. This is a synchronous command.

Syntax

```
raidcom unmap resource {-ldev_id <ldev#> -virtual_ldev_id
     {<ldev#>|reserve} | -port <port#> -virtual_port <port#>}
```

Options and parameters

Option	Description
-ldev_id <ldev#>	Specify an LDEV ID (0-65279). Example: • -ldev_id 400
-virtual_ldev_id {<ldev#>| reserve}	Specify an LDEV ID (0-65279) to be used in the virtual storage machine. If you specify "reserve" instead of the LDEV ID, the reserve attribute of global-active device is released. Example: • -virtual_ldev_id 100 • -virtual_ldev_id reserve
-port <port#>	Specify a port number. Specify the port number whose attribute is Target. Example: • CL1-A
-virtual_port <port#>	Specify a port number to be used in the virtual storage machine. Example: • CL3-B

Examples

Cancel a virtual LDEV100 in an LDEV400.

```
# raidcom unmap resource -ldev_id 400 -virtual_ldev_id 100
```

Release the global-active device reserve attribute to the LDEV400.

```
# raidcom unmap resource -ldev_id 400 -virtual_ldev_id reserve
```

Cancel a virtual port CL2-B in a port CL1-A.

```
# raidcom unmap resource -port CL1-A -virtual_port CL2-B
```

raidcom add snap_pool

Creates pools and adds pool VOLs for Thin Image and Copy-on-Write Snapshot by the specified LDEVs. A device group can also be specified instead of an LDEV.

When specifying a pool that is already created for Thin Image or Copy-on-Write Snapshot, the specified LDEV is added as a pool volume.

Specify either one of Pool ID or Pool Name certainly. If both the Pool ID and Pool Name options are omitted, this command is rejected with EX_REQARG.

This command is executed asynchronously with the command input. Check the completion of this process on the raidcom get command_status command.

If you create multiple pools with specifying only the pool names, execute the raidcom get command_status command to each pool and confirm each completion.

Syntax

```
raidcom add snap_pool {-pool_id <pool ID#> [-pool_name <pool
     naming>] | -pool_name <pool naming> [-pool_id <pool ID#>]
     | -pool_id <pool ID#> -pool_name <pool naming>}
     {-ldev_id <ldev#> …[-cnt<count>] | -grp_opt <group option>
     -device_grp_name <device group name> [<device name>]}
     [-user_threshold <%> ][-thinsnap]
```

Options and parameters

Option	Description
-pool_id <pool ID#>	Specifies the Pool ID (0-127) of a Thin Image or Copy-on-Write Snapshot pool. If a -pool_id option is non-numeric, the specified value is recognized as a pool name to identify the pool ID. When you omit specifying -pool_id option, you need to specify -pool_name option. When specifying -pool_name option without specifying -pool_id option, a pool ID is allocated automatically.
-pool_name <pool naming>	Specifies the pool name of a pool for Thin Image or Copy-on-Write Snapshot. Up to 32 characters can be specified. When specifying a pool ID or a pool name, if a pool name exists in the specified pool ID, the pool name is overwritten. If the pool volume is added by specifying only a pool ID, the pool name is not changed. When the specification of Pool Name is omitted, a Pool ID must be specified. When the Pool ID is specified and the Pool Name is omitted, a pool name is allocated automatically in the form of "New Pool<number>". The -pool_name option cannot be specified by configuring only in numeric because numeric values are preferentially identified as a pool ID. Specifies a pool ID with the '-pool_id<pool ID#>' option.
-ldev_id <ldev#>	Specifies the LDEV number (0-65279). Up to 64 of LDEVs can be specified at a time. For example: • -ldev_id 100 • -ldev_id 100-110 • -ldev_id 100 -cnt 10

Option	Description
[-cnt <count>]	Specifies the count (2-64). The count becomes singular if not specified. Up to 64 of LDEVs can be specified at a time.
-grp_opt <group option>	Specifies the device information extracted from the LDEV belonging to the device group. Specify "ldev" (fixed). The information of LDEV belonging to the device group is used.
-device_grp_name <device group name> [<device name>]	Specifies the name of device group (maximum 32 characters) to be operated. To operate an LDEV in the device group, specify the device name of LDEV (maximum 32 characters) within the device group. If the device name is omitted, all the LDEVs belonging to the device group are operated. When the -pool_name option is omitted, the device group name changes into the pool name.
[-user_threshold < %>]	Specifies the user defined threshold value (20-95) %. If this option is omitted, "80" is used. When you add a pool volume, this option is ignored even if it is specified. If you want to change the user defined threshold value of the additional pool volume, execute the raidcom modify pool command.
[-thinsnap]	When this option is specified, a pool for Thin Image is created.

Examples

Using LDEVs:400, 401, and 402, creating a pool of Pool ID:1, Pool Name: my_ss_pool for Copy-on-Write Snapshot.

```
# raidcom add snap_pool -pool_id 1 -pool_name my_ss_pool -ldev_id
400 401 402
```

Using LDEVs:410, 411, and 412, creating a pool of Pool ID:3, Pool Name: my_ss_pool for Thin Image.

```
# raidcom add snap_pool -pool_id 3 -pool_name my_ss_pool -ldev_id
410 411 412 -thinsnap
```

Using LDEVs:500, 501, and 502, creating a pool of Pool ID: Allocated automatically, Pool Name: my_ss_pool for Copy-on-Write Snapshot.

```
# raidcom add snap_pool -pool_name my_ss_pool -ldev_id 500 501 502
```

Using LDEVs:600, 601, and 602, creating a pool of Pool ID: 2, Pool Name: Allocated automatically for Copy-on-Write Snapshot.

```
# raidcom add snap_pool -pool_id 2 -ldev_id 600 601 602
```

Using LDEV belonging to the device group: grp1, creating a pool of Pool ID: 1, Pool Name: Allocated automatically for Copy-on-Write Snapshot.

```
# raidcom add snap_pool -pool_id 1 -grp_opt ldev -device_grp_name
grp1
```

raidcom get snap_pool

Displays pool information for Thin Image or Copy-on-Write Snapshot.

Syntax

```
raidcom get snap_pool
```

Options and parameters

None.

Examples

Displaying pool information for Thin Image or Copy-on-Write Snapshot.

```
# raidcom get snap_pool
PID POLS U(%) SSCNT Available(MB) Capacity(MB) Seq# Num LDEV# H(%)
003 POLS 100 10000           100  1000000000   62500  1  375  70
```

Description of each column in output example:

PID: pool ID

POLS: Displays the pool status:

- - POLN: "Pool Normal" (The pool is in the normal status.)
- - POLF: "Pool Full" (The pool is in the overflow status exceeding the threshold.)
- - POLS: "Pool Suspend" (The pool is in the overflow status exceeding the threshold and is suspended.)
- - POLE: "Pool failure" (The pool is suspended in the failure status.) In this status, the pool information cannot be displayed.

U(%): usage rate of the pool, including the mapped capacity and the capacity for Full Allocation

SSCNT: number of volumes in the pool

Available (MB): available capacity for the data volumes in the pool

Capacity (MB): total capacity of the pool

Seq#: Serial number. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a “3” added to the beginning (for example, “312345” = serial number 12345).

Num: number of LDEVs in the pool

LDEV#: number of the first LDEV in the pool

H(%): threshold value for the pool

raidcom add snapshot

Add a combination of the specified LDEV number and Pool ID to a snapshot group. If there is no name of specified snapshot group, create a new snapshot group.

Syntax

```
raidcom add snapshot -ldev_id <ldev#(P)> <ldev#(S)> -pool
{<pool ID#> | <pool naming>}
-snapshotgroup <name> [-snap_mode <mode>]
```

Options and parameters

Option	Description
-ldev_id <ldev#(P)> <ldev#(S)>	Specifies the LDEV number to be created the snapshot data. LDEV numbers for P-VOL and S-VOL must be included.
-pool {<pool ID#> | <pool naming>}	Specifies the pool ID or the pool name created for Snapshot.
-snapshotgroup <name>	Specifies a name to be given for snapshot group.
[-snap_mode <mode>]	Specifies the mode to create a snapshot group and the mode to add a P-VOL or S-VOL to the snapshot group. If you specify multiple modes, use a space as a separator. The following modes can be specified: <mode>= CTG: For creating in CTG mode. The consistency group number is allocated internally by itself. If this option is omitted, the snapshot group is created in normal mode. This option is effective only when a new snapshot group is to be created. This option is ignored if this is specified for the existing snapshot group. (VSP G1000, G1500, and VSP F1500) <mode> = clone: For adding a P-VOL or S-VOL as a volume for which you can create a pair with the clone attribute (clone mode). (VSP G1000, G1500, and VSP F1500) <mode>= cascade: For adding a P-VOL or S-VOL as a volume in which you can create a cascade pair (cascade mode). Example: For VSP G1000, G1500, and VSP F1500: `-snap_mode CTG clone` For other models: `-snap_mode CTG`

Examples

Adding a combination of the P-VOL (LDEV number 10:10), the S-VOL (LDEV number 20:20), and the Pool (SnapPool00) to the snapshot group (db1).

```
# raidcom add snapshot -ldev_id 0x1010 0x2020 -pool SnapPool00 -
snapshotgroup db1
```

raidcom map snapshot

Maps the specified snapshot data to the S-VOL. The S-VOL to be mapped snapshot data must be created before it is specified.

Syntax

```
raidcom map snapshot -ldev_id <ldev#(P)> <ldev#(S)> {-snapshotgroup
<name> | -mirror_id <mu#>}
```

Options and parameters

Option	Description
-ldev_id <ldev#(P)> <ldev#(S)>	Specifies the LDEV number of P-VOL and S-VOL.
-snapshotgroup <name>	Specifies the name of the snapshot group in which the snapshot data as the operation target is included. One MU that corresponds to the specified P-VOL is mapped from the specified snapshot group. **Note:** Because the MU is selected automatically, an unexpected MU could be mapped. So if you intend to specify the specific snapshot data, specify the snapshot data by an MU number instead of a snapshot group.
-mirror_id <mu#>	Specifies the mirror ID of a snapshot data to be a target.

Examples

Mapping the snapshot data of the LDEV number 10:10 that is included in the snapshot group (db1) to the LDEV number 20:00.

```
# raidcom map snapshot -ldev_id 0x1010 0x2000 –snapshotgroup db1
```

Mapping the snapshot data of the LDEV number 10:10 and the Mirror ID 10 to the LDEV number 20:00.

```
# raidcom map snapshot -ldev_id 0x1010 0x2000 –mirror_id 10
```

raidcom unmap snapshot

Unmaps the S-VOL which is mapping the snapshot data.

Syntax

```
raidcom unmap snapshot -ldev_id <ldev#> [-snapshotgroup <name> | -
mirror_id <mu#>]
```

Options and parameters

Option	Description
-ldev_id <ldev#>	Specifies the LDEV number to be unmapped. Snapshot group name or MU number must be specified when you specify the LDEV number of P-VOL to identify the snapshot data. Do not specify the snapshot group name and MU number when you specify the LDEV number of S-VOL.
[-snapshotgroup <name>]	Specifies the name of the snapshot group in which the snapshot data as the operation target is included. One MU which corresponds to the specified P-VOL is unmapped from the specified snapshot group. **Note:** Because the MU is selected automatically, an unexpected MU could be unmapped. So if you intend to specify the specific snapshot data, specify the snapshot data by an MU number instead of a snapshot group.
[-mirror_id <mu#>]	Specifies the mirror ID of the snapshot data to be a target of unmapping when you specify the LDEV number of P-VOL.

Examples

Unmapping the S-VOL (LDEV number 20:00).

```
# raidcom unmap snapshot -ldev_id 0x2000
```

Unmapping the snapshot data of the LDEV number 10:10 that is included in the snapshot group (db1).

```
# raidcom unmap snapshot -ldev_id 0x1010 –snapshotgroup db1
```

Unmapping the P-VOL (LDEV number 10:10) and the mirror ID 10.

```
# raidcom unmap snapshot -ldev_id 0x1010 –mirror_id 10
```

raidcom delete snapshot

Deletes the snapshot data and the snapshot group. The relevant snapshot data of the LDEV is deleted from the snapshot group by specifying LDEV number. When no snapshot data left in the snapshot group, the snapshot group is deleted.

Syntax

```
raidcom delete snapshot {-snapshotgroup <name> | -ldev_id <ldev#>
{-mirror_id <mu#> |-snapshotgroup <name> | -range tree}}
```

Options and parameters

Option	Description
-snapshotgroup <name>	Specifies the snapshot group in which the target data to be deleted is included.

Option	Description
	If the snapshot group is specified as the target, all the snapshot data and the snapshot group are deleted.
-ldev_id <ldev#>	Specifies the LDEV number of P-VOL or S-VOL for the snapshot data to be deleted. When P-VOL is specified, specify the snapshot data by specifying the MU number or the snapshot group (Specifying the MU number or the snapshot group is mandatory). When you specify the S-VOL, do not specify a MU number or a Snapshot group. If you specify the MU number or the Snapshot group, the P-VOL of specified LDEV number becomes the subject of deletion.
-mirror_id <mu#>	Specifies the Mirror ID of the snapshot data to be deleted.
-snapshotgroup <name>	Specifies the snapshot group to be deleted. The smallest number of MU in the snapshot group becomes the subject to be deleted.
-range tree	This option can be specified only for VSP G1000, G1500, and VSP F1500. Specify this option to delete snapshot data in all layers of a snapshot tree for which the root volume is specified by -ldev_id <ldev#>. To specify this option, the following conditions must be met: • Root volume is an LDEV specified by -ldev_id <ldev#>. • The pair to be deleted was created in the cascade or clone mode. • The user has the operation authority for volumes of all pairs to be deleted. **Note**: When multiple snapshot trees are cloned, specify the root volume of the first snapshot tree for -ldev_id <ldev#>, and execute the command. Only the first snapshot tree is deleted, and the status of the pairs under the first snapshot tree changes to PSUE. Specify the root volume of a snapshot tree under the first snapshot tree for -ldev_id <ldev#>, and execute the command again.

Examples

Deleting the snapshot data of the snapshot group (db1).

```
# raidcom delete snapshot -snapshotgroup db1
```

Deleting the snapshot data of the P-VOL (LDEV number 10:10) and the Mirror ID (10).

```
# raidcom delete snapshot -ldev_id 0x1010 –mirror_id 10
```

Deleting the snapshot data of the LDEV number 10:10 that is included in the snapshot group (db1).

```
# raidcom delete snapshot -ldev_id 0x1010 -snapshotgroup db1
# raidcom delete snapshot -snapshotgroup db1 -ldev_id 0x1010
```

Deleting the snapshot data of the S-VOL (LDEV number 20:10).

```
# raidcom delete snapshot -ldev_id 0x2010
```

Deleting the snapshot data in all layers of a snapshot tree whose root volume has LDEV number 20:10.

```
# raidcom delete snapshot -ldev_id 0x2010 -range tree
```

raidcom modify snapshot

Operate the specified snapshot group.

Syntax

(VSP G1000, G1500, and VSP F1500)

```
raidcom modify snapshot -ldev_id <ldev#> {-snapshotgroup <name>
| -mirror_id <mu#>} -snapshot_data <op> [-copy_pace <copy pace>]

raidcom modify snapshot -snapshotgroup <name> -snapshot_data <op>
[-copy_pace <copy pace>]

raidcom modify snapshot -ldev_id <ldev#> -snapshot_data <op>
[-copy_pace <copy pace>]
```

(Other models)

```
raidcom modify snapshot -ldev_id <ldev#> {-snapshotgroup <name>
| -mirror_id <mu#>} -snapshot_data <op>
raidcom modify snapshot -snapshotgroup <name> -snapshot_data <op>
raidcom modify snapshot -ldev_id <ldev#> -snapshot_data <op>
```

Options and parameters

Option	Description
-ldev_id <ldev#>	Specifies the LDEV number of P-VOL (or S-VOL) to be performed.
-snapshotgroup <name>	Specifies the snapshot group name in which the snapshot data is included.
-mirror_id <mu#>	Specifies the mirror ID of a snapshot data.
-snapshot_data <op>	Specifies the operation to be performed for the specified snapshot group. The parameter of the operation to be specified is the following: • create: Creates a snapshot data[1]. • split: Creates a snapshot data[1]. • resync: Discards the created snapshot data[1]. • restore: Restores the snapshot data[1]. • (VSP G1000, G1500, and VSP F1500) clone: Performs clones[2].
[-copy_pace <copy pace>]	(VSP G1000, G1500, and VSP F1500) Specifies the copy speed. Enabled only when `clone` is specified for `-snapshot_data`. The following speeds can be specified: • slower • medium • faster

Option	Description
	When `clone` is specified for `-snapshot_data`, if you did not specify the copy speed, `medium` is set. When you specify a value other than `clone`, if you specify the copy speed, this option is not enabled.
Notes: 1. The clone mode pair does not support this operation. 2. The cascade mode pair does not support this operation.	

The following shows the operation of the snapshot data with the combination of options and parameters:

When creating a snapshot data (when specifying create/split)

#	The ways to specify the parameter	CTG mode	normal mode
1	LDEV number and snapshot group.	P-VOL in the snapshot group.	P-VOL in the snapshot group and the smallest number of MU.
2	LDEV number and MU number.	Specified P-VOL and MU number.	Specified P-VOL and MU number.
3	LDEV number only (Specifying S-VOL).	P-VOL and MU number that are mapped by the specified S-VOL.	P-VOL and MU number that are mapped by the specified S-VOL.
4	Snapshot group.	All the P-VOLs related to the snapshot group. The consistency is endured.	All the P-VOLs related to the snapshot group. The consistency is not endured.

When discarding or restoring the snapshot data (when specifying resync/restore)

#	The ways to specify the parameter	CTG mode	normal mode
1	LDEV number and snapshot group.	P-VOL in the snapshot group.	P-VOL in the snapshot group and the smallest number of MU.
2	LDEV number and MU number.	Specified P-VOL and MU number.	Specified P-VOL and MU number.
3	LDEV number only (Specifying S-VOL).	P-VOL and MU number that are mapped by the specified S-VOL.	P-VOL and MU number that are mapped by the specified S-VOL.
4	Snapshot group.	All the P-VOLs related to the snapshot group.	All the P-VOLs related to the snapshot group.

Examples

Creating a snapshot data for the P-VOL (LDEV number 10:10) that is included in the snapshot group (db1).

```
# raidcom modify snapshot -ldev_id 0x1010 -snapshotgroup db1 -
snapshot_data create
```

Creating a snapshot data for the P-VOL (LDEV number 10:10) and the mirror ID 10.

```
# raidcom modify snapshot -ldev_id 0x1010 –mirror_id 10 -
snapshot_data create
```

Creating a snapshot data for the S-VOL (LDEV number 20:10).

```
# raidcom modify snapshot -ldev_id 0x2010 -snapshot_data create
```

Creating a snapshot data for all the P-VOLs that are included in the snapshot group (db1).

```
# raidcom modify snapshot -snapshotgroup db1 -snapshot_data create
```

Discarding the snapshot data for the P-VOL (LDEV number 10:10) and the mirror ID 10.

```
# raidcom modify snapshot -ldev_id 0x1010 –mirror_id 10 -
snapshot_data resync
```

Restoring the snapshot data for the S-VOL (LDEV number 20:10).

```
# raidcom modify snapshot -ldev_id 0x2010 -snapshot_data restore
```

raidcom get snapshot

Displays the information of snapshot group and snapshot data that are defined in the device. If this option is omitted, the list of snapshot group is displayed.

Syntax

(VSP G1000, G1500, and VSP F1500)

```
raidcom get snapshot [-ldev_id <ldev#> | -snapshotgroup <name> [-key
opt]] [{-check_status | -check_status_not} <string>... [-time
<time>]]
```

(Other models)

```
raidcom get snapshot [-ldev_id <ldev#> | -snapshotgroup <name>]
[{-check_status | -check_status_not} <string> [-time <time>]]
```

Options and parameters

Option	Description
[-ldev_id <ldev#>]	Specifies the LDEV number to be displayed the snapshot data information. Specifies either one of P-VOL or S-VOL for the LDEV number.

Option	Description
[-snapshotgroup <name>]	Specifies the snapshot group in which you want to display the snapshot data information.
[-key opt]	(VSP G1000, G1500, and VSP F1500) Specify this option to display SMPP as the status of the snapshot data.
[-check_status <string> [-time <time>]]	Check if the snapshot group or the snapshot data is in the same state as specified in <string>. If the option contains multiple states, the OR condition check is performed and verifies that the snapshot group or snapshot data is in one of the states contained in the option. The following strings are specified in the <string>: • COPY: Copy status. • PAIR: Pair status. • PSUS: Suspend status. • PSUE: Suspend failure status. • PFUL: Indicates that the Thin Image or Copy-on-Write Snapshot pool exceeds the threshold in the PAIR status. • PFUS: Indicates that the Thin Image or Copy-on-Write Snapshot pool exceeds the threshold in the PSUS status. • RCPY: Shows that the copying is in progress by resynchronization. • (VSP G1000, G1500, and VSP F1500) SMPP: Indicates that the pair is being deleted. When specifying SMPP, specify -key opt as well. • (VSP G1000, G1500, and VSP F1500) PSUP: Indicates that the pair with the clone attribute is split. If "-time" is specified, the status of the snapshot group or the snapshot data is checked every three seconds until the end of the specified <time> (seconds). When this option is specified, the returned values are as follows: • The snapshot group or the snapshot data is in one of the specified states: 0 • The snapshot group or the snapshot data is in none of the specified states (without -time option): 1 • The snapshot group or the snapshot data is in none of the specified states (when the specified <time> passed): EX_EWSTOT **Note:** When you specify -snapshotgroup <name>, and the pair is deleted, EX_ENOOBJ is returned.
[-check_status_not <string> [-time <time>]]	Check if the snapshot group or the snapshot data is not in the same state as specified in <string>. If the option contains multiple states, the OR condition check is performed and verifies that the snapshot group or snapshot data is not in any of the states contained in the option. The following strings are specified in the <string>. • COPY: Copy status. • PAIR: Pair status. • PSUS: Suspend status. • PSUE: Suspend failure status. • PFUL: Indicates that the Thin Image or Copy-on-Write Snapshot pool exceeds the threshold in the PAIR status.

Option	Description
	• PFUS: Indicates that the Thin Image or Copy-on-Write Snapshot pool exceeds the threshold in the PSUS status. • RCPY: Shows that the copying is in progress by resynchronization. • (VSP G1000, G1500, and VSP F1500) SMPP: Indicates that the pair is being deleted. When specifying SMPP, specify -key opt as well. • (VSP G1000, G1500, and VSP F1500) PSUP: Indicates that the pair with the clone attribute is split. If "-time" is specified, the status of the snapshot group or the snapshot data is checked every three seconds until the end of the specified <time> (seconds). When this option is specified, the returned values are as follows: • The snapshot group or the snapshot data is not in any of the specified states: 0 • The snapshot group or the snapshot data is in one of the specified states (without -time option): 1 • The snapshot group or the snapshot data is in one of the specified states (when the specified <time> passed): EX_EWSTOT **Note:** When you specify -snapshotgroup <name>, and the pair is deleted, EX_ENOOBJ is returned.

Examples

Displaying the list of snapshot groups.

```
# raidcom get snapshot
SnapShot_name P/S STAT Serial# LDEV# MU# P-LDEV# PID % MODE SPLT-TIME
snap1         -   -    85000098  -    -   -       -  - ----    -
snap2         -   -    85000098  -    -   -       -  - ----    -
snap3         -   -    85000098  -    -   -       -  - ----    -
```

Displaying the snapshot data related to the specific P-VOL (LDEV number: 14536).

```
# raidcom get snapshot -ldev_id 14536
SnapShot_name P/S STAT Serial# LDEV# MU# P-LDEV# PID % MODE SPLT-TIME
snap1       P-VOL PAIR 85000098 14536 1010    -    2 100 ----   -
snap2       P-VOL PAIR 85000098 14536 1011  13000  2 100 G---   -
snap3       P-VOL PAIR 85000098 14536 1012    -    2 100 ----   -
```

Displaying the snapshot data related to the specific S-VOL (LDEV number: 13000).

```
# raidcom get snapshot -ldev_id 13000
SnapShot_name P/S STAT Serial# LDEV# MU# P-LDEV# PID % MODE SPLT-TIME
snap2       S-VOL PAIR 85000098 13000 1011 14536  2 100 G---  -
```

Displaying the snapshot data included in the specific snapshot group.

```
# raidcom get snapshot -snapshotgroup snap2
SnapShot_name P/S STAT Serial# LDEV# MU# P-LDEV# PID % MODE SPLT-TIME
snap2       P-VOL PAIR 85000098 14536 1011 13000  2 100 G---  -
snap2       P-VOL PAIR 85000098 14537 1011 13001  2 100 G---  -
snap2       P-VOL PAIR 85000098 14538 1011 13002  2 100 G---  -
```

Description of each column in output example:

SnapShot_name: Displays the name of snapshot group defined in the device.

P/S: Displays the attribute of the target LDEV. It displays P-VOL for the P-VOL and S-VOL for the S-VOL. In the list of snapshot, "-" is displayed.

STAT: Displays the following status of each snapshot data:

- SMPP: The pair is being deleted.
- PSUP: The pair is being suspended.
- Other statuses: See pairdisplay on page 2-47.

Serial#: Displays the product serial number. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a “3” added to the beginning (for example, “312345” = serial number 12345).

LDEV#: Displays the LDEV number related to the snapshot.

MU#: Displays the Mirror ID of the P-VOL for the snapshot.

P-LDEV#: Displays the LDEV number of the volume (P-VOL or S-VOL) of the pair associated with the snapshot data. If the LDEV that is paired belongs to a different virtual storage machine, "----" is displayed.

PID: Displays the pool ID.

%: When MODE is clone or cascade mode, displays one of the following according to the status of STAT:

- When STAT is COPY, RCPY, SMPP, or PSUP: Displays the progress rate of each processing.
- For other statuses: Displays the concordance rate between the P-VOL and the S-VOL of a pair.

  When MODE is other than clone or cascade mode, the concordance rate between the P-VOL and the S-VOL is always displayed regardless of the STAT status.

MODE: Displays the status of snapshot data:

- G: The snapshot data created in CTG mode.
- W: The status when the data are written in the secondary volume from the host in the PSUS/PFUS status.
- (VSP G1000, G1500, and VSP F1500) C: The snapshot data created in clone mode.
- (VSP G1000, G1500, and VSP F1500) A: The snapshot data created in cascade mode.

SPLT-TIME: Displays the time when a snapshot data is created. Indicating accumulated time in seconds from January 1, 1970 (GMT).

raidcom replace snapshot

Replaces the snapshot data that is mapped to the S-VOL.

Syntax

```
raidcom replace snapshot -ldev_id <ldev#> {-snapshotgroup <name> | -
mirror_id <mu#> }
```

Options and parameters

Option	Description
-ldev_id <ldev#>	Specifies the LDEV number of the S-VOL to be replaced.
-snapshotgroup <name>	Specifies the name of the snapshot group in which the snapshot data as the operation target is included. One MU which corresponds to the snapshot group which is specified by the P-VOL, corresponding to the specified S-VOL, is mapped. Note: Because the MU is selected automatically, an unexpected MU could be mapped. So if you intend to specify the specific snapshot data, specify the snapshot data by an MU number instead of a snapshot group.
-mirror_id <mu#>	Specifies the mirror ID of the specified snapshot data. The specified snapshot data is mapped to the S-VOL.

Examples

Replacing the snapshot data of S-VOL (LDEV number 20:00) to the snapshot group snap3.

```
# raidcom replace snapshot -ldev_id 0x2000 -snapshotgroup snap3
```

raidcom add spm_wwn

Specifies the Server Priority Manager name for preferred/non-preferred WWNs.

Syntax

```
raidcom add spm_wwn -port <port#> -spm_name <nick_name> -hba_wwn
<wwn_strings>
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number with the Target attribute, for example: • CL1-A
-spm_name <nick_name>	Specifies the SPM name. Up to 64 characters can be specified by CLI. SPM names are managed uniquely in the entire system.

Option	Description
-hba_wwn <wwn_strings>	Specifies the monitored WWN. Before setting the SPM name, the WWN must be registered as preferred or non-preferred. The WWN is specified as a 16-digit hexadecimal value. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8

Examples

Specifies the SPM name (WWN_NICK_LINUX) to WWN (50060e8005fa0f36).

```
# raidcom add spm_wwn -port CL4-E -spm_name WWN_NICK_LINUX -hba_wwn
50060e80,05fa0f36
```

raidcom delete spm_wwn

Deletes WWN from the Server Priority Manager targets.

Syntax

```
raidcom delete spm_wwn -port <port#> [-hba_wwn <wwn_string> | -
spm_name <nick_name>]
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number whose attribute is Target. For example: • CL1-A
-hba_wwn <wwn_string>	Specifies the WWN to be deleted. The WWN is specified as a 16-digit hexadecimal value. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8
-spm_name <nick_name>	Specifies the SPM name to be deleted. Up to 64 characters can be specified by CLI.

Examples

Deletes the SPM name (WWN_NICK_LINUX) from the SPM targets.

```
# raidcom delete spm_wwn -port CL4-E -spm_name WWN_NICK_LINUX
```

Deletes the WWN (50060e8005fa0f36) from the SPM targets.

```
# raidcom delete spm_wwn -port CL4-E -hba_wwn 50060e80,05fa0f36
```

raidcom modify spm_wwn

Specifies the Server Priority Manager information to the Server Priority Manager target WWN.

Note: This command cannot be executed if SPM information is already set for the storage system by the raidcom modify spm_ldev command (VSP Gx00 models and VSP Fx00 models only).

Syntax

```
raidcom modify spm_wwn -port <port#> [-spm_priority <y/n>]
{-limit_io | -limit_kb | -limit_mb } <value>
{-hba_wwn <wwn_strings> | -spm_name <nick_name>}
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number whose attribute is Target. For example: • CL1-A
-spm_priority <y/n>	Specifies preferred/non-preferred WWN. • y: preferred WWN • n: non-preferred WWN
{-limit_io | -limit_kb | -limit_mb } <value>	Specifies maximum value/threshold value by the I/O rate or the transmission rate. • -limit_io: I/O rate, maximum value: 2,147,483,647 [IOPS] • -limit_kb: transmission rate (unit of KB), maximum value: 2,147,483,647 [KB] • -limit_mb: transmission rate (unit of MB), maximum value: 2,097,151 [MB] (If the value is specified by MB, 1 MB is calculated as 1024 KB.) The threshold value for the prioritized WWN is the same as the threshold value for the entire system.
-hba_wwn <wwn_strings>	Specifies WWN that you set the SPM information. The WWN is specified as a 16-digit hexadecimal value. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8
-spm_name <nick_name>	Specifies the SPM name. Up to 64 characters can be specified by CLI.

Examples

Specifies WWN (50060e8005fa0f36) as non-preferred WWN, and specifies 5000/[I/O] (I/O rate) as the maximum value.

```
# raidcom modify spm_wwn -port CL4-E -spm_priority n -limit_io 5000 -
hba_wwn 50060e80,05fa0f36
```

Specifies the SPM name (WWN_NICK_LINUX) as non-preferred WWN, and specifies 500[MB/s] (transmission rate) as the maximum value.

```
# raidcom modify spm_wwn -port CL4-E -spm_priority n -limit_mb 500 -
spm_name WWN_NICK_LINUX
```

Specifies WWN (50060e8005fa0f36) as preferred WWN, and specifies 5000/[I/O] (I/O rate) as the threshold value.

```
# raidcom modify spm_wwn -port CL4-E -spm_priority y -limit_io 5000 -
hba_wwn 50060e80,05fa0f36
```

Specifies the SPM name (WWN_NICK_LINUX) as preferred WWN, and specifies 500000[KB/s] (transmission rate) as the maximum value.

```
# raidcom modify spm_wwn -port CL4-E -spm_priority y -limit_kb
500000 -spm_name WWN_NICK_LINUX
```

Deletes the SPM information of WWN (50060e8005fa0f36).

```
# raidcom modify spm_wwn -port CL4-E -hba_wwn 50060e80,05fa0f36
```

Deletes the SPM information of the SPM name (WWN_NICK_LINUX).

```
# raidcom modify spm_wwn -port CL4-E -spm_name WWN_NICK_LINUX
```

raidcom get spm_wwn

Gets the Server Priority Manager information of the Server Priority Manager target WWN.

Syntax

```
raidcom get spm_wwn -port <port#> [-hba_wwn <wwn_strings>
     | -spm_name <nick_name>
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number whose attribute is Target. For example: • CL1-A
-hba_wwn <wwn_strings>	Specifies WWN that you get the SPM information. The WWN is specified as a 16-digit hexadecimal value. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8

Option	Description
-spm_name <nick_name>	Specifies the SPM name that you get the SPM information. Up to 64 characters can be specified by CLI.

Examples

Gets the SPM information of WWN that belongs to the specified port (CL4-E).

```
#raidcom get spm_wwn -port CL4-EPORT  SPM_MD                SPM_WWN
NICK_NAME  GRP_NAME    Serial#
CL4-E   WWN 210000e08b0256f8 WWN_NICK_LINUX_0 OLA_NODE0_CTL 63528
CL4-E   WWN 210000e08b0256f7 WWN_NICK_LINUX_1 OLA_NODE0_CTL 63528
```

Specifies WWN (50060e8005fa0f36) to get the SPM information.

```
# raidcom get spm_wwn -port CL4-E -hba_wwn 50060e80,05fa0f36
PORT  SPM_MD PRI IOps KBps Serial#
CL4-E WWN     Y 5000    - 63528
```

Specifies the SPM name (WWN_NICK_LINUX) to get the SPM information.

```
# raidcom get spm_wwn -port CL4-E -spm_name WWN_NICK_LINUX
PORT  SPM_MD PRI IOps KBps Serial#
CL4-E WWN     Y    - 5000 63528
```

Description of each column in output example:

PORT: Displays the port to which the WWN is set.

SPM_MD: Displays the Control mode of the SPM.

- WWN: WWN control
- PORT: Port control

SPM_WWN: Displays the set WWN.

NICK_NAME: Displays the SPM name set to the WWN. If the SPM name is not set, a hyphen (-) is displayed.

GRP_NAME: Displays the SPM group name to which the WWN belongs. If the WWN does not belong to the group, a hyphen (-) is displayed.

Serial#: Displays the Seq#. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

PRI: Displays the settings of the priority.

- Y: Preferred
- N: Non-preferred

IOps: If the PRI setting is Y, it displays the threshold. If the PRI setting is N, it displays the maximum value. If the value is set by the transferred rate (KBps), it displays a hyphen (-).

KBps: If the PRI setting is Y, it displays the threshold. If the PRI setting is N, it displays the maximum value. If the value is set by the IO rate (IOPS), it

displays a hyphen (-). If the value is set by MB, 1 MB is calculated as 1024 KB, and displays the value by KB.

raidcom monitor spm_wwn

Gets the monitoring information of Server Priority Manager target WWN.

Syntax

```
raidcom monitor spm_wwn {-hba_wwn <wwn_strings> | -spm_name
<nick_name>}
```

Options and parameters

Option	Description
-hba_wwn <wwn_strings>	Specifies WWN that you get the monitoring information. The WWN is specified as a 16-digit hexadecimal value. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8
-spm_name <nick_name>	Specifies the SPM name that you get the monitoring information. Up to 64 characters can be specified by CLI.

Examples

Specifies WWN (50060e8005fa0f36) to get the monitoring information.

```
# raidcom monitor spm_wwn -hba_wwn 50060e80,05fa0f36
PORT  SPM_MD IOps    KBps Serial#
CL4-E PORT   5000 5000000 63528
```

Specifies the SPM name (WWN_NICK_LINUX) to get the monitoring information.

```
# raidcom monitor spm_wwn -spm_name WWN_NICK_LINUX
PORT  SPM_MD IOps    KBps Serial#
CL4-E PORT   5000 5000000 63528
```

Description of each column in output example:

PORT: Displays the port to which the WWN is set.

SPM_MD: Displays the Control mode of the SPM.

- WWN: WWN control
- PORT: Port control

IOps: Displays the current IO rate (IOPS) of the specified WWN of or the specified SPM name.

KBps: Displays the current transferred rate (KBps) of the specified WWN or the specified SPM name.

Serial#: Displays the Seq#. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

raidcom add spm_group

Registers Server Priority Manager target WWN to Server Priority Manager group.

Note: This command cannot be executed if SPM information is already set for the storage system by the raidcom modify spm_ldev command (VSP G1000, G1500, and VSP F1500, VSP Gx00 models and VSP Fx00 models only).

Syntax

For registering the WWN to the SPM group:

```
raidcom add spm_group -port <port#> -spm_group <group_name>
   {<nick_name> | -hba_wwn <wwn_strings>}
```

(VSP only) For associating the host group with the SPM group:

```
raidcom add spm_group -spm_group <group name> -port <port#>
   [<host group name>] -spm_host_grp
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number whose attribute is Target. For example: • CL1-A
-spm_group <group_name>	Specifies the SPM group name. Up to 64 characters can be specified by CLI.
<nick_name>	Specifies the SPM target WWN using the SPM name. Up to 64 characters can be specified by CLI.
-hba_wwn <wwn_strings>	Specifies SPM target WWN. The WWN is specified as a 16-digit hexadecimal value. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8
-port <port#> [<host group name>] -spm_host_grp	VSP only. When registering the WWN registered in the host group to the SPM group, specifies the port number and the host group ID, or the host group name. If you register the WWN by this method, the host group is associated with the SPM group. When adding or deleting the WWN to or from the host group, the WWN is also added or deleted to or from the SPM group. Also, if you delete a host group, all WWNs registered in the host group are deleted from the SPM group. Examples: • CL1-A-*g*, where g is a value from 0 to 254.

Option	Description
	• CL1-A Linux_X86

Examples

Registers WWN (50060e8005fa0f36) as the SPM group name (WWN_GRP_LINUX).

```
# raidcom add spm_group -port CL4-E -spm_group WWN_GRP_LINUX
-hba_wwn 50060e80,05fa0f36
```

Registers the SPM name (WWN_NICK_LINUX) as the SPM group name (WWN_GRP_LINUX).

```
# raidcom add spm_group -port CL4-E -spm_group WWN_GRP_LINUX
WWN_NICK_LINUX
```

(VSP only) Registers the host group (CL4-E-1) as the SPM group name (WWN_GRP_LINUX).

```
# raidcom add spm_group -port CL4-E-1 -spm_host_grp
-spm_group WWN_GRP_LINUX
```

raidcom delete spm_group

Deletes the WWN of the specified port or the host group from the Server Priority Manager group to delete the SPM information of the WWN. If no WWN is registered in the SPM group, the SPM group itself is also deleted.

Syntax

```
raidcom delete spm_group -port <port#> -spm_group <group_name>
```

VSP only:

```
raidcom delete spm_group {-port <port#> -spm_group <group_name> |
   -port <port#> [<host group name>] -spm_host_grp}
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number whose attribute is Target. For example: • CL1-A
-spm_group <group_name>	Specifies the SPM group name. Up to 64 characters can be specified by CLI.
-port <port#> [<host group name>] -spm_host_grp	VSP only. When setting SPM information for the SPM group associated with the host group, specifies the port number and the host group ID, or the host group name. Examples: • CL1-A-*g*, where g is a value from 0 to 254. • CL1-A Linux_X86

Examples

Deletes the SPM group (WWN_GRP_LINUX).

```
# raidcom delete spm_group -port CL4-E -spm_group WWN_GRP_LINUX
```

(VSP only) Deletes SPM associated with the host group (CL4-E-1).

```
# raidcom delete spm_group -port CL4-E-1 -spm_host_grp
```

raidcom modify spm_group

Specifies the Server Priority Manager information to the Server Priority Manager target group.

Syntax

```
raidcom modify spm_group -port <port#> [-spm_priority <y/n>]
   {-limit_io | -limit_kb | -limit_mb } <value> -spm_group
<group_name>
```

VSP only:

```
raidcom modify spm_group {-port <port#> -spm_group <group_name> |
   -port <port#> [<host group name>] -spm_host_grp} [-spm_priority
<y/n>]
   {-limit_io | -limit_kb | -limit_mb} <value>
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number whose attribute is Target. For example: • CL1-A
-port <port#> [<host group name>] -spm_host_grp	VSP only. When you specify SPM information for the SPM group associated with the host group, specify the port number, host group ID, or host group name. Examples: • CL1-A-*g*, where g is a value from 0 to 254. • CL1-A Linux_X86
-spm_priority <y/n>	Specifies preferred/non-preferred WWN. • y: preferred WWN • n: non-preferred WWN
{-limit_io | -limit_kb | -limit_mb } <value>	Specifies maximum value/threshold value by the I/O rate or the transmission rate. • -limit_io: I/O rate, maximum value: 2,147,483,647 [IOPS] • -limit_kb: transmission rate (unit of KB), maximum value: 2,147,483,647 [KB] • -limit_mb: transmission rate (unit of MB), maximum value: 2,097,151 [MB] If you specify the value per MB, 1 MB is calculated as 1024 KB.

Option	Description
	The threshold value for the prioritized WWN is the same as the threshold value for the entire system.
-spm_group <group_name>	Specifies the SPM group name that you set the SPM information. Up to 64 characters can be specified by CLI.

Examples

Specifies the SPM group name (WWN_GRP_LINUX) as non-preferred WWN, and specifies 5000[I/O] (I/O rate) as the maximum value.

```
# raidcom modify spm_group -port CL4-E -spm_priority n -limit_io
5000 -spm_group WWN_GRP_LINUX
```

Specifies the SPM group name (WWN_GRP_LINUX) as non-preferred WWN, and specifies 500[MB/s] (transmission rate) as the maximum value.

```
# raidcom modify spm_group -port CL4-E -spm_priority n -limit_mb 500
-spm_group WWN_GRP_LINUX
```

Specifies the SPM group name (WWN_GRP_LINUX) as preferred WWN, and specifies 5000[I/O] (I/O rate) as the threshold value.

```
# raidcom modify spm_group -port CL4-E -spm_priority y -limit_io
5000 -spm_group WWN_GRP_LINUX
```

Specifies the SPM group name (WWN_GRP_LINUX) as preferred WWN, and specifies 500000[KB/s] (transmission rate) as the threshold value.

```
# raidcom modify spm_group -port CL4-E -spm_priority y -limit_kb
500000 -spm_group WWN_GRP_LINUX
```

Deletes the SPM information of the SPM group name (WWN_GRP_LINUX).

```
# raidcom modify spm_group -port CL4-E -spm_group WWN_GRP_LINUX
```

(VSP only) Specifies the SPM group associated with the host group (CL4-E-1) as non-preferred WWN, and specifies 5000[I/O] (I/O rate) as the maximum value.

```
# raidcom modify spm_group -port CL4-E-1 -spm_host_grp -spm_priority
n
-limit_io 5000
```

raidcom get spm_group

Gets the Server Priority Manager information of the Server Priority Manager target WWN in the specified port by the Server Priority Manager group unit.

Syntax

```
raidcom get spm_group -port <port#> -spm_group <group_name>
```

VSP only:

```
raidcom get spm_group {-port <port#> -spm_group <group_name> |
   -port <port#> [<host group name>] -spm_host_grp}
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number whose attribute is Target. For example: • CL1-A
-spm_group <group_name>	Specifies the SPM group name. Up to 64 characters can be specified by CLI.
-port <port#> [<host group name>] -spm_host_grp	VSP only. When obtaining SPM information of the SPM group associated with the host group, specifies the port number and the host group ID, or the host group name. Examples: • CL1-A-*g*, where g is a value from 0 to 254. • CL1-A Linux_X86

Examples

Specifies the port (CL4-E) and the SPM group name (WWN_GRP_LINUX) to get the SPM information.

```
# raidcom get spm_group -port CL4-E -spm_group WWN_GRP_LINUX
PORT  SPM_MD PRI IOps KBps Serial#
CL4-E PORT     Y 5000    - 63528
```

(VSP only) Specifies the host group (CL4-E-1) to obtain SPM information.

```
# raidcom get spm_group -port CL4-E-1 -spm_host_grp
PORT  SPM_MD PRI       IOps KBps  Serial#
CL4-E    WWN   Y 1000000000    -    63528
```

Description of each column in output example:

PORT: Displays the port to which the WWN is set.

SPM_MD: Displays the Control mode of the SPM.

- WWN: WWN control
- PORT: Port control

PRI: Displays the settings of the priority.

- Y: Preferred
- N: Non-preferred

IOps: If the PRI setting is Y, it displays the threshold. If the PRI setting is N, it displays the maximum value. If the value is set by the transferred rate (KBps), it displays a hyphen (-).

KBps: If the PRI setting is Y, it displays the threshold. If the PRI setting is N, it displays the maximum value. If the value is set by the IO rate (IOPS), it displays a hyphen (-). If the value is set by MB, 1 MB is calculated as 1024 KB, and displays the value by KB.

Serial#: Displays the Seq#. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

raidcom monitor spm_group

Gets the monitoring information of Server Priority Manager target WWN by the Server Priority Manager group unit.

Syntax

```
raidcom monitor spm_group -spm_group <group_name>
```

Options and parameters

Option	Description
-spm_group <group_name>	Specifies the SPM group name. Up to 64 characters can be specified by CLI.

Examples

Specifies the SPM group name (WWN_GRP_LINUX) to get the monitoring information.

```
# raidcom monitor spm_group -spm_group WWN_GRP_LINUX
PORT  SPM_MD IOps KBps    Serial#
CL4-E PORT   5000 5000000 63528
```

Description of each column in output example:

PORT: Displays the port to which the WWN is set.

SPM_MD: Displays the Control mode of the SPM.

- WWN: WWN control
- PORT: Port control

IOps: Displays the current IO rate (IOPS) of the specified WWN or the specified SPM name.

KBps: Displays the current transferred rate (KBps) of the specified WWN or the specified SPM name.

Serial#: Displays the Seq#. For VSP G1000, G1500, and VSP F1500 the serial number is displayed with a "3" added to the beginning (for example, "312345" = serial number 12345).

raidcom modify spm_ldev

Sets the Server Priority Manager information for a combination of an LDEV and WWN, or an LDEV and iSCSI name.

Note:

- This command cannot be executed if SPM information is already set for the storage system by the raidcom modify spm_wwn or raidcom add spm_group command.
- When the number of LDEVs with SPM configured exceeds 4,096, I/O response for the 4,097th and subsequent LDEVs is slower than for the other 4,096 LDEVs. To improve host I/O response, delete the existing SPM information so that the total number of LDEVS with SPM configured will be 4,096 or fewer.

Syntax

```
raidcom modify spm_ldev -ldev_id
   <ldev#>  {-hba_wwn <wwn strings>
   | - hba_iscsi_name <initiator iscsi name>}
   [-spm_priority {y/n}] [{-limit_io | -limit_mb} <value>]
```

Options and parameters

Option	Description
-ldev_id <ldev#>	Specifies the LDEV number (0 to 65279) whose SPM information you want to set. Example: -ldev_id 200
-hba_wwn <wwn_strings>	Specifies the WWN of the host bus adapter (initiator) for which you set the SPM information. The WWN is specified as a 16-digit hexadecimal value. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8
-hba_iscsi_name <initiator iscsi name>	Specifies the iSCSI name of the host bus adapter (initiator) for which you set the SPM information. A maximum of 223 characters can be specified. Example: • iqn.win2k8.example.of.iqn.form • eui.0123456789ABCDEF This option can be specified only for VSP Gx00 models and VSP Fx00 models.
-spm_priority <y/n>	Specifies the priority (prioritized or non-prioritized) for the combination of an LDEV and WWN, or an LDEV and iSCSI name. • y: prioritized. Obtains monitoring information, and the upper limit is not set. This combination is prioritized. • n: non-prioritized. Obtains monitoring information, but the upper limit is set. This combination is not prioritized. Non-prioritized is set if omitted. If y is set, only monitoring is performed.

Option	Description
	For details about operations for setting SPM with LDEVs and WWNs, or LDEVs and iSCSI names, see the *Command Control Interface User and Reference Guide*.
{-limit_io | -limit_mb } <value>	Specifies the upper limit for the I/O rate or the transmission rate. If omitted, the I/O rate or the transmission rate is not suppressed by the upper limit. • -limit_io: I/O rate Maximum value: 65,535 [IOPS] • -limit_mb: Transmission rate (in MB) Maximum value: 31 [MB]

Examples

The following shows an example of setting n (non-prioritized) for the combination of LDEV: 1024 and WWN: 50060e8005fa0f36, and I/O rate: 5000 [IOPS] as the upper limit:

```
# raidcom modify spm_ldev -ldev_id 1024 -hba_wwn 50060e80,05fa0f36 -
spm_priority n -limit_io 5000
```

The following shows an example of setting n (non-prioritized) for the combination of LDEV: 1024 and iSCSI name: iqn.z1, and I/O rate: 5000 [IOPS] as the upper limit:

```
# raidcom modify spm_ldev -ldev_id 1024 -hba_iscsi_name iqn.z1 -
spm_priority n -limit_io 5000
```

raidcom delete spm_ldev

Deletes a combination of the SPM target LDEV and WWN, or the SPM target LDEV and iSCSI name from the SPM target.

Syntax

```
raidcom delete spm_ldev -ldev_id <ldev#>  {-hba_wwn <wwn strings>
   | - hba_iscsi_name <initiator iscsi name>}
```

Options and parameters

Option	Description
-ldev_id <ldev#>	Specifies the LDEV number (0 to 65279) whose SPM information you want to delete. Example: -ldev_id 200
-hba_wwn <wwn_strings>	Specifies the WWN of the host bus adapter (initiator) whose SPM information you want to delete. The WWN is specified as a 16-digit hexadecimal value. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example:

Option	Description
	• 210000e08b0256f8 • 210000e0,8b0256f8
-hba_iscsi_name <initiator iscsi name>	Specifies the iSCSI name of the host bus adapter (initiator) whose SPM information you want to delete. A maximum of 223 characters can be specified. Example: • iqn.win2k8.example.of.iqn.form • eui.0123456789ABCDEF This option can be specified only for VSP Gx00 models and VSP Fx00 models.

Examples

The following shows an example of deleting the combination of LDEV: 1024 and WWN: 50060e8005fa0f36 from the SPM target:

```
# raidcom delete spm_ldev -ldev_id 1024 -hba_wwn 50060e80,05fa0f36
```

The following shows an example of deleting the combination of LDEV: 1024 and iSCSI name: iqn.z1 from the SPM target:

```
# raidcom delete spm_ldev -ldev_id 1024 -hba_iscsi_name iqn.z1
```

raidcom monitor spm_ldev

Obtains the monitoring information for the combination of an LDEV and WWN, or an LDEV and iSCSI name. This command displays information when both the following conditions are met:

- SPM information is set for the specified LDEV.
- The current I/O rate or transfer rate for the LDEV with the specified WWN or iSCSI name is not 0.

Syntax

```
raidcom monitor spm_ldev -ldev_id <ldev#> {-hba_wwn <wwn strings>
   | - hba_iscsi_name <initiator iscsi name>}
```

Options and parameters

Option	Description
-ldev_id <ldev#>	Specifies the LDEV number (0 to 65279) whose monitoring information you want to obtain. Example: -ldev_id 200
-hba_wwn <wwn_strings>	Specifies the WWN of the host bus adapter (initiator) whose monitoring information you want to obtain.

Option	Description
	The WWN is specified as a 16-digit hexadecimal value. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8
-hba_iscsi_name <initiator iscsi name>	Specifies the iSCSI name of the host bus adapter (initiator) whose monitoring information you want to obtain. A maximum of 223 characters can be specified. Example: • iqn.win2k8.example.of.iqn.form • eui.0123456789ABCDEF This option can be specified only for VSP Gx00 models and VSP Fx00 models.

Examples

The following shows an example of obtaining monitoring information for the combination of LDEV: 1024 and WWN: 50060e8005fa0f36:

```
# raidcom monitor spm_ldev -ldev_id 1024 -hba_wwn 50060e80,05fa0f36
Serial#  LDEV  IOps     KBps  WWN
  63528  1024  5000  5000000  50060e8005fa0f36
```

The following shows an example of obtaining monitoring information for the combination of LDEV: 1024 and iSCSI name: iqn.z1:

```
# raidcom monitor spm_ldev -ldev_id 1024 -hba_iscsi_name iqn.z1
Serial#  LDEV  IOps     KBps  IQN
  63528  1024  5000  5000000  iqn.z1
```

Description of each column in output example:

LDEV: Displays the LDEV number.

IOps: Displays the current I/O rate (IOPS) of the LDEV identified by the specified WWN or iSCSI name.

KBps: Displays the current transfer rate (KBps) for the LDEV identified by the specified WWN or iSCSI name.

WWN: Displays the WWN of the host bus adapter (initiator).

IQN: Displays the iSCSI name of the host bus adapter (initiator).

raidcom get spm_ldev

Displays the Server Priority Manager information for a combination of an LDEV and WWN or an LDEV and iSCSI name.

Syntax

```
raidcom get spm_ldev -ldev_id <ldev#>  {-hba_wwn <wwn strings>
   | - hba_iscsi_name <initiator iscsi name>}
```

Options and parameters

Option	Description
-ldev_id <ldev#>	Specifies the LDEV number (0 to 65279) whose SPM information you want to obtain. Example: -ldev_id 200 This command terminates without displaying information if SPM information is not set for the combination of an WWN and the specified LDEV, or an iSCSI name and the specified LDEV.
-hba_wwn <wwn_strings> |	Specifies the WWN of the host bus adapter (initiator) whose SPM information you want to obtain. The WWN is specified as a 16-digit hexadecimal value. The 17th digit and later are ignored. The value can be split in units of 4 bytes by "," (comma). For example: • 210000e08b0256f8 • 210000e0,8b0256f8 This command terminates without displaying information if SPM information is not set for the combination of an LDEV and the specified WWN.
-hba_iscsi_name <initiator iscsi name>	Specifies the iSCSI name of the host bus adapter (initiator) whose SPM information you want to obtain. A maximum of 223 characters can be specified. Example: • iqn.win2k8.example.of.iqn.form • eui.0123456789ABCDEF This command terminates without displaying information if SPM information is not set for the combination of an LDEV and the specified iSCSI name.

Examples

The following shows an example of displaying SPM information for the combination of LDEV: 1024 and WWN, and LDEV: 1024 and iSCSI name:

```
# raidcom get spm_ldev -ldev_id 1024
Serial# LDEV PRI IOps  KBps   T Name
63528  1024    Y      -       -   W 50060e8005fa0f3
63528  1024    N      - 31744   I iqn.z1
```

The following shows an example of displaying SPM information for the combination of an LDEV and iSCSI name: iqn.z1:

```
# raidcom get spm_ldev -hba_iscsi_name iqn.z1
Serial# LDEV PRI IOps KBps  T Name
63528  1024    Y      -      -   I iqn.z1
63528  1025    N      - 31744 I iqn.z1
```

The following shows an example of displaying SPM information for the combination of an LDEV and WWN: 50060e8005fa0f36:

```
# raidcom get spm_ldev -hba_wwn 50060e8005fa0f3
Serial# LDEV PRI IOps KBps  T Name
63528  1024    Y      -      -   W 50060e8005fa0f3
63528  1025    N      - 31744 W 50060e8005fa0f3
```

The following shows an example of displaying SPM information for the combination of an LDEV and WWN, and an LDEV and iSCSI name:

```
# raidcom get spm_ldev
Serial# LDEV PRI IOps  KBps    T      Name
63528 1024    Y      -      -        W     50060e8005fa0f3
63528 1024    N      - 31744I      iqn.z1
63528 1025    N 5000       -    I      iqn.z1
```

Description of each column in output example:

Serial#: Displays the product serial number.

LDEV: Displays the LDEV number.

PRI: Displays the priority.

- Y: Prioritized
- N: Non-prioritized

IOps: For the non-prioritized setting, displays the upper limit. For the prioritized setting, displays a hyphen (-) if the transfer rate is set.

KBps: Displays the upper limit for the non-prioritized setting. For the prioritized setting, displays a hyphen (-) if the I/O rate is set. In addition, if the value is set in megabytes, it is converted to kilobytes by using the following formula: 1 MB = 1024 KB

T: Displays the type of name to be displayed in the Name column:

- W: WWN
- I: iSCSI name

Name: Displays the WWN or iSCSI name.

raidcom add dp_pool

Create a pool for Dynamic Provisioning or Dynamic Provisioning for Mainframe by the specified LDEVs. Or, add pool volumes to the pools for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe. A device group can also be specified instead of an LDEV.

When specifying a pool that is already created for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe, the specified LDEV is added as a pool volume.

Specify either one of Pool ID or Pool Name certainly. If both the Pool ID and Pool Name options are omitted, this command is rejected with EX_REQARG.

This command is executed asynchronously with the command input. Check the completion of this process on the raidcom get command_status command.

If you create multiple pools with specifying only the pool names, execute the raidcom get command_status command to each pool and confirm each completion.

Syntax

```
raidcom add dp_pool {{-pool_id <pool ID#> [-pool_name
     <pool naming>] | -pool_name <pool naming>[-pool_id
     <pool ID#>]} | -pool_id <pool ID#> -pool_name <pool naming>}
     {-ldev_id <ldev#> …[-cnt <count>] | -grp_opt <group option>
     -device_grp_name <device group name> [<device name>]}
     [ -user_threshold <threshold_1>[<threshold_2>] ]
```

Options and parameters

Option	Description
-pool_id <pool ID#>	Specifies the Pool ID (0-127) for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe. When the specification of Pool ID is omitted, a Pool Name must be specified. If a -pool_id option is non-numeric, the specified value is recognized as a pool name to identify the pool ID. When you omit specifying -pool_id option, you need to specify -pool_name option. When specifying -pool_name option without specifying -pool_id option, a pool ID is allocated automatically.
-pool_name <pool naming>	Specifies a pool name of a pool for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe. Up to 32 characters can be specified. When specifying a pool ID or a pool name, if the pool name exists in the specified pool ID, the pool name is overwritten. If the pool volume is added by specifying only a pool ID for already existing pool, the pool name is not changed. When the specification of Pool Name is omitted, a Pool ID must be specified. When the Pool ID is specified and the Pool Name and -device_grp_name option are omitted, a pool name is allocated automatically in the form of "New Pool<number>". The -pool_name option cannot be specified by configuring only in numeric because numeric values are preferentially identified as a pool ID. Specifies a pool ID with the '-pool_id<pool ID#>' option.
-ldev_id <ldev#> …	Specifies the LDEV number (0-65279). Up to 64 of LDEVs can be specified at a time. For example: • -ldev_id 100 • -ldev_id 100 - 110 • -ldev_id 100 -cnt 10
[-cnt <count>]	Specifies the count (2-64). If this specificaion is omitted, "1" is used.

Option	Description
	Up to 64 of LDEVs can be specified at a time.
-grp_opt <group option>	Specifies the device information extracted from the LDEV belonging to the device group. Specify "ldev" (fixed). The information of LDEV belonging to the device group is used.
-device_grp_name <device group name> [<device name>]	Specifies the name of device group (maximum 32 characters) to be operated. To operate an LDEV in the device group, specify the device name of LDEV (maximum 32 characters) within the device group. If the device name is omitted, all the LDEVs belonging in the device group are operated. When the -pool_name option is omitted, the device group name changes into the pool name.
[-user_threshold <threshold_1> [<threshold_2>]]	You may specify two user-defined thresholds, and their valid ranges are 1-100%, respectively. If you specify <threshold_1> and <threshold_2>: the value of <threshold_1> is set as the threshold for *WARNING* specified to a pool. the value of <threshold_2> is set as the threshold for *High water mark* specified to a pool. If you specify only <threshold_1>, your specified value and the system default value (80%) are applied. If you omit to specify the value, 70% and 80% are applied, automatically. When you add a pool volume, this option is ignored even if it is specified. If you want to change the user defined threshold value of the additional pool volume, execute the raidcom modify pool command.

Examples

By using LDEVs:400, 401, and 402, creating a pool of Pool ID:1, Pool Name: my_pool for Dynamic Provisioning/Dynamic Provisioning for Mainframe.

```
# raidcom add dp_pool -pool_id 1 -pool_name my_pool -ldev_id 400 401
402
```

By using LDEVs:500, 501, and 502, creating a pool of Pool ID: Allocated automatically, Pool Name: my_pool for Dynamic Provisioning/Dynamic Provisioning for Mainframe.

```
# raidcom add dp_pool -pool_name my_pool -ldev_id 500 501 502
```

By using LDEVs:600, 601, and 602, creating a pool of Pool ID: 2, Pool Name: Allocated automatically for Dynamic Provisioning/Dynamic Provisioning for Mainframe.

```
# raidcom add dp_pool -pool_id 2 -ldev_id 600 601 602
```

By using LDEVs: 700, 701, and 702, creating a pool of Pool ID: 3, Pool Name: my_pool for Dynamic Provisioning, Dynamic Provisioning for Mainframe, with the user-defined thresholds *WARNING* specified to 70% and *High water mark* to 80%.

```
# raidcom add dp_pool -pool_id 3 -pool_name my_pool
-ldev_id 700 701 702 -user_threshold 70 80
```

Add LDEV: 368 to the pool ID: 10 for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe.

```
# raidcom add dp_pool -pool_id 10 -ldev_id 368
```

By using LDEV belonging to the device group: grp1, creating a pool of Pool ID:1, pool name: Allocated automatically for Dynamic Provisioning/Dynamic Provisioning for Mainframe.

```
# raidcom add dp_pool -pool_id 1 -grp_opt ldev -device_grp_name grp1
```

raidcom get dp_pool

Displays pool information for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, and active flash for mainframe.

Syntax

```
raidcom get dp_pool [-key <keyword> [-fx] [-pool {<pool_id> | <pool
naming>} ]]
```

Options and parameters

Option	Description
[-key <keyword> [-fx]]	Specifies the display keyword. Specify opt as <keyword>. If you specify opt, information about Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe pool is displayed. If you specify the -fx option, TL_RANGE and TD_RANGE are displayed in hexadecimal notation.
[-pool {<pool_id> | <pool naming>}]	Specifies the pool ID or the pool name of Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe when you want to display the range for each tiering level of Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe pools. When you specify only digits, it is recognized as a pool ID. When the pool name consists of digits, specify the pool ID instead of the pool name. This option is effective only when the -key option is specified.

Examples

Displaying the pool information of the pool for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, and active flash for mainframe.

```
# raidcom get dp_pool
PID POLS U(%) AV_CAP(MB) TP_CAP(MB) W(%) H(%) Num LDEV# LCNT
TL_CAP(MB) BM TR_CAP(MB) RCNT
001 POLN   10   45000000   50000000   50   80   2   265   33
```

```
65000000 PF   4000000     1
002 POLF   95      10000  100000000   50   80   3   270  900
100000000 PF         0     0
004 POLN    0   10000000  100000000   80   90   2   280    0
200000000 PF         0     0
```

Description of each column in output example:

PID: Displays the pool ID of Dynamic Provisioning/Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe.

POLS: Displays the following status of the pool.

- POLN: "Pool Normal" (The pool is in the normal status.)
- POLF: "Pool Full" (The pool is in the overflow status exceeding the threshold.)
- POLS: "Pool Suspend" (The pool is in the overflow status exceeding the threshold and is suspended.)
- POLE: "Pool failure" (The pool is suspended in the failure status.) In this status, the pool information cannot be displayed.

U(%): Displays the usage rate of the pool (including the mapped capacity and the capacity for Full Allocation).

AV_CAP(MB): Displays the available capacity for the volumes of Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe mapped to this pool.

TP_CAP(MB): Displays the total capacity of the pool.

W(%): Displays the threshold value for WARNING set for the pool.

H(%): Displays the threshold value set for the pool as high water mark.

Num: Displays the number of LDEVs configuring the pool.

LDEV#: Displays the LDEV number of a pool-VOL that includes the pool management area. 65535(ffff) is displayed if the pool is being created.

LCNT: Displays the total number of Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe volumes mapped to the pool.

TL_CAP(MB): Displays the total capacity of all Dynamic Provisioning/Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe volumes mapped to the pool.

BM: Displays the I/O Blocking Mode of the pool.

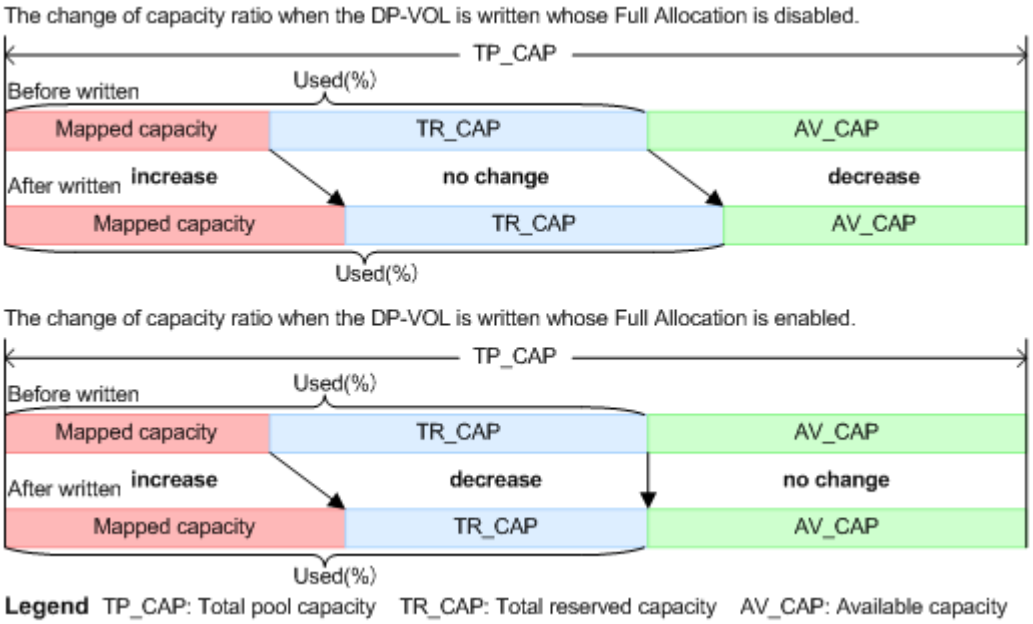
- PF (Pool Full): If the pool is full, you cannot read from the target DP-VOL or write to the target DP-VOL. If the pool VOL is blocked, you can read from the target DP-VOL or write to the target DP-VOL.
- PB (Pool vol Blockade): If the pool VOL is blocked, you cannot read from the target DP-VOL or write to the target DP-VOL. If the pool is full, you can read from the target DP-VOL or write to the target DP-VOL.

- FB (Full or Blockade): You cannot read from the target DP-VOL or write to the target DP-VOL if the pool is full and/or pool VOL is blocked.
- NB (No Blocking): You can read from the target DP-VOL or write to the target DP-VOL even if the pool is full or pool VOL is blocked.
- - (Not supported): The configuration that does not support the I/O Blocking Mode.

TR_CAP(MB): Shows the sum of the pool capacities which are reserved for the volumes on which Full Allocation or Proprietary Anchor is enabled. In the configuration that does not support Full Allocation, a hyphen (-) is displayed.

RCNT: Shows the number of the volumes on which Full Allocation is enabled, and to which a pool is mapped. In the configuration that does not support Full Allocation, a hyphen (-) is displayed.

The following figures show the difference between the capacity ratio changing according to whether Full Allocation is enabled or disabled when DP-VOL is written. The "Mapped capacity" in the figure is the total capacity of the user data in each virtual volumes and the page capacity which is storing the control information.



Displays the tier information of the pool for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe. For details about the parameters, see the *Provisioning Guide* for the storage system.

```
# raidcom get dp_pool -key opt
PID POLS MODE STS DAT TNO TL_RANGE TD_RANGE TU_CAP(MB) TT_CAP(MB)
T(%) P(%) R(%) B(%) MM
001 POLN DEF  STP VAL 1  00005000  00003000    200000    1000000
80   54   98   40   PM
001 POLN DEF  STP VAL 2  00003000  00002000    400000    1000000
80   54   98   30   CM
001 POLN DEF  STP VAL 3  00002000  00002000    600000    1000000
80   54   98   40   PM
```

```
002 POLF AUT  MON PND 1         -         -    500000    1000000
80   54  100    2   PM
```

When you specify -pool, displays the range for each tiering level of corresponding pools.

```
# raidcom get dp_pool  -pool 1 -key opt
PID POLS MODE STS DAT TNO TL_RANGE TD_RANGE  TU_CAP(MB)  TT_CAP(MB)
T(%) P(%) R(%) B(%) MM
001 POLN DEF  STP VAL 0 4294967294 00000000  8064 8190 10   28  100
2 PM
001 POLN DEF  STP VAL 0 4294967294 00000000  3948 3990 10  100  100
2 PM
001 POLN DEF  STP VAL 0   00000000 00000000   504 8190 10   33  100
2 PM
001 POLN DEF  STP VAL 1   00000000 00000000  8064 8190 10   28  100
2 PM
001 POLN DEF  STP VAL 1   00000000 00000000  3948 3990 10  100  100
2 PM
001 POLN DEF  STP VAL 1   00000000 00000000   504 8190 10   33  100
2 PM
001 POLN DEF  STP VAL 2   00000039 00000000  8064 8190 10   28  100
2 PM
001 POLN DEF  STP VAL 2   00000000 00000000  3948 3990 10  100  100
2 PM
001 POLN DEF  STP VAL 2   00000000 00000000   504 8190 10   33  100
2 PM
001 POLN DEF  STP VAL 3   00000100 00000000  8064 8190 10   28  100
2 PM
001 POLN DEF  STP VAL 3   00000041 00000000  3948 3990 10  100  100
2 PM
001 POLN DEF  STP VAL 3   00000000 00000000   504 8190 10   33  100
2 PM
001 POLN DEF  STP VAL 4   00000001 00000000  8064 8190 10   28  100
2 PM
001 POLN DEF  STP VAL 4   00000000 00000000  3948 3990 10  100  100
2 PM
001 POLN DEF  STP VAL 4   00000000 00000000   504 8190 10   33  100
2 PM
001 POLN DEF  STP VAL 5   00000001 00000000  8064 8190 10   28  100
2 PM
001 POLN DEF  STP VAL 5   00000001 00000000  3948 3990 10  100  100
2 PM
001 POLN DEF  STP VAL 5   00000000 00000000   504 8190 10   33  100
2 PM
```

Description of each column in output example:

PID: Displays the pool ID for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, active flash, Dynamic Tiering for Mainframe, or active flash for mainframe.

POLS: Displays the following status of the pool.

- POLN: "Pool Normal" (The pool is in the normal status.)
- POLF: "Pool Full" (The pool is in the overflow status exceeding the threshold.)
- POLS: "Pool Suspend" (The pool is in the overflow status exceeding the threshold and is suspended.)

- POLE: "Pool failure" (The pool is suspended in the failure status.) In this status, the pool information cannot be displayed.

MODE: Displays the execution mode.

- DEF: The start/termination of the monitor is performed by the instruction of the CCI, and the Tier range setting is performed by the automatic calculation of the storage system.
- AUT: The start/termination of the monitor is performed by time specification, and the Tier range setting is performed by the automatic calculation of the storage system.

  Note: AUT cannot be instructed from the CCI. AUT can only performed if displayed when set from the SN2.

STS: Displays the operational status of the performance monitor and the tier relocation.

- STP: The performance monitor and the tier relocation are stopped.
- RLC: The performance monitor is stopped. The tier relocation is waiting or operating.
- MON: The performance monitor is operating. The tier relocation is stopped.
- RLM: The performance monitor is operating. The tier relocation is waiting or operating.

DAT: Displays the status of the monitor information.

- VAL: Valid.
- INV: Invalid.
- PND: Being calculated.

TNO: Tiering number. When you specify the pool, displays the tiering level (0 means "all" is set to the level of tiering policy).

TL_RANGE: Lowest limit value of the Tier in IOPH.

0 (0x00000000) to 4294967294 (0xFFFFFFFE): When "all" is set to the level of tiering policy, the lowest limit value of the tier is displayed. When there is no V-VOL where "all" is set to the level of tiering policy, or when there is no V-VOL related to the pool, the invalid value "-" (0xFFFFFFFF) is displayed. If the -fix option is specified, this displays the value in parentheses given in hexadecimal.

TD_RANGE: Delta value of the Tier in IOPH. 0 (0x00000000) to 4294967294 (0xFFFFFFFE): When "all" is set to the level of tiering policy, the lowest limit value of the tier is displayed. When there is no V-VOL where "all" is set to the level of tiering policy, or when there is no V-VOL related to the pool, the invalid value "-" (0xFFFFFFFF) is displayed. If the -fix option is specified, this displays the value in parentheses given in hexadecimal.

TU_CAP(MB): Tier capacity (Usage amount)

TT_CAP(MB): Tier capacity (Total capacity)

T(%): The free space percentage for the new allocation

P(%): Performance working ratio

R(%): Progress percentage of relocation.

- 0 to 99: Shows one of the following statuses.
  - When the value of STS is RLC or RLM: relocation is waiting or in progress.
  - When the value of STS is STP or MON: relocation is suspended.
- 100: Shows if the relocation operation is not in progress, or the relocation is complete.

B(%): Displays the amount of buffer for the tier reallocation.

MM: Displays the mode of performance monitoring and the availability of active flash:

- PM: Periodical mode.
- CM: Continuous mode.
- RPM: Periodical mode and active flash is enabled.
- RCM: Continuous mode and active flash is enabled.

raidcom send ping

Sends a ping from the specified port to the specified host, and then displays the result.

Syntax

```
raidcom send ping -port <port#> -address <IP address>
```

Options and parameters

Option	Description
-port <port#>	Specifies the port number. For example: • CL1-A
-address <IP address>	Specifies the IP address of the host that is the destination of the ping. You can specify IPv4 address or IPv6 address.

Examples

To send a ping from the port: CL4-E to the host whose IP address is 10.213.60.111, and then display the result (Normal).

```
# raidcom send ping -port CL4-E -address 10.213.60.111
raidcom : 5 packets transmitted, 5 packets received.
```

To send a ping from the port: CL4-E to the host whose IP address is 10.213.60.111, and then display the result (No response from the host).

```
# raidcom send ping -port CL4-E -address 10.213.60.111
raidcom : 5 packets transmitted, 0 packets received.
```

To send a ping from the port: CL4-E to the host whose IP address is 10.213.60.111, and then display the result (Fail to send a ping by an internal error etc).

```
# raidcom send ping -port CL4-E -address 10.213.60.111
raidcom : 0 packets transmitted.
```

Description of output example:

N packets transmitted: Number of packets sent to the host.

N packets received: Number of packets responded from the host normally.

raidcom initialize pool

This command initializes deduplication system data volumes and volumes that contain deduplicated data. This command is processed asynchronously with the command input. Use the **`raidcom get command_status`** command to check if the raidcom initialize pool command completes.

Syntax

```
raidcom initialize pool -pool {<pool ID#> | <pool naming>} -
operation initialize_deduplication
```

Options and parameters

Option	Description
-pool {<pool ID#> | <pool naming>}	Specifies the pool ID (0 to 127) or pool name.
-operation initialize_deduplication	Initializes the deduplication system data volume specified by the –pool option and the volumes that contain deduplicated data.

Examples

Initializing the deduplication system data volume and the volumes that contain deduplicated data in the pool with pool ID: 1.

```
#raidcom initialize pool -pool 1 -operation initialize_deduplication
```

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