Overland Storage

SnapSAN™ CLI Command Reference (WIN)

User Guide

S3000/S5000

overland storage

This user guide contains a list of commands (Window) for the following functions: Common, Data Replication, Snapshot, Data Retention, Power Saving, Link, and Operation. This guide assumes that you are familiar with computer hardware, data storage, and network administration terminology and tasks. It also assumes you have basic knowledge of Internet SCSI (iSCSI), Serial-attached SCSI (SAS), Serial ATA (SATA), Storage Area Network (SAN), and Redundant Array of Independent Disks (RAID) technology.

This guide assumes that you are familiar with computer hardware, data storage, and network administration terminology and tasks. It also assumes you have basic knowledge of Internet SCSI (iSCSI), Serial-attached SCSI (SAS), Serial ATA (SATA), Storage Area Network (SAN), and Redundant Array of Independent Disks (RAID) technology.

Product Documentation and Firmware Updates

Overland Storage SnapSAN product documentation and additional literature are available online, along with the latest release of the SnapSAN 3000/5000 software.

Point your browser to:

http://doc.overlandstorage.com/snapsan

Follow the appropriate link to download the **latest** software file or document. For additional assistance, search at http://support.overlandstorage.com.

Overland Technical Support

For help configuring and using your SnapSAN 3000/5000, search for help at:

http://support.overlandstorage.com/kb

You can email our technical support staff at techsupport@overlandstorage.com or get additional technical support information on the Contact Us web page:

http://www.overlandstorage.com/company/contact-us/

For a complete list of support times depending on the type of coverage, visit our web site at:

http://support.overlandstorage.com/support/overland_care.html

Conventions

This user guide exercises several typographical conventions:

Convention	Description & Usage
Boldface	Words in a boldface font (**Example**) indicate items to select such as menu items or command buttons.
Ctrl-Alt-r	This type of format details the keys you press simultaneously. In this example, hold down the **Ctrl** and **Alt** keys and press the **r** key.
NOTE	A Note indicates neutral or positive information that emphasizes or supplements important points of the main text. A note supplies information that may apply only in special cases—for example, memory limitations or details that apply to specific program versions.
IMPORTANT	An Important note is a type of note that provides information essential to the completion of a task or that can impact the product and its function.
CAUTION	A Caution contains information that the user needs to know to avoid damaging or permanently deleting data or causing physical damage to the hardware or system.
WARNING	A Warning contains information concerning personal safety. Failure to follow directions in the warning could result in bodily harm or death.
Menu Flow Indicator (>)	Words in bold font with a greater than sign between them indicate the flow of actions to accomplish a task. For example, **Setup > Passwords > User** indicates that you should press the Setup button, then the Passwords button, and finally the User button to accomplish a task.

Information contained in this guide has been reviewed for accuracy, but not for product warranty because of the various environments, operating systems, or settings involved. Information and specifications may change without notice.

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Command List

Overview

The following lists commands (Windows environment) described in this document and can be used by installing ControlCommand.

No.	Command Name	Operation	Description	Windows
1	iSMvollist	Volume list creation/display	Associates the logical disk information (disk array side) and the system information (server side) and displays it.	✓
2	iSMcc_hostinfo	Host information collection	Collects the host information (including OS identification and system configuration information).	✓
3	iSMrc_ldlist	Logical disk information display	Lists the information on logical disks in the disk array.	✓
4	iSMrc_sense	Volume list display, ATgroup setting information display	Displays the information on a specific volume or the setting information of ATgroup.	✓
5	iSMrc_flush	File system buffer flush	Flushes the file system cache buffer.	✓
6	iSMrc_mount	Volume mount	Mounts the volume (file system).	✓
7	iSMrc_umount	Volume unmount	Unmounts the volume (file system).	✓
8	iSMrc_signature	Disk signature operation	Performs an operation on each disk signature.	✓
9	iSMrc_scan	Disk scanning	Scans for available disks.	✓

✓: Target -: Non-target

Commands No.1 and No.2 above can be used by installing the volume list command (iSMvollist) included in SnapSAN Manager.

Each command mentioned in the above can be shared among data replication function (ReplicationControl, ReplicationControl/DisasterRecovery), snapshot function (SnapControl), data retention function (ProtectControl), and power saving function (PowerControl).

Windows System

Commands in the above table can be operated only by a user who belongs to the Administrators group.

However, in a Windows Server 2008 environment in which User Account Control (UAC) is enabled, to log on as a user other than the user belonging to the OS local system administrators group and perform the operation, elevate to the system administrator in advance.

To use control volumes or to operate together with SnapSAN Manager, joint operation is possible with regard to commands No.3 and No.4. Commands No.1, No.2, and No.5 to No.9 are not targeted in joint operation with control volumes or SnapSAN Manager because those commands operate the system's volumes and collect the system information.

No.	Command Name	Operation	Description	Windows
1	iSMrc_replicate	Pair and ATgroup replicate	Starts replicating pairs and ATgroups.	✓
2	iSMrc_separate	Pair and ATgroup separate	Separates pairs and ATgroups.	✓
3	iSMrc_restore	Pair and ATgroup restore	Starts restoring pairs and ATgroups.	✓
4	iSMrc_change	Pair copy control change , and ATgroup state change	Changes the copy control state of pairs and the state of ATgroups.	✓
5	iSMrc_wait	Waiting for state transition of pair and ATgroup	Waits until replication, restoration, or separation is completed.	✓
6	iSMrc_query	Pair and ATgroup state display	Displays the state of pairs and ATgroups.	✓
7	iSMrc_rvmode	Change RV access restriction	Change RV access restriction.	✓
8	iSMrc_updprevent	Cancels the update prevention state of the specified volume.	Cancels the update prevention state of the specified volume.	✓

No.	Command Name	Operation	Description	Windows
9	iSMrc_pair	Pairing/unpairing	Sets and cancels the paired volume.	✓
10	iSMrc_swap	Swap for Remote Replication pair	Swaps an Remote Replication pair or resumes a swap .	✓
11	iSMrc_atg	ATgroup build	Creates and deletes ATgroups, updating attributes, and adds pairs to and deletes them from ATgroups.	✓
12	iSMrc_arrayinfo	Disk array information display	Displays information about disk array replication.	✓

✓: Target-: Non-target

Commands in Command for Common Function and each command mentioned in the above table can be used for data replication function (ReplicationControl and ReplicationControl/DisasterRecovery).

Windows System

Commands mentioned in the above table can be operated only by users who belong to the Administrators group.

However, in a Windows Server 2008 environment in which User Account Control (UAC) is enabled, to log on as a user other than the user belonging to the OS local system administrators group and perform the operation, elevate to the system administrator in advance.

No.	Command Name	Operation	Description	Windows
1	iSMsc_create	Snapshot creation	Creates a snapshot (SV).	✓
2	iSMsc_restore	Snapshot restoration	Restores from a snapshot (SV).	✓
3	iSMsc_delete	Snapshot deletion	Deletes snapshot (SV) data.	✓
4	iSMsc_svguard	SV guard classification setting and cancellation	Sets or cancels SV guard classification.	✓
5	iSMsc_wait	Snapshot state wait	Waits for the snapshot (SV) state.	✓

No.	Command Name	Operation	Description	Windows
6	iSMsc_query	Snapshot information display	Displays snapshot information.	✓
7	iSMsc_link	Link setting	Sets a link between a link- volume (LV) and BV/SV.	✓
8	iSMsc_unlink	Link release	Releases a link between a link-volume (LV) and BV/SV.	✓
9	iSMsc_linkinfo	Link information display	Displays link-related information.	✓

✓: Target-: Non-target

Commands mentioned in Table 1-1 Command for Common Function and each command mentioned in the above table can be used for snapshot function (SnapControl).

Windows System

Commands mentioned in the above table can be operated only by a user who belongs to the Administrators group.

However, in a Windows Server 2008 environment in which User Account Control (UAC) is enabled, to log on as a user other than the user belonging to the OS local system administrators group and perform the operation, elevate to the system administrator in advance.

No.	Command Name	Operation	Description	Windows
1	iSMpc_protect	Protection setting or protection setting change for volume	Performs the protection setting for volume or changes the protection setting for volume.	✓
2	iSMpc_release	Protection cancellation for volume	Cancels the protection for volume.	✓

✓: Target-: Non-target

Commands mentioned in Table 1-1 Command for Common Function and each command mentioned in the above table can be used for data retention function (ProtectControl).

Windows System

Commands mentioned in the above table can be operated only by a user who belongs to the Administrators group.

However, in a Windows Server 2008 environment in which User Account Control (UAC) is enabled, to log on as a user other than the user belonging to the OS local system administrators group and perform the operation, elevate to the system administrator in advance.

Each command mentioned above is not targeted in joint operation with SnapSAN Manager.

No.	Command Name	Operation	Description	Windows
1	iSMec_start	Starts using volumes or starts rotation of a pool	Starts using volumes or starts rotation of a pool.	✓
2	iSMec_stop	Stops using volumes	Stops using volumes.	✓
3	iSMec_sense	Displays the use state and rotation state	Displays the use state and rotation state.	✓

✓: Target-: Non-target

Commands mentioned in Table 1-1 Command for Common Function and each command mentioned in the above table can be used for power saving function (PowerControl).

Windows System

Commands mentioned in the above table can be operated only by a user who belongs to the Administrators group.

However, in a Windows Server 2008 environment in which User Account Control (UAC) is enabled, to log on as a user other than the user belonging to the OS local system administrators group and perform the operation, elevate to the system administrator in advance.

Each command mentioned above is not targeted in joint operation with SnapSAN Manager.

The commands described can be used by installing ReplicationControl SQL Option. These commands are used in combination with the data replication function or snapshot function of ControlCommand.

No.	Command Name	Operation	Description	Windows
1	iSMsql_snapshotbkup	Snapshot backup	Creates backups of the Microsoft SQL Server database.	✓
2	iSMsql_snapshotrst	Snapshot restoration	Restores the Microsoft SQL Server database from the backup.	✓

✓: Target-: Non-target

Windows System

Commands mentioned in the above table can be operated only by a user who belongs to the Administrators group.

However, in a Windows Server 2008 environment in which User Account Control (UAC) is enabled, to log on as a user other than the user belonging to the OS local system administrators group and perform the operation, elevate to the system administrator in advance.

Each command mentioned in the above table is not targeted in joint operation with control volumes or SnapSAN Manager because those commands directly operate the system's volumes.

Volume Types

Types of volumes that are specified as operation targets by each function are as follows:

Windows System

No.	Type	Description	Identifier
1	Logical disk name	Specifies the logical disk name set on the disk array side.	ld
2	Mount point volume name	Specifies the mount point volume name assigned by the system to the volume.	mvol
3	NTFS folder name	Specifies the NTFS folder name (path name) set for the volume.	mdir
4	Drive letter	Specifies the drive letter set for the volume.	drv
5	Physical disk number	Specifies the physical disk number of the disk (logical disk) assigned by the system.	dskn
6	Relative generation name	Specifies a number that is assigned in descending order (as in -2, -3, -4, etc.) relative to the latest generation (-1) to identify an SV corresponding to a BV.	relgen
7	Cyclic generation	Specified when the snapshot of the oldest generation is deleted as a new snapshot is created.	cyclic
8	Deleted SV auto selection	Indicates that the SV to be deleted is automatically selected when a snapshot is deleted.	auto
9	SV batch operation	Specified at the batch deletion of snapshots in all generations when a snapshot is deleted. Alternatively, specified to cancel all SV guard classifications under a BV together.	all

The identifier is a character string that indicates the volume type and is used in the following cases:

- When specifying a volume type by a command argument.
- When specifying a volume type in the operation files of individual functions (replication operation file, snapshot operation file, and data retention operation file).

To use the volume group, the LVM environment is necessary.

To use the disk group, the VxVM environment is necessary.

On Linux version, to specify a special file name (/dev/sdX# X is an alphabetic lower-case character), remove the special file name's partition number (#).

Volume types No.5 to No.8 can be used only when using the snapshot operation commands and link operation commands.

For the data retention operation commands, it is impossible to specify an LVM volume group or a VxVM disk group as the volume type.

The pair operation command and ATgroup build command operation are performed on a single logical disk; therefore, it is impossible to specify an LVM volume group or a VxVM disk group.

The volume type that can be used in remote operation (operation targeting a pair or volume of the remote disk array) is logical disk name only.

The volume type that can be used in the joint operation with SnapSAN Manager is logical disk name only.

Log Output

ControlCommand outputs command operation history information to the command trace file. The following describes an overview of command trace file output operation and the contents of output items.

Operation Overview
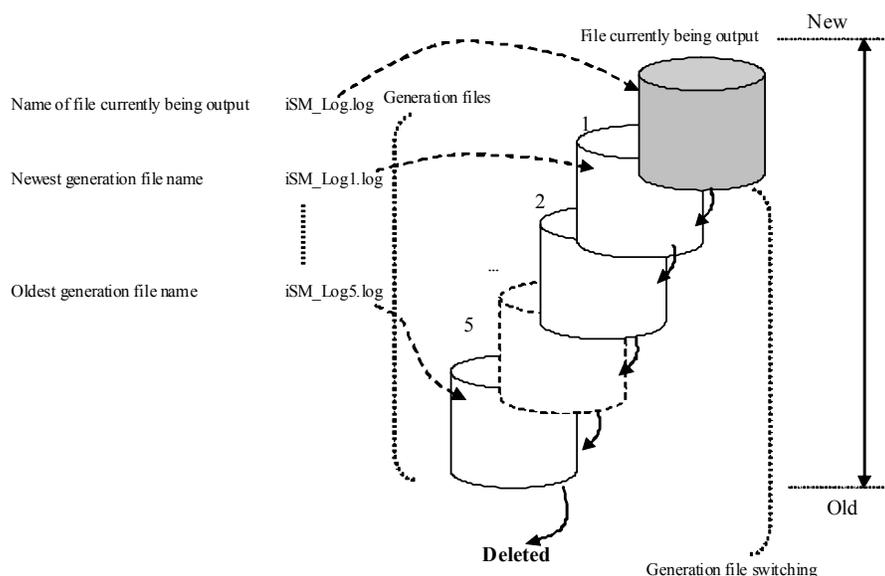
Figure 1-1: Five Generation Files Created in Command Trace File

Overview of Command Trace File

Location of command trace file creation

Create a command trace file directly in the etc directory (folder) created under the directory (folder) where ControlCommand is installed.

Command trace file size

Create 200-KB (kilobytes) files of up to five generations by default.

In Windows, the file size and the number of generations can be changed by using the operation option setting file. .

Command trace file name

iSM_Log.log: Newest command trace file

iSM_Log(n).log: Command trace file of n generations ago

Generation file switching

Generation file switching of the command trace file takes place when the size set in the operation option setting file (Windows).

At this time, if the maximum number of generations set in the operation option setting file (Windows) or in the environment variable.

Generation file switching is transparent to the user because it is automatically performed.

Contents of Output Items

The following items are output to the command trace file.

Trace information output time and information for identifying commands and processes (common information)

Command execution image

The image of the executed command is output.

Command output messages and execution result

The contents of output messages displayed on a terminal when a command is executed are also output to the command trace file. However, if a command for information display is executed, the display result is not output.

```
2007/09/12 11:27:58.639 host1 VOL-CLI    : 0000003521(0000002580) Info    vollist      iSM13200: ~
2007/09/12 11:27:58.690 host1 VOL-CLI    : 0000003521(0000002580) Info    vollist      iSM13247: ~
2007/09/12 11:28:24.493 host1 RPL-CLI    : 0000003526(0000002864) Info    rc_query     iSM13200: ~
2007/09/12 11:28:24.574 host1 RPL-CLI    : 0000003526(0000002864) Info    rc_query     iSM13247: ~
2007/09/12 11:29:01.140 host1 SC-CLI     : 0000003528(0000002792) Info    sc_query     iSM19000: ~
2007/09/12 11:29:48.577 host1 EC-CLI     : 0000003531(0000002264) Info    ec_sense     iSM25000: ~
2007/09/12 11:30:12.112 host1 PC-CLI     : 0000003533(0000002592) Info    pc_protect   iSM21000: ~
2007/09/12 11:30:12.322 host1 PC-CLI     : 0000003533(0000002592) Info    pc_protect   iSM21011: ~
          :
```

Figure 1-2: Command Trace File Output

Item	Description
Date	Date information is output in the "yyyy/mm/dd" format.
Time	Time information is output in the "hh:mm:ss.msec" format.
Host name	The host name of server that executed the command is output.
Function type	A function type is output.
Process number (thread number)	A command process number is output in a decimal format. For Windows, a thread number is output in decimal.
Error level	An error level is output.
Command type	A command type is output.
Message ID	A message ID is output.
Message text	A message text is output.

ControlCommand

Operating Environment

The supported OS environment for.SnapSAN S3000/S5000.

For using data retention and power saving function:

*:The host information collection function (common function) included in Storage Manager Agent Utility can be used for the disk arrays with FC.

*: It is not possible to connect one server to a disk array with an FC port and a disk array with a SAS port at the same time.

Item	Description
Operating System	Microsoft Windows Server 2003, Standard Edition (SP0 to SP2) (*1)
	Microsoft Windows Server 2003 R2, Standard Edition (SP0, SP2)
	Microsoft Windows Server 2003, Standard x64 Edition (SP0, SP2)
	Microsoft Windows Server 2003 R2, Standard x64 Edition (SP0, SP2)
	Microsoft Windows Server 2003, Enterprise Edition (SP0 to SP2) (*1)
	Microsoft Windows Server 2003 R2, Enterprise Edition (SP0, SP2)
	Microsoft Windows Server 2003, Enterprise x64 Edition (SP0, SP2)
	Microsoft Windows Server 2003 R2, Enterprise x64 Edition (SP0, SP2)
	Microsoft Windows Server 2003, Enterprise Edition for Itanium-based Systems (SP0 to SP2) (*1) (*4)
	Microsoft Windows Server 2008 Standard (SP0, SP2) (*2) (*3) (*5)
	Microsoft Windows Server 2008 R2 Standard (SP0, SP1) (*3) (*5)
	Microsoft Windows Server 2008 Enterprise (SP0, SP2) (*2) (*3) (*5)
	Microsoft Windows Server 2008 R2 Enterprise (SP0, SP1) (*3) (*5)
	Microsoft Windows Server 2008 R2, Datacenter (SP0, SP1) (*3)
	Microsoft Windows Server 2008 for Itanium-based Systems (SP0, SP2) (*4)

Item	Description
Related software	BaseProduct (including Storage Manager)
	AccessControl
	<Data replication function>
	Volume Cloning
	Volume Cloning Lite
	Replication and Mirroring
	Replication and Mirroring Asynchronous
	Replication and Mirroring /DisasterRecovery
	<Snapshot function>
	SnapshotsVolume Cloning
	Volume Cloning Lite
	<Data retention function>
	WORM
	<Power saving function>
	PowerConserver

Item	Description
Memory	<For using data replication function>
	Microsoft Windows Server 2003, Standard Edition
	OS required memory + 18 MB or more
	Microsoft Windows Server 2003 R2, Standard Edition
	OS required memory + 18 MB or more
	Microsoft Windows Server 2003, Standard x64 Edition
	OS required memory + 22 MB or more
	Microsoft Windows Server 2003 R2, Standard x64 Edition
	OS required memory + 22 MB or more
	Microsoft Windows Server 2003, Enterprise Edition
	OS required memory + 18 MB or more
	Microsoft Windows Server 2003 R2, Enterprise Edition
	OS required memory + 18 MB or more
	Microsoft Windows Server 2003, Enterprise x64 Edition
	OS required memory + 22 MB or more
	Microsoft Windows Server 2003 R2, Enterprise x64 Edition
	OS required memory + 22 MB or more
	Microsoft Windows Server 2003, Enterprise Edition for Itanium-based Systems
	OS required memory + 44 MB or more
	Microsoft Windows Server 2008 Standard (IA32)
	OS required memory + 18 MB or more
	Microsoft Windows Server 2008 Enterprise (IA32)
	OS required memory + 18 MB or more
	Microsoft Windows Server 2008 Standard (EM64T)
	OS required memory + 22 MB or more
	Microsoft Windows Server 2008 R2, Standard (EM64T)
	OS required memory + 22 MB or more
	Microsoft Windows Server 2008 Enterprise (EM64T)
	OS required memory + 22 MB or more
	Microsoft Windows Server 2008 R2, Enterprise (EM64T)
	OS required memory + 22 MB or more
	Microsoft Windows Server 2008 R2, Datacenter(EM64T)
	OS required memory + 22 MB or more
	Microsoft Windows Server 2008 for Itanium-based Systems
	OS required memory + 44 MB or more
	<For using snapshot function>
	Microsoft Windows Server 2003, Standard Edition
	OS required memory + 18 MB or more
	Microsoft Windows Server 2003 R2, Standard Edition OS required memory + 18 MB or more
	Microsoft Windows Server 2003, Standard x64 Edition OS required memory + 22 MB or more
	Microsoft Windows Server 2003 R2, Standard x64 Edition OS required memory + 22 MB or more
	Microsoft Windows Server 2003, Enterprise Edition OS required memory + 18 MB or more

Item	Description
Memory	<For using snapshot function>
	Microsoft Windows Server 2003 R2, Enterprise EditionOS required memory + 18 MB or more
	Microsoft Windows Server 2003, Enterprise x64 EditionOS required memory + 22 MB or more
	Microsoft Windows Server 2003 R2, Enterprise x64 Edition
	OS required memory + 22 MB or more
	Microsoft Windows Server 2003, Enterprise Edition for Itanium-based Systems
	OS required memory + 44 MB or more
	Microsoft Windows Server 2008 Standard (IA32) OS required memory + 18 MB or more
	Microsoft Windows Server 2008 Enterprise (IA32) OS required memory + 18 MB or more
	Microsoft Windows Server 2008 Standard (EM64T) OS required memory + 22 MB or more
	Microsoft Windows Server 2008 R2, Standard (EM64T) OS required memory + 22 MB or more
	Microsoft Windows Server 2008 Enterprise (EM64T) OS required memory + 22 MB or more
	Microsoft Windows Server 2008 R2, Enterprise (EM64T)OS required memory + 22 MB or more
	Microsoft Windows Server 2008 R2, Datacenter(EM64T)OS required memory + 22 MB or more
	Microsoft Windows Server 2008 for Itanium-based Systems
	OS required memory + 44 MB or more
	Microsoft Windows Server 2003, Standard EditionOS required memory + 18 MB or more
	Microsoft Windows Server 2003 R2, Standard EditionOS required memory + 18 MB or more
	Microsoft Windows Server 2003, Standard x64 EditionOS required memory + 22 MB or more
	Microsoft Windows Server 2003 R2, Standard x64 Edition
	OS required memory + 22 MB or more
	Microsoft Windows Server 2003, Enterprise EditionOS required memory + 18 MB or more
	Microsoft Windows Server 2003 R2, Enterprise EditionOS required memory + 18 MB or more
	Microsoft Windows Server 2003, Enterprise x64 EditionOS required memory + 22 MB or more
	Microsoft Windows Server 2003 R2, Enterprise x64 Edition
	OS required memory + 22 MB or more
	Microsoft Windows Server 2003, Enterprise Edition for Itanium-based Systems
	OS required memory + 44 MB or more
	Microsoft Windows Server 2008 Standard (IA32) OS required memory + 18 MB or more

Item	Description
Memory	Microsoft Windows Server 2008 Enterprise (IA32) OS required memory + 18 MB or more
	Microsoft Windows Server 2008 Standard (EM64T) OS required memory + 22 MB or more
	Microsoft Windows Server 2008 R2, Standard (EM64T) OS required memory + 22 MB or more
	Microsoft Windows Server 2008 Enterprise (EM64T) OS required memory + 22 MB or more
	Microsoft Windows Server 2008 R2, Enterprise (EM64T)OS required memory + 22 MB or more
	Microsoft Windows Server 2008 R2, Datacenter(EM64T)OS required memory + 22 MB or more
	Microsoft Windows Server 2008 for Itanium-based Systems
	OS required memory + 44 MB or more
	<For using power saving function>
	Microsoft Windows Server 2003, Standard EditionOS required memory + 18 MB or more
	Microsoft Windows Server 2003 R2, Standard EditionOS required memory + 18 MB or more
	Microsoft Windows Server 2003, Standard x64 EditionOS required memory + 22 MB or more
	Microsoft Windows Server 2003 R2, Standard x64 Edition
	OS required memory + 22 MB or more
	Microsoft Windows Server 2003, Enterprise EditionOS required memory + 18 MB or more
	Microsoft Windows Server 2003 R2, Enterprise EditionOS required memory + 18 MB or more
	Microsoft Windows Server 2003, Enterprise x64 EditionOS required memory + 22 MB or more
	Microsoft Windows Server 2003 R2, Enterprise x64 Edition
	OS required memory + 22 MB or more
	Microsoft Windows Server 2003, Enterprise Edition for Itanium-based Systems
	OS required memory + 44 MB or more
	Microsoft Windows Server 2008 Standard (IA32) OS required memory + 18 MB or more
	Microsoft Windows Server 2008 Enterprise (IA32) OS required memory + 18 MB or more
	Microsoft Windows Server 2008 Standard (EM64T) OS required memory + 22 MB or more
	Microsoft Windows Server 2008 R2, Standard (EM64T) OS required memory + 22 MB or more
	Microsoft Windows Server 2008 Enterprise (EM64T) OS required memory + 22 MB or more
	Microsoft Windows Server 2008 R2, Enterprise (EM64T)OS required memory + 22 MB or more
	Microsoft Windows Server 2008 R2, Datacenter(EM64T)OS required memory + 22 MB or more
	Microsoft Windows Server 2008 for Itanium-based Systems
	OS required memory + 44 MB or more
Disk capacity	53 MB or more

Install

Installing ControlCommand enables use of the following functions.

- ReplicationControl
- ReplicationControl/DisasterRecovery
- SnapControl
- ProtectControl
- PowerControl
- Storage Manager Agent Utility

If any of the following software products are installed, uninstall before installing ControlCommand.

- If ReplicationControl/DisasterRecovery is installed, you must uninstall it before uninstalling ReplicationControl.
- ReplicationControl
- ReplicationControl/DisasterRecovery
- SnapControl
- Volume list command (iSMvollist)* or Storage Manager Agent Utility
- ControlCommandSet or ControlCommand

NOTE: If the version of the Storage Manager Agent Utility that is installed is Ver7.1 or later and if its version is equal to or less than the version of ControlCommand, then ControlCommand can be overwritten and installed without uninstalling the Storage Manager Agent Utility. For disk arrays configured with a Replication and Mirroring pair, the version of the software to be installed must support both the disk array connected to the server and the disk array connected to the server-connected disk array using Replication and Mirroring. On Windows Server 2008 or later, User Account Control (UAC) is enabled by default.If the installation is performed by a user other than the Local Administrator Account which is the default super user of the operating system, the user must be elevated to Administrator privileges before the operation.

After the installation of ControlCommad, the following operation must also be operated after elevation to Administrator privileges.

- When you execute the function of ControlCommad
- When you execute the command of this software using command prompt, select [Run as administrator] at the launch of command prompt.
- When you edit the operation option setting file of ControlCommad using text editor etc
- When applying quota management*1 and file screening*2 to the folder and disk where the SnapSAN ManagerSnapSAN Manager is installed, use them properly; otherwise, problems may occur during installation or operation.

*1 The function which controls the usable capacity and prevents the capacity from being used above the set limit.

*2 The function which prevents files with certain names (extensions) from being saved.

To use ControlCommand through the Windows task scheduler or previously installed job scheduling software after installation, it is required to restart services and systems in order to recognize the path names of the installed execution files and also to start the SnapSAN Manager host agent service that has been installed.

1. Select [Services] of [Administrative Tools] in Windows [Control Panel] and then start the following services.
- Overland Storage Manager Host Agent
- SnapSAN Manager Host Information Registration Agent

   a. When there are the task scheduler, job scheduling and command prompt of Windows which are already started for recognition of a pathname of an executable file, restart them.

2. Log on as a user with Administrator privileges.

3. Set the ControlCommand CD on the server and execute the following installation program:

\ISMCCS\SETUP.EXE

4. For Windows Server 2008 or later, the [User Account Control] dialog box might be displayed when installation starts. Select [Continue], [Allow] or [Yes] to execute the installation program.

5. Follow the installer directions.

6. After installing ControlCommand, collect/store Host Information disk arrays with FC and create a volume list.

Uninstall

To uninstall ControlCommand, follow the procedure below.

On Windows Server 2008 or later, User Account Control (UAC) is enabled by default. So if the uninstallation is performed by a user other than the Local Administrator Account which is the default super user of the operating system, the user must be elevated to Administrator privileges before the operation.

1. Log on as a user with Administrator privileges.

2. Check whether commands for each software product are running and whether the Volume List Display screen is open.

3. Terminate all running commands and close all screens.

4. Close [Event Viewer] if it is open.

5. Select the following from [Control Panel].

6. On Windows Server 2008 or later, select [Programs and Features] or [Programs]

7. On Windows Server 2003, select [Add or Remove Programs]

8. On Windows 2000 Server, select [Add/Remove Programs]

9. Select the following software, and uninstall it.

ControlCommand

For Windows Server 2008 or later, the [User Account Control] dialog box might be displayed when uninstallation starts. Select [Continue], [Allow] or [Yes] to execute the uninstallation program.

For the Server Core environment, set the CD of the version to be uninstalled, and then execute the following at the command prompt.

```
\ISMCCS\SETUP.EXE  /uninstall
```

Follow the uninstaller directions.

If commands of any software products are running or the Volume List Display screen is open and uninstallation is performed, a message may appear which prompts you to reboot the operating system. Reboot the operating system if this is the case. If not restart the system, restart the task scheduler, the job scheduling and the command prompt of Windows which are already started for the renewal of the recognized pathname.

Update

To update the ControlCommand software, uninstall the existing software, and then install the new software.

When you upgrade OS of the server to which ControlCommand is installed to Windows Server 2008 or later, you must update ControlCommand by the following procedure.

This procedure is necessary even if the version of installed ControlCommand is the same as that of ControlCommand after update.

1. Upgrade the OS of the server to which ControlCommand is installed to Windows Server 2008 or later.

2. After the upgrade to Windows Server 2008 or later has finished, uninstall the installed ControlCommand.

3. Install ControlCommand again.

4. Display the [Properties] of the following executable file which is stored in the folder of installation destination.

   iSMvollistGUI.exe

   iSMvolmnu_gather.exe

5. At the [Properties] of each executable file, click to select the [Run this program as an administrator] check box at [Privilege Level] of [Compatibility] tab and then click [OK].

When using a version of ReplicationControl, the operation option setting file iSMrpl.ini (replication operation option setting file of data replication function) is deleted when uninstalled. To update ReplicationControl to ControlCommand:

1. Save the operation option setting file before uninstalling ReplicationControl. Then, after installing ControlCommand, inherit the file by overwriting it to the new folder where ControlCommand has been installed.

The operation option setting file is stored just under the system folder.

```
%SystemRoot%\iSMrpl.ini
```

The operation option setting file is stored under the ismvol folder in the system folder.

```
%SystemRoot%\ismvol\iSMrpl.ini
```

Since the operation option setting file is not deleted at uninstallation when using ReplicationControl you can inherit the file as it is when updating to ControlCommand. When updating the ControlCommand software:

2. Re-create the volume list after performing the update; otherwise, the property information of the volume list will not be displayed when using the following functions:

- Specifying the -p or -ax option for the iSMvollist command to display information
- Selecting [File] ? [Properties] on the Volume List Display screen to display information

The volume list property information can be used when the volume list is created with ControlCommand software.

Prepare Operation

Host Information Collection/Storage

When using the disk arrays with FC, collect host information by using SnapSAN ManagerHost Agent Service (Overland Storage Manger Host Agent) or iSMcc_hostinfo (host information collection command) included in ControlCommand, and store the host information in the Storage Manager server.

This procedure is not mandatory. But by collecting and storing host information, the following disk array configuration setting is performed by using host information.

- LD Quick Configuration
- LD Set Setting of Access Control

It is possible to display the connected host information in the connected host list screen of SnapSAN Manager SnapSAN Manager client

(Web GUI)

On an application server which does not meet the operation requirement, SnapSAN Manager Host Agent Service and iSMcc_hostinfo (host information collection command) cannot be operated.

And, storing host information by using SnapSAN Manager Host Agent Service, iSMcc_hostinfo (host information collection command), or iSMhoststore (host information store command) is possible only for the disk arrays with FC.

Collection of Host Information

There are roughly two methods for collection of host information and it differs depending on the composition of the system.

- Automatic Collection of Host Information Using Snapsan Manager Host Agent Service
- "Forward Host Information File and Host Information Storage"

Automatic Collection

When the disk array is newly introduced and all new servers of Windows (server that does not begin operating) are introduced as a server connected with the FC cable, automatic collection of host information that uses the SnapSAN Manager host agent service and FC connection between the disk array and servers of Windows is possible.
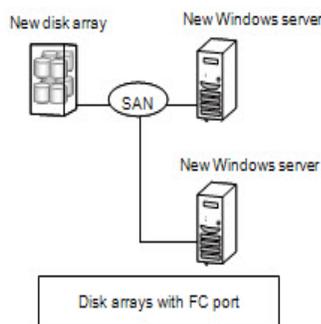
Figure 2-1: Configuration Automatic Collection

Confirm the FC connection between new disk array and new Windows server. Then, carry out the procedure shown below.

Enable the Host Recognize Volume Mode

1. Use SnapSAN Manager client (Web GUI) to launch the configuration setting (Setting Mode).

2. Select [Setting Disk Array], and select "Special 2" screen.

3. Enable Host Recognize Volume mode check box and click "Apply" button.

4. Restart SnapSAN Manager Host Agent Service

5. Restart SnapSAN Manager Host Agent Service (Overland Storage Manager Host Agent), and wait for at least three minutes or more.

6. Restart of the service can be executed by using [Services] of [Administrative Tools] in Windows [Control Panel].

Disable the Host Recognize Volume.

1. Use SnapSAN Manager client (Web GUI) to launch the configuration setting (Setting Mode).

2. Select "Setting Disk Array ", and select "Special 2" screen.

3. Clear [Enable Host Recognize Volume mode.] check box and click [Apply] button.

4. Confirm that the host information has been collected and stored by SnapSAN Manager Host Agent Service

Confirmation can be done by connected host list screen of SnapSAN Manager client (Web GUI).

Host Information Collection Using File Output From Host Information Collection Command

Collect host information by using file output from host information collection command (iSMcc_hostinfo) under any of these scenarios:

• Set up a disk array unit in a system that has already begun operation

• An application server connected by FC cable contains OS other than Windows

• Collect the host information without FC cable connection between disk array and server,
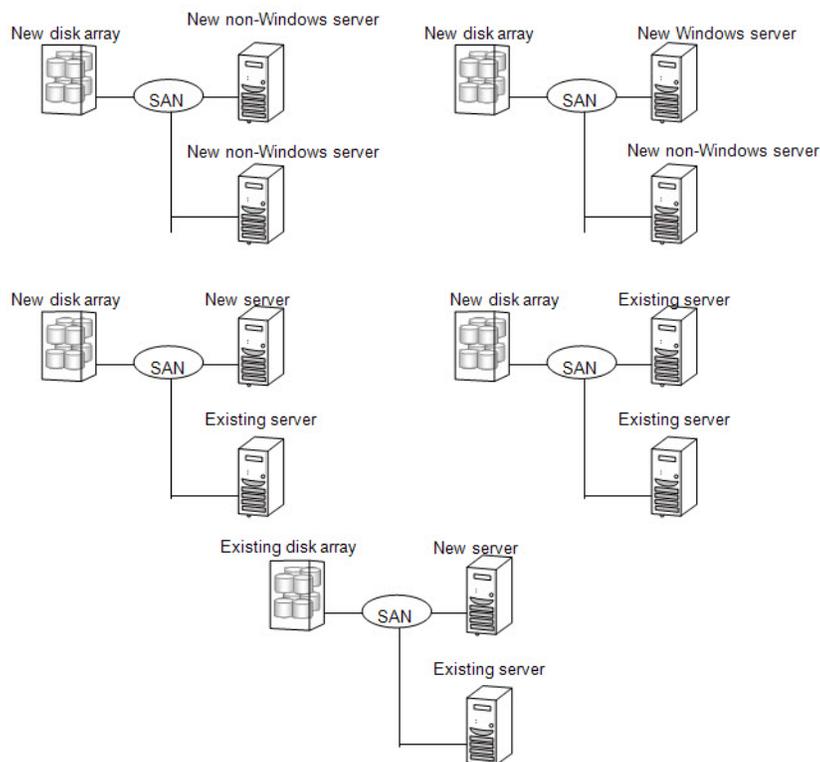
Figure 2-2: Configuration Automatic Collection Using File Output

1. Execute the host information collection command (iSMcc_hostinfo) from the command prompt in the application server for host information collection.

2. In the -export option, specify the file that is the output destination of the host information (host information file).

3. Execute the host information collection command (iSMcc_hostinfo) as a user with administrator privileges.

```
iSMcc_hostinfo -export \ServerName
```

When host information collection succeeded, the following message is output. The process number is output in aaaa in the message and an internal code for maintenance is output in bbbb.

```
iSMcc_hostinfo: Info:        iSM11770: Host Information was exported successfully.
(code=aaaa-bbbb-bbbb-bbbb)
iSMcc_hostinfo: Info:        iSM11100: Command has completed successfully.
```

Forward Host Information File and Host Information Storage

If Host information collection using file output from host information collection command" was performed in "Collection of Host Information":

1. Transfer the host information file that is output by executing the host information collection command (iSMcc_hostinfo) to the management server on which the Storage Manager server is operating by using file transfer or USB memory, etc.

2. Execute the host information store command (iSMhoststore) on the management server on which the Storage Manager server is operating.

3. In the -import option, specify the host information file that was transferred from the application server.

4. In the -arrayname option, specify the nickname of the disk array to which the operation applies.

5. Execute the host information store command (iSMhoststore) as a user with appropriate privileges.

    In addition, when performing host information storage, the target disk array that is the storage destination must be being monitored normally from the Storage Manager server.

```
iSMhoststore -import \ServerName -arrayname StorageName
```

When host information storage succeeds, the following message is output.

```
iSMhoststore: 002 Host Information was imported successfully. (Disk
Array=StorageName)
iSMhoststore: 001 Command completed successfully.
```

Confirmation of Stored Host Information

1. Confirm the stored host information of application server is displayed in connected host list screen of SnapSAN Manager client (Web GUI).

2. Open the connected host detail information screen by right-clicking the host information in connected host list screen and select [Properties].

3. Confirm the following in the connected host detail information screen.

- HBA information (WWNN, WWPN) of FC port, of the relevant application server is displayed in [HBA List].
- Port information of the connected disk array is displayed in [Diskarray Port] when a WWNN/WWPN of FC port connected to the disk array is selected in [HBA List].

If host information of application server is not displayed in connected host list screen of SnapSAN Manager client (Web GUI) or 'HBA information (WWNN, WWPN) of FC port', of the application server is not displayed in [HBA List], note that the following occurred in the configuration setting of disk array.

- Host name is not displayed in "Selection host" in the "LD Bind Quick Configuration" screen of Quick Configuration.
- Host name is not displayed in "Host" in the "Link Path" screen of AccessControl

When multiple IP addresses are set for an application server (cluster configuration hosts, etc), IP addresses of the host collected by the host information collection command (iSMcc_hostinfo) become the IP addresses returned by the OS on a priority basis.

Unintended IP address

If the IP address stored as host information is not an intended IP address, it is possible to store the host information with another IP address by the following procedures.

1. After stopping SnapSAN Manager Host Agent Service, change the Startup type of SnapSAN Manager Host Agent Service to [Manual]. Stopping the service and changing the Startup type can be executed by using [Services] of [Administrative Tools] in Windows [Control Panel].

2. Update the IP address (Item name: IPAddress) of host information file to the preferable one by using text editor, etc. (Host information file is output in the application server.)

3. Store the host information of updated host information file by using iSMhoststore command.

4. Refer to the connected host list screen of SnapSAN Manager client (Web GUI) and confirm that IP address has been updated correctly.

When multiple network adaptors are installed, and there are multiple "connections", it is possible to collect the intended IP address by change the priority of "connections". But this may affect the other application, it is necessary to confirm that the modification of priority of "connections" does not affect the system before doing the following procedure.

How To Change the Priority of Connections

1. Open [Network Connections] in [Control Panel].

2. Select and start [Advanced] from the [Advanced Settings] menu.

3. Select the connection of the IP address to be prioritized from the [Connections] list on the [Adapters and Bindings] tab. Move to the top of the list using the arrow button.

4. Click [OK] to close [Advanced Settings].

5. Restart the SnapSAN Manager Host Agent Service and wait for at least three minutes or more, then refer to the connected host list screen of SnapSAN Manager client (Web GUI) and confirm that IP address has been updated correctly.

SnapSAN Manager Host Agent Service

After installing ControlCommand and restarting the system, or starting [Overland Storage Manager Host Agent] from [Services] of [Administrative Tools] in Windows [Control Panel], a SnapSAN Manager host agent service (Overland Storage Manager Host Agent) is started as a Windows service. Confirm that [Overland Storage Manager Host Agent] was successfully started by using [Services] of [Administrative Tools] in Windows [Control Panel].

Since then, the SnapSAN Manager host agent service starts and stops automatically when the system starts and stops.

If you want to prevent the SnapSAN Manager host agent service from automatically starting during reboot of the system:

1. Start [Services] of [Administrative Tools] in Windows [Control Panel], select [Overland Storage Manager Host Agent], and change the startup type from [Automatic] to [Manual].

The SnapSAN Manager host agent service collects and registers host information to the disk array in the following situations:

- When starting the SnapSAN Manager host agent service.
- When the OS detects and recognizes a logical disk that is assigned to the Windows server.

* A logical disk might not be recognized to OS only by the allocation of a logical disk to the server or connecting the FC cable between the disk array and the server. In this case, to recognize the logical disk allocated to OS, it is necessary to use the function such as "Disk Management" of Windows or restart the server.

The SnapSAN Manager host agent service can be operated in the stopped state when it is unnecessary to collect and register host information to the disk array automatically.

SnapSAN Manager Host Information Registration Agent

After installing ControlCommand and restarting the system, or starting [SnapSAN Manager Host Information Registration Agent] from [Services] of [Administrative Tools] in Windows [Control Panel], the SnapSAN Manager host information registration agent is started. The SnapSAN Manager host information registration agent is a Windows service with the function to register the configuration information between the host and the disk array in the disk array.

1. Check that the "SnapSAN Manager host information registration agent" service has been started by selecting [Services] from [Administrative Tools] in Windows [Control Panel].The SnapSAN Manager host information registration agent is automatically started when the system is started and automatically stopped when the system is stopped.

   To prevent the SnapSAN Manager host information registration agent from being automatically started due to system restart:

2. Start [Services] from [Administrative Tools] in Windows [Control Panel], specify [SnapSAN Manager Host Information Registration Agent], and change the startup method from [Automatic] to [Manual].

Configuration information between the host and the disk array can be registered in the disk array.

The SnapSAN Manager host information registration agent collects configuration information between the host and the disk array and registers it in the disk array in response to the following triggers.

- When the SnapSAN Manager host information registration agent service is started
- If changed configuration information is found as a result of every minute configuration information check
- Configuration information is registered at least every ten minutes even if it has not been changed

Note that the system can operate with the SnapSAN Manager host information registration agent stopped when it is not necessary to automatically collect configuration information between the host and the disk array and register it in the disk array.

Volume List Creation

Volume List Creation Command:

```
iSMvollist -cr
```

You must create a volume list under the condition that a logical disk bound on the disk array is recognized as a disk device by a server.For operations other than the joint operation with SnapSAN Manager, creation of a volume list is required before using ControlCommand functions.

Following the appropriate method to create a volume list:

- Activate the Volume List Display screen and select [File]   [Create/Update Volume List],
- Execute the iSMvollist command with the -cr option. Execute the iSMvollist command as a user with administrator privileges.

Upon successful creation of the volume list, the following message is displayed:

```
iSM11701: Volume list is created successfully.
```

If creation of a volume list fails, execution of ControlCommand functions is disabled.

3. Troubleshoot in accordance with error messages and create a volume list again.

After create a volume list, confirm that logical disk information and corresponding Windows physical disk information is stored correctly by display the volume list information.

a. If partitions were created, or mount point (drive letter or NTFS folder name) setting was performed, confirm that volume information (mount point volume name) and mount point is stored correctly.

4. To display the volume list information, launch the Volume List Display function or execute iSMvollist command with -a option.

```
iSMvollist -a
```

After a volume list is created correctly, the volume list must be recreated and updated in the following cases:

- Failure to update volume lists may result in abnormality or data inconsistency upon execution of ControlCommand commands.
- Change of disk array settings (disk array name, logical disk name, OS type)
- Setting/change of Access Control
- Addition/change/deletion of logical disk
- Addition/deletion of snapshot generation (SV)
- Binding of link-volume (LV)
- Addition/change/deletion of partition

- Addition/change/deletion of drive name on partition and drive path mounted on NTFS folder
- Addition/change/deletion of control volume (Only when a control volume is used)
- Addition/deletion of disk array which is connected using Replication and Mirroring
- Change of the connection composition (path) between a disk array and server
- Settings have been changed (disk array name, logical disk name, and OS type) on the remote side disk array of the disk arrays configured with a Replication and Mirroring pair.

Create and update volume lists with the link path between disk arrays under normal conditions.

Control Volume Settings

For operations using ReplicationControl/DisasterRecovery, SnapControl, ProtectControl, or PowerControl functions, a control volume must be registered.

- Replication-volumes (RV) or base-volumes (BV), and link-volumes (LV) for the snapshot function cannot be registered as control volumes since they enter the Not Ready state during operation.
- Do not pair logical disks built as control volumes as replication-volumes (RV).

The control volume setting procedure differs depending on the disk array functions as shown below.

Disk Arrays Identifying the Control Volume Attribute

Create or update the volume list when a logical disk built as a control volume is connected to the server and recognized as a disk by the system. The disk array identifies the logical disk with the control volume attribute from the logical disks connected to the server and automatically registers it in the volume list.

After updating the volume list, display the Volume List Display screen or the control volume list with the iSMvollist command to check that the setting information in the control volume definition file has been successfully reflected to the volume list.

The following is an example of displaying the control volume list using the iSMvollist command.

```
iSMvollist –ctl
```

Other Disk Arrays

It is necessary to select a volume to be used as a control volume from the logical disks connected to the server and to describe and define the disk array name and logical disk number of the selected volume in the control volume definition file of the server.

The control volume definition function is used to register a control volume on the Volume List Display screen. This function is activated by starting the Volume List Display screen and selecting [Operation]   [Define Control Volume].

After updating the volume list, display the Volume List Display screen or the control volume list with the iSMvollist command to check that the setting information in the control volume definition file has been successfully reflected to the volume list.

The following is an example of displaying the control volume list using the iSMvollist command.

```
iSMvollist -ctl
```

Disabling Automount

When the volume being unmounted is accessed through a file system, unmount operations are invalid since Windows automatically mounts the volume. This will leave unintended data in the file system buffer and damage the file system.

To disable unexpected automounts like this, specify the -offline option when executing an unmout operation with the iSMrc_umount command. The following is an example of unmounting an H drive volume with the specification of the -offline option.

```
iSMrc_umount  -drv H:  -offline
```

Also, when using Windows Server 2003 or later, execute the MOUNTVOL command with the /N option, which is the OS standard for automount disabling, in addition to the setting above. The /N option of the MOUNTVOL command is valid in the subsequent operation by executing it once after system configuration.

```
MOUNTVOL  /N
```

Operation Option Setting File

Various operations can be specified for commands by using the operation option setting file.

The operation option setting file corresponds to the replication operation option setting file for the data replication function, the option setting filed for the snapshot function, data retention function, and power saving function.

[Location and name of the operation option setting file]

```
%SystemRoot%\ismvol\iSMrpl.ini
```

Automount Disable Setting

For data replication operation using the ReplicationControl function:

1. Disable automount so that an unmounted replication-volume (RV) is not mounted automatically due to unintended access to this volume.

   This setting is especially essential for disaster recovery operations using the ReplicationControl/DisasterRecovery function.

   If unintended access to the replication-volume (RV) being unmounted occurs and automount is not disabled, Windows automatically mounts the volume. This will leave unintended data in the file system buffer. If replication operation is executed under these conditions, the replication-volume (RV) file system may be damaged. Therefore, be sure to execute operation with automount disabled.

2. To set automount disable, specify NOTREADY for the UMOUNT_RVACC parameter in the [FILESYSTEMOPERATION] section of the operation option setting file.

   The following is a description example:

```
[FILESYSTEMOPERATION]
UMOUNT_RVACC=NOTREADY
```

   a. If using Windows Server 2003 or later, execute the MOUNTVOL command with the /N option, which is the OS standard for automount disabling, in addition to the

setting above. The /N option of the MOUNTVOL command is valid in the subsequent operation by executing it once after system configuration.

```
MOUNTVOL  /N
```

Operation Trace Collecting

In preparation for fault occurrence, ControlCommand outputs the operation trace (trace log) in the following directory when executing commands.

In operation trace files, messages output to the standard output, standard error output, event log and command trace, and the detailed internal information are recorded. These files are used as critical data for analyzing a fault upon occurrence.

\iSMrpl\etc\trace under the installation folder

The output operation trace amount (file size) and retention amount and period vary depending on the command execution frequency and other factors. You can set these items optionally by writing the following option parameters:

 [TRACELOG] section

```
RPLLOGFILENUM
```

Specifies the maximum number of log files to be saved.

When this option parameter is omitted, up to 10 log files are used sequentially.

```
RPLLOGFILEMAXSIZE
```

Specifies the maximum size per log file to be saved in kilobytes.

When this option parameter is omitted, the size of one log file is about 400 kilobytes.

In ReplicationControl Ver2.1 or earlier, log data recorded during the number of days specified by the option parameter RPLLOG in the [TRACELOG] section was saved in one log file. This conventional method is not recommended due to the following reasons:

- The saved log file becomes larger in proportion to the command execution frequency.
- When the first command is executed after a change-of-day, the log for one day out of the retention period is deleted.
- If there is a lot of log data for the day to be deleted, it takes a long time to delete it.

Accordingly, if option parameter RPLLOG was used, it is advised to change settings using the option parameters above, RPLLOGFILENUM and RPLLOGFILEMAXSIZE, for operation.

Other Settings

When a low-speed line (low-speed line and a line without the band guarantee) is used for lines between disk arrays where Replication and Mirroring is composed, the link path fault might occur on the line between disk array due to the delay and performance degradation by the defect of line quality and the decreasing bandwidth. In such cases, the commands of this software that operate the pair of Replication and Mirroring might terminate abnormally.

Therefore, it is necessary to do the various operation settings about the retry control for the link path fault when a low-speed line is used.

From SnapControl Ver3.4, the default port number to be used for communication is changed to 8060 for joint operation with SnapSAN Manager. For joint operation with SnapSAN Manager, check the environment settings of the SnapSAN Manager (port number used for snapshot management) and operation option setting file and use the same port number.

To use ControlCommand functions on a Hyper-V virtual machine with Windows Server 2008 R2 or later, you must execute iSMpassthrough_enabler command on the host once before using a Hyper-V virtual machine.

This command must also be executed when a Hyper-V virtual machine is added to your operating environment.

.NET Framework must be installed by executing the following commands on Windows Server 2008 R2 Server Core.

start /w ocsetup NetFx2-ServerCore

   start /w ocsetup NetFx2-ServerCore-WOW64

Common Functions

Volume List Creation/Display

iSMvollist (Windows)

Name

iSMvollist   Creates and displays the table of logical disks and related information.

Synopsis

iSMvollist -cr

iSMvollist -d

iSMvollist -dl disk_array [ld_number]

iSMvollist -de disk_array [ld_name]

iSMvollist -dd disk_array [drive | path]

iSMvollist -dp disk_array [disk_number]

iSMvollist -dh disk_array [HBT [LUN]]

iSMvollist -a

iSMvollist -al ld_number

iSMvollist -ae ld_name

iSMvollist -ad {drive | path}

iSMvollist -ap disk_number

iSMvollist -av volume_name

iSMvollist -ah HBT [LUN]

iSMvollist -ai [-pd pd_type]

iSMvollist -ctl

iSMvollist -p

iSMvollist -ax

iSMvollist -ver

iSMvollist -tgt {-all | -ldname ldname | -arrayname arrayname}

iSMvollist -?

The iSMvollist command creates and displays the table of logical disks and related information.

The options which start with a display the relations of ld_number/ld_name/VAA/OS Type/drive/path/volume_name/HBT/LUN/disk_number/disk_array for all the disk arrays in the Volume List. In addition, the ai option and the ax option display information about pd_type.

The options which start with d display the relations of ld_number/drive/path HBT/LUN/disk_number/ld_name/OS Type for the specified disk arrays.

The Volume List can be created and displayed only by the devices recognized by the system.

The Volume List is necessary when using commands of ReplicationControl, SnapControl, and ProtectControl (except for joint operation with iSM).

Options

iSMvollist

The iSMvollist command recognizes the following options and arguments.

cr Scans the physical disks connected to the server, and creates or updates the volume information of the target devices. When disk arrays are added or deleted, and when logical disks are bound or unbound, you must perform this command to recreate the Volume List.

d Displays the list of the disk arrays in the Volume List as well as the number of logical drives in each disk array.

dl disk_array [ld_number]Displays the relations for the disk arrays specified by disk_array, sorted by the logical disk number as the key.

If ld_number is specified, it displays the relations only for the specified logical disk.

de disk_array [ld_name]Displays the relations for the disk arrays specified by disk_array, sorted by the logical disk name as the key.

If ld_name is specified, it displays the relations only for the specified logical disk name.

dd disk_array [drive | path]Displays the relations for the disk arrays specified by disk_array, sorted by the drive letter or path name of the NTFS folder as the key.

If drive or path is specified, it displays the relations only for the specified drive letter or path name of the NTFS folder.

dp disk_array [disk_number]Displays the relations for the disk arrays specified by disk_array, sorted by the physical disk number as the key.

If disk_number is specified, it displays the relations only for the specified physical disk.

dh disk_array [HBT [LUN]]Displays the relations for the disk arrays specified by disk_array, sorted by HBT and LUN as the keys.

If HBT is specified, it displays the relations only for the specified HBT.

Furthermore, if LUN is specified, it displays the relations only for the specified HBT and LUN.

Displays all volume information in the Volume List.

al ld_number Displays the relations only for the logical disk number specified by ld_number.

ae ld_name Displays the relations only for the logical disk name specified by ld_name.

ad {drive | path} Displays the relations only for the drive letter or path name of the NTFS folder specified by drive or path.

ap disk_numberDisplays the relations only for the physical disk number specified by disk_number.

av volume_nameDisplays the relations only for the mount point volume name specified in volume_name.

ah HBT [LUN]Displays the relations only for the host numbers, bus numbers, and target IDs specified by HBT. If LUN is specified, it displays the relations only for the specified HBT and LUN.

ai [pd pd_type]Displays information about configurations of all volumes in the volume list.

For pd_type of the pd option, PD Type of logical disks (attribute of physical disks in the disk arrays) can be specified. Displays only configuration information about a PD Type if pd_type is specified.

Specify either attribute to pd_type:

FC FC attribute

ATA ATA attribute

SAS SAS attribute

SSD SSD attribute

NLSAS Nearline SAS attribute

SAS(SED) Encrypting SAS attribute

ctl Lists the physical disk number and logical disk number of the control volume, and the corresponding disk array name. The control volume is used in operating data replication and snapshot functions from the business server.

p Displays the version and creation time and date of the Volume List property information.

ax Lists disk array information in the Volume List, information about all volumes, and property information of the Volume List.

ver Displays the version information of this command.

tgt Displays targetname of a volume in the Volume List.

all: Displays iSCSI information of all volumes in the Volume List. Message 11932 is output if the volumes are not an iSCSI volume.

ldname: Displays iSCSI information of the specified volume. Message 11933 is output if the specified volume is not a iSCSI volume.

array name:

Displays iSCSI information of all volumes for the specified disk array. Message 11933 is output if the volumes are not an iSCSI volume.

Lists the version information and options of this command.

Displayed Information

```
C:\>iSMvollist -d
--- Disk Array List ---
Disk Array Name               Number of Drives
disk_array                    nnnn

C:\>
```

Description of messages:

Disk Array Name Disk array name

Number of Drives Number of items of volume information for each disk array

```
C:\>iSMvollist -a
LDN    LD Name                        VAA                OS Type
 HBT            LUN    Disk No.    Disk Array
 Volume Name
 Path
ldn      ld_name                      vaa                type
 hbt            lun    disk_no     disk_array
 volume_name
 path

C:\>
```

Description of messages:

LDN Logical disk number

LD Name Logical disk name

VAA Volume Absolute Address

OS Type Type of operating system

HBT Host adapter number, bus number, target ID

LUN LUN (Logical unit number)

Disk No.Physical disk number

Disk Array Disk array name

Volume Name Mount point volume name

Path Drive letters or path name of the NTFS folder

```
C:\>iSMvollist -a
LDN    LD Name                        VAA                OS Type
 HBT            LUN    Disk No.    Disk Array
 Volume Name
 Path
ldn      ld_name                      vaa                type
 hbt            lun    disk_no     disk_array
 volume_name
 path

C:\>
```

Description of messages:

The version of iSMvollist is displayed on the first line.

LDN Logical disk number

LD NameLogical disk name

VAA Volume Absolute Address

OS Type Type of operating system

HBT Host adapter number, bus number, target ID

LUN LUN (Logical unit number)

Disk No.Physical disk number

Disk Array Disk array name

PD Type PD Type

Volume Name Mount point volume name

Path Drive letters or path name of the NTFS folder

```
C:\>iSMvollist -ctl
--- Control Volume List ---
Disk No.        LDN         Disk Array Name
disk_no         ldn         disk_array

C:\>
```

Description of messages:

Disk No. Physical disk number

LDN Logical disk number

Disk Array Name Disk array name

```
C:\>iSMvollist -p
--- Property of Volume List File ---
Version                     v.v.vvv
Created                     date_time
Owner Host Name             hostname
Disk Array                  ddd
Volume Information          nnn

C:\>
```

Description of messages:

Version Version of iSMvollist used in Volume List creation

Created Time and date of Volume List creation

Owner Host Name Host name of the server that has the Volume List

Disk Array Number of disk arrays in the Volume List

Volume Information Number of items of volume information in the Volume List

```
C:\>iSMvollist -ax
Volume List   iSMvollist    Version V.V.VVV              Date: yyyy/mm/dd HH:MM:SS

--- Disk Array List ---
Disk Array Name                   Number of Drives
disk_array                        nnnn

--- Volume List ---
LDN    LD Name                    VAA                           OS Type
 HBT          LUN      Disk No.    Disk Array                    PD Type
 Volume Name
 Path
ldn      ld_name                  vaa                           type
 hbt           lun      disk_no    disk_array                    pd_type
 volume_name
 path

--- Property of Volume List File ---
Version                           v.v.vvv
Created                           date_time
Owner Host Name                   hostname
Disk Array                        ddd
Volume Information                nnn

C:\>
```

Description of messages:

The version and execution date and time of iSMvollist are displayed on the first line.

The information displayed as Disk Array List is the same as when the d option is specified.

The information displayed as Volume List is the same as when the ai option is specified.

The information specified as Property of Volume List File is the same as when the p option is specified.

```
C:\> iSMvollist -tgt –all
LDN        LD Name      Disk Array        Target Name
ldn        ld_name      disk_array_name   target_name

C:\>
```

Description of messages:

ldn Logical disk number

ld_name Logical disk name

disk_array_name Disk array name

target_name Target name

Usage

The command creates the Volume List.

```
C:\>iSMvollist -cr
iSMvollist: Info:        iSM11700: Please wait a minute.
iSMvollist: Info:        iSM11701: Volume list is created successfully.

C:\>
```

The command displays the Volume List with the logical disk name specified.

```
C:\>iSMvollist -ae dev001
LDN    LD Name                      VAA                    OS Type
 HBT           LUN     Disk No.   Disk Array
 Volume Name
 Path
030ch   dev001                      3000000000000002030c   WN
 h4b0t35        000h    disk2      Storage4100/1007
 \\?\Volume{674de734-ee66-11d5-95d8-00004c792133}\
 H:

C:\>
```

While updating or creating a Volume List, you cannot create, update, or display the Volume List or execute ReplicationControl or SnapControl.

Create or update the volume list when the OS on the server recognizes the logical disks and volumes.

For a replication volume (RV) of the data replication function, the pair must be in the Separated state.

For a linkvolume (LV) of the snapshot function, a link to a snapshotvolume (SV) must be established.

Create or update the volume list when a mount point (drive letter or NTFS folder) to be used has been set for volumes.

Return Values

0: Normal termination

1: Abnormal termination

This command terminates abnormally in the following cases.

A parameter is invalid.

A condition for operation is not satisfied.

An attempt to operate a disk array fails.

Options

The iSMvollist command recognizes the following options.

r Creates the list of the logical disks, VAAs, and special files.

When a disk array has been added or deleted, or a logical disk has been bound or unbound, be sure to execute this command to recreate the volume list.

Since you must create the volume list according to the operation, refer to the descriptions of the nr and or options, too. When a volume list does not exist and this option is specified, a new volume list is created based on the persistent special file. When a volume list already exists, a new volume list is created according to the type of the special file based on the existing volume list.

d Lists the disk arrays stored in the volume list and displays the number of logical disks located in each disk array.

l [Special File | LD Name]

Displays the relations for the logical disk names, VAA, and special file names.

If Special File or LD Name is specified, the relation only for the specified special file name or logical disk name is displayed.

vs Disk Array Name [Special File]

Displays the relations for the disk arrays specified by Disk Array Name, sorted by the special file name as the key.

If Special File is specified, the relation only for the specified special file name is displayed.

vl Disk Array Name [LDN]

Displays the relations for the disk arrays specified by Disk Array Name, sorted by the logical disk number as the key.

If LDN is specified, the relation only for the specified logical disk number is displayed.

ve Disk Array Name [LD Name]

Displays the relations for the disk arrays specified by Disk Array Name, sorted by the logical disk name as the key.

If LD Name is specified, the relation only for the specified logical disk name is displayed.

ai [pd PD Type]Displays the relations and configuration information for the logical disk names, VAA, and special file names.

For PD Type of the pd option, PD Type of logical disks (attribute of physical disks in the disk arrays) can be specified. Displays only configuration information about a PD Type if PD Type is specified.

Specify either attribute to PD Type:

FC FC attribute

ATA ATA attribute

SAS SAS attribute

SSD SSD attribute

NLSAS Nearline SAS attribute

SAS (SED) Encrypting SAS attribute

ctl Lists the special file name, logical disk number, and corresponding disk array name of the control volume.

The control volume is used in operating data replication and snapshot functions from the business server.

p Displays the version and creation time and date of the Volume List property information.

ax Lists disk array information in the Volume List, volume information about all logical disk names/VAAs/special file names, and Volume List property information.

ver Displays the version information of this command.

tgt Displays targetname of a volume in the Volume List.

all: Displays iSCSI information of all volumes in the Volume List. Message 11932 is output if the volumes are not an iSCSI volume.

ldname: Displays iSCSI information of the specified volume. Message 11933 is output if the specified volume is not a iSCSI volume.

array name:

Displays iSCSI information of all volumes for the specified disk array. Message 11933 is output if the volumes are not an iSCSI volume.

* This option is supported only for Linux.

helpLists the version information and options of this command.

 Displayed Information

```
# iSMvollist -d
```

Disk Array List

Disk Array Name Number of LDN

disk_array nnn

#

Description of messages:

Disk Array Name Disk array name

Number of LDN Number of items of volume information for each disk array

```
# iSMvollist l
```

LDN LD Name V AATYPE

Special File Disk Array Path

ldn ld name VAA type

special_file_name disk_arraypath

#

Description of messages:

LDN Logical disk number

LD Name Logical disk name

VAA Volume Absolute Address

TYPE OS type

Special File Special file name

Disk Array Disk array name

Path Availability of special file

Usually nothing is displayed. In data replication or snapshot operations, B is displayed if an error is detected in access to the relevant special file.

```
# iSMvollist ai
```

Volume List iSMvollist   Version V.V.VVV

LDNLD Name VAATYPE

Special File Disk Array Path

PD Type

ldnld name VAAtype

special_file_namedisk_arraypath

pd_type

#

Description of messages:

The version of iSMvollist is displayed on the first line.

LDNLogical disk number

LD NameLogical disk name

VAAVolume Absolute Address

TYPEOS type

Special File Special file name

Disk ArrayDisk array name

PathAvailability of special file

Usually nothing is displayed. In data replication or snapshot operations, B is displayed if an error is detected in access to the relevant special file.

PD TypePD Type

```
   # iSMvollist ctl
```

 Control Volume List

Special FileLDN Disk Array NamePath

special_file_nameldndisk_arraypath

#

Description of messages:

Special File Special file name

LDN Logical disk number

Disk Array Name Disk array name

Path Availability of special file

Usually nothing is displayed. In data replication or snapshot operations, B is displayed if an error is detected in access to the relevant special file.

```
   # iSMvollist p
```

 Property of Volume List File

Versionv.v.vvv

Created date_time

Owner Host Name hostname

Disk Array ddd

Volume Information nnn

#

Description of messages:

VersionVersion of iSMvollist used in Volume List creation

CreatedTime and date of Volume List creation

Owner Host NameHost name of the server that has the Volume List

Disk ArrayNumber of disk arrays in the Volume List

Volume InformationNumber of items of volume information in the Volume List

#

iSMvollist ax

Volume List iSMvollist Version V.V.VVV Date: yyyy/mm/dd HH: MM: SS

 Disk Array List

Disk Array Name Number of LDN

disk_arraynnnn

Volume List

LDNLD NameVAATYPE

Special FileDisk ArrayPath

PD Type

ldnld nameVAAtype

special_file_namedisk_arraypath

pd_type

 Property of Volume List File

Versionv.v.vvv

Created date_time

Owner Host Namehostname

Disk Arrayddd

Volume Informationnnn

#

Description of messages:

The version and execution date and time of iSMvollist are displayed on the first line.

The information displayed as Disk Array List is the same as when the d option is specified.

The information displayed as Volume List is the same as when the ai option is specified.

The information specified as Property of Volume List File is the same as when the p option is specified.

```
  # iSMvollist tgt all
```

LDN   LD Name   Disk Array   Target Name

ldn   ld_name   disk_array_name target_name

#

Description of messages:

ldnLogical disk number

ld_nameLogical disk name

disk_array_nameDisk array name

target_nameTarget name

USAGE

The command creates the volume list.

```
# iSMvollist r
```

iSMvollist: Info: iSM11700: Please wait a minute.

iSMvollist: Info: iSM11100: Command has completed successfully.

#

```
# iSMvollist l
```

LDNLD NameVAATYPE

Special FileDisk ArrayPath

0002hdisk002200000304c5176340002CX

/dev/rdsk/c1t230000004C517634d1Storage0001

0004hdisk004200000304c5176340004CX

/dev/rdsk/c1t230000004C517634d2Storage0001

#


```
# iSMvollist l /dev/rdsk/c1t2d0
```

LDNLD Name   VAA   TYPE

Special File Disk Array Path

0001hdisk001   30000000000000020000NX

/dev/rdsk/c1t2d0 Storage4100/07

#

iSMvollist l /dev/rdisk/disk137

LDNLD NameVAATYPE

Special FileDisk ArrayPath

0042hdisk001200000004c7f089c0042NX

/dev/rdisk/disk137S2800/0108

#

 Notes

While the volume list is being created or updated, it is not possible to create, update, or display the volume list or to perform the command operations of the ReplicationControl operation or SnapControl operation.

Create or update the volume list when the OS on the server recognizes the logical disks and volumes.

For a replication volume (RV) of the data replication function, the pair must be in the Separated state.

For a linkvolume (LV) of the snapshot function, a link to a snapshotvolume (SV) must be established.

Create or update the volume list when a mount point (drive letter or NTFS folder) to be used has been set for volumes.

The version of the volume list command can be checked by the ver option.

Return Values

0: Normal termination

1: Abnormal termination

This command terminates abnormally in the following cases.

A parameter is invalid.

A condition for operation is not satisfied.

An attempt to operate a disk array fails.

Host Information Collection

iSMcc_hostinfo (Windows)

Name

iSMcc_hostinfo   Collects the host information.

Synopsis

iSMcc_hostinfo export file_name [arrayname diskarray]

iSMcc_hostinfo store [arrayname diskarray]

iSMcc_hostinfo ver

iSMcc_hostinfo

Description

The iSMcc_hostinfo command collects the information including the host name, OS identification information, and HBA (host bus adapter) information of the server on which this command is executed. Additionally, the collected host information can be registered in the disk arrays and exported to a file.

The file exported by this command is transferred to the server on which the SnapSAN Manager server operates by using the file transfer or USB memory, and then registered to the disk arrays by using the host information store command. Collecting the host information and registering it to the disk array enables the SnapSAN Manager client to display the configuration as the host connected to the disk arrays to check and manage the host information.

Options

The iSMcc_hostinfo command recognizes the following options.

export file_nameAcquires the information including the host name, OS identification information, and HBA (host bus adapter) information of the server on which this command is executed, and writes the host information to the host information file. For file_name, specify the path name of the host information file to which the host information is stored.

store Acquires the information including the host name, OS identification information, and HBA (host bus adapter) information of the server on which this command is executed, and stores the host information to the disk arrays which is connected to the server. (The disk array logical disks must be recognized on the server on which this command is executed.)

array name disk array While targeting the disk arrays specified in disk array, collects the host information, exports it to the host information file, or stores it to the disk arrays.

When no disk array is specified in collecting host information by specifying the export option, disk arrays with FC or SAS are the target of operation among the disk arrays connected to the server. In registering host information by specifying the store option, the disk arrays with FC or SAS are the target among disk arrays connected to the server.

ver Displays the version information of this command.

Displays the usage of this command.

Displayed Information

The command collects the host information and exports it to the host information file.

C: \> iSMcc_hostinfo export file_name

iSMcc_hostinfo: Info: iSM11700: Please wait a minute.

iSMcc_hostinfo: Info: iSM11770: Host Information was exported successfully. (Disk Array= diskarray1) (code=aaaabbbbbbbbbbbb)

iSMcc_hostinfo: Info: iSM11770: Host Information was exported successfully. (Disk Array= diskarray2) (code=aaaabbbbbbbbbbbb)

iSMcc_hostinfo: Info: iSM11100: Command has completed successfully.

C: \>

The command collects the host information and stores it to the disk array.

```
C: \> iSMcc_hostinfo store
```

iSMcc_hostinfo: Info: iSM11700: Please wait a minute.

iSMcc_hostinfo: Info: iSM11770: Host Information was exported successfully. (Disk Array= diskarray1) (code=aaaabbbbbbbbbbbb)

iSMcc_hostinfo: Info: iSM11770: Host Information was exported successfully. (Disk Array= diskarray2) (code=aaaabbbbbbbbbbbb)

iSMcc_hostinfo: Info: iSM11100: Command has completed successfully.

C: \>

Description of messages:

iSM11700: Please wait a minute.

Indicates that the collection of the host information is started.

iSM11770: Host Information was exported successfully. (Disk

Array=diskarray) (code=aaaabbbbbbbbbbbb).

Indicates that the host information has been exported to the host information file or stored to the disk arrays.

In diskarray, the nickname of target disk array is displayed. Additionally, the process number is displayed in aaaa and the internal code for maintenance is displayed in bbbb.

iSM11100: Command has completed successfully.

Indicates that the command execution is completed.

Usage

The command collects the host information and exports it to the host information file.

C: \> iSMcc_hostinfo export \OUTPUT\Server001

iSMcc_hostinfo: Info: iSM11700: Please wait a minute.

iSMcc_hostinfo: Info: iSM11770: Host Information was exported successfully. (Disk Array= Storage001) (code=759d580000a30000)

iSMcc_hostinfo: Info: iSM11770: Host Information was exported successfully. (Disk Array= Storage002) (code=759d580000a30000)

iSMcc_hostinfo: Info: iSM11100: Command has completed successfully.

C: \>

The command collects the host information and stores it to the disk array.

C: \> iSMcc_hostinfo store arrayname Storage002

iSMcc_hostinfo: Info: iSM11700: Please wait a minute.

iSMcc_hostinfo: Info: iSM11770: Host Information was exported successfully. (Disk Array=Storage002) (code=6351580000a30000)

iSMcc_hostinfo: Info: iSM11100: Command has completed successfully.

C: \>

Collecting host information (export option) can be operated for the disk arrays with FC or SAS.

Collecting host information (export option) cannot be performed for the disk arrays to which the secure mode is set.

Registering the host information to the disk arrays (store option) can be operated only for the disk array with FC or SAS which supports the host information display.

Registering the host information to the disk arrays (store option) cannot be performed for the disk arrays to which the secure mode is set.

Since the length of the host name that is registered after registering the host information to the disk array (store option) is up to 32 bytes, bytes from the 33rd byte are ignored. Therefore, the host name may be redundant with the host name already registered.

This command cannot be executed in parallel on the same server.

Return Values

0: Collecting and exporting the host information has been normally terminated.

1: Collecting and exporting the host information has been abnormally terminated.

This command terminates abnormally in the following cases.

A parameter is invalid.

A condition for operation is not satisfied.

The information collection from the system fails.

An error occurs in the system function.

The instruction fails due to a disk array error.

2: Collecting and exporting a part of the host information has been abnormally terminated.

Options

The iSMcc_hostinfo command recognizes the following options.

export file_name Acquires the information including the host name, OS identification information, and HBA (host bus adapter) information of the server on which this command is executed and writes the host information to the host information file. For file_name, specify the path name of the host information file to which the host information is stored.

store Obtains the host name, OS identification information, and host bus adapter (HBA) information of the server on which this command is executed and stores the information in a disk array connected to the server. (The disk array logical disks must be recognized on the server on which this command is executed.)

arrayname diskarray While targeting the disk array specified in diskarray, collects the host information and exports it to the host information file.

When no disk array is specified, the disk arrays with FC or SAS are the target of operation among disk arrays connected to the server.

ver Displays the version information of this command.

help Displays the usage of this command.

Displayed Information

The command collects the host information and exports it to the host information file.

```
# iSMcc_hostinfo export file_name
```

iSMcc_hostinfo: Info: iSM11700: Please wait a minute.

iSMcc_hostinfo: Info: iSM11770: Host Information was exported successfully. (Disk Array=diskarray1) (code=aaaabbbbbbbbbbbb)

iSMcc_hostinfo: Info: iSM11770: Host Information was exported successfully. (Disk Array=diskarray2) (code=aaaabbbbbbbbbbbb)

iSMcc_hostinfo: Info: iSM11100: Command has completed successfully.

#

The command collects the host information and stores it in the disk array.

```
# iSMcc_hostinfo store
```

iSMcc_hostinfo: Info: iSM11700: Please wait a minute.

iSMcc_hostinfo: Info: iSM11770: Host Information was exported successfully. (Disk Array=diskarray1) (code=aaaabbbbbbbbbbbb)

iSMcc_hostinfo: Info: iSM11770: Host Information was exported successfully. (Disk Array=diskarray2) (code=aaaabbbbbbbbbbbb)

iSMcc_hostinfo: Info: iSM11100: Command has completed successfully.

Description of messages:

iSM11700: Please wait a minute.

Indicates that the collection of the host information is started.

iSM11770: Host Information was exported successfully. (Disk

Array=diskarray) (code=aaaabbbbbbbbbbbb).

Indicates that the host information has been exported to the host information file or stored to the disk arrays.

In diskarray, the nickname of target disk array is displayed. Additionally, the process number is displayed in aaaa and the internal code for maintenance is displayed in bbbb.

iSM11100: Command has completed successfully.

Indicates that the command execution is completed.

Usage

The command collects the host information and exports it to the host information file.

iSMcc_hostinfo export /tmp/Server001 arrayname Storage002

iSMcc_hostinfo: Info: iSM11700: Please wait a minute.

iSMcc_hostinfo: Info: iSM11770: Host Information was exported successfully. (Disk Array=Storage002) (code==5749580000a30000)

iSMcc_hostinfo: Info: iSM11100: Command has completed successfully.

#

The command collects the host information and stores it in the disk array.

#

  # iSMcc_hostinfo store arrayname Storage002

iSMcc_hostinfo: Info: iSM11700: Please wait a minute.

iSMcc_hostinfo: Info: iSM11770: Host Information was exported successfully. (Disk Array=Storage002) (code=4360580000a30000)

iSMcc_hostinfo: Info: iSM11100: Command has completed successfully.

#

Collecting host information (export option) can be operated for the disk arrays with FC or SAS.

Collecting host information (export option) cannot be performed for the disk arrays to which the secure mode is set.

Host information can only be stored in a disk array with FC or SAS (by using the store option) that belongs which support host information display.

Host information cannot be stored in a disk array (by using the store option) for which the secure mode is specified.

When storing host information in a disk array (by using the store option), the maximum host name length is 32 bytes, and any additional bytes are ignored. This might result in a host name being the same as a previously stored name.

This command cannot be executed in parallel on the same server.

Return Values

0: Collecting and exporting the host information has been normally terminated.

1: Collecting and exporting the host information has been abnormally terminated.

This command terminates abnormally in the following cases.

A parameter is invalid.

A condition for operation is not satisfied.

The information collection from the system fails.

An error occurs in the system function.

The instruction fails due to a disk array error.

2: Collecting and exporting a part of the host information has been abnormally terminated.

Host Information File

The host information file that is exported by the iSMcc_hostinfo command is described.

[FILE LOCATION AND Name]

Can be freely specified.

Description

The host information including the host name, OS identification information, and HBA (host bus adapter) information of the server is stored in one host information file per one server.

Synopsis

This file is described in the following synopsis:

```
<websamexport>
<class name="table-name-1">
    <property name="item-name-1-1" value="value-1-1"></property>
    <property name="item-name-1-2" value="value-1-2"></property>
        :
    <property name="item-name-1-n" value="value-1-n"></property>
</class>
<class name="table-name-2">
    <property name="item-name-2-1" value="value-2-1"></property>
        :
    <property name="item-name-2-n" value="value-2-n"></property>
</class>
<class name="table-name-3">
    :
</class>
    :
    :
<class name="table-name-n">
    :
</class>
</websamexport>
```

Rules

The number of characters to be described in one line is up to 2048 bytes (including space character, tab character, and linefeed code).

Be sure to describe <websamexport> on the first line.

Only one block surrounded by < and > can be described in one line.

However, only if an item name (property name) and the value are described, the blocks of <property name=itemname value=value> and </property> can be described in one line.

- No space or tab character can be described immediately after < and </.
- However, any number of space or tab characters can be described in the following location:
- Before and after a block surrounded by < and >
- Before and after name
- Before and after value
- Before and after =
- Before and after a character string of table name, item name, and value surrounded by double quotation marks or single quotation marks (')
- No line break is allowed in the middle of a block surrounded by < and >.
- An uppercase character and the corresponding lowercase character are handled as different characters.
- No comment can be described.
- Although a line with only space or tab characters can be described, the line is ignored.
- When a character string to be described includes double quotation marks , surround the entire character string by single quotation marks (').
- When describing multibyte characters such as Japanese characters, use UTF8 (Unicode) as the character code.
- The same item name cannot be described twice or more in each table.

Describing the table (class) and item (property)

The table names (class names) to be described in the host information file are listed below.

The underlined table (class) names must be described in the host information file.

Table Name (Class Name)	Description
iSM_NodeInfo	Describe the information related to the nodes of the server. Describe one table for each server (host information file). This table is mandatory and the description cannot be omitted.
iSM_ArrayInfo	Describe the information related to a disk array connected to the server. Describe one table for each disk array. Multiple tables can be described in one server (host information file).
iSM_HBAInfo	Describe the information related to an FC HBA (host bus adapter) mounted on the server. Describe one table for each HBA. Multiple tables can be described in one server (host information file).
iSM_FCPortInfo	Describe the information related to an FC HBA mounted on the server. Describe one table for each FC port of the HBA. Multiple tables can be described in one server (host information file). When you describe this table, you need to describe the corresponding iSM_HBAInfo table as well.

Table Name (Class Name)	Description
iSM_FCConnectionInfo	Describe the information related to a connection between an FC HBA mounted on the server and the disk array. Describe one table for one connection configuration between each FC port of the HBA and the disk array. Multiple tables can be described in one server (host information file). When you describe this table, you need to describe the corresponding iSM_ArrayInfo table, iSM_HBAInfo table, and iSM_FCPortInfo table as well.
iSM_SASHBAInfo	Describe the information related to a SAS HBA (host bus adapter) mounted on the server. Describe one table for each HBA. Multiple tables can be described in one server (host information file).
iSM_SASPortInfo	Describe the information related to a SAS HBA mounted on the server. Describe one table for each SAS port of the HBA. Multiple tables can be described in one server (host information file). When you describe this table, you need to describe the corresponding iSM_SASHBAInfo table as well.
iSM_SASConnectionInfo	Describe the information related to a connection between a SAS HBA mounted on the server and the disk array. Describe one table for one connection configuration between each SAS port of the HBA and the disk array. Multiple tables can be described in one server (host information file). When you describe this table, you need to describe the corresponding iSM_ArrayInfo table, iSM_SASHBAInfo table, and iSM_SASPortInfo table as well. This table is output when the `iSMcc_hostinfo` command is executed in a Linux environment. It is not output in a Windows environment.

The item (property) names to be defined in each table are listed below.

The underlined items (properties) are required and cannot be omitted when the relevant tables (classes) are described in the host information file.

Item Name (Property Name)	Description
OwnerHostName	Describe the host name (node name) of the server within 256 singlebyte characters. However, the host name that can be registered to the disk array is up to 32 singlebyte characters. Characters from the 33rd character are ignored. The domain name and the sub domain name need not be described.

Item Name (Property Name)	Description
HostInfoDate	Describe the date and time on which the host information file was created in the following format. "yyyymmddΔHH: MM: SS" yyyyYear (in Western calendar, 4 digits) mmMonth (2 digits*) ddDay (2 digits*) ΔSpace of 1 byte HHHour (2 digits*) MMMinute (2 digits*) SSSecond (2 digits*) * Add "0" to the head if necessary so as to become 2 digits.
OSType	Describe any value of the following as the OS type of the server. "65530"In the case of Windows environment "36"In the case of Linux environment "9" In the case of AIX environment "1" Others (In the case of OS environment other than above) In this case, an arbitrary character string that shows the type of OS can be described in the item of OSInfo.
OSInfo	When the OSType item is "1" (Others), describe a character string with up to 16 singlebyte characters that indicates the OS type of the server. The other description is ignored. However, a character string of 17 singlebyte characters or more cannot be described. The singlebyte uppercase and lowercase alphabetical characters, numbers, space, slash (/), underbar (_), hyphen , and period (.) can be used for the description.
IPAddress	Describe the IP addresses of the servers by delimiting with a period (".") as the information to recognize the host. For a server with multiple IP addresses, describe only one IP address which can identify the server. If "1" is specified for the AddressType, it is required to describe this item.
AddressType	Select whether or not to describe the IP Address by describing either of the following values: "1"To describe IPAddress "0"To not describe IPAddress
SystemName	Describe the node identification ID. In the host information file created by the host information collection command, this value is automatically created for each server. In this case, you cannot change this value. When describing an arbitrary value, describe an alphanumeric character string of 33 bytes or less that is unique in the entire system (server's host name etc). Once a value was registered to the disk array as the node identification ID of the server, you cannot change the value.
PCDBVersion	Be sure to describe the following value: "1.0"

Item (Property) List in the iSM_ArrayInfo

Item Name (Property Name)	Description
DiskArrayName	Describe the nickname of the disk array.
SAA	Describe the SAA (Subsystem Absolute Address). This value can be checked by displaying the property information of the relevant disk array from the SnapSAN Manager client.
WWNN	Describe WWNN (World Wide Node Name or World Wide Name) of the disk array. This value can be checked by displaying the property information of the relevant disk array from the SnapSAN Manager client. Only alphanumeric characters can be described.
SystemName	Describe the same value as the SystemName item of the iSM_NodeInfo table.
CSName	Even if a value is described, it is ignored (for future use).
PCDBVersion	Be sure to describe the following value: "1.0"

Item (Property) List in the iSM_HBAInfo

Item Name (Property Name)	Description
WWNN	Describe the WWNN (World Wide Node Name) of the FC HBA. Only alphanumeric characters can be described.
SystemName	Describe the same value as the SystemName item of the iSM_NodeInfo table.
PCDBVersion	Be sure to describe the following value: "1.0"

Item (Property) List in the iSM_FCPortInfo

Item Name (Property Name)	Description
WWNN	Describe the WWNN (World Wide Node Name) of the FC HBA to which the FC port belongs. Describe the same value as the WWNN item of the associated iSM_HBAInfo table.
WWPN	Describe the WWPN (World Wide Port Name) of the FC port. Only alphanumeric characters can be described.
SystemName	Describe the same value as the SystemName item of the iSM_NodeInfo table.
PCDBVersion	Be sure to describe the following value: "1.0"

Item (Property) List in the iSM_FCConnectionInfo

Item Name (Property Name)	Description
WWPN	Describe the WWPN (World Wide Port Name) of the FC port. Describe the same value as the WWPN item of the associated iSM_FCPortInfo table.
TargetWWNN	Describe the WWNN (World Wide Node Name) of the disk array being connected to the FC port. Describe the same value as the WWNN item of the iSM_ArrayInfo table described for the relevant disk array.
TargetWWPN	Describe the WWPN (World Wide Port Name) of the port of the disk array being connected to the FC port. Only alphanumeric characters can be described.
StoragePortNumber	Describe the host director number and the port number of the storage being connected to the FC port by the value (in decimal) calculated by the following formula: ((hostdirectornumber x 256) + portnumber)
SystemName	Describe the same value as the SystemName item of the iSM_NodeInfo table.
PCDBVersion	Be sure to describe the following value: "1.0"

Item (Property) List in the iSM_SASHBAInfo

Item Name (Property Name)	Description
SystemName	Describe the same value as the SystemName item of the iSM_NodeInfo table.
PCDBVersion	Be sure to describe the following value: "1.0"

Item (Property) List in the iSM_SASPortInfo

Item Name (Property Name)	Description
WWPN	Describe the WWPN (World Wide Port Name) of the SAS port. Only alphanumeric characters can be described.
SystemName	Describe the same value as the SystemName item of the iSM_NodeInfo table.
PCDBVersion	Be sure to describe the following value: "1.0"

Item (Property) List in the iSM_SASConnectionInfo Table

Item Name (Property Name)	Description
WWPN	Describe the WWPN (World Wide Port Name) of the SAS port. Describe the same value as the WWPN item of the associated iSM_SASPortInfo table.
TargetWWPN	Describe the WWPN (World Wide Port Name) of the port of the disk array being connected to the SAS port. Only alphanumeric characters can be described.
StoragePortNumber	Describe the host director number and the port number of the storage being connected to the SAS port by the value (in decimal) calculated by the following formula: ((hostdirectornumber x 256) + portnumber)
SystemName	Describe the same value as the SystemName item of the iSM_NodeInfo table.
PCDBVersion	Be sure to describe the following value: "1.0"

The host information file examples are shown below.

Example for a server with FC HBA

```xml
<websamexport>
<class name="IBM_NodeInfo">
    <property name="OwnerHostName"  value="TestServer"></property>
    <property name="HostInfoDate" value="2007-09-12  13:35:59"></property>
    <property name="OSType"  value="65530"></property>
    <property name="IPAddress" value="10.1.2.3"></property>
    <property name="AddressType" value="1"></property>
    <property name="SystemName" value="W12FBC11403304730A264CE1B63BC29A2">
    </property>
    <property name="PCDBVersion" value="1.0"></property>
</class>
<class name="IBM_ArrayInfo">
    <property name="DiskArrayName" value="TestStorage"></property>
    <property name="SAA" value="0200200000004C517BFD0000000000 0000000 0000000 000000000 000000">
    </property>
    <property name="WWNN" value="200000004C517BFD"></property>
    <property name="SystemName" value="W12FBC11403304730A264CE1B63BC29A2">
    </property>
    <property name="PCDBVersion" value="1.0"></property>
</class>
<class name="IBM_HBAInfo">
    <property name="WWNN" value="20000000C92BB354"></property>
    <property name="SystemName" value="W12FBC11403304730A264CE1B63BC29A2">
    </property>
    <property name="PCDBVersion" value="1.0"></property>
</class>
<class name="IBM_FCPortInfo">
    <property name="WWNN" value="20000000C92BB354"></property>
    <property name="WWPN" value="10000000C92BB354"></property>
    <property name="SystemName" value="W12FBC11403304730A264CE1B63BC29A2">
    </property>
    <property name="PCDBVersion" value="1.0"></property>
</class>
<class name="IBM_FCConnectionInfo">
    <property name="WWPN" value="10000000C92BB354"></property>
    <property name="TargetWWNN"  value="200000004C517BFD"></property>
    <property name="TargetWWPN"  value="280000004C517BFD"></property>
    <property name="StoragePortNumber"  value="1"></property>
    <property name="SystemName" value="W12FBC11403304730A264CE1B63BC29A2">
    </property>
    <property name="PCDBVersion" value="1.0"></property>
</class>
<class name="IBM_HBAInfo">
    <property name="WWNN" value="20000000C92BB3A6"></property>
    <property name="SystemName" value="W12FBC11403304730A264CE1B63BC29A2">
    </property>
    <property name="PCDBVersion" value="1.0"></property>
</class>
<class name="IBM_FCPortInfo">
    <property name="WWNN" value="20000000C92BB3A6"></property>
    <property name="WWPN" value="10000000C92BB3A6"></property>
    <property name="SystemName" value="W12FBC11403304730A264CE1B63BC29A2">
    </property>
    <property name="PCDBVersion" value="1.0"></property>
</class>
<class name="IBM_FCConnectionInfo">
    <property name="WWPN" value="10000000C92BB3A6"></property>
    <property name="TargetWWNN"  value="200000004C517BFD"></property>
    <property name="TargetWWPN"  value="250000004C517BFD"></property>
    <property name="StoragePortNumber"  value="257"></property>
    <property name="SystemName" value="W12FBC11403304730A264CE1B63BC29A2">
    </property>
    <property name="PCDBVersion" value="1.0"></property>
</class>
</websamexport>
```

Example for a server with SAS HBA

```
<websamexport>
<class name="IBM_NodeInfo">
    <property  name="OwnerHostName"  value="TestServer"></property>
    <property  name="HostInfoDate"  value="2007-09-12  13:35:59"></property>
    <property  name="OSType"  value="65530"></property>
    <property  name="IPAddress"  value="10.1.2.3"></property>
    <property  name="AddressType"  value="1"></property>
    <property  name="SystemName"  value="W12FBC11403304730A264CE1B63BC29A2"></property>
    <property  name="PCDBVersion"  value="1.0"></property>
</class>
<class name="IBM_ArrayInfo">
    <property  name="DiskArrayName"  value="TestStorage"></property>
    <property  name="SAA"  value="0200200000004C517BFD000000000000000000000000000000000000">
    </property>
    <property  name="WWNN"  value="200000004C517BFD"></property>
    <property  name="SystemName"  value="W12FBC11403304730A264CE1B63BC29A2"></property>
    <property  name="PCDBVersion"  value="1.0"></property>
</class>
<class name="IBM_SASHBAInfo">
    <property  name="SystemName"  value="W12FBC11403304730A264CE1B63BC29A2"></property>
    <property  name="PCDBVersion"  value="1.0"></property>
</class>
<class name="IBM_SASPortInfo">
    <property  name="WWPN"  value="500605B0027C2A30"></property>
    <property  name="SystemName"  value="W12FBC11403304730A264CE1B63BC29A2"></property>
    <property  name="PCDBVersion"  value="1.0"></property>
</class>
<class name="IBM_SASConnectionInfo">
    <property  name="WWPN"  value="500605B0027C2A30"></property>
    <property  name="TargetWWPN"  value="5000991000010040"></property>
    <property  name="StoragePortNumber"  value="1"></property>
    <property  name="SystemName"  value="W12FBC11403304730A264CE1B63BC29A2"></property>
    <property  name="PCDBVersion"  value="1.0"></property>
</class>
<class name="IBM_SASHBAInfo">
    <property  name="SystemName"  value="W12FBC11403304730A264CE1B63BC29A2"></property>
    <property  name="PCDBVersion"  value="1.0"></property>
</class>
<class name="IBM_SASPortInfo">
    <property  name="WWPN"  value="500605B0027C2B70"></property>
    <property  name="SystemName"  value="W12FBC11403304730A264CE1B63BC29A2"></property>
    <property  name="PCDBVersion"  value="1.0"></property>
</class>
<class name="IBM_SASConnectionInfo">
    <property  name="WWPN"  value="500605B0027C2B70"></property>
    <property  name="TargetWWPN"  value="5000991000010080"></property>
    <property  name="StoragePortNumber"  value="257"></property>
    <property  name="SystemName"  value="W12FBC11403304730A264CE1B63BC29A2"></property>
    <property  name="PCDBVersion"  value="1.0"></property>
</class>
<websamexport>
```

Since the host name that can be registered to the disk array is up to 32 single byte characters, characters from the 33rd character are ignored. Therefore, the host name may be redundant with the host name already registered.

If you need to change the host name, change the host name in the host information file output by the iSMcc_hostinfo command. Then, register the host information again using that host information file. Be careful not to overwrite the newly registered host information by registering the original host name in the operations afterwards.

If the FC host bus adapter including multiple FC ports is mounted on the Linux server, different HBAs (iSM_HBAInfo table) may be associated to each of the FC port information (iSM_FCPortInfo table) in the host information file output by the iSMcc_hostinfo command.

If the SAS host bus adapter including multiple SAS ports is mounted on the Linux server, different HBAs (iSM_SASHBAInfo table) may be associated to each of the SAS port information (iSM_SASPortInfo table) in the host information file output by the iSMcc_hostinfo command.

To delete the registered host information, right click the host information on Connected Host List Screen of the SnapSAN Manager client and select (left click) [Host Information Deleting].

[Sample host information file (when described to the minimum)]

The following is an example performing only a minimum description in host information file to use host information in LD Set Setting of Access Control and LD Bind Quick Configuration of Configuration Setting.

Collection of information on server described in host information file

It is necessary to collect information on the following items beforehand, and to decide it.

Information on Server that Needs to Be Collected

Item Name	Example
Host name of the server	Server1
Date and time on which the host information file was created	20070912 13: 35: 59
OS type of the server	65530
IP address of the server	10.1.1.10
Node identification ID of the server	Server1
WWNN of the FC HBA of the server	200000004C517BFD
WWPN of the FC port of the FC HBA of the server	250000004C517BFD
WWPN of the SAS port of the SAS HBA of the server	500605B0027C2A30

Creating the host information file

Create the host information file according to the collected information by using a text editor etc.

Referring to the following example of host information file, replace the under line part with an actual value.

In this example, the server has a configuration in which there are two FC HBAs and each of them has one FC port. Depending on the number of FC or SAS HBAs and the number of FC or SAS ports, change the number of iSM_HBAInfo tables and the number of iSM_FCPortInfo tables, or the number of iSM_SASHBA Info tables and the number of iSM_SASPortInfo tables.

```
<websamexport>
  <class name="IBM_NodeInfo">
      <property name="OwnerHostName"  value="Host name of the server"></property>
      <property name="HostInfoDate"  value="Date and time when the host information  file was created">
      </property>
      <property name="OSType"  value="OS  type of the server"></property>
      <property name="IPAddress"  value="IP address  of the server"></property>
      <property name="AddressType"  value="1"></property>
      <property name="SystemName"  value="Node ID of the server"></property>
      <property name="PCDBVersion"  value="1.0"></property>
  </class>
  <class name="IBM_HBAInfo">
      <property name="WWNN"  value="WWNN of the first FC HBA of the server"></property>
      <property name="SystemName"  value="Node ID of the server"></property>
      <property name="PCDBVersion"  value="1.0"></property>
  </class>
  <class name="IBM_FCPortInfo">
      <property name="WWNN"  value="WWNN of the first FC HBA of the server"></property>
      <property name="WWPN"  value="WWPN of the  FC port of the first FC HBA of the server"></property>
      <property name="SystemName"  value="Node ID of the server"></property>
      <property name="PCDBVersion"  value="1.0"></property>
  </class>
  <class name="IBM_HBAInfo">
      <property name="WWNN"  value="WWNN of the second FC HBA of the server"></property>
      <property name="SystemName"  value="Node ID of the server"></property>
      <property name="PCDBVersion"  value="1.0"></property>
  </class>
  <class name="IBM_FCPortInfo">
      <property name="WWNN"  value="WWNN of the second FC HBA of the server"></property>
      <property name="WWPN"  value="WWPN of the  FC port of the second FC HBA of the server"></property>
      <property name="SystemName"  value="Node ID of the server"></property>
      <property name="PCDBVersion"  value="1.0"></property>
  </class>
</websamexport>
```

When this example host information file was stored, the information of [Diskarray Port] is not displayed on the connected host detail information screen.

Logical Disk Information Display

iSMrc_ldlist

Name

iSMrc_ldlist   Displays logical disks and related information.

Synopsis

iSMrc_ldlist a[protect disks][node][iopath iopath]

iSMrc_ldlist d[iopath iopath]

iSMrc_ldlist de diskarray [ld_name]

[node]

[protect disks]

iSMrc_ldlist cr[iopath iopath]

iSMrc_ldlist ver

iSMrc_ldlist

iSMrc_ldlist help

Description

The iSMrc_ldlist command displays logical disks and related information.

Options

The iSMrc_ldlist command recognizes the following options and arguments.

a Displays information of the logical disks stored in all disk arrays.

d Displays the list of disk arrays and indicates whether or not the system recognizes the disk arrays as target systems.

d e disk_array [ld_name]Displays information of the logical disks stored in the disk array specified by disk_array. If ld_name is specified, only information of the specified logical disk name is displayed.

cr Updates the latest information by reobtaining information of disk arrays and logical disks that are connected to the system. This option can be used only when joint operation with SnapSAN Manager (controlling the issuance of I/O to disk arrays via the iSM) is conducted.

protect disks Specify this option when additionally displaying whether the logical disk protection by the data retention function has been set.

One of the following can be specified for disks.

all All logical disks are targeted for the display.

only Only the logical disks having been protected are targeted for the display.

node Specify this option when additionally displaying the node number to which the logical disk belongs.

iopath iopath Specify a replication I/O path for a disk array. The specification with this argument overrides the replication operation option setting file on Windows.

One of the following can be specified for iopath.

direct Replication I/O commands are issued directly to disk arrays.

managerSnap SAN Manager being operated in the same server is connected and replication I/O commands are issued to disk arrays from iSM.

If this argument is omitted, the replication operation option setting file (Windows).

ver Displays the version information of this command.

Displays the usage of this command (Windows).

Displayed Information

A list of logical disks on all disk arrays is displayed.

When de option was specified, only the information on a specific disk array and the logical disks is displayed. In this case, the displayed items are the same as those with a option specified.

Windows System

```
C:\> ISMrc_ldlist -a
Receiving...
-------------------------------------------------------------------------------
[Disk Array Name](Management)
LDN     OS Type  LD Name                    Attribute   Capacity   PD Type
-------------------------------------------------------------------------------
[disk_array_name](management)
ldn     type     ld_name                    attribute   capacity   pd_type

C:\>
```

```
C:\> ISMrc_ldlist -d
Receiving...
-------------------------------------------------------------------------------
Disk Array Name                Management
-------------------------------------------------------------------------------
disk_array_name                management

C:\>
```

```
C:\> ISMrc_ldlist -a -protect disks
Receiving...
-------------------------------------------------------------------------------
[Disk Array Name](Management)
LDN     OS Type  LD Name           Attribute    Capacity    PD Type   Data Protection
-------------------------------------------------------------------------------
[disk_array_name](management)
ldn     type     ld_name           attribute    capacity    pd_type   protect_state

C:\>
```

```
C:\> iSMrc_ldlist -a -node
Receiving...
-------------------------------------------------------------------------------
[Disk Array Name](Management)
LDN     OS Type  LD Name           Attribute    Capacity    PD Type   Node Number
-------------------------------------------------------------------------------
[disk_array_name](management)
ldn     type     ld_name           attribute    capacity    pd_type   node_number

C:\>
```

```
C:\> ISMrc_ldlist -a
-------------------------------------------------------------------------------
[Disk Array Name](Management)
LDN     OS Type   LD Name                 Attribute      Capacity    PD Type
-------------------------------------------------------------------------------
[Storage2800](direct)
0000h   WN        200000004C0010550000    IV             2.0 GB      FC
0001h   WN        WN_RDR01                MV/RV          2.0 GB      FC
0002h   WN        WN_RDR02                MV             2.0 GB      FC

[Storage1800](direct)
0000h   NX        GSF0000                 IV             2.0 GB      ATA
0001h   LX        DBGSF01                 RV             2.0 GB      ATA
0002h   LX        DBGSF02                 RV             2.0 GB      ATA

C:\>
```

```
C:\> ISMrc_ldlist -de Storage1800   -protect all
-------------------------------------------------------------------------------
[Disk Array Name](Management)
LDN     OS Type   LD Name     Attribute    Capacity    PD Type   Data Protection
-------------------------------------------------------------------------------
[Storage1800](direct)
0000h   NX        GSF0000     IV           2.0 GB      ATA       protection
0001h   LX        DBGSF01     RV           2.0 GB      ATA       -
0002h   LX        DBGSF02     RV           2.0 GB      ATA       -

C:\>
```

```
C:\> iSMrc_ldlist -de StorageD8 -node
-------------------------------------------------------------------------------
[Disk Array Name](Management)
LDN     OS Type   LD Name     Attribute    Capacity    PD Type   Node Number
-------------------------------------------------------------------------------
[StorageD8](direct)
0000h   NX        DSF0000     IV           2.0 GB      FC              1
0001h   LX        FBGSF01     RV           2.0 GB      FC              3
0002h   LX        FBGSF02     MV           2.0 GB      FC              0

C:\>
```

The following logical disk attributes are not displayed:

```
C:\> ISMrc_ldlist -de StorageD8  -node
--------------------------------------------------------------------------------
[Disk Array Name](Management)
LDN     OS Type   LD Name     Attribute     Capacity    PD Type   Node Number
--------------------------------------------------------------------------------
[StorageD8](direct)
0000h   NX        DSF0000     IV            2.0 GB      FC              1
0001h   LX        FBGSF01     RV            2.0 GB      FC              3
0002h   LX        FBGSF02     MV            2.0 GB      FC              0

C:\>
```

Reserved attributes (registered with the reserve group)

SDV for snapshot (snapshot data volume)

System Volume

The attribute of the control volume is displayed when the control volume is bound on a disk array which can identify the control volume attribute.

The control volume attribute is not displayed when it cannot be obtained from the disk array not recognized by the system (indirect for management).

For a logical disk defined as a control volume on the server, the attribute is not displayed.

The following notes do not apply to joint operation with iSM.

At least one logical disk on the target disk array must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

For the disk arrays to which the secure mode is set as the operation mode from the relevant system and the link disk arrays, the logical disks to be displayed must satisfy any of the following conditions:

 The logical disks must have been registered in the volume list.

 The volume to be paired with the target logical disk must have been registered in the volume list.

 A paired upper or lower volume for the target logical disk must have been registered in the volume list.

 When the target logical disk is BV (basevolume), SV (snapshotvolume), or LV (linkvolume) for snapshot, the BV or the LV linked to the BV or SV must have been registered in the volume list.

 The target logical disk must not be locked by the operation guard setting.

Return Values

0: The display of logical disks and related information has been normally terminated.

1: The display of logical disks and related information has been abnormally terminated.

This command terminates abnormally in the following cases.

A parameter is invalid.

A condition for operation is not satisfied.

The instruction fails due to a disk array error.

iSMrc_sense

Name

iSMrc_sense   Displays the specific volume name or information about ATgroup settings.

Synopsis

iSMrc_sensevol volume volflg vol_flg

[attr] [protect] [updprevent]

[iopath iopath]

iSMrc_sensefile file_name

[attr] [protect] [updprevent]

[iopath iopath]

iSMrc_senseatg [atgroup]

[site atg_site]

[arrayname diskarray]

[linkarrayname]

[iopath iopath]

iSMrc_sense ver

iSMrc_sense

iSMrc_sensehelp

Description

The iSMrc_sense command displays the volume name and attribute of a specified volume or information about the settings of a specified ATgroup.

Options

The iSMrc_sense command recognizes the following options.

vol volumeSpecify the volume name.

volflg vol_flgSpecify the volume type specified in vol.

This argument must be specified with vol.

The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

attr Specify to display the logical disk attribute and the LV link state (linkvolume).

protect Specify to additionally display the information on the logical disk protection by the data retention function.

updprevent Specify to display the volume update prevention state additionally.

atg [atgroup] Specify the ATgroup name of an operation target.

If no ATgroup name is specified, all ATgroups are assumed.

site atg_site Specify the location of an ATgroup.

atg_site can be either of the following:

conc Information about an ATgroup is displayed with the concentrator as a target.

dist Information about an ATgroup is displayed with the distributor specified as a target.

If this parameter is omitted, information about an ATgroup is displayed with both the concentrator and distributor specified as targets.

arrayname diskarray Specify the disk array name (nickname) of an operation target.

linkarrayname Specify to display the link disk array configuring the ATgroup.

iopath iopath Specify a replication I/O path for a disk array. The specification with this argument overrides the replication operation option setting file on Windows.

One of the following can be specified for iopath.

directReplication I/O commands are issued directly to disk arrays.

managerSnapSAN Manager being operated in the same server is connected and replication I/O commands are issued to disk arrays from iSM.

If this argument is omitted, the replication operation option setting file (Windows).

file file_name To specify multiple volumes, describe the volumes in file_name.

When multiple volumes are specified, if an error occurs in some volumes, an error message indicating that is displayed, and the process is continued until it is terminated in all the specified volumes.

ver Displays the version information of this command.

Displays the usage of this command (Windows).

Displayed Information

Windows System

The command displays the following information if a volume name display is selected.

```
C:\>ISMrc_sense  -vol ld-name  -volflg ld
    Disk No.                  disk_number
    LD Name                   ld_name
    VAA                       VAA
    Type                      type
    Volume  Name              volume_name
    Path                      path

C:\>
```

```
C:\>ISMrc_sense  -vol ld-name  -volflg ld -attr
    Disk No.                  disk_number
    LD Name                   ld_name
    VAA                       VAA
    Type                      type
    Volume  Name              volume_name
    Path                      path
    Attribute                 ld_attribute
    LV Link Status            link_status

C:\>
```

(2) The command displays the following information if a protection information display is selected.

```
C:\>ISMrc_sense  -vol ld-name  -volflg ld   -protect
    Disk No.                  disk_number
    LD Name                   ld_name
    VAA                       VAA
    Type                      type
    Volume  Name              volume_name
    Path                      path
    Protection  Information
        Protection  State         protection_state
        Begin Date                begin_date
        Retention  Date           retention_date
        Retention  Mode           retention_mode
        Reinitialize              reinitialize_status

C:\>
```

```
C:\>ISMrc_sense  -vol ld-name  -volfig ld   -attr -protect
  Disk No.              disk_number
  LD Name               ld_name
  VAA                   VAA
  Type                  type
  Volume  Name          volume_name
  Path                  path
  Attribute             ld_attribute
  LV Link Status        link_status
  Protection  Information
   Protection  State         protection_state
   Begin Date                begin_date
   Retention  Date           retention_date
   Retention  Mode           retention_mode
   Reinitialize              reinitialize_status

C:\>
```

(3)   The command displays the following information if an update prevention state display is selected.

```
C:\>ISMrc_sense  -vol ld-name  -volfig ld -updprevent
  Disk No.              disk_number
  LD Name               ld_name
  VAA                   VAA
  Type                  type
  Volume  Name          volume_name
  Path                  path
  Update Prevention  State      prevention_state

C:\>
```

(4)   The command displays the following information if an ATgroup setting display is selected.

```
C:\>ISMrc_sense  -atg atgroup

No.    ATG Name                       Site        Entry
        Disk Array Name
xxxxth  atgroup                       site        entry
        diskarray

C:\>
```

```
C:\>ISMrc_sense  -atg atgroup    -linkarrayname
No.    ATG Name                       Site        Entry
        Disk Array Name
        Link Disk Array  Name
xxxxth  atgroup                       site        entry
        diskarray
        linkdiskarray

C:\>
```

Description of messages:

Disk No.Physical disk number

LD NameLogical disk name

VAAVolume Absolute Address

TypeOS type

Volume NameMount point volume name

PathDrive letters mounted on the NTFS volume folder accessed by users

AttributeLogical disk attribute

This display appears only if the attr option is specified.

IV: Logical disk not paired

MV: Logical disk set as MV

RV: Logical disk set as RV

RV/MV: Logical disk set as MV and RV

MV(ATG):   Logical disk set as MV and belonging to an ATgroup

LV: Logical disk set as LV (linkvolume)

BV: Logical disk set as BV (basevolume) for snapshot

SV: Logical disk set as SV (snapshotvolume) for snapshot

MV/BV: Logical disk set as MV and BV (basevolume) for snapshot

MV(ATG)/BV: Logical disk set as MV belonging to an ATgroup and BV (basevolume) for snapshot

RV/BV: Logical disk set as RV and BV (basevolume) for snapshot

RV/MV/BV: Logical disk set as RV and MV, and BV (basevolume) for snapshot

CV: Logical disk having been bound as a control volume

MV/CV: Logical disk having been bound as a control volume and paired as MV

LV Link Status LV link state

This display appears only if the attr option is specified. is displayed unless the target volume is LV.

link: Link connected

unlink: Link not connected

Protection Information

Displays the information on the logical disk protection . When the logical disk is not protected or when the protection information cannot be acquired, a hyphen (-) is displayed for all items.

Protection State

Protection state

RO Writeprotect (Valid)

NA Read/writeprotect (Valid)

RO (expired) Writeprotect (Expired)

NA (expired) Read/writeprotect (Expired)

Begin Date Begin date (year/month/day)

Retention Date Retention date (year/month/day)

When the retention date has not been specified, a hyphen (-) is displayed.

When the retention date is specified as permanent, the following value is displayed.

permanent Retention date is specified as permanent

Retention Mode Retention mode

normal Normal mode

You can release protection and reset the retention period at any time.

secure Secure mode

You cannot release protection until the retention period has elapsed. However, you can extend the retention period or change the protection state.

strict Strict mode

You cannot release protection until the retention period has elapsed. Neither can you reset the retention period and protection state.

Reinitialize Reinitialization of logical disk

When reinitialization has not bee executed, a hyphen (-) is displayed.

formatting (nn%)

Reinitialization is being executed

nn displays the value indicating progress ratio of the initialization processing.

formatfail Reinitialization failed

Update Prevention State

Volume update prevention state.

When the swap function for Remote Replication pair cannot be used or the information cannot be obtained, a hyphen (-) is displayed.

Prevent Prevent state

When the Remote Replication pair is being swapped, swapping the Remote Replication pair is suspended, or the Remote Replication quick sync function is being used, the paired MV and RV are in the Prevent state.

Not Prevent Not Prevent state

Normal state.

No.Concentrator number (4 hexadecimal digits)

Unitspecific number assigned to concentrator

ATG Name ATgroup name

Site ATgroup location

concentrator: Concentrator

distributor: Distributor

Entry Number of pairs registered with the ATgroup

Disk Array Name

Disk array name

Link Disk Array Name

Nickname of the link disk array will be shown if ATgroup matches both conditions below. However, (unknown) will be shown instead if failed to get nickname for disk array.

ATgroup to which pairs are registered

ATgroup created by specifying the link disk array for disk arrays which supports the function specifying the link disk array

For others for which link disk array is not fixed, a hyphen (-) is displayed.

Windows System

```
C:\>ISMrc_sense -vol ld-name -volflg ld  -attr -protect
    Disk No.              disk_number
    LD Name               ld_name
    VAA                   VAA
    Type                  type
    Volume Name           volume_name
    Path                  path
    Attribute             ld_attribute
    LV Link Status        link_status
    Protection Information
      Protection State         protection_state
      Begin Date               begin_date
      Retention Date           retention_date
      Retention Mode           retention_mode
      Reinitialize             reinitialize_status

C:\>
```

(3)   The command displays the following information if an update prevention state display is selected.

```
C:\>ISMrc_sense  -vol ld-name  -volflg ld -updprevent
    Disk No.              disk_number
    LD Name               ld_name
    VAA                   VAA
    Type                  type
    Volume Name           volume_name
    Path                  path
    Update Prevention State       prevention_state

C:\>
```

(4) The command displays the following information if an ATgroup setting display is selected.

```
C:\>ISMrc_sense  -atg atgroup

No.    ATG Name                          Site          Entry
          Disk Array Name
xxxxh  atgroup                           site          entry
          diskarray

C:\>
```

```
C:\>ISMrc_sense  -atg atgroup    -linkarrayname
No.    ATG Name                          Site          Entry
          Disk Array Name
          Link Disk Array Name
xxxxh  atgroup                           site          entry
          diskarray
          linkdiskarray

C:\>
```

Displaying information about ATgroup Settings

An ATgroup for which no pair is registered can be a display target.

The following notes do not apply to joint operation with SnapSAN Manager.

When the secure mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, MVs or RVs of all the pairs that belong to the target ATgroup must have been registered in the volume list.

When the standard mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, at least one logical disk that belongs to the target ATgroup must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

Return Values

Volume name display

0: Operation for all the paired volumes terminated normally.

1: Operation for all the paired volumes terminated abnormally.

This command terminates abnormally in the following cases.

A parameter is invalid.

A condition for operation is not satisfied.

An attempt to operate a disk array fails.

2: Operation for some paired volumes terminated abnormally.

<Displaying information about ATgroup settings>

0: ATgroup operation terminated normally.

1: ATgroup operation terminated abnormally.

This command terminates abnormally in the following cases.

A parameter is invalid.

A condition for operation is not satisfied.

An attempt to operate a disk array fails.

Windows Volume Operation

iSMrc_flush (Windows)

Name

 iSMrc_flush Flushes the file system buffer.

Synopsis

 iSMrc_flush drv drive:

 iSMrc_flush mvol volume_name

 iSMrc_flush mdir path

 iSMrc_flush ver

 iSMrc_flush

Description

The iSMrc_flush command requests flushing the unwritten buffer data of specified drive/mount point volume/NTFS folder onto disk.

For writing data completely, execution and normal termination of iSMrc_flush and iSMrc_umount commands is required. If iSMrc_umount command results in an error on server with MV and BV connected, waiting for delayed updating of file system for approx. 60 seconds after execution of iSMrc_flush command, and then executing iSMrc_separate allows reflection of almost all updating onto disk. In this case, use the commands after mounting RV or LV and restoring the file system with the /F option of CHKDSK command.

Options

The iSMrc_flush command recognizes the following options and arguments.

drv drive: Specify the name of the drive to be flushed.

mvol volume_nameSpecify the name of the mount point volume to be flushed.

mdir pathSpecify the name of the NTFS folder to be flushed.

verDisplays the version information of this command.

Displays the usage of this command.

Displayed Information

```
C:\>iSMrc_flush  -drv volume-name
Flush  Start                    YYYY/MM/DD  hh:mm:ss
          disk_number      ld_name                      type
          volume  name
          path

Flush  Normal End            YYYY/MM/DD  hh:mm:ss
          disk_number      ld_name                      type
          volume  name
          path
C:\>
```

Description of message:

Flush Start   YYYY/MM/DD hh: mm: ss

File system flush unmount starting message and Start Time

disk_number   ld_name   type

volume name

path

Physical disk number, logical disk name, OS type, mount point volume name, and drive letter accessed by users or path name of the NTFS folder.

Flush Normal End   YYYY/MM/DD hh: mm: ss

File system flush end message and end time

Usage

The command flushes the volume with the physical disk number 4 and drive letter R:

```
C:\>MOUNTVOL  R: /D
C:\>iSMrc_flush   -mvol \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
Flush  Start                         2001/02/06   20:32:43
              disk4                                    rpl302_7                          WN
              \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
              R:
Flush  Normal End            2001/02/06   20:32:43
              disk4                                    rpl302_7                          WN
              \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
              R:
C:\>
```

The operation target volume must have been registered in the Volume List.

The operation target volume must be available for Read/Write.

A dynamic disk cannot be specified.

The drive of the specified name must be mounted.

This command flushes only the Windows file system. Therefore, it cannot flush the data of an application which processes its own cache. To flush the data from the application to the disk, flush the data of the application first, and then use this command to flush the file system.

The command cannot be executed if the update prevention state of the target volume is Prevent by the volume update prevention function.

Return Values

0: Normal termination

1: Abnormal termination

This command terminates abnormally in the following cases.

A parameter is invalid.

The system function (Win32API) fails.

iSMrc_mount (Windows)

Name

iSMrc_mount   Mounts volumes (file systems).

Synopsis

iSMrc_mount mol volume_name

        [{ drv drive: | mdir path }]

iSMrc_mount drv drive:

iSMrc_mount mdir path

iSMrc_mount ver

iSMrc_mount

Description

The iSMrc_mount command mounts the specified mount point volume name, drive letter, or NTFS folder to the Windows file system.

When mounting a volume to which a mount point (drive letter or NTF folder name) is not set, specify the name of the mount point volume to be mounted and the mount point to be set to the volume. In this case, set the specified mount point to the volume to be mounted and mount the volume.

If the access restriction state of the disk of interest has been set to the Not Ready state by unmounting the disk with the iSMrc_umount command, the volume is automatically released from the Not Ready state before it is mounted.

Options

The iSMrc_mount command recognizes the following options and arguments.

mvol volume_nameSpecify the name of the mount point volume to be mounted.

drv drive: Specify the name of the drive to be mounted.

When using this option together with the mvol option, specify the drive letter of a mount point to be set up for the mount point volume of interest.

mdir pathSpecify the name of the NTFS folder to be mounted.

When using this option together with the mvol option, specify the NTFS folder name of a mount point to be set up for the mount point volume of interest.

verDisplays the version information of this command.

Displays the usage of this command.

```
C:\>ISMrc_mount  -mvol volume_name    -drv drive:
Mount  Start                 YYYY/MM/DD  hh:mm:ss
           disk_number      ld_name                      type
           volume_name
           path

ISMrc_mount:  Info:        ISM13220:  Setting  drive letter  (drive:)  has  succeeded.

Mount  Normal End          YYYY/MM/DD  hh:mm:ss
           disk_number      ld_name                      type
           volume_name
           path

C:\>
```

Description of message:

"drive:

Drive letter

"Mount Start   YYYY/MM/DD hh:mm:ss

Physical disk mount starting message and Start Time

"disk_number   ld_name   type

volume name

path

Physical disk number, logical disk name, OS type, mount point volume name, and drive letter accessed by users or path name of the NTFS folder.

"Mount Normal End   YYYY/MM/DD hh:mm:ss

Physical disk mount end message and end time

Usage

The command mounts the volume with the drive name "R:":

```
C:\>iSMrc_mount  -mvol \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\  -drv R:
Mount  Start                          2001/02/06  20:32:43
         disk4                                    rpl302_7                          WN
         \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
         R:


iSMrc_mount:  Info:           ISM13220:  Setting  drive letter  (R:) has  succeeded.


Mount  Normal End            2001/02/06  20:32:43
         disk4                                    rpl302_7                          WN
         \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
         R:


C:\>
```

The target volume must be registered in the Volume List.

The target volume must be in the Read/Write enabled state or must have been changed to the Not Ready state, when unmounting using the iSMrc_umount command.

A dynamic disk cannot be specified.

The command cannot be executed if the update prevention state of the target volume is Prevent by the volume update prevention function.

When restarting a server with the disk access restriction set to the Not Ready state by unmounting, the volume is not recognized by OS. In this case, it is necessary to make OS recognize the volume in advance and mount the volume by releasing the Not Ready state and scanning devices with the iSMrc_scan command after a server is started.

Return Values

0: Normal termination

When having executed the iSMrc_mount command by specifying a mount point (drive letter or NTFS folder name) for the relevant mount point volume name, even if the mount point setting failed, the iSMrc_mount command terminates normally if the specified mount point volume name is successfully mounted.

1: Abnormal termination

This command terminates abnormally in the following cases.

A parameter is invalid.

The system function (Win32API) fails.

iSMrc_umount (Windows)

Name

iSMrc_umount   Unmounts volumes (file system).

Synopsis

iSMrc_umount mvol volume_name [force] [offline]

iSMrc_umount drv drive: [force] [offline]

iSMrc_umount mdir path [force] [offline]

iSMrc_umount ver

iSMrc_umount

Description

The iSMrc_umount command unmounts the specified mount point volume name, drive letter, or NTFS folder from the Windows file system. The unmounting causes the file system cache data to be reflected on the disk device.

When an attempt to access a volume being unmounted occurs via the file system, Windows automatically mounts the volume to cancel the unmounting operation. Note that this may leave unexpected data in the file system buffer; resulting the file system being destroyed. To suppress unexpected automatic mounting, use the offline option.

Specifying the offline option causes a mount point (drive letter or NTFS folder name) set up for a target volume to be deleted automatically and the volume to be unmounted in such a way that it will not be mounted automatically. On Windows 2000, the access restriction state of the disk of interest (logical disk) is changed to the Not Ready state. When unmounting a specified volume in a multiple partition configuration, volumes in the other partitions are internally unmounted before setting the access restriction state of disks to the Not Ready state. All volumes (partitions) on the disk of interest enter the reference and updatedisabled state, making it impossible to access the other partitions on the same disk for reference or update purposes and to operate the iSMrc_flush command. For this reason, care must be taken in following the procedure of use and operation.

If unmounting has already set the access restriction state of the disk to the Not Ready state, the iSMrc_umount command terminates normally.

When the unmount command is issued to an LV with the offline option omitted, it behaves as if the offline option were specified. When the unmount command is issued to an RV with the offline option omitted, it operates according to the UMOUNT_RVACC parameter in the replication option setting file.

If the force option is specified, the target volume is forcibly unmounted even if it cannot be locked because it is in use. If the volume to be unmounted is a business volume such as MV or BV, specification of this option is not recommended because the volume may be forcibly unmouted without data consistency secured.

If the volume to be unmounted is RV or LV, the iSMrc_umount command always operates as the -force option is specified even if this option is omitted.

An unmounted volume can be mounted again to a specified mount point by specifying both the mount point volume name of the target volume and the mount point (drive letter or NTFS folder name) at the same time using the iSMrc_mount command. On Windows 2000, the disk of interest is released from the Not Ready state before mounting.

● **OPTIONS**

The iSMrc_umount command recognizes the following options.

-mvol volume_name	Specify the name of the mount point volume to be unmounted.
-dev drive:	Specify the name of the drive to be unmounted.
-mdir path	Specify the name of the NTFS folder to be unmounted.
-force	Unmount a target drive/mount point volume/NTFS folder forcibly even if the target volume cannot be locked. When the unmount command is issued to an RV or LV with the -force option omitted, it always behaves as if the -force option were specified.
-offline	Deletes a mount point to disable automatic mounting. The target volume is forcibly unmounted even if it cannot be locked. When the unmount command is issued to an LV with the -offline option omitted, it always behaves as if the -offline option were specified. When the unmount command is issued to an RV with the -offline option omitted, it operates according to the UMOUNT_RVACC parameter in the replication option setting file.
-ver	Displays the version information of this command.
-?	Displays the usage of this command.

[DISPLAYED INFORMATION]

```
C:\>iSMrc_umount -drv volume_name
Umount Start                 YYYY/MM/DD hh:mm:ss
       disk_number    ld_name                   type
       volume_name
       path
Umount Normal End            YYYY/MM/DD hh:mm:ss
       disk_number    ld_name                   type
       volume_name
       path
C:\>
```

Description of message:

- volume_name

  Mount point volume name

- Umount Start   YYYY/MM/DD hh:mm:ss

  Physical disk (drive) unmount starting message and Start Time

- disk_number   ld_name   type

  volume_name

  path

  Physical disk number, logical disk name, OS type, mount point volume name,

  and drive letter accessed by users or path name of the NTFS folder.

- Umount Normal End   YYYY/MM/DD hh:mm:ss

  Physical disk (drive) unmount end message and end time

[USAGE]

The command unmounts the volume (RV) with the drive name "R".

```
C:\>MOUNTVOL R:/D
C:\>iSMrc_flush -mvol \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
Flush Start            2001/02/06  20:32:43
       disk4                       rp1302_7                   WN
       \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
       R:
Flush Normal End       2001/02/06  20:32:43
       disk4                       rp1302_7                   WN
       \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
       R:
C:\>iSMrc_umount -mvol \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
Umount Start           2001/02/06  20:32:43
       disk4                       rp1302_7                   WN
       \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
       R:
Umount Normal End      2001/02/06  20:32:43
       disk4                       rp1302_7                   WN
```

```
       \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
       R:
C:\>
```

The target volume must be registered in the Volume List.

The operation target volume must be available for Read/Write.

A dynamic disk cannot be specified.

If a drive to be unmounted is being used by another application, the iSMrc_umount command may encounter an error. In this case, executing the CHKDSK command with /F /X specified forcibly cancels the reference and update requested by that application.

On Windows 2000, if the command is issued with the offline option specified or to an LV, it causes the access restriction state of the disk (logical disk) of interest to be changed to the Not Ready state. If an attempt is made to unmount a volume on a disk in a multiple partition configuration, it becomes impossible to reference or update all volumes (partitions) on the disk. For this reason, care must be taken in following the procedure of use and operation.

If the offline is specified or if the volume to be unmounted is an LV, the volume must have only one mount point (drive letter or NTFS folder name) specified. It is impossible to unmount a volume for which no mount point is specified or more than one mount point is specified.

The command cannot be executed if the update prevention state of the target volume is Prevent by the volume update prevention function.

When restarting a server with the disk access restriction set to the Not Ready state, the relevant disk is not recognized by OS. In this case, it is necessary to make OS recognize the relevant disk and volume with the iSMrc_scan command after a server is started.

Return Values

0: Normal termination

1: Abnormal termination

This command terminates abnormally in the following cases.

A parameter is invalid.

The system function (Win32API) fails.

iSMrc_signature (Windows)

[NAME]

    iSMrc_signature :   Operations regarding disk signature.

[SYNOPSIS]

    iSMrc_signature {-read | -set | -del | -init | -list} {-dskn *disk_number*
    | -all}

    iSMrc_signature {-export | -import} *file_name* {-dskn *disk_number* | -all}

    iSMrc_signature -ver

    iSMrc_signature -?

[DESCRIPTION]

    The iSMrc_signature command performs save, restoration, deletion, initialization, and
    display of disk signature. It also writes the disk signature information to a file or reads it
    from a file.

● OPTIONS

The iSMrc_signature command recognizes the following options.

-read	Saves the signature of the physical disk currently recognized by Windows. If -all is specified, all signature information is saved. If *disk_number* is specified, only the signatures of the target physical disks are saved. Saved signatures are recorded in the signature map file managed by the iSMrc_signature command.
-set	Recovers the disk signatures saved in the map file by -read to the disk. If -all is specified, all signature information saved is recovered to the physical disk. If *disk_number* is specified, only the signatures of the target physical disks are recovered.
-del	Deletes the disk signatures saved in the map file by -read. If -all is specified, signature information of all disks is deleted. If *disk_number* is specified, only the signatures of the target physical disks are deleted.
-init	Initializes the signature on the physical disk. If -all is specified, signature information of all disks is

	initialized. If *disk_number* is specified, only the signatures of the target physical disks are initialized.
-list	Displays the list of disk signatures saved by -read, signatures on the physical disk, and signatures saved in the disk array. If -all is specified, signature information of all disks is displayed. If *disk_number* is specified, only the signatures of the target physical disks are displayed.
-export	Writes the disk signature information to the specified file. If -all is specified, signature information of all disks is written to the file. If *disk_number* is specified, only the signatures of the target physical disks are written to the file.
-import	Reads the disk signature information recorded in the specified file from the file and registers it. If -all is specified, signature information of all disks is read from the file and registered. If *disk_number* is specified, only the signatures of the target physical disks are read from the file and registered.
file_name	Specify the file name to which the disk signature information is written, or from which it is read.
-dskn *disk_number*	Specify the disk number of the physical disk to which the disk signature operation is performed.
-all	Performs the disk signature operation for all the physical disks connected to the host.
-ver	Displays the version information of this command.
-?	Displays the usage of this command.

[USAGE]

The command saves signature information about all physical disks connected to the server and then lists the signature information.

```
C:\>iSMrc_signature -read -all
iSMrc_signature: Info:      iSM13222: Reading signature succeeded. 2 records
C:\>iSMrc_signature -list -all

                      Disk       Map       Disk      Saved                    LV Link
 Disk Array Name      No.  LDN   Signature  Signature Signature  Attribute     Status
 -------------------  ---- ----- ---------- --------- ---------- ----------    --------
 Storage2800           4   001f  AA6143BD   AA6143BD  AA6143BD   RV           -
 Storage2800           5   0030  81288D0A   81288D0A  -          LV           link

C:\>
```

Notes

The value of the disk signature reported by means of the iSMrc_signature command may seem to be different from the value of the disk signature reported by means of Windows or other disk management tools because the byte order is handled differently.

Therefore, pay special attention when using the value of the disk signature displayed or saved by the iSMrc_signature command for another disk management tool.

Target volume must have been registered in the volume list.

The command cannot be executed if the target volume is in the Not Ready state.

A dynamic disk or the partition disk in GPT format cannot be specified.

When the update prevention state of the target volume is Prevent by the volume update prevention function, operations to initialize the signature on the physical disk and to restore the disk signature saved in the map file cannot be performed.

The control volume attribute is displayed only for the control volume bound in the disk array that can identify the control volume attribute. For a logical disk defined as a control volume on the server, the attribute is not displayed.

Return Values

0: Normal termination

1: Abnormal termination

This command terminates abnormally in the following cases.

A parameter is invalid.

The system function (Win32API) fails.

iSMrc_scan (Windows)

Name

iSMrc_scan   Device scan.

Synopsis

iSMrc_scan

iSMrc_scan ver

iSMrc_scan

Description

The iSMrc_scan command scans devices and let the system recognize the available devices.

If the access restriction state of the target volume has been changed to the Not Ready state (both reference and write access are inhibited) when it is unmounted using the iSMrc_umount, the device is scanned after the volume is released from the Not Ready state.

Options

The iSMrc_scan command recognizes the following options:

verDisplays the version information of this command.

Displays the usage of this command.

Return Values

0: Normal termination

1: Abnormal termination

This command terminates abnormally in the following cases.

A parameter is invalid.

The system function (configuration manager API) fails.

SCSI Pass Through I/O

By enabling the issuance of hyperv virtual machine and displaying the status can be enabled by SCSI Pass Through I/O.

iSMpassthrough_enabler (Windows)

[NAME]

    iSMpassthrough_enabler   Enables the issuance of SCSI pass through I/O from a Hyper-V
                             virtual machine and displays whether such issuance is enabled.

[SYNOPSIS]

    iSMpassthrough_enabler
    iSMpassthrough_enabler -l
    iSMpassthrough_enabler -ver
    iSMpassthrough_enabler -?

[DESCRIPTION]

    The iSMpassthrough_enabler command enables the issuance of SCSI pass through I/O
    from a Hyper-V virtual machine and displays whether such issuance is enabled.
    By enabling the issuance of SCSI pass through I/O, you can create and display a volume
    list and use replication operation commands from a Hyper-V virtual machine.
    To use these functions, you must execute this command on the host once before using a
    Hyper-V virtual machine. This command must also be executed when a new Hyper-V
    virtual machine is added to your operating environment.

    ● OPTIONS
    The iSMpassthrough_enabler command recognizes the following options:

    (No option)   Enables the issuance of SCSI pass through I/O from all the
                            Hyper-V virtual machines set up on the host where this
                            command is executed.

    -l   Displays whether SCSI pass through I/O can be issued from all
                            the Hyper-V virtual machines set up on the host where this
                            command is executed.

    -ver   Displays the version information of this command.

```
   -?                              Displays the usage of this command.
```

[DISPLAYED INFORMATION]

```
C:\>iSMpassthrough_enabler -l
  --- Host Machine ---
  Name                  : HostMachine

  --- Virtual Machines ---
  Name                  : VirtualMachine1
  SCSI Pass Through     : enabled

  Name                  : VirtualMachine2
  SCSI Pass Through     : enabled

C:\>
```

Description of messages:

- --- Host Machine ---

  Name   : HostMachine

     Name of the host where this command is executed

- --- Virtual Machine ---

  Name   : VirtualMachine1

  SCSI Pass Through   : enabled

     Name of the Hyper-V virtual machine that was set up on the host where this
     command is executed, and whether SCSI pass through I/O can be issued from
     this virtual machine.

[USAGE]

The following command enables the Hyper-V virtual machines VirtualMachine1 and
VirtualMachine2, which are set up on the host HostMachine, to issue SCSI pass through
I/O.

```
C:\>iSMpassthrough_enabler
  iSMpassthrough_enabler:002    SCSI pass-through setting was enabled successfully.
(Host = HostMachine Virtual = VirtualMachine1)
  iSMpassthrough_enabler:002    SCSI pass-through setting was enabled successfully.
(Host = HostMachine Virtual = VirtualMachine2)
  iSMpassthrough_enabler:001    Command has completed successfully.

C:\>
```

This command can be installed in an environment running Windows Server 2008 R2 or later.

This command can be executed in an environment running Windows Server 2008 R2 or later and Windows Server 2008 R2 HyperV or later.

This command can be executed in an environment where .NET Framework is installed.

This command can be executed on a host where a HyperV virtual machine is set up.

SCSI pass through I/O can be issued from a HyperV virtual machine by executing this command as a user with administrator privileges.

After enabling the issuance of SCSI pass through I/O by using this command, it is necessary to start a HyperV virtual machine.

Return Values

0: Normal termination

1: Abnormal termination

This command terminates abnormally in the following cases:

A parameter is invalid.

The conditions to execute this command are not satisfied.

Operations for a HyperV virtual machine failed.

2: Abnormal termination because operations for some HyperV virtual machines failed.

Data Replication Function

Replication Operation File

To perform batch setting of paired volumes by a command of the data replication function with the -file option, use the replication operation file. Also to perform batch setting of operation target volumes by the iSMrc_sense command of the common function with the -file option, the replication operation file can be used.

The replication operation file is described below.

File Location and Name

Can be freely specified.

Description

The replication operation file is used to perform batch setting of multiple pairs by using a data replication command.

Synopsis

This file is described in the following synopsis:

MV_Type:MV RV_Type:RV

To describe the MV and RV, use a colon (:) to connect the volume type (MV_Type or RV_Type) with the volume (MV or RV).

Specifying volume types (MV_Type, RV_Type)

The following values can be specified as a volume type by using either a numerical value or a character string.

Target Volume	Volume Types		
By Number	By Characters	Windows	By Number
Logical disk name	0	ld	✓
Special file name	1	sfn	✓
Volume group name	2	vg	✓
Drive letter	4	drv	-
Disk group name	5	dg	✓

Target Volume	Volume Types		
By Number	By Characters	Windows	By Number
Mount point volume name	6	mvol	-
NTFS folder name	7	mdir	-

Specifying a volume (MV, RV)

Specify the name of the target volume that has an attribute specified as a volume type.

The maximum number of characters is as follows:

Target Volume	Maximum Number of Characters
Logical disk name	24 single-byte characters
Special file name	32 single-byte characters 64 single-byte characters
Volume group name	32 single-byte characters
Disk group name	
Mount point volume name	52 single-byte characters
Path name (drive letter or NTFS folder name)	260 single-byte characters

Rules

- Start description from the first column of the line.
- A line break shall be a partition of records.
- Up to 1,024 single-byte characters can be described per record.
- One pair can be described per record.
- When one MV and one RV exist, description of the RV can be omitted.
- Normally, when one MV and multiple RVs exist, description of the RVs cannot be omitted. It can be omitted only when the iSMrc_query command or the iSMrc_wait command is used.
- Use a blank space or a tab character to separate the description of the MV from the description of the RV.
- Text displayed from the sharp (#) character to the end of the record is recognized as a comment.
- If there is an error in the file syntax, operations to all pairs described in the file become invalid.

- When using the iSMrc_sense or iSMrc_updprevent command, specify the volume type and the volume name for MV_Type and MV, respectively. Descriptions of RV_Type and RV are ignored.

- When describing a pair that combines a volume group or a disk group with a special file name (or logical disk name), multiple volumes can be specified by describing multiple special file names (or logical disk names) separated by a comma (,).

- When specifying a pair that combines a volume group or a disk group with a special file name (or logical disk name), the number of logical volumes that consist of the volume group or the disk group must coincide with the number of special file names to be described.

- If a character string, such as an NTFS folder name, includes a blank space ( ) or colon (:), enclose the entire character string in double quotation marks (").

- Specify a file path name by a relative or absolute path name within 256 one-byte characters.

The following is an example of a description of the replication operation file:

An example for the Windows system

```
#Type:MV                        Type:RV
Id:dev000                       Id:dev001
drv:E                           drv:F
0:dev006                        4:G
4:H                             0:dev007

# Parallel configuration
Id:dev002                       Id:dev003
Id:dev002                       Id:dev004

# Serial configuration
Id:dev012                       Id:dev013
Id:dev013                       Id:dev014

# Remote operation
Id:dev032                       Id:dev023
Id:dev013                       Id:dev014

# MV:RV=1:1
Id:dev005
```

An example for the UNIX system

```
#Type:MV                            Type:RV
sfn:/dev/rdsk/c16t1d0               sfn:/dev/rdsk/c16t1d1
1:/dev/rdsk/c16t1d2                 1:/dev/rdsk/c16t1d3
vg:vgvol                            sfn: /dev/rdsk/c16t1d4,/dev/rdsk/c16t1d5
dg:dg_name
Id:dev001                           Id:dev002
0:dev003                            1:/dev/rdsk/c23t2d0

# Parallel configuration
sfn:/dev/rdsk/c16t2d0               sfn:/dev/rdsk/c16t2d1
sfn:/dev/rdsk/c16t2d0               sfn:/dev/rdsk/c16t2d2

# Serial configuration
sfn:/dev/rdsk/c16t12d0              sfn:/dev/rdsk/c16t12d1
sfn:/dev/rdsk/c16t12d1              sfn:/dev/rdsk/c16t12d2

# Remote operation
Id:dev032                           Id:dev023
Id:dev013                           Id:dev014

# MV:RV=1:1
sfn:/dev/rdsk/c22t3d0
```

Replication Operations

iSMrc_replicate

Name

iSMrc_replicate - Starts pair or ATgroup replication.

Synopsis

iSMrc_replicate -mv volume -mvflg mv_flg

[-rv volume -rvflg rv_flg]

   [-cprange copy_range] [-cpmode copy_mode]

   [-rvacc rv_access] [-wait [second] | -nowait]

   [-iopath iopath]

iSMrc_replicate -file file_name

   [-cprange copy_range] [-cpmode copy_mode]

   [-rvacc rv_access] [-wait [second] | -nowait]

   [-iopath iopath]

iSMrc_replicate -atg atgroup

   [-atmode atomic_mode] [-cpmode copy_mode]

   [-cprange copy_range]

   [-rvacc rv_access] [-wait [second] | -nowait]

   [-arrayname diskarray]

   [-iopath iopath]

iSMrc_replicate -ver

iSMrc_replicate

iSMrc_replicate -help

Description

The iSMrc_replicate command copies data from the paired MV to RV.

If an ATgroup is specified, MV-to-RV replication is performed for all Remote Replication pairs belonging to the ATgroup.

The RV file system must be unmounted just before replication.

For the Windows system, the RV file system is unmounted before replication if the RV has been recognized by the server where the replication is to be performed.

Options

The iSMrc_replicate command recognizes the following Options.

-mv volume Specify volume of MV.

-mvflg mv_flg Specify the volume type specified in -mv.

This argument must be specified together with -mv.

The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

-rv volume Specify volume of RV.

-rvflg rv_flg Specify the volume type specified in -rv.

 This argument must be specified if -rv is specified.

The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

-atg atgroup Specify the name of ATgroup to be operated.

-atmode atomic_mode

 Specify the Atomic-break mode for the ATgroup.

 One of the following can be specified in atomic_mode.

 stop MV access stop

If an Atomic break is put into effect, the synchronization state of the ATgroup changes to Rpl/suspend, and each pair enters the abnormal suspend state. In this case, I/O operations for the MV are rejected; resulting in an abnormal termination.

The user may be required to perform forced separation if necessary when using the RV. The forced separation enables I/O operations for the MV.

 continue MV access continuation

If an Atomic break is put into effect, the synchronization state of the ATgroup changes to Fault, and each pair is automatically separated, leading to fault state. In this case, I/O operations for the MV are continued. The user does not have to separate pairs.

This value is default if the parameter is omitted.

 If this parameter is specified, no background copy can be selected with -cpmode.

-cpmode copy_mode Specify how to reflect the MV update to RV.

 In copy_mode, one of the following can be specified.

 sync Sync mode

This value is default if this parameter is omitted.

 semi Semi-sync mode

For ATgroups, the copy mode of order guarantee is selected.

 bg Background copy mode

If a background copy is selected for ATgroups, it is impossible to specify -atmode. Selecting a background copy disables the Atomic-break mode. In this case, no Atomic break is put into effect if a copy failure occurs and only the copy of the relevant pair stops.

cprange copy_range Specify the range of copy from MV to RV.

In copy_range, one of the following can be specified.

- diff Differences between MV and RV are copied from MV to RV.
- full Copies all area of MV to RV.

 If this argument is omitted, the operation is the same as the operation when diff is specified.

- rvacc rv_access Specify the access restrictions for RV.

In rv_access, one of the following can be specified.

- ro Only read is allowed for RV.
- nr Access to RV is not allowed.

 If this argument is omitted, the operation is the same as the operation when nr is specified.

-wait [second] | -nowait

If -wait is specified, the system waits for replication to be completed while monitoring the pair or ATgroup sync state at regular intervals. For second, monitoring time interval can be specified within a range of 1 to 30 (integer) seconds. The default is 5 seconds. This value can

be changed in the replication operation option setting file on the Windows system. If any abnormality is detected during sync state transition, the wait operation is stopped immediately; resulting in an abnormal termination.

Specifying -nowait only starts replication; no wait operation is performed for the completion of replication.

If this argument is omitted, the operation is the same as the operation when -nowait is specified.

arrayname diskarray

If -atg is used to specify an ATgroup, it is possible to specify the disk array name (nickname) of an operation target.

iopath iopath Specify a replication I/O path for a disk array. The specification with this argument overrides the replication operation option setting file on Windows.

One of the following can be specified for iopath.

direct Replication I/O commands are issued directly to disk arrays.

manager SnapSAN Manager being operated in the same server is connected and replication I/O commands are issued to disk arrays from SnapSAN Manager.

If this argument is omitted, the replication operation option setting file (Windows).

file file_name To specify multiple pairs, describe the pairs of MV/RV in file_name.

When multiple pairs are specified, if an error occurs in some pairs, the process is continued until it is terminated in all the specified pairs.

ver Displays the version information of this command.

Displays the usage of this command (Windows).

Displayed Information

Windows system

When pair replication terminates normally with the -wait specification, the following information is displayed.

```
C:\>iSMrc_replicate -mv ld_name -mvflg ld -rv ld_name -rvflg ld -wait 2
Replicate Start                    YYYY/MM/DD hh:mm:ss
    MV:disk_number    ld_name                      type
        volume name
        path
    RV:disk_number    ld_name                      type
        volume name
        path
Replicating.....
Replicate Normal End  YYYY/MM/DD hh:mm:ss
    MV:disk_number    ld_name                      type
        volume name
        path
    RV:disk_number    ld_name                      type
        volume name
        path

C:\>
```

When ATgroup replication terminates normally with the -wait specification, the following information is displayed.

```
C:\>iSMrc_replicate -atg atgroup -wait

Replicate Start              YYYY/MM/DD hh:mm:ss
   ATG:atgroup
Replicating.....
Replicate Normal End         YYYY/MM/DD hh:mm:ss
   ATG:atgroup

C:\>
```

The following information is displayed when the paired MV and RV information is output by setting an option.

```
C:\>iSMrc_replicate -atg atgroup -wait

Replicate Start                  YYYY/MM/DD hh:mm:ss
   ATG:atgroup
      MV:disk_number    ld_name type
         volume name
         path
      RV:disk_number    ld_name              type
         volume name
         path
Replicating.....
Replicate Normal End             YYYY/MM/DD hh:mm:ss
   ATG:atgroup
      MV:disk_number    ld_name              type
         volume name
         path
      RV:disk_number    ld_name              type
         volume name
         path

C:\>
```

Description of messages:

Replicate Start   YYYY/MM/DD hh:mm:ss

Replicate starting message and Start Time

ATG:atgroup

ATgroup name

MV:disk_number   ld_name   type

 volume name

 path

RV:disk_number   ld_name   type

volume name

 path

MV/RV physical disk number, logical disk name, OS type, mount point volume name, and drive letters or path name mounted to the folder of the NTFS volume accessed by users

Replicating.....

Message in Replicate execution

The display of this message can be suppressed by setting an option. Replicate Normal End YYYY/MM/DD hh:mm:ss

Replicate end message and end time

When ATgroup replication terminates normally with the -wait specification, the following information is displayed.

iSMrc_replicate -atg atgroup -wait

 Replicate Start YYYY/MM/DD hh:mm:ss

ATG:atgroup

 Replicating.....

 Replicate Normal End YYYY/MM/DD hh:mm:ss

 ATG:atgroup

#

The following information is displayed when the paired MV and RV information is output by setting an option.

iSMrc_replicate -atg atgroup -wait

Replicate Start YYYY/MM/DD hh:mm:ss

 ATG:atgroup

  MV:special_file_name LD Name type

  RV:special_file_name LD Name type

Replicating.....

Replicate Normal End YYYY/MM/DD hh:mm:ss

 ATG:atgroup

  MV:special_file_name LD Name type

  RV:special_file_name LD Name type

#

Description of messages:

Replicate Start   YYYY/MM/DD hh:mm:ss

Replicate start message and start time

ATG:atgroup

ATgroup name

MV:special_file_name   LD Name   type

 RV:special_file_name   LD Name   type

MV/RV's special file name, logical disk name, OS type

Replicating.....

Message that appears during Replicate execution

The display of this message can be suppressed by setting an option.

Replicate Normal End   YYYY/MM/DD hh:mm:ss

Replicate end message and end time

Usage

Windows system

Pair replication is performed with a monitoring time interval of 2 seconds specified with -wait.

```
C:\>iSMrc_replicate -mv dev001 -mvflg ld -rv dev002 -rvflg ld -wait 2

 Replicate Start                2001/01/28 17:33:17
    MV:1    dev001                          WN
        \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
        G:
    RV:-    dev002                          WN
        -
        -
 Replicating.....
 Replicate Normal End           2001/01/28 17:33:19
    MV:1    dev001                          WN
        \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
        G:
    RV:-    dev002                          WN
        -
        -

C:\>
```

Replication is performed for more than one pair, using the replication operation file. In this case, a monitor time interval of 2 seconds is specified with -wait.

```
C:\>iSMrc_replicate -file volume_file -wait 2

 Replicate Start              2001/01/28 17:33:17
    MV:3    dev002                          WN
        \\?\Volume{70facee0-58a7-11d5-ad3e-806d6172696f}\
        E:
    RV:-    dev102                          WN
        -
        -

 Replicate Start              2001/01/28 17:33:17
    MV:5    dev003                          WN
        \\?\Volume{71facee0-58a7-11d5-ad3e-806d6172696f}\
        G:
    RV:-    dev103                          WN
        -
        -
 Replicating.....
 Replicate Normal End         2001/01/28 17:38:15
    MV:3    dev002                          WN
        \\?\Volume{70facee0-58a7-11d5-ad3e-806d6172696f}\
        F:
    RV:-    dev102                          WN
        -
        -

 Replicate Normal End         2001/01/28 17:38:17
    MV:5    dev003                          WN
        \\?\Volume{71facee0-58a7-11d5-ad3e-806d6172696f}\
        G:
    RV:-    dev103                          WN
        -
        -

C:\>
```

```
C:\>iSMrc_replicate -atg ATmdb_test

 Replicate Start              2003/08/13 00:05:21
   ATG:ATmdb_test

C:\>
```

The end messages are displayed in the order Replicate commands terminate.

Replication is started for an ATgroup.

Pair replication is performed by specifying a persistent special file name The end messages are displayed in the order Replicate commands terminate.

Replication is performed by specifying a volume group where the MV consists of 2 logical volumes, /dev/rdsk/c1t1d0 and /dev/rdsk/c1t1d1.

iSMrc_replicate -mv /dev/vg100 -mvflg vg -rv disk221 disk222 -rvflg ld -wait 2

 Replicate Start 2000/10/10 09:11:23

 MV:/dev/rdsk/c1t1d0 disk001 NX

 RV:- disk221 NX

Replicate Start 2000/10/10 09:11:23

MV:/dev/rdsk/c1t1d1 disk002 NX

RV:- disk222 NX

Replicating.....

Replicate Normal End 2000/10/10 09:16:12

MV:/dev/rdsk/c1t1d0 disk001 NX

RV:- disk221 NX

Replicate Normal End 2000/10/10 09:16:35

MV:/dev/rdsk/c1t1d1 disk002 NX

RV:- disk222 NX

#

Replication is started for an ATgroup.

iSMrc_replicate -atg ATG01

Replicate Start 2003/08/13 10:06:32

ATG:ATG01

#

Pair Replication

The target MV and RV must be paired.

The activity state of the target pair must be Separate. However, the command cannot be executed if the sync state is Separate Preparing.

The Replication cannot be specified for pairs set in the same disk array. Specify the Replication for pairs set in different disk arrays when required.

Specify the back ground copy mode when using the Overland Mirroring remote data replication function (Replication and Mirroring Asynchronous) for the pair set in different disk arrays.

The command cannot be executed if the disk array that contains the MV and RV is in the freeze state.

The command cannot be executed if the activity state of a pair of the specified MV and the paired RV is in Restore.

If the specified MV is used as a BV (base-volume) for snapshot, the command cannot be executed when restoration from the SV (snapshot-volume) is in progress or a restore fault occurs.

If the specified RV is used as a BV (base-volume) for snapshot, the command cannot be executed when restoration from the SV (snapshot-volume) is in progress or a restore fault occurs.

If the specified RV is used as a BV (base-volume) for snapshot, the command cannot be executed when link setting of the BV is in progress.

If the specified RV is used as a BV (base-volume) for snapshot, the copy control state of the pair must be the background copy mode.

The sync state of the pair of the specified MV and the paired upper MV must be Separated, replication execution, or sync state.

If the activity state of a pair of the specified MV and the paired upper MV is Replicate, specify the background copy mode for the target pair.

The sync state of the pair of the specified RV and the paired lower RV must be in the Separated state, replicate execution, or sync state.

If the activity state of the pair of the specified RV and the paired lower RV is Replicate, the copy control state of the replicated lower pair must be in the background copy mode.

The command cannot be executed if the MV is NotAccessible, or RV is in the protection state (ReadOnly or NotAccessible) by the data retention function.

A dynamic disk cannot be used.

RV must be unmounted.

No pair belonging to an ATgroup can be operated.

The command cannot be executed if the logical disk of MV or RV is in the not in use state or the pool to which the logical disk belongs is in the rotation stop state by the power saving function.

The command cannot be executed if the update prevention state of the RV is Prevent by the volume update prevention function.

The following notes do not apply to joint operation with SnapSAN Manager.

The target MV or RV must have been registered in the volume list.

When a remote-side volume is to be operated in remote operation, the target volume must satisfy the following conditions:

- A paired upper or lower volume for the target pair must have been registered in the volume list.
- When the MV or RV of the target pair is used also as a BV (base-volume) for snapshot, the BV or the LV linked to the BV must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

When specifying the combination of a volume group or a disk group with a special file name (logical disk name), for an MV(RV), specify the same number of logical volumes that constitute a volume group or a disk group on the specified special file name (logical disk name) side. In this case, copying is performed in the specified order.

- To specify a volume group, the target volume group must be active.
- To specify a disk group, the target disk group must be active.

ATgroup Replication

The operation target must be in one of the following ATgroup sync states:

Separation completed (Separated)

Failure separation (Fault)

Replicate start (Rpl/start)

Replicate suspend (Rpl/suspend)

If the background copy mode (asynchronous) is selected, the Atomic-break mode is disabled, and, when replication is completed, the Non-atomic Rpl/sync state is entered.

If the Atomic-break mode, copy mode, or RV access restriction is not specified, the values specified at the start of replication are taken over when replication is restarted for the ATgroup in the Rpl/start or Rpl/suspend state.

If the Atomic-break mode, copy mode, and RV access restriction are specified, the values must coincide with the values specified at the start of replication when replication is restarted for the ATgroup in the Rpl/start or Rpl/suspend state.

If mismatch occurs, replication restart results in an abnormal termination.

Since the number of ATgroups to be replicated in semi-synchronization mode (order guarantee) is limited for the disk arrays, replication over the limit cannot be executed.

The command cannot be executed if the replication function of the disk array to which the target ATgroup belongs is in the freeze state.

A dynamic disk cannot be used.

The RV must have been unmounted.

The command cannot be executed if the logical disk of MV or RV included in the ATgroup is in the not in use state or the pool to which the logical disk belongs is in the rotation stop state by the power saving function.

The command cannot be executed if the update prevention state of the RV in the ATgroup is Prevent by the volume update prevention function.

The following notes do not apply to joint operation with SnapSAN Manager.

When the secure mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, MVs or RVs of all the pairs that belong to the target ATgroup must have been registered in the volume list.

When the standard mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, at least one logical disk that belongs to the target ATgroup must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

Return Values

Pair Replication

Operation for all the paired volumes terminated normally.

Operation for all the paired volumes terminated abnormally.

This command terminates abnormally in the following cases.

- A parameter is invalid.
- A condition for operation is not satisfied.
- An attempt to operate a disk array fails.
- Operation for some paired volumes terminated abnormally.
- The command terminated abnormally because all or some of the paired volumes were already in Replicate State.

ATgroup Replication

ATgroup operation terminated normally.

ATgroup operation terminated abnormally.

This command terminates abnormally in the following cases.

- A parameter is invalid.
- A condition for operation is not satisfied.
- An attempt to operate a disk array fails.

- An attempt to operate some pairs fails.
- A wait for replication to be completed is discontinued.
- Transition occurs to an ATgroup sync state other than Rpl/exec or Rpl/sync during a wait for replication to be completed.

ATgroup operation terminated abnormally because operation for some paired volumes terminated abnormally.

ATgroup operation terminated abnormally because the current ATgroup sync state is already Rpl/exec or Rpl/sync.

iSMrc_separate

iSMrc_separate   Separates pairs or ATgroups.

Synopsis

iSMrc_separate -mv volume -mvflg mv_flg

  [-rv volume -rvflg rv_flg]

  [-rvacc rv_access]

  [-rvuse rv_use | -force force_arg]

  [-wait [second] | -nowait]

  [-iopath iopath]

iSMrc_separate -file file_name

  [-rvacc rv_access]

  [-rvuse rv_use | -force force_arg]

  [-wait [second] | -nowait]

  [-iopath iopath]

iSMrc_separate -atg atgroup

  [-force]

  [-wait [second] | -nowait]

  [-arrayname diskarray]

  [-iopath iopath]

iSMrc_separate -ver

iSMrc_separate

iSMrc_separate -help

Description

The iSMrc_separate command separates the paired MV and RV.

If an ATgroup is specified, the MVs and RVs in all Remote Replication pairs belonging to the ATgroup are separated.

Options

The iSMrc_separate command recognizes the following Options and arguments.

-mv volume Specify volume of MV.

-mvflg mv_flg Specify the volume type specified in -mv.

This argument must be specified with -mv.

The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

-rv volume Specify volume of RV.

-rvflg rv_flg Specify the volume type specified in -rv.

This argument must be specified if -rv is specified.

The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

-atg atgroup Specify the name of ATgroup to be operated.

-rvacc rv_access Specify the access restrictions for RV.

In rv_access, one of the following can be specified.

ro Read Only is allowed for RV.

rw Read/write are allowed for RV.

If this argument is omitted, the operation is the same as the operation when rw is specified.

If -force is specified, this argument is not required.

-rvuse rv_use Determine when to make the RV available.

One of the following can be specified for rv_use:

immediate After Separate execution, the RV is immediately available while the difference between the MV and RV contents is being reflected into the RV (Separate(immediate)).

 This function can be specified only for Volume Cloning pair.

complete After Separate execution, the RV becomes available when the difference between the MV and RV contents has been reflected into the RV (Separate(completion)).

default This value can be changed in the replication operation option setting file on the Windows system.

If this argument is omitted, the system performs the same operation as when default is selected.

Do not specify the -rvuse option with the -force option.

 -force force_arg Separate the relevant pair forcibly (forced separate) if a copy error occurs in the MV/RV, and the replication state cannot be continued.

One of the following can be specified for force_arg to separate the pair.

all Performs Forced Separate for MV/RV.

mv Performs Forced Separate only for MV.

rv Performs Forced Separate only for RV.

Do not specify the -force option with the -rvuse option.

force_arg can be used also to specify that all MVs on the concentrator belonging to an ATgroup or all RVs on the distributor side be forcibly separated. It cannot be used for ATgroups.

-wait [second] | -nowait

Specifying -wait causes the pair sync state or ATgroup sync state to be monitored at regular intervals to wait for separation to be completed. For second, monitoring time interval can be specified within a range of 1 to 30 (integer) seconds. The default is 5 seconds. This value can

be changed in the replication operation option setting file on the Windows system. If an abnormality occurs in sync state transition during a wait, the wait is discontinued immediately; resulting in an abnormal termination.

Specifying -nowait simply starts separation; it does not wait for separation to be completed.

If this argument is omitted, the operation is the same as the operation when -nowait is specified.

-arrayname diskarray

If -atg is used to specify an ATgroup, it is possible to specify the disk array name (nickname) of an operation target.

-iopath iopath Specify a replication I/O path for a disk array. The specification with this argument overrides the replication operation option setting file on Windows.

One of the following can be specified for iopath.

direct Replication I/O commands are issued directly to disk arrays.

manager SnapSAN Manager being operated in the same server is connected and replication I/O commands are issued to disk arrays from SnapSAN Manager.

If this argument is omitted, the replication operation option setting file (Windows).

-file file_name To specify multiple pairs, describe the pairs of MV/RV in file_name.

When multiple pairs are specified, if an error occurs in some pairs, the process is continued until it is terminated in all the specified pairs.

-ver Displays the version information of this command.

Displays the usage of this command (Windows).

Displayed Information

Windows system

When pair separation terminates normally with -wait specified, the following information is displayed.

```
C:\>iSMrc_separate -mv ld_name -mvflg ld -rv ld_name -rvflg ld -wait 2

Separate Start              YYYY/MM/DD hh:mm:ss
    MV:disk_number    ld_name                    type
        volume name
        path
    RV:disk_number    ld_name                    type
        volume name
        path
Separating.....
Separate Normal End         YYYY/MM/DD hh:mm:ss
    MV:disk_number    ld_name                    type
        volume name
        path
    RV:disk_number    ld_name                    type
        volume name
        path

C:\>
```

```
C:\>iSMrc_separate -atg atgroup -wait

Separate Start                YYYY/MM/DD hh:mm:ss
  ATG:atgroup
Separating.....
Separate Normal End           YYYY/MM/DD hh:mm:ss
  ATG:atgroup

C:\>
```

The following information is displayed when the paired MV and RV information is output by setting an option. For details on the option setting, refer to 8.1 "Operation Option Setting File".

```
C:\>iSMrc_separate -atg atgroup -wait

Separate Start                YYYY/MM/DD hh:mm:ss
  ATG:atgroup
    MV:disk_number   ld_name                type
         volume name
         path
    RV:disk_number   ld_name                type
         volume name
         path
Separating.....
Separate Normal End           YYYY/MM/DD hh:mm:ss
  ATG:atgroup
    MV:disk_number   ld_name                type
         volume name
         path
    RV:disk_number   ld_name                type
         volume name
         path

C:\>
```

Description of messages:

Separate Start   YYYY/MM/DD hh:mm:ss

Separate starting message and Start Time

ATG:atgroup

ATgroup name

MV:disk_number   ld_name   type

    volume name

    path

RV:disk_number   ld_name   type

    volume name

    path

MV/RV physical disk number, logical disk name, OS type, mount point volume name, and drive letters or path name mounted to the folder of the NTFS volume accessed by users

Separating.....

Message in Separate execution

The display of this message can be suppressed by setting an option.

Separate Normal End   YYYY/MM/DD hh:mm:ss

Separate end message and end time

When ATgroup separation terminates normally with -wait specified, the following information is displayed.

iSMrc_separate -atg atgroup -wait

 Separate Start YYYY/MM/DD hh:mm:ss

 ATG:atgroup

 Separating.....

 Separate Normal End YYYY/MM/DD hh:mm:ss

 ATG:atgroup

 #

 The following information is displayed when the paired MV and RV information is output by setting an option.

iSMrc_separate -atg atgroup -wait

 Separate Start YYYY/MM/DD hh:mm:ss

 ATG:atgroup

 MV:special_file_name LD Name type

 RV:special_file_name LD Name type

 Separating.....

 Separate Normal End YYYY/MM/DD hh:mm:ss

 ATG:atgroup

 MV:special_file_name LD Name type

 RV:special_file_name LD Name type

 #

Description of messages:

Separate Start   YYYY/MM/DD hh:mm:ss

Separate start message and start time

ATG:atgroup

ATgroup name

MV:special_file_name   LD Name   type

 RV:special_file_name   LD Name   type

MV/RV's special file name, logical disk name, OS type

Separating.....

Message that appears during Separate execution

The display of this message can be suppressed by setting an option.

Separate Normal End   YYYY/MM/DD hh:mm:ss

Separate end message and end time

Usage

Windows system

This command performs ATgroup separation.

```
C:\>iSMrc_separate -atg ATmdb_test

Separate Start          2003/08/13 00:05:21
   ATG:ATmdb_test

C:\>
```

This command forcibly separates ATgroups and waits for separation to be completed.

iSMrc_separate -atg ATmdb_test -force -wait

 Separate Start 2003/10/10 09:11:23

 ATG:ATmdb_test

 Separating.....

 Separate Normal End 2003/10/10 09:15:32

 ATG:ATmdb_test

#

Notes

<Pair separation>

The target MV and RV must be paired.

The command cannot be executed if the sync state of the target pair is in the Replicate Preparing, Separate Preparing, Restore Preparing, or restore execution state.

The command cannot be executed if the sync state of the upper pair, which is paired with MV of the target pair, is in the separate execution state.

The command cannot be executed if the sync state of the lower pair, which is paired with RV of the target pair, is in the Separate Preparing or separate execution state.

The command cannot be executed if the disk array that contains the specified MV and RV is in the freeze state. Note that a forced separation to an Remote Replication pair can forcibly separate an MV or an RV in the local disk array individually even if the replication function is in the freeze state in the remote disk array.

Separate (immediate) function is not available for Remote Replication pair.

A dynamic disk cannot be used.

When Separate starts, flush the file system cache used by MV before the instruction is executed or unmount MV in order to finish updates to MV.

No pair belonging to an ATgroup can be operated.

The command cannot be executed if the logical disk of MV or RV is in the not in use state or the pool to which the logical disk belongs is in the rotation stop state by the power saving function. However, only the MV or RV that are neither in the not in use state nor rotation stop state can be forcibly separated individually.

The following notes do not apply to joint operation with SnapSAN Manager.

The target MV or RV must have been registered in the volume list.

When a remote-side volume is to be operated in remote operation, the target volume must satisfy the following conditions:

- A paired upper or lower volume for the target pair must have been registered in the volume list.

- When the MV or RV of the target pair is used also as a BV (base-volume) for snapshot, the BV or the LV linked to the BV must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

When specifying the combination of a volume group or a disk group with a special file name (logical disk name), for an MV(RV), specify the same number of logical volumes that constitute a volume group or a disk group on the specified special file name (logical disk name) side.

To specify a volume group, the target volume group must be active.

To specify a disk group, the target disk group must be active.

<ATgroup separation>

ATgroups to be separated must be in any of the following states except for forced separation specified with the -force option.

Replicate state (Rpl/sync) in the Atomic or Non-atomic state

Replicate execution (Rpl/exec) in the Non-atomic state

Separate start (Sep/start) in the Non-atomic state

To keep data consistent throughout an ATgroup, separate it in the following ATgroup state. Forced separation does not maintain data consistency.

Replicate state (Rpl/sync) in the Atomic state

After separation (except forced separation), the RV access restriction becomes the Read/Write enabled state.

The RV access restriction stays in the ReadOnly or NotReady state at forced separation. In this case, the RV access restriction can be shifted to the Read/Write enabled state by forcibly changing (iSMrc_change) the ATgroup and pair sync state on the distributor side to put the ATgroup in Separated state.

The command cannot be executed if the replication function of the disk array to which the target ATgroup belongs is in the freeze state. Note that, if the replication function is in the freeze state in the remote disk array, the command forcibly separates only the concentrator or distributor in the local disk array.

A dynamic disk cannot be used.

The file system used by the MV has been flushed or the MV must have been unmounted.

The command cannot be executed when logical disk of MV or RV included in the ATgroup is not in use state or that the pool to which the logical disk belongs is in the rotation stop state for the power saving function. However, only the MV or RV that are neither in the not in use state nor rotation stop state can be forcibly separated individually.

The command cannot be executed if the logical disk of MV or RV included in the ATgroup is in the not in use state and the pool to which the logical disk belongs is in the rotation stop state by the power saving function. However, only the MV or RV that are neither in the not in use state nor rotation stop state can be forcibly separated individually.

The following notes do not apply to joint operation with SnapSAN Manager.

When the secure mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, MVs or RVs of all the pairs that belong to the target ATgroup must have been registered in the volume list.

When the standard mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, at least one logical disk that belongs to the target ATgroup must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

Return Values

<Pair separation>

Operation for all the paired volumes terminated normally.

Operation for all the paired volumes terminated abnormally.

This command terminates abnormally in the following cases.

- • A parameter is invalid.
- • A condition for operation is not satisfied.
- • An attempt to operate a disk array fails.

Operation for some paired volumes terminated abnormally.

The command terminated abnormally because all or some of the paired volumes were already in Replicate State.

<ATgroup separation>

ATgroup operation terminated normally.

ATgroup operation terminated abnormally.

This command terminates abnormally in the following cases.

- • A parameter is invalid.
- • A condition for operation is not satisfied.
- • An attempt to operate a disk array fails.
- • An attempt to operate some pairs fails.
- • A wait for separation to be completed is discontinued.

An attempt to operate some pairs fails and ATgroup operation terminated abnormally.

ATgroup operation terminated abnormally because the current ATgroup sync state is already Sep/exec, Separated, Fault/recovering, or Fault.

iSMrc_restore

Name

   iSMrc_restore - Starts restoring pairs or ATgroups.

Synopsis

iSMrc_restore -mv volume -mvflg mv_flg

 [-rv volume -rvflg rv_flg]

 [-cprange copy_range] [-cpmode copy_mode]

 [-rvacc rv_access] [-wait [second] | -nowait]

 [-mode operation_mode]

[-iopath iopath]

iSMrc_restore -file file_name

  [-cprange copy_range] [-cpmode copy_mode]

  [-rvacc rv_access] [-wait [second] | -nowait]

  [-mode operation_mode]

  [-iopath iopath]

iSMrc_restore -atg atgroup

  [-cprange copy_range]

  [-rvacc rv_access] [-wait [second] | -nowait]

  [-arrayname diskarray]

  [-iopath iopath]

iSMrc_restore -ver

iSMrc_restore

iSMrc_restore -help

Description

The iSMrc_restore command restores data from the paired RV to MV.

If an ATgroup is specified, restoration is performed from the RV to the MV in all Remote Replication pairs belonging to the ATgroup. Restore (protect) is applied to the ATgroup. Performing restoration requires unmounting the MV and RV file system previously.

If the MV has been recognized by the server where restoration is to be performed, on the Windows system, unmount MV, flush the file system buffer, and then start Restore. After starting Restore, re-mount the MV.

Options

The iSMrc_restore command recognizes the following Options and arguments.

-mv volume Specify volume of MV.

-mvflg mv_flg Specify the volume type specified in -mv.

This argument must be specified with -mv.

The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

- rv volume Specify volume of RV.
- rvflg rv_flg Specify the volume type specified in -rv.

This argument must be specified if -rv is specified.

The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

- atg atgroup Specify the name of ATgroup to be operated.
- cprange copy_range Specify the range of copy from RV to MV.

In copy_range, one of the following can be specified.

diff Differences between the MV and RV are copied from the RV to the MV.

full Restore all area from RV to MV.

If this argument is omitted, the operation is the same as the operation when diff is specified.

- cpmode copy_mode Specify how to reflect the MV update to RV (copy mode).

In copy_mode, one of the following can be specified.

sync Sync mode

semi Semi-sync mode

bg Background copy mode

If this argument is omitted, the operation is the same as the operation when sync is specified.

If the Restore (protect) is carried out, this argument specification becomes invalid.

- rvacc rv_access Specify the access restrictions for RV.

In rv_access, one of the following can be specified.

ro Only read is allowed for RV.

nr Access to RV is not allowed.

If this argument is omitted, the operation is the same as the operation when nr is specified.

-wait [second] | -nowait Specifying -wait causes the pair sync state or ATgroup sync state to be monitored at regular intervals to wait for restoration to be completed. Restore (protect) is applied to the ATgroup. For this reason, the ATgroup state automatically shifts to Separated as restoration sync is completed.

For second, monitoring time interval can be specified within a range of 1 to 30 (integer) seconds. The default is 5 seconds. This value can be changed in the replication operation option setting file on the Windows system

If an abnormality occurs in sync state transition, the wait is discontinued immediately; resulting in an abnormal termination.

Specifying -nowait simply starts restoration; it does not wait for restoration to be completed.

If this argument is omitted, the operation is the same as the operation when -nowait is specified.

-mode operation_mode Specify an operation mode for RV at execution of Restore.

One of the following can be specified for operation_mode:

update: Performs restoration while reflecting the updated data of the MV into the RV. When the restoration is completed, the state changes to Sync State (rst/sync).

protect: Performs restoration without reflecting the updated data of the MV into the RV. When the restoration is completed, Separate is automatically executed and then the state changes to Separated State.

default: This value can be changed in the replication operation option setting file on the Windows system.

If this argument is omitted, the system performs the same operation as when default is selected.

- arrayname diskarray If -atg is used to specify an ATgroup, it is possible to specify the disk array name (nickname) of an operation target.
- iopath iopath Specify a replication I/O path for a disk array. The specification with this argument overrides the replication operation option setting file on Windows.

One of the following can be specified for iopath.

direct Replication I/O commands are issued directly to disk arrays.

manager SnapSAN Manager being operated in the same server is connected and replication I/O commands are issued to disk arrays from SnapSAN Manager.

If this argument is omitted, the replication operation option setting file (Windows).

- file file_name To specify multiple pairs, describe the pairs of MV/RV in file_name.

When multiple pairs are specified and if an error occurs in some pairs, the process is continued until it is terminated in all the specified pairs.

- ver Displays the version information of this command.

Displays the usage of this command (Windows).

Displayed Information

Windows System

When pair restoration terminates normally with -wait specified, the following information is displayed.

```
C:\>iSMrc_restore -mv Id_name -mvflg Id -rv Id_name -rvflg Id -wait2

iSMrc_restore: Info:            iSM13224: MV is restored.
    Volume Name: volume name

    MountPoint: drive letter or mount point

Umount Start               YYYY/MM/DD hh:mm:ss
Umount Normal End          YYYY/MM/DD hh:mm:ss
Restore Start              YYYY/MM/DD hh:mm:ss
    MV:disk_number    Id_name               type
        volume name
        path
    RV:disk_number    Id_name               type
        volume name
        path

Restoring.....
Restore Normal End         YYYY/MM/DD hh:mm:ss
    MV:disk_number    Id_name               type
        volume name
        path
    RV:disk_number    Id_name               type
        volume name
        path

C:\>
```

When ATgroup restoration terminates normally with -wait specified, the following information is displayed.

```
C:\>iSMrc_restore -atg atgroup -wait

Restore Start                    YYYY/MM/DD hh:mm:ss
   ATG:atgroup
     MV:disk_number     ld_name                      type
         volume name
         path
     RV:disk_number     ld_name                      type
         volume name
         path

Restoring.....
Restore Normal End               YYYY/MM/DD hh:mm:ss
   ATG:atgroup
     MV:disk_number     ld_name                      type
         volume name
         path
     RV:disk_number     ld_name                      type
         volume name
         path

C:\>
```

Description of messages:

iSM13224: MV is restored.

   Volume Name: Volume_name

   Mount Point: drive letter or mount point

Mount point volume name of MV, and drive letter or NTFS folder name

Umount Start   YYYY/MM/DD hh:mm:ss

Message indicating the start of unmounting MV, and start time

Umount Normal End   YYYY/MM/DD hh:mm:ss

Message indicating the end of unmounting MV, and end time

Restore Start   YYYY/MM/DD hh:mm:ss

Message indicating the start of restore, and start time

ATG:atgroup

ATgroup name

MV:disk_number   ld_name   type

   volume name

   path

RV:disk_number   ld_name   type

   volume name

   path

MV/RV physical disk number, logical disk name, OS type, mount point volume name, and drive letters or path name mounted to the folder of the NTFS volume accessed by users

Restoring.....

Message in Restore execution

This option setting enables this message to be output.

Restore Normal End   YYYY/MM/DD hh:mm:ss

Restore end message and end time

When ATgroup restoration terminates normally with -wait specified, the following information is displayed.

iSMrc_restore -atg atgroup -wait

 Restore Start YYYY/MM/DD hh:mm:ss

  ATG:atgroup

   MV:special_file_name LD Name type

   RV:special_file_name LD Name type

 Restoring.....

 Restore Normal End YYYY/MM/DD hh:mm:ss

  ATG:atgroup

   MV:special_file_name LD Name type

   RV:special_file_name LD Name type

#

Description of messages:

Restore Start   YYYY/MM/DD hh:mm:ss

Restore start message and start time

ATG:atgroup

ATgroup name

MV:special_file_name   LD Name   type

 RV:special_file_name   LD Name   type

MV/RV's special file name, logical disk name, OS type

The special file name is displayed as a 32-byte item on Linux.

Restoring.....

Message that appears during Restore execution

The display of this message can be suppressed by setting an option. .

Restore Normal End   YYYY/MM/DD hh:mm:ss

Restore end message and end time

Usage

Windows System

This command restores a pair with a monitoring time interval of 2 seconds specified with -wait.

```
C:\>iSMrc_restore -mv dev001 -mvflg ld -rv dev002 -rvflg ld -wait 2

iSMrc_restore: Info:              iSM13224: MV is restored.
    Volume Name: \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
    MountPoint: G:\
Umount Start                      2001/01/28 17:55:11
Umount Normal End                 2001/01/28 17:55:12
Restore Start                     2001/01/28 17:55:13
    MV:1     dev001                            WN
        \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
        G:
    RV:-     dev002                            WN
        -
        -

Restoring.....
Restore Normal End                2001/01/28 17:55:19
    MV:1     dev001                            WN
        \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
        G:
    RV:-     dev002                            WN
        -
        -

C:\>
```

This command restores more than one pair, using the replication operation file. In this example, a monitoring time interval of 2 seconds is specified with -wait.

```
C:\>iSMrc_restore -file volume_file -wait 2

iSMrc_restore: Info:              iSM13224: MV is restored.
    Volume Name: \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
    MountPoint: E:\
Umount Start                      2001/01/28 17:55:16
Umount Normal End                 2001/01/28 17:55:17
Restore Start                     2001/01/28 17:55:17
    MV:1    dev001                              WN
        \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
        E:
    RV:-    dev101                              WN
        -
        -
iSMrc_restore: Info:              iSM13224: MV is restored.
    Volume Name:  \\?\Volume{70facee0-58a7-11d5-ad3e-806d6172696f}\
    MountPoint:  F:\
Umount Start                      2001/01/28 17:55:20
Umount Normal End                 2001/01/28 17:55:21
Restore Start                     2001/01/28 17:55:21
    MV:3    dev002                              WN
        \\?\Volume{70facee0-58a7-11d5-ad3e-806d6172696f}\
        F:
    RV:-    dev102                              WN
        -
        -
Restoring.....

Restore Normal End                2001/01/28 17:55:51
    MV:3    dev002                              WN
        \\?\Volume{70facee0-58a7-11d5-ad3e-806d6172696f}\
        F:
    RV:-    dev102                              WN
        -
        -
Restore Normal End                2001/01/28 17:55:58
    MV:1    dev001                              WN
        \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
        E:
    RV:-    dev101                              WN
        -
        -

C:\>
```

The end messages are displayed in the order Restore commands terminate.

This command starts restoring an ATgroup.

```
C:\>iSMrc_restore -atg ATmdb_test

Restore Start              2003/08/13 00:05:21
  ATG:ATmdb_test
   MV:9      WN_1126_0331h_MV              WN
      \\?\Volume{fe357b40-757c-11d7-92f4-00004c7929e8}\
      F:
   RV:-      WN_0010_051dh_RV             WN
      -
      -

   MV:10     WN_1126_0332h_MV             WN
      \\?\Volume{fe357b3a-757c-11d7-92f4-00004c7929e8}\
   RV:-      WN_0010_051eh_RV            WN
      -
      -

C:\>
```

The command is executed by specifying a volume group that consists of two logical volumes, /dev/rdsk/c1t1d0 and /dev/rdsk/c1t1d1, for an MV.

iSMrc_restore -mv /dev/vg100 -mvflg vg -rv disk221 disk222 -rvflg ld -wait 2

 Restore Start 2000/10/10 09:11:23

　MV:/dev/rdsk/c1t1d0   disk001   NX

　RV:-   disk221   NX

 Restore Start   2000/10/10 09:11:23

　MV:/dev/rdsk/c1t1d1   disk002   NX

　RV:-   disk222   NX

 Restoring.....

 Restore Normal End 2000/10/10 09:16:12

　MV:/dev/rdsk/c1t1d0   disk001   NX

　RV:-   disk221   NX

Restore Normal End 2000/10/10 09:16:35

MV:/dev/rdsk/c1t1d1 disk002 NX

RV:- disk222   NX

#

This command starts restoring an ATgroup.

iSMrc_restore -atg ATG01

 Restore Start 2000/10/10 09:11:23

 ATG:ATG01

　MV:/dev/rdsk/c28t0d4   NX_1126_0331h_MV   NX

　RV:-   NX_0010_051dh_RV   NX

　MV:/dev/rdsk/c28t0d5   NX_1126_0332h_MV   NX

　RV:-   NX_0010_051eh_RV   NX

#

Notes

<Pair restoration>

The target MV and RV must be paired.

The activity state of the target pair must be Separate. However, the command cannot be executed if the sync state is Separate Preparing or Separating.

The Semi-Sync copy mode cannot be specified for pairs set in the same disk array. Specify the Semi-Sync copy mode for pairs set in different disk arrays when required.

The command cannot be executed if the disk array that contains the specified MV and RV is in the freeze state.

The activity state of the pair of the specified MV and the paired upper RV must be Separated state.

If the specified MV is used as a BV (base-volume) for snapshot, the command cannot be executed when a restore fault occurs.

If the specified MV is used as a BV (base-volume) for snapshot, the snapshot for all SVs (snapshot- volumes) paired with the BV must be snapshot-inactive.

If the specified RV is used as a BV (base-volume) for snapshot, the command cannot be executed when restoration from the SV (snapshot-volume) is in progress or a restore fault occurs.

If the specified RV is used as a BV (base-volume) for snapshot, the RV update restore cannot be executed.

If the specified MV or RV is used as a BV (base-volume) for snapshot, the command cannot be executed when link setting of the BV is in progress.

The activity state of the pair of the specified MV and the paired upper MV must be Separated state.

The sync state of the pair of the specified RV and the paired lower RV must be in the Separated state.

When MV or RV is in the protection state (ReadOnly or NotAccessible) by the data retention function, Restore (update) cannot be executed.

When MV is in the protection state (ReadOnly or NotAccessible) or RV is NotAccessible by the data retention function, Restore (protect) cannot be executed.

A dynamic disk cannot be used.

MV and RV must be unmounted.

No pair belonging to an ATgroup can be operated.

The command cannot be executed if the logical disk of MV or RV is in the not in use state or the pool to which the logical disk belongs is in the rotation stop state by the power saving function.

Restore(update) cannot be executed if the update prevention state of the MV or RV is Prevent by the volume update prevention function.

Restore(protect) cannot be executed if the update prevention state of the MV is Prevent by the volume update prevention function.

The following notes do not apply to joint operation with SnapSAN Manager.

The target MV or RV must have been registered in the volume list.

When a remote-side volume is to be operated in remote operation, the target volume must satisfy the following conditions:

- A paired upper or lower volume for the target pair must have been registered in the volume list.
- When the MV or RV of the target pair is used also as a BV (base-volume) for snapshot, the BV or the LV linked to the BV must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

When specifying the combination of a volume group or a disk group with a special file name (logical disk name), for an MV(RV), specify the same number of logical volumes that constitute a volume group or a disk group on the specified special file name (logical disk name) side. In this case, copying is performed in the specified order.

To specify a volume group, the target volume group must be active.

To specify a disk group, the target disk group must be active.

<ATgroup restoration>

The ATgroup sync state of the target ATgroup must be either of the following.

Separate completed (Separated)

Restore suspend (Rst/suspend)

The command cannot be executed if the replication function of the disk array to which the target ATgroup belongs is in the freeze state.

A dynamic disk cannot be used.

Both the MV and RV must have been used

The command cannot be executed if logical disk of MV or RV included in the ATgroup is not in use state or that the pool to which the logical disk belongs is in the rotation stop state for the power saving function.

The command cannot be executed if the update prevention state of the MV in the ATgroup is Prevent by the volume update prevention function.

The following notes do not apply to joint operation with SnapSAN Manager.

When the secure mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, MVs or RVs of all the pairs that belong to the target ATgroup must have been registered in the volume list.

When the standard mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, at least one logical disk that belongs to the target ATgroup must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

Return Values

<Pair restoration>

Operation for all the paired volumes terminated normally.

Operation for all the paired volumes terminated abnormally.

This command terminates abnormally in the following cases.

A parameter is invalid.

A condition for operation is not satisfied.

An attempt to operate a disk array fails.

Operation for some paired volumes terminated abnormally.

The command terminated abnormally because all or some of the paired volumes were already in Restore State.

<ATgroup restoration>

ATgroup operation terminated normally.

ATgroup operation terminated abnormally.

This command terminates abnormally in the following cases.

 A parameter is invalid.

 A condition for operation is not satisfied.

 An attempt to operate a disk array fails.

 An attempt to operate some pairs fails.

 A wait for restoration to be completed is discontinued.

 Transition occurs to an ATgroup sync state other than Rst/exec or Separated (that accompanies the completion of restoration) during a wait for restoration to be completed.

An attempt to operate some pairs fails and ATgroup operation terminated abnormally.

ATgroup operation terminated abnormally because the current ATgroup sync state is already Rst/exec.

iSMrc_change

Name

iSMrc_change - Changes copy control state of a pair or recovers from fault separation state by ATgroup state change.

Synopsis

iSMrc_change {-suspend | -resume | -sync | -semi | -bg}

  -mv volume -mvflg mv_flg

  [-rv volume -rvflg rv_flg]

  [-iopath iopath]

iSMrc_change -file file_name

  {-suspend | -resume | -sync | -semi | -bg}

  [-iopath iopath]

iSMrc_change -atg atgroup

  -force force_state

  [-arrayname diskarray]

  [-iopath iopath]

iSMrc_change -ver

iSMrc_change

iSMrc_change -help

Description

The iSMrc_change command changes the copy control state of the paired MV/RV.

In Restore (protect), copy mode changes (Overland Mirroring, Replication, and background copy mode) do not take effect because updates to the MV are not reflected on the RV.

If an ATgroup is specified, changing the ATgroup sync state from Fault to Separated makes the MV or RV usable.

To continue operations using the RV on the distributor side in case of a system failure on the concentrator (MV) side and so on, you must change the ATgroup sync state forcibly to Separated state using this command on the distributor side and make the RV usable.

In addition, when you perform Restore after the ATgroup sync state becomes Fault due to ATgroup forced separation and so on, you must change the ATgroup sync state to Separated state using this command on the concentrator side before executing Restore.

Options

The iSMrc_change command recognizes the following Options and arguments.

- suspend Suspends all the copy control states of the Sync Copy mode, Semi-Sync Copy mode, and Background Copy mode.
- resume Selects the foreground copy mode.
- sync Executes with the Sync Copy mode as the copy control state.
- semi Executes with the Semi-Sync Copy mode as the copy control state.
- bg Selects the background copy mode to perform copy operations asynchronously from I/O operations.
- mv volume Specify volume of MV.
- mvflg mv_flg Specify the volume type specified in -mv.

This argument must be specified with -mv.

The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

- rv volume Specify volume of RV.
- rvflg rv_flg Specify the volume type specified in -rv.

This argument must be specified if -rv is specified.

The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

- atg atgroup Specify the name of ATgroup to be operated.
- arrayname diskarray If -atg is used to specify an ATgroup, it is possible to specify the disk array name (nickname) of an operation target.
- force force_state Used to forcibly change the ATgroup sync state.

The following value is specified for force_state.

- separated The ATgroup sync state is changed from Fault to Separated. (Recovery from fault separation state)
- iopath iopath Specify a replication I/O path for a disk array. The specification with this argument overrides the replication operation option setting file.

One of the following can be specified for iopath.

direct Replication I/O commands are issued directly to disk arrays.

manager SnapSAN Manager being operated in the same server is connected and replication I/O commands are issued to disk arrays from SnapSAN Manager.

If this argument is omitted, the replication operation option setting file (Windows) -file file_name. To specify multiple pairs, describe the pairs of MV/RV in file_name.

When multiple pairs are specified and if an error occurs in some pairs, the process is continued until it is terminated in all the specified pairs.

- ver Displays the version information of this command.
- Displays the usage of this command (Windows).

Displayed Information

Windows System

When a change to the copy control state of a pair terminates normally with -suspend specified, the following information is displayed.

```
C:\>iSMrc_change -suspend -mv ld_name -mvflgld -rv ld_name -rvflgld

Change Start                        YYYY/MM/DD hh:mm:ss
    MV:disk_number      ld_name                        type
        volume name
        path
    RV:disk_number      ld_name                        type
        volume name
        path

Change Normal End                   YYYY/MM/DD hh:mm:ss
    MV:disk_number      ld_name                        type
        volume name
        path
    RV:disk_number      ld_name                        type
        volume name
        path

C:\>
```

When changes to an ATgroup state terminate normally, the following information is displayed.

```
C:\>iSMrc_change -atg atgroup   -force force_state

Change Start                      YYYY/MM/DD hh:mm:ss
  ATG:atgroup
    MV:disk_number      ld_name                 type
       volume name
       path
    RV:disk_number      ld_name                 type
       volume name
       path

Change Normal End                 YYYY/MM/DD hh:mm:ss
  ATG:atgroup
    MV:disk_number      ld_name                 type
       volume name
       path
    RV:disk_number      ld_name                 type
       volume name
       path

C:\>
```

Description of messages:

Change Start   YYYY/MM/DD hh:mm:ss

Change Copy Control State starting message and Start Time

ATG:atgroup

ATgroup name

MV:disk_number   ld_name   type

  volume name

  path

RV:disk_number   ld_name   type

  volume name

  path

MV/RV physical disk number, logical disk name, OS type, mount point volume name, and drive letters mounted to the folder of the NTFS volume accessed by users

Change Normal End   YYYY/MM/DD hh:mm:ss

Change Copy Control State end message and end time

When changes to an ATgroup state terminate normally, the following information is displayed.

iSMrc_change -atg atgroup -force force_state

 Change Start YYYY/MM/DD hh:mm:ss

 ATG:atgroup

 MV:special_file_name LD Name type

 RV:special_file_name LD Name type

Change Normal End YYYY/MM/DD hh:mm:ss

ATG:atgroup

MV:special_file_name LD Name type

RV:special_file_name LD Name type

#

Description of messages:

Change Start   YYYY/MM/DD hh:mm:ss

Change Copy Control State start message and start time

ATG:atgroup

ATgroup name

MV:special_file_name   LD Name   type

RV:special_file_name   LD Name   type

MV/RV's special file name, logical disk name, OS type

Change Normal End   YYYY/MM/DD hh:mm:ss

Change Copy Control State end message and end time

Usage

Windows system

The command changes the ATgroup state to Separated.

```
C:\>iSMrc_change -atg ATmdb_test -force separated
Change Start                    2003/08/13 10:06:32
  ATG:ATmdb_test
    MV:1    dev001                          WN
        \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
        E:
    RV:-    dev101                          WN
        -
        -

    MV:1    dev002                          WN
        \\?\Volume{69facee0-58ae-11d6-ad3e-806d6172696f}\
        F:
    RV:-    dev102                          WN
        -
        -
Change Normal End               2003/08/13 10:06:35
  ATG:ATmdb_test
    MV:1    dev001                          WN
        \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
        E:
    RV:-    dev101                          WN
        -
        -

    MV:1    dev002                          WN
        \\?\Volume{69facee0-58ae-11d6-ad3e-806d6172696f}\
        F:
    RV:-    dev102                          WN
        -
        -

C:\>
```

Change Start 2000/10/10 09:11:30

MV:/dev/rdsk/c0t1d0 disk001 NX

RV:- disk002 NX

Change Normal End 2000/10/10 09:11:31

MV:/dev/rdsk/c0t1d0 disk001 NX

RV:- disk002 NX

\#

The command changes the ATgroup state to Separated.

\# iSMrc_change -atg ATmdb_test -force separated

Change Start 2003/08/13 10:06:32

ATG:ATmdb_test

MV:- NX_1126_0331h_MV NX

RV:/dev/rdsk/c30t0d6 NX_0010_051dh_RV NX

MV:- NX_1126_0332h_MV NX

RV:/dev/rdsk/c30t0d7 NX_0010_051eh_RV NX

Change Normal End 2003/08/13 10:06:35

ATG:ATmdb_test

MV:- NX_1126_0331h_MV NX

RV:/dev/rdsk/c30t0d6 NX_0010_051dh_RV NX

MV:- NX_1126_0332h_MV NX

RV:/dev/rdsk/c30t0d7 NX_0010_051eh_RV NX

\#

Notes

<Changing the copy control state of a pair>

The target MV and RV must be paired.

The activity state of the target pair must be Replicate or Restore. However, the command cannot be executed if the sync state is Replicate Preparing or Restore Preparing.

The Semi-Sync copy mode cannot be specified for pairs set in the same disk array.

When the asynchronous remote data replication function (Replication and Mirroring Asynchronous) is used for the pair, set in different disk arrays, of which activity state is Replicate, the copy control state of the pair must be the background copy mode.

Specify the Semi-Sync copy mode for pairs set in different disk arrays when required.

The command cannot be executed if the disk array that contains the specified MV and RV is in the freeze state.

Changing from Sync to Semi-Sync copy mode or from Semi-Sync to Sync copy mode is disabled.

If the activity state of the target pair and a pair of the specified MV and the upper paired MV is Replicate, the copy control state of the pair must be the background copy mode.

If the specified RV is used as a BV (base-volume) for snapshot, the copy control state of the pair must be the background copy mode.

The copy control state cannot be changed when the activity state of the pair of the specified MV and the paired upper MV is separate execution.

The copy control state cannot be changed when the activity state of the pair of the specified RV and the paired lower RV is Separate Preparing, Replicate Preparing, or separate execution.

A dynamic disk cannot be used.

No pair belonging to an ATgroup can be operated.

The command cannot be executed if the logical disk of MV or RV is in the not in use state or the pool to which the logical disk belongs is in the rotation stop state by the power saving function.

The following notes do not apply to joint operation with SnapSAN Manager.

The target MV or RV must have been registered in the volume list.

When a remote-side volume is to be operated in remote operation, the target volume must satisfy the following conditions:

- A paired upper or lower volume for the target pair must have been registered in the volume list.
- When the MV or RV of the target pair is used also as a BV (base-volume) for snapshot, the BV or the LV linked to the BV must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

When specifying the combination of a volume group or a disk group with a special file name (logical disk name), for an MV (RV), specify the same number of logical volumes that constitute a volume group or a disk group on the specified special file name (logical disk name) side.

- To specify a volume group, the target volume group must be active.
- To specify a disk group, the target disk group must be active.

Changing the copy control state of an ATgroup>

If the sync state of an ATgroup and pair is to be changed forcibly, the sync state of the target ATgroup must be Fault.

If the distributor forcibly changed the sync state of an ATgroup and pair, the access restriction of the RV shifts to the Read/Write enabled state.

The command cannot be executed if the replication function of the disk array to which the target ATgroup belongs is in the freeze state.

A dynamic disk cannot be used.

The following notes do not apply to joint operation with SnapSAN Manager.

When the secure mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, MVs or RVs of all the pairs that belong to the target ATgroup must have been registered in the volume list.

When the standard mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, at least one logical disk that belongs to the target ATgroup must have been registered in the volume list.

"The command cannot be executed when the volume list is being created."

Return Values

Changing the Copy Control State of a Pair

- Operation for all the paired volumes terminated normally.
- Operation for all the paired volumes terminated abnormally.

This command terminates abnormally in the following cases.

- A parameter is invalid.
- A condition for operation is not satisfied.
- An attempt to operate a disk array fails.
- Operation for some paired volumes terminated abnormally.

The command terminated abnormally because all or some of the paired volumes were already in Replicate State.

- Operation with -suspend specified for paired volumes for which Copy has been suspended
- Operation with -resume, -sync, or -semi specified for paired volumes for which Foreground Copy is in progress
- Operation with -bg specified for paired volumes for which Background Copy is in progress

Changing the State of an ATgroup

- ATgroup operation terminated normally.
- ATgroup operation terminated abnormally.

This command terminates abnormally in the following cases.

- A parameter is invalid.
- A condition for operation is not satisfied.
- An attempt to operate a disk array fails.

An attempt to forcibly change the sync state of an ATgroup and pair terminated abnormally because the current ATgroup sync state is already Fault/recovering or Separated.

iSMrc_wait

Name

iSMrc_wait - Waits for a pair and ATgroup to enter the Rpl/sync, Rst/sync, or Separated state.

Synopsis

iSMrc_wait -cond condition

 -mv volume -mvflg mv_flg

 [-rv volume -rvflg rv_flg]

 [-interval interval_time] [-limit limit_time]

 [-iopath iopath]

iSMrc_wait -cond condition

 -rv volume -rvflg rv_flg

 [-interval interval_time] [-limit limit_time]

 [-iopath iopath]

iSMrc_wait -cond condition

 -file file_name

 [-interval interval_time] [-limit limit_time]

 [-iopath iopath]

iSMrc_wait -cond condition

 -atg atgroup

 [-interval interval_time]

 [-limit limit_time]

 [-arrayname diskarray]

 [-iopath iopath]

iSMrc_wait -ver

iSMrc_wait

iSMrc_wait help

Description

The iSMrc_wait command waits for a specified pair of volumes to enter the Sync State (rpl/sync), Sync State (rst/sync), or Separated State.

It also waits for a specified ATgroup to enter the Rpl/sync or Separated State, which accompanies the completion of separation or restoration.

Options

The iSMrc_wait command recognizes the followingOptions:

MV and/or RV can be specified in any of the combinations below.

o MV and RV: Waits for a specified pair of volumes to enter a target state.

o MV only: If an MV is paired with an RV on a 1:1 basis, the RV can be omitted. The command waits for the relevant pair to enter a target state in the same manner as when both MV and RV are specified.

o RV only: Same operation as when MV and RV are specified

- mv volume Specify a volume of MV.
- mvflg mv_flg Specify the type of the volume specified for -mv.

This argument must be specified with -mv.

 The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

- rv volume Specify a volume of RV.
- rvflg rv_flg Specify the type of the volume specified for -rv.

This argument must be specified if -rv is specified.

The only volume type usable in joint operation with SnapSAN Manager is logical disk name.-atg atgroup Specify the name of ATgroup to be operated.

- cond condition Specify a wait end condition. This argument cannot be omitted. Either of the following can be specified as condition to wait for a pair to enter a target state.

sync Waits for Sync State (rpl/sync) or Sync State (rst/sync).

sep Waits for Separated State (separated).

One of the following can be specified as condition to wait for an ATgroup to enter a target state.

sync Waits for:

Rpl/sync in the Atomic state

Rpl/sync in the Non-atomic state

sep Waits for:

Separated in the Atomic state

Separated in the Non-atomic state

The command terminates abnormally if transition occurs to Fault during the wait, however.

fault Waits for:

Separated in the Atomic state

Fault in the Atomic state

Separated in the Non-atomic state

Fault in the Non-atomic state

atsep Waits for:

Separated in the Atomic state

The command terminates abnormally if transition occurs to one of the following states during the wait, however.

Fault in the Atomic state

Separated in the Non-atomic state

Fault in the Non-atomic state

Fault/recovering in Non-atomic state

atfault Waits for:

Separated in the Atomic state

Fault in the Atomic state

The command terminates abnormally if transition occurs to one of the following states during the wait, however.

Separated in the Non-atomic state

Fault in the Non-atomic state

Fault/recovering in Non-atomic state

interval interval_time

Specify an interval (in seconds) at which the state of paired volumes or ATgroup is to be monitored.

The value can be specified from 1 to 30 seconds (integer).

This value can be changed in the replication operation option setting file on the Windows.

The default is an interval of 5 seconds.

limit limit_time Specify a wait time limit.

Either of the following can be specified for limit_time.

numeric-value

Waits until the specified time elapses since the wait starts. A value 0 to 86,400 seconds (integer) can be specified.

nolim Unlimited wait

If the end condition specified for the -cond option is not satisfied before the specified time passes after the wait starts, the wait is discontinued and the command terminates abnormally.

This value can be changed in the replication operation option setting file on the Windows system.

The default is unlimited wait.

One of the following can be specified for iopath.

direct Replication I/O commands are issued directly to disk arrays.

manager SnapSAN Manager being operated in the same server is connected and replication I/O commands are issued to disk arrays from SnapSAN Manager.

If this argument is omitted, the replication operation option setting file (Windows).

file file_name To specify more than a pair of volumes, specify the volume names for file_name.

If multiple pairs of volumes are specified and an error occurs in a pair of volumes, the system does not discontinue operation. The system continues operation until processing for all the specified pairs of volumes is completed.

- ver Displays the version information of this command.

Displays the usage of this command (Windows).

Displayed Information

Windows System

When the command executed to wait for a pair to enter the Rpl/sync, Rst/sync, or Separated state terminates normally, the following information is displayed.

```
C:\> iSMrc_wait -mv Id_name -mvflg Id  -rv Id_name -rvflg Id  -cond sync
Waiting.....
activity Normal End              YYYY/MM/DD hh:mm:ss
    MV:disk_number    Id_name                   type
        volume name
        path
    RV:disk_number    Id_name                   type
        volume name
        path

C:\>
```

When the command executed to wait for an ATgroup to enter the Rpl/sync or Separated state, which accompanies the completion of restoration or separation terminates normally, the following information is displayed.

```
C:\> iSMrc_wait -atg atgroup -cond condition
Waiting.....
activity Normal End      YYYY/MM/DD hh:mm:ss
  ATG:atgroup
    MV:disk_number   ld_name                 type
        volume name
        path
    RV:disk_number   ld_name                 type
        volume name
        path

C:\>
```

Description of messages:

Waiting.....

Message during execution of the wait command

The display of this message can be suppressed by setting an option.

activity Normal End   YYYY/MM/DD hh:mm:ss

Message indicating the end of a wait, and date and time of the end

activity represents one of the following:

Replicate : Wait for Rpl/sync

Restore : Wait for Rst/sync

Separate : Wait for Separated (including Separated that accompanies the   completion of Restore (protect)).

ATG:atgroup

ATgroup name

MV:disk_number   ld_name   type

  volume name

  path

RV:disk_number   ld_name   type

  volume name

  path

MV/RV physical disk number, logical disk name, OS type, mount point volume name, and drive letter of the drive mounted in the folder of the NTFS volume accessed by the user

When the command executed to wait for an ATgroup to enter the Rpl/sync or Separated state, which accompanies the completion of restoration or separation terminates normally, the following information is displayed.

iSMrc_wait -cond condition -atg atgroup

 Waiting.....

 activity Normal End YYYY/MM/DD hh:mm:ss

ATG:atgroup

MV:special_file_name   LD Name type

RV:special_file_name   LD Name type

#

Description of messages:

Waiting.....

Message that appears during execution of the wait command

The display of this message can be suppressed by setting an option.

activity Normal End   YYYY/MM/DD hh:mm:ss

Message indicating the end of a wait, and date and time of the end

activity represents one of the following:

Replicate : Wait for Rpl/sync

Restore : Wait for Rst/sync

Separate : Wait for Separated (including Separated that accompanies the   completion of Restore (protect)).

ATG:atgroup

ATgroup name

MV:special_file_name   LD Name   type

RV:special_file_name   LD Name   type

MV/RV's special file name, logical disk name, OS type

Usage

Windows System

With 1 second specified as the monitoring interval in the -interval option, the command is executed to wait for paired volume to enter the Separated State.

```
C:\>iSMrc_wait -mv dev001 -mvflg ld -rv dev002 -rvflg ld -cond sep -interval 1
Waiting.....
Separate Normal End 2001/01/28 17:56:23
    MV:1      dev001                            WN
        \\?\Volume{69facee0-58a7-11d5-ad3e-806d6172696f}\
        G:
    RV:-      dev002                            WN
        -
        -

C:\>
```

The command waits for an ATgroup to enter the Separated state.

```
C:\>iSMrc_wait -atg ATmdb_test -cond sep
Waiting.....
Separate Normal End        2003/08/13 10:52:48
  ATG:ATmdb_test
   MV:9   WN_1126_0331h_MV                    WN
       \\?\Volume{fe357b40-757c-11d7-92f4-00004c7929e8}\
        F:
   RV:-    WN_0010_051dh_RV                   WN
    -
    -

   MV:10   WN_1126_0332h_MV                   WN
       \\?\Volume{fe357b3a-757c-11d7-92f4-00004c7929e8}\
        G:
   RV:-    WN_0010_051eh_RV                   WN
    -
    -

C:\>
```

The command waits for an ATgroup to enter the Separated state.

iSMrc_wait -cond sep -atg ATmdb_test

  Waiting.....

  Separate Normal End 2003/08/13 10:52:48

   ATG:ATmdb_test

   MV:- NX_1126_0331h_MV NX

   RV:/dev/rdsk/c30t0d6 NX_0010_051dh_RV NX

   MV:- NX_1126_0332h_MV NX

   RV:/dev/rdsk/c30t0d7 NX_0010_051eh_RV NX

#

Notes

Waiting for a Pair to enter a Target State

The MV and RV to be operated must be set as a pair.

A dynamic disk cannot be used.

The following notes do not apply to joint operation with SnapSAN Manager.

The MV or RV to be operated must be registered in the volume list.

When a remote-side volume is to be operated in remote operation, the target volume must satisfy the following conditions:

- A paired upper or lower volume for the target pair must have been registered in the volume list.
- When the MV or RV of the target pair is used also as a BV (base-volume) for snapshot, the BV or the LV linked to the BV must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

When specifying the combination of a volume group or a disk group with a special file name (logical disk name), for an MV(RV), specify the same number of logical volumes that constitute a volume group or a disk group on the specified special file name (logical disk name) side.

To specify a volume group, the target volume group must be active.

To specify a disk group, the target disk group must be active.

Waiting for an ATgroup to enter a Target State

If an ATgroup link path failure occurs or if a difference between ATgroup copies cannot be obtained normally, the wait is discontinued and processing is discontinued, leading to an abnormal termination.

If an ATgroup enters the Rpl/suspend or Rst/suspend state during a wait, the wait is discontinued and processing is discontinued, leading to an abnormal termination.

The command cannot be executed if the replication function of the disk array to which the target ATgroup belongs is in the freeze state. If a freeze state is detected during a wait, the wait is discontinued and processing is discontinued, leading to an abnormal termination.

A dynamic disk cannot be used.

The following notes do not apply to joint operation with SnapSAN Manager.

- When the secure mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, MVs or RVs of all the pairs that belong to the target ATgroup must have been registered in the volume list.

- When the standard mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, at least one logical disk that belongs to the target ATgroup must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

Return Values

Waiting For A Pair To Enter A Target State

Operation for all the paired volumes terminated normally.

If the state specified for the wait end condition is already placed, normal termination is assumed.

Operation for all the paired volumes terminated abnormally.

The wait command terminates abnormally in the following cases:

- A parameter is invalid.
- A condition for operation is not satisfied.
- An attempt to operate a disk array fails.
- The state specified for the wait end condition is not placed before the specified time limit.

Operation for some paired volumes terminated abnormally.

Waiting for an ATgroup to enter a target state

ATgroup operation terminated normally.

Normal termination occurs if a target wait state is already satisfied.

ATgroup operation terminated abnormally.

Abnormal termination occurs in the following cases.

- A parameter is invalid.
- A condition for operation is not satisfied.

- An attempt to operate a disk array fails.
- If a wait end condition is not satisfied within a specified time interval.

iSMrc_query

Name

iSMrc_query - Displays the copy state of a pair or ATgroup.

Synopsis

iSMrc_query -mv volume -mvflg mv_flg

 [-rv volume -rvflg rv_flg]

 [-iopath iopath]

iSMrc_query -rv volume -rvflg rv_flg

 [-iopath iopath]

iSMrc_query -file file_name

 [-iopath iopath]

iSMrc_query -atg atgroup

 [-arrayname diskarray]

 [-iopath iopath]

iSMrc_query -ver

iSMrc_query

iSMrc_query -help

Description

The iSMrc_query command displays the copy state of the specified paired volumes.

It also displays the state values of an ATgroup and the Remote Replication pair that belongs to the ATgroup if the ATgroup is specified.

Options

The iSMrc_query command recognizes the following Options and arguments.

MV and RV can be specified in one of the following combinations:

- MV and RV Displays the state of the specified pair of volumes.
- MV only Displays the state of all volumes paired with MV.
- RV only Displays the state of volumes in the same way as when specifying MV and RV.
- mv volume Specify volume of MV.
- mvflg mv_flg Specify the volume type specified in -mv.

This argument must be specified with -mv.

The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

- rv volume Specify volume of RV.
- rvflg rv_flg Specify the volume type specified in -rv.

This argument must be specified if -rv is specified.

The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

- atg atgroup Specify the name of ATgroup to be operated.
- arrayname diskarray If -atg is used to specify an ATgroup, it is possible to specify the disk array name (nickname) of an operation target.
- iopath iopath Specify a replication I/O path for a disk array. The specification with this argument overrides the replication operation option setting file on Windows.

One of the following can be specified for iopath.

direct Replication I/O commands are issued directly to disk arrays.

manager SnapSAN Manager being operated in the same server is connected and replication I/O commands are issued to disk arrays from SnapSAN Manager.

 If this argument is omitted, the replication operation option setting file (Windows) .

- file file_name To specify multiple pairs, describe the pairs of MV/RV in file_name.

When multiple pairs are specified, if an error occurs in some pairs, an error message indicating that is displayed, and the process is continued until it is terminated in all the specified pairs.

- ver Displays the version information of this command.

Displays the usage of this command (Windows).

Displayed Information

Windows System

This command displays the following information about the copy state of a pair.

```
C:\>iSMrc_query-mv dev001 -mvflg ld
 MV: Disk No.                  mv_disk_number
     LD Name                   mv_ld_name
     Type                      mv_type
     Volume Name               mv_volume_name
     Path                      mv_path
 RV: Disk No.                  rv_disk_number
     LD Name                   rv_ld_name
     Type                      rv_type
     Volume Name               rv_volume_name
     Path                      rv_path
 Activity State               activity_state
 Sync State                   sync_state
 Copy Control State           copycontrol_state
 <state> Start Time           YYYY/MM/DD hh:mm:ss
 <state> End Time             YYYY/MM/DD hh:mm:ss
 Separate Diff                eeeeKB
 Copy Diff                    ffffKB
 RV Access                    gg
 Previous Active              previous_active_state
C:\>
```

This command displays the following information about the copy state of an ATgroup.

```
C:\>iSMrc_query-atg atgroup
ATG: atgroup
      Disk Array Name              arrayname
      Site                         site
      ATG State                    atg_consistency_state(atg_sync_state)
      ATG Path State               atg_path_state
      Atomic-break Mode            atmode
      Copy Mode                    cpmode
      ATG Copy Diff                bbb.bBB
      Pair Entry                   entry
MV: Disk No.                       mv_disk_number
      LD Name                      mv_ld_name
      Type                         mv_type
      Volume Name                  mv_volume_name
      Path                         mv_path
RV: Disk No.                       rv_disk_number
      LD Name                      rv_ld_name
      Type                         rv_type
      Volume Name                  rv_volume_name
      Path                         rv_path
Activity State                     activity_state
Sync State                         sync_state
Copy Control State                 copycontrol_state
<state> Start Time                 YYYY/MM/DD hh:mm:ss
<state> End Time                   YYYY/MM/DD hh:mm:ss
Separate Diff                      eeeeKB
Copy Diff                          ffffKB
RV Access                          gg
Previous Active                    previous_active_state

C:\>
```

Description of messages:

• `Disk Array Name`	Disk array name
• `Site`	ATgroup location
	concentrator : Concentrator
	distributor : Distributor
• `ATG State`	ATgroup consistency state and ATgroup sync state

The ATgroup sync state display is enclosed in parentheses, following the ATgroup consistency state display.

ATgroup consistency state

`Atomic`	State in which data consistency is kept throughout an ATgroup
`Non-atomic`	State in which data consistency is not kept throughout an ATgroup
`-`	State in which no pair is registered with the ATgroup, which, therefore, does not function (Invalid state)

ATgroup sync state

`-`	State in which no pair is registered with the ATgroup (Invalid state)
`Separated`	Separation completed
	All pairs in the ATgroup are in the following state and sync is at stop
	separate (separated)
`Fault/recovering`	Recovery from fault separation in progress
	Each pair in the ATgroup is in one of the following states and being transited from Fault to Separated.
	separate (separated)
	separate (fault)
	separate (cancel)
`Fault`	Failure separation
	Each pair in the ATgroup is in one of the following states and sync is at stop
	separate (separated)
	separate (fault)
	separate (cancel)
`Sep/start`	Separate start
	State in which some pairs in the ATgroup have been separated, that is, the activity state of some pairs is separate and that of others is replicate
`Sep/exec`	Separate execution
	State in which all pairs in the ATgroup have started separating and they are in one of the following states
	separate (sep/exec)
	separate (separated)
`Rpl/start`	Replicate start
	State in which some pairs in the ATgroup have started or restarted sync, that is, the activity state of some pairs is separate and that of

	others is replicate
Rpl/exec	Replicate execution
	State in which all pairs in the AT group have started replicating and in one of the following states
	replicate (rpl/exec)
	replicate (rpl/sync)
Rpl/sync	Replicate synchronous
	State in which all pairs in the AT group are in the following state, that is, they have been replicated and are in sync
	replicate (rpl/sync)
Rpl/suspend	Replicate suspend
	At least one pair in the AT group has stopped replicating and its copy control state is the following:
	abnormal suspend
Rst/exec	Restore execution
	At least one pair in the AT group has started restoring and its state is the following:
	restore (rst/exec)
Rst/suspend	Restore suspend
	At least one pair in the AT group has stopped restoring and its copy control state is the following:
	abnormal suspend

- **ATG Path State** — AT group link path state
  - – — State in which no pair is registered with the AT group
  - online — There is a normal link path.
  - freeze — The connected disk array is in the freeze state.
  - fault — All link paths are abnormal.
- **Atomic-break Mode** — Atomic-break mode

  This display appears if the current AT group sync state is Rpl/start, Rpl/exec, Rpl/sync, or Rpl/suspend. "-" (hyphen) is displayed in the other sync states. "-" is displayed if the current copy mode is the background copy mode, because the atomic break function is disabled.
  - stop — MV access stop
  - continue — MV access continuation
- **Copy Mode** — Copy mode

  This display appears if the current AT group sync state is Rpl/start, Rpl/exec, Rpl/sync, or Rpl/suspend. "-" (hyphen) is displayed in the other sync states.
  - sync — Synchronous copy mode
  - semi — Semi-synchronous copy mode
  - bg — Background copy mode
- **ATG Copy Diff**

  This display is an update difference value in the AT group followed by a measurement unit symbol ("MB", "GB", "TB", "PB", or "EB"). 1 kilobyte is 1024 bytes. For 1 GB and above, the displayed value is rounded up to the first decimal place. If the current AT group link path state is "fault", "-" (hyphen) is displayed.

• Pair Entry	Number of pairs registered with the ATgroup	
• Allowed Response	The allowed time for the MV delay that is an ATgroup attribute is displayed with the unit (s: second). Only the allowed time of the concentrator is displayed. A hyphen (-) is displayed for the allowed time of the distributer or when this function is not supported.	
• MV: Disk No.	MV physical disk number	
LD Name	Logical disk name	
Type	OS type	
Volume Name	Mount point volume name	
Path	Drive name mounted to the folder of the NTFS volume accessed by users	
• RV: Disk No.	RV physical disk number	
LD Name	Logical disk name	
Type	OS type	
Volume Name	Mount point volume name	
Path	Drive name mounted to the folder of the NTFS volume accessed by users	
• Activity State	Indicates the activity state.	
replicate	Replicate state	
restore	Restore state	
restore (protect)	Restore state with RV protection specified	
separate	Separate state	
• Sync State	Indicates the paired operation state.	
separated	Separated	
sep/preparing	Separate Preparing	
sep/exec	Separate execution	
cancel	Separate state (forced separate)	
fault	Separate state (fault separate)	
rpl/sync	Replicate complete	
rpl/preparing	Replicate Preparing	
rpl/exec	Replicate execution	
rst/sync	Restore complete	
rst/preparing	Restore Preparing	
rst/exec	Restore execution	

```
Copy Control State        -
Separate Start Time       -
Separate End Time         2001/06/03  13:37:24
Separate Diff             2177024 KB
Copy Diff                 0 KB
RV Access                 rw
Previous Active           -

#
```

(2) The command displays the information about the copy state of a pair by specifying a persistent special file name (example of HP-UX).

```
# iSMrc_query -mv /dev/rdisk/disk150 -mvflg sfn

MV: Special File          /dev/rdisk/disk150
    LD Name               disk001
    Type                  NX
RV: Special File          -
    LD Name               disk002
    Type                  NX
Activity State            separate
Sync State                separated
Copy Control State        -
Separate Start Time       2008/01/25 21:41:48
Separate End Time         2008/01/25 21:41:48
Separate Diff             0 KB
Copy Diff                 0 KB
RV Access                 rw
Previous Active           sep/exec

#
```

(3) The command displays the following information about the copy state of a pair (example when a Solaris QLC general-purpose driver is used as the HBA driver on Solaris).

```
# iSMrc_query -mv /dev/rdsk/c1t2001003013840874d1 -mvflg sfn

MV: Special File          /dev/rdsk/c1t2001003013840874d1
    LD Name               disk100
    Type                  CX
RV: Special File          -
    LD Name               disk200
    Type                  CX
Activity State            replicate
Sync State                rpl/sync
```

```
Copy Control State        foreground copy(sync)
Replicate Start Time      2001/10/20 11:41:33
Replicate End Time        2001/10/20 11:41:33
Separate Diff             0 KB
Copy Diff                 0 KB
RV Access                 nr
Previous Active           rpl/exec

#
```

(4)   The command displays the copy state of an ATgroup (example of HP-UX).

```
# iSMrc_query -atg ATmdb_test

ATG: ATmdb_test
        Disk Array Name       StorageS4300/1126
        Site                  concentrator
        ATG State             Atomic(Rpl/sync)
        ATG Path State        online
        Atomic-break Mode     continue
        Copy Mode             sync
        ATG Copy Diff         0 MB
        Pair Entry            2
        Allowed Response      -

MV: Special File          /dev/rdsk/c29t4d3
    LD Name               NX_1126_0122h_MV
    Type                  NX
RV: Special File          -
    LD Name               NX_0010_051bh_RV
    Type                  NX
Activity State            replicate
Sync State                rpl/sync
Copy Control State        foreground copy (sync)
Replicate Start Time      2003/08/13 00:02:34
Replicate End Time        2003/08/13 00:02:36
Separate Diff             0 KB
Copy Diff                 0 KB
RV Access                 nr
Previous Active           rpl/exec

MV: Special File          /dev/rdsk/c29t4d4
    LD Name               NX_1126_0123h_MV
    Type                  NX
RV: Special File          -
    LD Name               NX_0010_051ch_RV
    Type                  NX
Activity State            replicate




Sync State                rpl/sync
Copy Control State        foreground copy (sync)
Replicate Start Time      2003/08/13 00:02:35
Replicate End Time        2003/08/13 00:02:36
Separate Diff             0 KB
Copy Diff                 0 KB
RV Access                 nr
Previous Active           rpl/exec

#
```

Displaying the Copy State of a Pair

The target MV and RV must be paired.

A dynamic disk cannot be used.

The following notes do not apply to joint operation with SnapSAN Manager.

The target MV or RV must be registered in the Volume List.

When a remote-side volume is to be operated in remote operation, the target volume must satisfy the following conditions:

- A paired upper or lower volume for the target pair must have been registered in the volume list.
- When the MV or RV of the target pair is used also as a BV (base-volume) for snapshot, the BV or the LV linked to the BV must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

When specifying the combination of a volume group or a disk group with a special file name (logical disk name), for an MV(RV), specify the same number of logical volumes that constitute a volume group or a disk group on the specified special file name (logical disk name) side.

To specify a volume group, the target volume group must be active.

To specify a disk group, the target disk group must be active.

Displaying the Copy State of an ATgroup

An ATgroup having no registered pair can be a display target. In this case, information about the ATgroup is displayed; no information about the MV, RV or pair states is displayed, however.

A dynamic disk cannot be used.

The following notes do not apply to joint operation with SnapSAN Manager.

- When the secure mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, MVs or RVs of all the pairs that belong to the target ATgroup must have been registered in the volume list.
- When the standard mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, at least one logical disk that belongs to the target ATgroup must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

Return Values

Displaying the Copy State of a Pair

Operation for all the paired volumes terminated normally.

Operation for all the paired volumes terminated abnormally.

This command terminates abnormally in the following cases.

- A parameter is invalid.
- A condition for operation is not satisfied.
- An attempt to operate a disk array fails.

Operation for some paired volumes terminated abnormally.

Displaying the Copy State of an ATgroup

ATgroup operation terminated normally.

ATgroup operation terminated abnormally.

This command terminates abnormally in the following cases.

- A parameter is invalid.
- A condition for operation is not satisfied.
- An attempt to operate a disk array fails.

Displaying the cOpy State of a Pair

The target MV and RV must be paired.

A dynamic disk cannot be used.

The following notes do not apply to joint operation with SnapSAN Manager.

The target MV or RV must be registered in the Volume List.

When a remote-side volume is to be operated in remote operation, the target volume must satisfy the following conditions:

- A paired upper or lower volume for the target pair must have been registered in the volume list.
- When the MV or RV of the target pair is used also as a BV (base-volume) for snapshot, the BV or the LV linked to the BV must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

When specifying the combination of a volume group or a disk group with a special file name (logical disk name), for an MV(RV), specify the same number of logical volumes that constitute a volume group or a disk group on the specified special file name (logical disk name) side.

- To specify a volume group, the target volume group must be active.
- To specify a disk group, the target disk group must be active.

Displaying the Copy State of an ATgroup

An ATgroup having no registered pair can be a display target. In this case, information about the ATgroup is displayed; no information about the MV, RV or pair states is displayed, however.

A dynamic disk cannot be used.

The following notes do not apply to joint operation with SnapSAN Manager.

When the secure mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, MVs or RVs of all the pairs that belong to the target ATgroup must have been registered in the volume list.

When the standard mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, at least one logical disk that belongs to the target ATgroup must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

Return Values

Displaying the Copy State of a Pair

- Operation for all the paired volumes terminated normally.
- Operation for all the paired volumes terminated abnormally.

This command terminates abnormally in the following cases.

- • A parameter is invalid.
- • A condition for operation is not satisfied.
- • An attempt to operate a disk array fails.

Operation for some paired volumes terminated abnormally.

Displaying the Copy State of an ATgroup

ATgroup operation terminated normally.

ATgroup operation terminated abnormally.

This command terminates abnormally in the following cases.

- • A parameter is invalid.
- • A condition for operation is not satisfied.
- • An attempt to operate a disk array fails.

iSMrc_rvmode

Name

iSMrc_rvmode - Makes a change for the RV access restriction or RV data status.

Synopsis

iSMrc_rvmode -rv volume -rvflg rv_flg

{ -rvacc rv_access [-force] | -cancel }

[-rvdata rv_datastate]

[-iopath iopath]

iSMrc_rvmode -rv volume -rvflg rv_flg

-rvdata rv_datastate

[-iopath iopath]

iSMrc_rvmode -ver

iSMrc_rvmode

iSMrc_rvmode -help

Description

The iSMrc_rvmode command makes a change for the access restriction to a specified RV or data status of a specified RV.

Options

The iSMrc_rvmode command recognizes the following Options and arguments.

- • rv volume Specify an RV volume.
- • rvflg rv_flg Specify the type of the volume specified with -rv.

Note that the type of volume usable in joint operation with SnapSAN Manager is only the logical disk name.

-rvacc rv_access Specify the access restriction to be set to the specified RV.

rv_access must be any of the following:

 rw Makes the RV readable/writable (Read/Write).

ro Makes the RV readable (Read Only).

nr Makes the RV unreadable/unwritable (Not Ready).

na Makes the RV invalidated as an LU and unidentifiable from the system (Not Available). The na argument always requires the -force option to be specified together.

Omitting the argument for this option does not make any change for the RV access restriction.

- force Specify to set the RV access restriction to Not Ready or Not Available.

Any RV access restriction specified by this option remains kept regardless of the status of the pair. To cancel the RV access restriction specified by the -force option, execute the command using the -cancel option.

- cancel Specify to cancel the RV access restriction specified by the -force option. Canceling the RV access restriction using this option resumes the access restriction to it when the pair is replicated, separated, or restored.

Executing the command with the -cancel option to the RV access restriction without the -force option applied, the command abnormally ends.

rvdata rv_datastate Specify to make a change to the data status of the RV.

The data status of the RV is the information automatically controlled by the disk array's hardware provider in joint operation with Windows Server 2003 or Windows Server 2008 VSS (Volume Shadow copy Service), so the user usually does not need to operate it.

rv_datastate can be either of the following:

valid Makes the data status of the RV valid.

invalid Makes the data status of the RV invalid.

Omitting this argument does not make any change to the data status of the RV.

- iopath iopath Specify a replication I/O path for the disk arrays. The path specified with this option overrides the setting in the replication operation option setting file on Windows.

One of the following can be specified for iopath.

direct Replication I/O commands are issued directly to disk arrays.

manager SnapSAN Manager being operated in the same server is connected and replication I/O commands are issued to disk arrays from SnapSAN Manager. This argument cannot be specified in remote operations.

Omitting this argument applies the setting in the replication operation option setting file on Windows . -ver Displays the version of this command.

Displays the usage of this command (on Windows).

Displayed Information

Windows System

This command displays information about the execution when it successfully changes the RV access restriction or RV data status as follows.

```
C:\> iSMrc_updprevent -vol LD01 -volflg ld –mode cancel -force
iSMrc_updprevent: Info: iSM13247: Command has completed successfully.
(code=aaaa-bbbb-bbbb-bbbb)

C:\>
```

Description of messages:

iSM13247: Command has completed successfully. (code=aaaa-bbbb-bbbb-bbbb)

Indicates that the RV access restriction or data status of the RV was successfully changed. aaaa is a process number, and bbbb is the internal code for maintenance.

Usage

Windows System

To make the RV access restriction only readable (Read Only):

Notes

The target RV must be paired.

To make an RV readable/writable (Read/Write), the activity state of the target pair must be Separate.

The command cannot be executed if the sync state of the target pair is Replicate Preparing, Separate Preparing, or Restore Preparing.

The command cannot be executed if the sync state of the specified RV and the paired lower RV is Replicate Preparing, Separate Preparing, or Restore Preparing.

The command cannot be executed if the disk array that contains the target RV and paired MV is in the freeze state.

A dynamic disk cannot be used.

Any paired RV belonging to an ATgroup cannot be operated.

The following notes do not apply to joint operation with SnapSAN Manager.

The target RV must have been registered in the volume list.

Note that no remote operation is allowed to volumes in the remote disk array.

The command cannot be executed when the volume list is being created.

To specify a volume group, the target volume group must be active.

To specify a disk group, the target disk group must be active.

Return Values

The command successfully changed the RV access restriction or data status of the RV.

The command failed to change the RV access restriction or data status of the RV.

The command terminates abnormally in the following cases:

- A parameter is invalid.
- A condition for operation is not satisfied.
- An attempt to operate a disk array failed.

iSMrc_updprevent

Name

iSMrc_updprevent - Cancels the update prevention state of the specified volume.

Synopsis

iSMrc_updprevent -vol volume -volflg vol_flg

 -mode cancel -force

 [-iopath iopath]

iSMrc_updprevent -file file_name

 -mode cancel -force

 [-iopath iopath]

iSMrc_updprevent -ver

iSMrc_updprevent

iSMrc_updprevent -help

Description

The iSMrc_updprevent command cancels the update prevention state of the specified volume. This command must be executed for both MV and RV that constitute a Remote Replication pair. This command can be executed for IV that has been removed from a Remote Replication pair. If a trouble occurs in the disk array or the link path between disk arrays failed while the swap function of Remote Replication pair is being executed, the update prevention state of the volume may be Prevent. In this case, as recovery operation, it is necessary to cancel the update prevention state of the specified volume.

Options

The iSMrc_updprevent command recognizes the followingOptions.

- vol volume Specify a volume name.
- volflg vol_flg Specify the volume type specified in -vol.

This argument must be specified together with -vol.

The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

- mode cancel Specify cancellation of update prevention for a volume.

This argument must be specified together with the -force option.

- force Specify forced cancellation of update prevention.

This argument must be specified together with the -mode option.

- iopath iopath Specify a replication I/O path for a disk array. The specification with this argument overrides the replication operation option setting file on Windows

One of the following can be specified in iopath.

direct Replication I/O commands are issued directly to disk arrays.

manager SnapSAN Manager being operated in the same server is connected and replication I/O commands are issued to disk arrays from SnapSAN Manager.

If this argument is omitted, the replication operation option setting file (Windows) is used.

- file file_name To specify multiple volumes, describe the volume names in file_name.

When multiple volumes are specified, if an error occurs in some volumes, the process is not suspended but continued until it is terminated in all the specified volumes.

- ver Displays the version information of this command.

Displays the usage of this command (Windows).

Displayed Information

Windows System

This command specifies a volume and performs forced cancellation of update prevention.

```
C:\> iSMrc_updprevent -vol ld-name -volflg ld –mode cancel -force
iSMrc_updprevent: Info: iSM13247: Command has completed successfully.
(code=aaaa-bbbb-bbbb-bbbb)

C:\>
```

Windows system

The command specifies a volume and cancels update prevention forcibly.

```
C:\> iSMrc_updprevent -vol LD01 -volflg ld –mode cancel -force
iSMrc_updprevent: Info: iSM13247: Command has completed successfully.
(code=aaaa-bbbb-bbbb-bbbb)

C:\>
```

Pair Operations

iSMrc_pair

Name

iSMrc_pair - Pair setting, unpair or forced unpair.

Synopsis

iSMrc_pair -pair

 -mv volume -mvflg mv_flg

 -rv volume -rvflg rv_flg

 [-iopath iopath]

iSMrc_pair -unpair

 -mv volume -mvflg mv_flg

 [-rv volume -rvflg rv_flg]

 [-force force_arg]

 [-iopath iopath]

iSMrc_pair {-pair | -unpair [-force force_arg]}

-file file_name

[-iopath iopath]

iSMrc_pair -ver

iSMrc_pair

iSMrc_pair -help

Description

The iSMrc_pair command performs pair setting, unpair, or forced unpair operation for the specified pair.

Options

The iSMrc_pair command recognizes the following Options and arguments:

- pair Performs the pair setting for the logical disks specified as an MV and an RV.
- unpair Unpair the logical disks specified as an MV and an RV.
- mv volume Specify the volume of MV.
- mvflg mv_flg Specify the volume type specified in -mv.

This argument must be specified together with -mv.

The pair setting and canceling operation is performed on a single logical volume basis. Therefore, neither an LVM volume group nor a VxVM disk group can be specified as volume. The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

- rv volume Specify the volume of RV.

At unpairing, if multiple RVs are paired with one MV, the RV specification cannot be omitted.

- rvflg rv_flg Specify the volume type specified in -rv.

This argument must be specified together with -rv.

The pair setting and canceling operation is performed on a single logical volume basis. Therefore, neither an LVM volume group nor a VxVM disk group can be specified as volume. The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

- iopath iopath Specify a replication I/O path for a disk array. The specification with this argument overrides the replication operation option setting file on Windows.

One of the following can be specified for iopath.

direct Replication I/O commands are issued directly to disk arrays.

manager SnapSAN Manager being operated in the same server is connected and replication I/O commands are issued to disk arrays from SnapSAN Manager.

If this argument is omitted, the replication operation option setting file (Windows).

- force force_arg Forced unpair. If a failure occurred on the MV side or RV side disk array and the regular unpair is impossible, forced unpair of either the MV or the RV. After the cause of the failure has been removed, be sure to perform forced unpair of the other MV or RV.

One of the following can be specified in force_arg.

all Forced unpair of both the MV and the RV.

The target MV and RV must have been recognized by the OS.

mv Forced unpair of the MV.

 The target MV must have been recognized by the OS.

rv Forced unpair of the RV.

The target RV must have been recognized by the OS.

-file file_name To specify multiple pairs, describe the paired MV and RV in file_name.

When multiple pairs are specified, if an error occurs in any of the pairs, the process is continued until processing of all the specified pairs has been completed.

-ver Displays the version information of this command.

Displays the usage of this command (Windows).

Displayed Information

The pair setting operation is performed.

Windows system

```
C:\> iSMrc_pair -pair -mv Id_name -mvflg Id -rv Id_name -rvflg Id
iSMrc_pair: Info:        iSM13247: Command has completed successfully. (code =
aaaa-bbbb-bbbb-bbbb)
C:\>
```

Usage

Windows System

This command specifies the MV and the RV and cancels the pair relation.

```
C:\> iSMrc_pair -unpair -mv MV01 -mvflg Id -rv RV01 -rvflg Id
iSMrc_pair: Info:        iSM13247: Command has completed successfully. (code =
1862-0d03-0004-0000)
C:\>
```

iSMrc_swap

Name

iSMrc_swap - Swaps an Remote Replication pair or resumes swap

Synopsis

iSMrc_swap -mv volume -mvflg mv_flg

 -rv volume -rvflg rv_flg

 [-iopath iopath]

iSMrc_swap -file file_name

 [-iopath iopath]

iSMrc_swap -ver

iSMrc_swap

iSMrc_swap -help

Description

The iSMrc_swap command swaps the specified Remote Replication pair or resumes the swap. When swapping operation is suspended due to abnormality, the swap operation is executed again after recovery. This is the resumption of the swap.

The file system of the MV and the RV needs to be unmounted before the swap.

Windows System

When the MV or the RV is recognized on the server where swap operation for the pair is executed, unmount the file system of the MV or the RV before swapping the pair.

Options

The iSMrc_swap command recognizes the followingOptions.

- mv volume Specify MV before pair swap.
- mvflg mv_flg Specify the type of volume specified with -mv.

This argument must be specified together with -mv.

The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

- -rv volume Specify an RV before pair swap.

When multiple RVs are set to the MV, RV specification cannot be omitted.

- rvflg rv_flg Specify the type of volume specified with -rv.

This argument must be specified together with -rv.

The only volume type usable in joint operation with SnapSAN Manager is logical disk name.

- iopath iopath Specify a replication I/O path for a disk array. The specification with this argument overrides the replication operation option setting file on Windows.

One of the following can be specified in iopath.

direct Replication I/O commands are issued directly to disk arrays.

manager SnapSAN Manager being operated in the same server is connected and replication I/O commands are issued to disk arrays from SnapSAN Manager.

 If this argument is omitted, the replication operation option setting file (Windows) or the environment variable settings is used. -file file_name To specify multiple pairs, describe the pairs of MV/RV in file_name.

When multiple pairs are specified, if an error occurs in some pairs, the process is not suspended but continued until it is terminated in all the specified pairs.

- ver Displays the version information of this command.

Displays the usage of this command (Windows).

Displayed Information

Windows system

This command swaps an Remote Replication pair or resumes the swap.

```
C:\> iSMrc_swap -mv ld-name -mvflg ld -rv ld-name -rvflg ld
iSMrc_swap: Info:       iSM13247: Command has completed successfully.
(code=aaaa-bbbb-bbbb-bbbb)
C:\>
```

Usage

Windows System

The command specifies the MV and the RV and swaps the Remote Replication pair or resumes the swap.

```
C:\> iSMrc_swap -mv MV01 -mvflg ld -rv RV01 -rvflg ld
iSMrc_swap: Info:       iSM13247: Command has completed successfully.
(code=1862-2704-0000-0000)
C:\>
```

To perform swap for Remote Replication pair, the following conditions must be satisfied.

The target MV and RV must be paired.

The target pair must be an Remote Replication pair.

The target pair must be the top-level pair.

The command cannot be executed if the number of pairs with the lower RVs, which are paired with the specified RV, reaches the upper limit number of settable pairs.

The command cannot be executed if the disk array that contains the specified MV and RV is in the freeze state.

The sync state of the target pair must be in the sync state for replication.

The command cannot be executed if the sync state of the pair with the lower RV, which is paired with the specified RV, is the Separate Preparing, Replicate Preparing, or separate execution state.

The command cannot be executed, if a pair with other RV, which is paired with the specified MV, exists, when the sync state of the pair is Separate Preparing, Replicate Preparing, separate execution state or swap operation is being executed.

A dynamic disk cannot be used.

MV and RV must be unmounted.

This command cannot be executed if volume comparing/identity certified is being executed for the target pair or the pair set with other RV, which is paired with the specified MV, by the Remote Replication quick sync function.

The command cannot be executed when the target pair is being swapped.

No pair belonging to an ATgroup can be operated.

The command cannot be executed if the logical disk of MV or RV is in the not in use state or the pool to which the logical disk belong is in the rotation stop state by the power saving function.

The resumption of swap is used as the recovery operation from a failure in swap.

The following notes do not apply to joint operation with SnapSAN Manager.

The target MV or RV must have been registered in the volume list.

When a remote-side pair is to be operated in remote operation, the target pair must satisfy the following conditions:

- • An upper or lower volume to be paired of the target pair has been registered in the volume list.
- • When the MV or RV of the target pair is also used as a BV (base-volume) for snapshot, the BV or the LV linked to the BV must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

When specifying the combination of a volume group or a disk group with a special file name (logical disk name), for an MV (RV), specify the same number of logical volumes that constitute a volume group or a disk group on the specified special file name (logical disk name) side. In this case, pairs are swapped in the specified order.

To specify a volume group, the target volume group must be active.

To specify a disk group, the target disk group must be active.

Return Values

Operation for the swap for all Remote Replication pairs or operation for resumption of the swap terminated normally.

Operation for the swap for all Remote Replication pairs or operation for resumption of the swap terminated abnormally.

This command terminated abnormally in the following cases.

- • A parameter is invalid.
- • A condition for operation is not satisfied.
- • An instruction fails due to abnormal disk array.

Operation for the swap for some Remote Replication pairs or operation for resumption of the swap terminated abnormally.

Building ATgroups

iSMrc_atg

[NAME]

iSMrc_atg - ATgroup creation and deletion, attribute updating, pair registration and deletion with an ATgroup.

Synopsis

iSMrc_atg -create -atg atgroup -arrayname diskarray

  [-linkarrayname linkdiskarray]

  [-allowedresponse allowedresponsetime]

  [-iopath iopath]

iSMrc_atg -delete -atg atgroup -arrayname diskarray

  [-force]

  [-iopath iopath]

iSMrc_atg -add   -atg atgroup

-mv mv_volume -mvflg mv_flg [-rv rv_volume -rvflg

rv_flg]

[-arrayname diskarray]

[-iopath iopath]

iSMrc_atg -add   -atg atgroup

 -file file_name

[-arrayname diskarray]

[-iopath iopath]

iSMrc_atg -remove   -atg atgroup

 -mv mv_volume -mvflg mv_flg [-rv rv_volume -rvflg

 rv_flg]

[-arrayname diskarray]

[-iopath iopath]

iSMrc_atg -remove   -atg atgroup

 -file file_name

[-arrayname diskarray]

[-iopath iopath]

iSMrc_atg -update   -atg atgroup

 -allowedresponse allowedresponsetime

[-arrayname diskarray]

[-iopath iopath]

iSMrc_atg -ver

iSMrc_atg

iSMrc_atg -help

Description

The iSMrc_atg command creates and deletes an ATgroup. It also registers pairs with an ATgroup and deletes them.

Options

The iSMrc_atg command recognizes the followingOptions.

- create Creates an ATgroup.
- delete Deletes an ATgroup.
- Deleting an ATgroup requires previously deleting all pair registrations from the ATgroup.
- add Registers pairs with an ATgroup.
- remove Deletes pairs from an ATgroup.
- update Updates the allowed time for the MV delay that is an ATgroup attribute.
- atg atgroup Specifies an ATgroup name as an operation target.

- force Specifies to perform forced deletion of ATgroup information from the concentrator or the distributor. (Forced deletion of ATgroup)

If a remote disk array failure or its recovery has erased information from the concentrator or distributor, or if an MV-side disk array failure or its recovery has erased information from the concentrator; resulting in discrepancy with the ATgroup information held on the disk array of the local system, it is necessary to forcibly delete the ATgroup information from the local system, using this option.

- mv mv_volume Specifies an MV for a pair to be registered with an ATgroup.
- mvflg mv_flg Specifies the type of a volume specified with the -mv option.

The -mvflg option must be specified together with the -mv option.

It is impossible to specify the LVM volume group and VxVM disk group, because each ATgroup is built in units of a single logical volume. Note that the type of volume usable in joint operation with SnapSAN Manager is only the logical disk name.

- rv rv_volume Specifies an RV for a pair to be registered with the ATgroup. The RV must have been paired in Remote Replication configuration.
- rvflg rv_flg Specifies the type of a volume specified with the -rv option.

The -rvflg option must be specified together with the -rv option.

It is impossible to specify the LVM volume group and VxVM disk group, because each ATgroup is built in units of a single logical volume. Note that the type of volume usable in joint operation with SnapSAN Manager is only the logical disk name.

- file file_name Registering more than one pair with an ATgroup at a time or deleting more than one pair from an ATgroup at a time requires previously describing all volumes in the target pairs in the replication operation file and specifying the file with the file_name option.

If a failure is detected during processing of pairs, the command terminates abnormally, aborting the processing.

- arrayname diskarray Specifies the disk array name (nickname) of the operation target.
- linkarrayname linkdiskarray

When creating an ATgroup with the disk array which supports the function specifying the link disk array as a concentrator, specify link disk array name (nickname) configuring the ATgroup.

With the disk array which does not support this function, it is not required to specify this function. It is ignored even if specified.

To check whether the operation target disk array supports the function specifying the link disk array, refer to the disk array properties of the disk array on the replication screen of the SnapSAN Manager.

- allowedresponse allowedresponsetime

Specifies the allowed time for the MV delay that is an ATgroup attribute in seconds. The specifiable range is 1 to 18 (seconds). The default value is 18.

- iopath iopath Specifies the I/O issuance path for disk array replication. This argument overrides the replication operation option setting file (Windows).

The following can be specified for iopath.

direct Directly issues a replication I/O command to a disk array.

manager SnapSAN Manager being operated in the same server is connected and replication I/O commands are issued to disk arrays from SnapSAN Manager.

If this argument is omitted, the replication operation option setting file (Windows).

- ver Displays the version information of this command.

Displays the usage of this command (Windows).

Displayed Information

Windows system

The command creates an ATgroup and registers a pair with it.

```
C:\> iSMrc_atg -create -atg ATGmdb01 -arrayname LocalArray -linkarrayname RemoteArray
-allowedresponse AllowedResponseTime
iSMrc_atg: Info:        iSM13247: Command has completed successfully.
                        (code=aaaa-bbbb-bbbb-bbbb)

C:\> iSMrc_atg -add -atg ATGmdb01 -mv MVDB001 -mvflg Id -arrayname LocalArray
iSMrc_atg: Info:        iSM13247: Command has completed successfully.
                        (code=aaaa-bbbb-bbbb-bbbb)

C:\>
```

The command updates the allowed time for the MV delay for the ATgroup.

```
C:\> iSMrc_atg -update -atg ATGmdb01 -allowedresponse AllowedResponseTime
iSMrc_atg: Info:        iSM13247: Command has completed successfully.
                        (code=aaaa-bbbb-bbbb-bbbb)

C:\>
```

The command cancels registration of pairs from an ATgroup and deletes the ATgroup.

```
C:\> iSMrc_atg -remove -atg ATGmdb01 -mv MVDB001 -mvflg ld -arrayname LocalArray
iSMrc_atg: Info:          iSM13247: Command has completed successfully.
                          (code=aaaa-bbbb-bbbb-bbbb)

C:\> iSMrc_atg -delete -atg ATGmdb01 -arrayname LocalArray
iSMrc_atg: Info:          iSM13247: Command has completed successfully.
                          (code=aaaa-bbbb-bbbb-bbbb)


C:\>
```

Description of messages:

iSM13247: Command has completed successfully. (code=aaaa-bbbb-bbbb-bbbb)

The message means that the operations for a target ATgroup were completed normally.

aaaa represents a process number, and bbbb, an internal code for maintenance.

The command updates the allowed time for the MV delay for the ATgroup.

iSMrc_atg -update -atg ATGmdb01 -allowedresponse AllowedResponseTime

iSMrc_atg: Info: iSM13247: Command has completed successfully. (code=aaaa-bbbb-bbbb-bbbb)

#

 The command cancels registration of pairs from an ATgroup and deletes the ATgroup.

iSMrc_atg -remove -atg ATGmdb01 -mv MVDB001 -mvflg ld -arrayname LocalArray

iSMrc_atg: Info: iSM13247: Command has completed successfully. (code=aaaa-bbbb-bbbb-bbbb)

iSMrc_atg -delete -atg ATGmdb01 -arrayname LocalArray

iSMrc_atg: Info: iSM13247: Command has completed successfully. (code=aaaa-bbbb-bbbb-bbbb)

#

Description of messages:

iSM13247: Command has completed successfully. (code=aaaa-bbbb-bbbb-bbbb)

The message means that the operations for a target ATgroup were completed normally.

aaaa represents a process number, and bbbb, an internal code for maintenance.

Create and Delete Atgroups, Update The Attributes, and Register Pairs with an Atgroup

It is possible to create and delete ATgroups, update the attributes, and register pairs with an ATgroup and cancel the registration of pairs from an ATgroup only from the concentrator on the MV side.

The name of each ATgroup to be created must be unique throughout the system. Only alphanumeric characters, "_" (underbar), and "/" (slash) can be used in ATgroup names; any other characters cannot be used.

- To create an ATgroup, it is required to specify a link disk array using the "-linkarrayname" option when the disk array on the concentrator side supports the function specifying the link disk array.

- To delete an ATgroup, all the pair registrations must have been deleted from the ATgroup and the ATgroup sync state must be Invalid.

- To update the allowed time for the MV delay that is an ATgroup attribute, the ATgroup sync state must be Invalid, Separated, or Fault.

Forcibly deleting an ATgroup from the concentrator requires previously setting the ATgroup sync state to Invalid, Separated, or Fault.

It is possible to forcibly delete an ATgroup from the concentrator while the disk array on the distributor side has been struck (the link path status is abnormal) but it may take several minutes to complete the forced deletion. Although a SCSI I/O error (detailed code SenseKey=4 or b, ASC=98, ASCQ=0a) may be returned for the forced deletion and recorded to syslog and the like, the ATgroup has been deleted.

When having forcibly deleted an ATgroup from the concentrator while the disk array on the distributor side has been struck (the link path status is abnormal), before rebuilding the ATgroup, restore the disk array on the distributor side and link path to the normal status. It is impossible to create an ATgroup while the disk array on the distributor side has been struck (the link path status is abnormal).

Pairs to be registered with ATgroups must be in Remote Replication configuration. Only one RV in Remote Replication configuration can be specified for a single MV.

- When a pair in Remote Replication configuration is to be registered with an ATgroup, if the RV of the pair has been used as a BV (base-volume) for snapshot, the pair cannot be registered with the ATgroup.

- When a pair in Remote Replication configuration is to be registered with an ATgroup, if the MV or RV of the pair has been protected by the data retention function, the pair cannot be registered with the ATgroup.

- When a pair in Remote Replication configuration to be registered with an ATgroup is being swapped by the swap function for Remote Replication pair, the pair cannot be registered with the ATgroup.

- When pairs are to be registered with an ATgroup, the sync state of the ATgroup must be Invalid, Separated, or Fault.

Deleting the registration of pairs from an ATgroup requires that the sync state of the ATgroup be Separated or Fault.

The command cannot be executed if the replication function of a disk array to which the target ATgroup belongs is in the freeze state.

A dynamic disk cannot be used.

The following notes do not apply to joint operation with SnapSAN Manager.

The MV or RV of a pair to be registered with an ATgroup must have been registered in the volume list.

At least one logical disk on the disk array to which the target ATgroup belongs must have been registered in the volume list.

The command cannot be executed when the volume list is being created.

When the secure mode is set as the operation mode from the relevant system for the disk array or link disk array including the ATgroup to be operated, MVs or RVs of all the pairs that belong to the target ATgroup must have been registered in the volume list in order to use any of the following functions.

- Forced deletion of ATgroup
- Deleting a pair from an ATgroup
- Registering a pair to an ATgroup

Return Values

The operations of an ATgroup or all pairs terminated normally.

The operations of an ATgroup or all pairs terminated abnormally.

This command terminates abnormally in the following cases.

- A parameter is invalid.
- A condition for operation is not satisfied.
- An attempt to operate a disk array fails.

Operation for some pairs terminated abnormally.

The ATgroup create operation terminated abnormally because another ATgroup having the same name has already been created.

Alternatively, the pair registration operation to the ATgroup terminated abnormally because all pairs or some pairs have already been registered to the ATgroup.

Disk Array Operations

iSMrc_arrayinfo

Name
```
iSMrc_arrayinfo -  Displays information about the disk array
replication function.
```

Synopsis
```
iSMrc_arrayinfo -arrayname diskarray  {-dinfo | -linfo}
 [-iopath iopath]
iSMrc_arrayinfo -ver
iSMrc_arrayinfo
iSMrc_arrayinfo -help
```

Description

The iSMrc_arrayinfo command obtains and displays information about the disk array replication function.

Options

The iSMrc_arrayinfo command recognizes the following Options.

- arrayname diskarray Specifies the disk array name (nickname) of an operation target.
- dinfo Obtains and displays the settings of the replication function.
- linfo As for disk arrays having the Replication and Mirroring function, obtains and displays information about disk array connections and the state of each link path.
- iopath iopath Specify a replication I/O path for a disk array. The specification with this argument overrides the replication operation option setting file on Windows.

One of the following can be specified for iopath.

direct Replication I/O commands are issued directly to disk arrays.

manager SnapSAN Manager being operated in the same server is connected and replication I/O commands are issued to disk arrays from iSM.

If this argument is omitted, the replication operation option setting file (Windows) is used.

-ver Displays the version information of this command.

Displays the usage of this command (Windows).

Displayed Information

Information about the disk array replication function

Given below is an example of executing the command on Windows.

```
C:\> iSMrc_arrayinfo -arrayname diskarray -dinfo
Disk Array Name            dddddddddddddddddddddddddddddddd
SAA                        aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa ... aaa
Differential Map           mmmmmmmm
Replication Status         ssssssss
Back Ground Copy Level     c
Max Number of RV Setting   r
Max Capacity of Pair Volume   volume_capacity


C:\>
```

Description of messages:

Disk Array Name Disk array name

SAA Subsystem Absolute Address

Indicates the value that can identify the disk array of interest uniquely.

Differential Map Differential map mounted/not

Indicates whether the differential management function for holding the status of copy differences between the MV and RV is available.

- Build Differential map mounted
- Not Build Differential map not mounted

Replication Status Status of the disk array replication function

- Ready The function is usable.
- Freeze The function is unusable.

Indicates whether the disk array replication function is frozen or the disk array power is turned off.

Back Ground Copy Level Background copy level

Indicates the priority of the background copy mode.

Max Number of RV Setting

- Maximum number of RVs that can be specified. Indicates the maximum number of RVs that can be specified for one MV.

Max Capacity of Pair Volume

- Maximum capacity. Indicates the maximum capacity of a volume to which a pair can be set in GB.

Disk array connections and the state of each link path

Given below is an example of executing the command on Windows.

```
C:\> iSMrc_arrayinfo -arrayname StorageS3300/1035 -dinfo
Disk Array Name           StorageS3300/1035
SAA                       0200200000004c517b220000000000000000 ... 0000
Differential Map          Build
Replication Status        Ready
Back Ground Copy Level    3
Max Number of RV Setting  4
Max Capacity of Pair Volume 2046GB

C:\>
```

The command can be used to display the connections of disk arrays and the link path state for confirmation purposes.

Snapshot Function

Operation File

To perform batch setting of paired volumes by a snapshot command with the -file option, use the snapshot operation file.

The snapshot operation file is described below.

File Location and Name

Can be freely specified.

Description

The snapshot operation file is used to perform batch setting of multiple pairs by using a snapshot command.

Synopsis

This file is described in the following synopsis:

 For the snapshot operation commands (iSMsc_create, iSMsc_delete, iSMsc_restore, iSMsc_wait, and iSMsc_svguard)

 For the snapshot information acquisition command (iSMsc_query)

```
BV_Type:BV                          SV_Type:SV
```

```
BV_Type:BV
```

To describe the BV and SV, use a colon (":") to connect the volume type (*BV_Type* or *SV_Type*) with the volume (*BV* or *SV*). When the SV can be omitted, describe only the BV information.

❖ For the link operation commands (iSMsc_link and iSMsc_unlink)

```
LV_Type:LV                          BV_Type:BV
```

```
LV_Type:LV                          SV_Type:SV
```

```
LV_Type:LV
```

Describe the LV and BV/SV, with the volume type (*LV_Type* or *BV_Type*/*SV_Type*) and the volume (*LV* or *BV*/*SV*) connected using a colon (":"). When the BV/SV can be omitted, describe only the LV information.

❖ For the link information acquisition command (iSMsc_linkinfo)

```
VOL_Type:VOL
```

To display the link information, describe the volume, with the volume type (VOL_Type) and the volume (VOL) connected using a colon (:).

Specifying volume types

The following values can be specified as a volume type (BV_Type or SV_Type) by using either a numerical value or a character string.

Target Volume	Volume Types		Target System
	By Number	By Characters	Windows
Logical disk name	0	ld	✓
Special file name	1	sfn	-
Volume group name	2	vg	-
Drive letter	4	drv	✓
Disk group name	5	dg	-

Target Volume	Volume Types		Target System
	By Number	By Characters	Windows
Mount point volume name	6	mvol	✓
NTFS folder name	7	mdir	✓
Relative generation (SV only)	10	relgen	✓
Cyclic generation (SV only)	11	cyclic	✓
Auto selection (SV only)	12	auto	✓
SV batch operation (SV only)	13	all	✓

When cyclic generation, auto selection or SV batch deletion is specified, the volume name is not described (no data is described after :).

The following values can be specified as a volume type (LV_Type or VOL_Type) by using either a numerical value or a character string.

Volume Types (LV_Type and VOL_Type)

Target Volume	Volume Types		Target System
	By Number	By Characters	Windows
Logical disk name	0	ld	✓
Special file name	1	sfn	-
Drive letter	4	drv	✓
Mount point volume name	6	mvol	✓
NTFS folder name	7	mdir	✓

A volume type (SV_Type or VOL_Type) can also be specified as [BV volume type + relative generation]. The following values can be specified using either a numerical value or a character string.

Volume Types (SV_Type and VOL_Type)

Target Volume	Volume Types		Target System
	By Number	By Characters	Windows
Logical disk name	100	ld.relgen	✓
Special file name	101	sfn.relgen	-
Drive letter	104	drv.relgen	✓
Mount point volume name	106	mvol.relgen	✓
NTFS folder name	107	mdir.relgen	✓

Describe the volume type (character string) with the character string representing the relative generation (relgen) connected using a period (.). Likewise, describe the volume with the character string connected using a period (.).

A description example is as follows: ld.relgen: volume-LD-name.-1

Specifying a volume (BV, SV, LV, VOL)

Specify the name of the target volume that has an attribute specified as a volume type.

The maximum number of characters is as follows:

Specifying a Volume

Target Volume	Maximum Number of Characters
Logical disk name	32 single-byte characters
Volume group name	
Drive letter	
Disk group name	
Special file name	32 single-byte characters 64 single-byte characters
Mount point volume name	52 single-byte characters
NTFS folder name	260 single-byte characters
Relative generation	4 single-byte characters * ".-n" format (n = 1 to 16)

Rules

- Start description from the first column of the line.
- A line break shall be a partition of records.
- Up to 1,024 single-byte characters can be described per record.
- One pair can be described per record.
- When there is one BV and one SV, description of the SV can be omitted.
- Normally, when there is one BV and multiple SVs, description of the SVs cannot be omitted.
- Use a blank space or a tab character to separate the description of the BV (LV) from the description of the SV.
- Text displayed from the sharp (#) character to the end of the record is recognized as a comment.
- If there is an error in the file syntax, operations to all pairs described in the file become invalid.
- When describing a pair that combines a volume group or a disk group with a special file name (or logical disk name), multiple volumes can be specified by describing multiple special file names (or logical disk names) separated by a comma (,).
- When specifying a pair that combines a volume group or a disk group with a special file name (or logical disk name), the number of logical volumes that consist of the volume group or the disk group must coincide with the number of special file names to be described.

- If a character string, such as an NTFS folder name, includes a blank space ( ), colon (:), or period (.), enclose the entire character string in double quotation marks .

The following is an example of a volume description of the snapshot operation file:

For the snapshot command (Windows)

```
(Specify the BV and SV.)
ld:bv000                    ld:sv001
0:bv000                     0:sv001
drv:E                       ld:bv001
mdir:"c:\mnt q\vol\"        ld:sv001
mvol:\\?\Volume{c619c48b-1234-11d8-5678-00e018fa017d}ld:sv001
ld:bv000                    relgen:.-1

(Specify cyclic generation.)
ld:bv000          cyclic              #iSMsc_create command only
0:bv000           11                  #iSMsc_create command only

(Specify deleted SV auto selection.)
ld:bv011          auto                #iSMsc_delete command only

(Specify SV batch operation.)
ld:bv012          all                 #iSMsc_delete or iSMsc_svguard
                                      command only

(When the number of SV generations for the BV is 1)
ld:bv000
```

Snapshot Operations

iSMsc_create

Name

iSMsc_create   Creates the current image of the BV in the specified SV.

Synopsis

iSMsc_create -bv volume -bvflg bv_flg

[-sv volume -svflg sv_flg | -cyclic]

iSMsc_create -file file_name

iSMsc_create -ver

iSMsc_create -?(Windows)

Description

The iSMsc_create command creates the current image of the BV in the specified SV.

Note that, if the specified SV stores any data, the command deletes the stored data before creating the BV image.

When snapshots have been created in all the SVs and the oldest SV has been linked with a LV, a snapshot creation by cyclic creation of the iSMsc_create command fails. When SnapControl is operated in corporation with iSM, a snapshot will be created in the next oldest generation except the linked SV.

Options

The iSMsc_create command recognizes the following options.

-bv volumeSpecify the volume of the BV.

As the volume, specify a logical disk name, special file name, drive letter, mount point volume name, NTFS folder name, volume group for the file system using LVM, or disk group for the file system using VxVM.

-bvflg bv_flgSpecify the type of the volume specified in -bv.

In bv_flg, one of the following can be specified.

  ldLogical disk name

Windows system

Upon normal termination, the command displays the following information.

```
C:\>iSMsc_create -bv ld_name -bvflg ld -sv ld_name -svflg ld

iSMsc_create:Info: iSM19010: iSMsc_create has normally terminated.
    BV:ld_name                 type
        Volume Name: volume name
        Path          : path
    SV:ld_name                 type
        Generation: generation
        Status     : snap_status [YYYY/MM/DD hh:mm:ss]


C:\>
```

Description of messages:

iSMsc_create: Info: iSM19010: iSMsc_create has normally terminated.

Snapshot creation end message

 BV: ld_nametype

Volume Name: volume name

Path: path

The BV logical disk name, OS type, mount point volume name, and drive letter mounted to the folder of the NTFS volume accessed by users are displayed.

 SV: ld_nametype

Generation: generation

Status: snap_status [YYYY/MM/DD hh: mm: ss]

The SV logical disk name, OS type, SV relative generation number (after successful snapshot creation, -1 is displayed indicating the latest generation), SV snapshot status (snap/active), and snapshot creation time are displayed.

Upon abnormal termination, the command displays the following information.

```
C:\>iSMsc_create -bv id_name -bvflg id -sv id_name -svflg id

iSMsc_create:Error:iSM19104: The volume is not paired cannot be specified.
iSMsc_create:Info :iSM19012:iSMsc_create has abnormally terminated.
    BV:volume name
    SV:volume name

C:\>
```

Description of messages:

 The following error messages are output.

iSMsc_create: Error: iSM19104: The volume is not paired cannot be specified.

iSMsc_create: Info : iSM19012: iSMsc_create has abnormally terminated.

 BV: volume name

SV: volume name

The logical disk name, drive letter, mount point volume name, NTFS folder name, or SV relative generation number of the BV/SV specified on the command line is displayed.

iSMsc_delete

Name

iSMsc_delete   Deletes specified snapshot data.

Notes

Synopsis

iSMsc_delete -bv volume -bvflg bv_flg

[-sv volume -svflg sv_flg | -auto| -all]

iSMsc_delete -file file_name

iSMsc_delete -ver

iSMsc_delete -?(Windows)

Notes

Description

The iSMsc_delete command deletes snapshot data from the specified SV.

Options

The iSMsc_delete command recognizes the following options.

-bv volumeSpecify the volume of the BV.

As the volume, specify a logical disk name, special file name, drive letter, mount point volume name, NTFS folder name, or volume group for the file system using LVM or disk group for the file system using VxVM.

Notes-bvflg bv_flgSpecify the type of the volume specified in -bv.

In bv_flg, one of the following can be specified.

ldLogical disk name

Notes

-svflg sv_flgSpecify the type of the volume specified in -sv.

In sv_flg, one of the following can be specified.

ldLogical disk name

relgen Relative generation

This argument must be specified when -sv is specified.

For a derived SV without a generation number, only ld (logical disk name) can be specified.

-autoAutomatically select the SV from which snapshot data is deleted.

If snapshots have been created for all SV generations, the SV of the oldest generation except the protected SV and derived SVs without a generation number (SV of the oldest generation through time among the SVs including the derived SVs with a generation number) is selected. If there already exists an SV for which no snapshot has been created, the snapshot deletion will not be done.

If the number of generations is 1 (the BV and SV correspond on a one-to-one basis), the -sv/-svflg , -auto, and -all options can be omitted together.

Notes-allPerform batch deletion of all snapshots.

When there exists the protected SV, the SV in process of link setting or the SV in process of deletion/restoration, snapshot deletion is not performed.

If the number of generations is 1 (the BV and SV correspond on a one-to-one basis), the -sv/-svflg, -auto, and -all options can be omitted together.

Notes-file file_nameSpecify sets of BVs and SVs in file_name if it is necessary to specify more than one set.

Snapshot Operation File.

If an error occurs with any set when multiple sets are specified, an error message is output and the processing continues until all specified sets are done.

-ver Displays the version information of this command.

? Displays the usage of this command (for Windows system).

Displayed Information

Windows system

Upon normal termination, the command displays the following information.

```
C:\>iSMsc_delete -bv ld_name -bvflg ld -sv ld_name -svflg ld

iSMsc_delete:Info:iSM19020: iSMsc_delete has normally terminated.
    BV:ld_name               type
        Volume Name : volume name
        Path         : path
    SV:ld_name               type
        Generation: generation
        Status     : snap_status

C:\>
```

Description of messages:

iSMsc_delete: Info: iSM19020: iSMsc_delete has normally terminated.

Deletion end message

 BV: ld_nametype

Volume Name: volume name

Path: path

The BV logical disk name, OS type, mount point volume name, and drive letter mounted to the folder of the NTFS volume accessed by users are displayed.

 SV: ld_nametype

Generation: generation

Status: snap_sts

The SV logical disk name, OS type, deleted SV's relative generation, and SV snapshot status (snap/inactive, etc.) are displayed.

Upon normal termination of the snapshot deletion with auto option, the command displays the following information.

```
C:\>iSMsc_delete  -bv ld_name -bvflg ld -sv ld_name -svflg ld

iSMsc_delete:Info:iSM19020: iSMsc_delete has normally terminated.
    BV:ld_name                   type
        Volume Name  : volume name
        Path           : path
    SV:ld_name                   type
        Generation : generation
        Status       : snap_status

C:\>
```

Description of messages:

iSMsc_delete: Info: iSM19020: iSMsc_delete has normally terminated.

Deletion end message

 BV: ld_nametype

Volume Name: volume name

Path: path

 SV: ld_nametype

Generation: generation

Status: snap_sts

The BV/SV logical disk name, OS type, mount point volume name, drive letter mounted to the folder of the NTFS volume accessed by users, deleted SV's relative generation, and SV snapshot status (snap/inactive, etc.) are displayed.

Upon normal termination of the snapshot deletion with all option, the command displays the following information.

```
C:\>iSMsc_delete  -bv ld_name -bvflg ld -auto

iSMsc_delete:Info:iSM19020: iSMsc_delete has normally  terminated.
  BV:ld_name                    type
     Volume  Name  : volume name
     Path           : path
  SV:ld_name                    type
     Generation  : generation
     Status        : snap_status


C:\>
```

Description of messages:

 iSMsc_delete: Info: iSM19020: iSMsc_delete has normally terminated.

Deletion end message

 BV: ld_name type

Volume Name: volume name

Path: path

 LD NameType GenerationStatus

SV: ld_name1type-xxstatus

SV: ld_name2type-xxstatus

The BV logical disk name, OS type, mount point volume name, drive letter mounted to the folder of the NTFS volume accessed by users, deleted SV's logical disk name, OS type, deleted generation, and status after deletion are displayed. All the deleted SVs are displayed for all option.

iSMsc_restore

Name

iSMsc_restore   Restores snapshot data from SV to BV.

Synopsis

iSMsc_restore -bv volume -bvflg bv_flg

[-sv volume -svflg sv_flg]

[-derivsv derivsv_flg]

[-wait | -nowait]

iSMsc_restore -file file_name

[-derivsv derivsv_flg]

[-wait | -nowait]

iSMsc_restore -ver

iSMsc_restore -?(Windows)

Description

The iSMsc_restore command restores snapshot data from SV to BV. When there are multiple generations of snapshot data if the data of any intermediate generation is restored, you can specify whether to automatically delete or retain the snapshot data of later generation than the restored one.

Options

The iSMsc_restore command recognizes the following options.

-bv volumeSpecify the volume of the BV.

As the volume, specify a logical disk name, special file name, drive letter, mount point volume name, NTFS folder name, or volume group for the file system using LVM or disk group for the file system using VxVM.

-bvflg bv_flgSpecify the type of the volume specified in -bv.

In bv_flg, one of the following can be specified.

  ldLogical disk name

For

  sfnSpecial file name

  vgVolume group

  dgDisk group

For Windows

  drvDrive letter

  mvolMount point volume name

  mdirNTFS folder name

This argument must be specified when -bv is specified.

If a volume group or disk group is specified, the same disk configuration as -sv must be specified in -bv.

Also, if a volume group or disk group is specified, that specified volume group or disk group must be active.

If the BV cannot be identified by the host on which the command is executed (the BV has not been registered in the volume list), only an ld (logical disk name) can be specified.

-sv volumeSpecify the volume of the SV.

As the volume, specify a logical disk name or relative generation.

When specifying a relative generation, use .-1 as the latest generation, with the subsequent generations represented by .-n (where n = 2 to 16).

If the number of generations is 1 (the BV and SV correspond on a one-to-one basis), both the -sv and -svflg options can be omitted.

-svflg sv_flgSpecify the type of the volume specified in -sv.

In sv_flg, one of the following can be specified.

  ldLogical disk name

  relgen Relative generation

This argument must be specified when -sv is specified.

For a derived SV without a generation number, only ld (logical disk name) can be specified.

-derivsv derivsv_flg

Specify whether to automatically delete the derived generation or to retain the data at execution of restoration.

In derivsv_flg, one of the following can be specified.

  keep Retains the data of derived SV.

  delete Automatically deletes the derived SV.

  default Complies with the operation option setting file (Windows) or

environment variable settings .

If -derivsv is omitted, the command behaves in the same way as when the default is specified.

-wait Specify this option to instruct the command to wait until the data restoration process is completed.

This option cannot be specified simultaneously with the -nowait option.

-nowait Specify this option when only instructing the command to start restoration.

This option cannot be specified simultaneously with the -wait option.

If the -wait and -nowait options are both omitted, the command behaves in the same way as when the -wait is specified.

-file file_nameSpecify sets of BVs and SVs in file_name if it is necessary to specify more than one set.

Snapshot Operation File

If an error occurs with any set when multiple sets are specified, an error message is output and the processing continues until all specified sets are done.

-verDisplays the version information of this command.

-helpDisplays the usage of this command (for system).

-?Displays the usage of this command (for Windows system).

Displayed Information

Windows System

 Upon normal termination, the command displays the following information.

(Individual specification)

Description of messages:

 iSMsc_restore: Info: iSM19030: iSMsc_restore has normally terminated.

Snapshot restoration end message

 BV: ld_nametype

Volume Name: volume name

Path: path

The BV logical disk name, OS type, mount point volume name, and drive letter mounted to the folder of the NTFS volume accessed by users are displayed.

 SV: ld_nametype

Generation: generation

Status: snap_sts [YYYY/MM/DD hh: mm: ss]

The SV logical disk name, OS type, relative generation, and snapshot status (rst/exec, etc.) are displayed. When the status is snap/active or rst/exec, the snapshot creation time of the specified SV is also displayed.

In the derived generation auto delete mode, upon normal termination of the snapshot restoration for any intermediate generation, the command displays the following information.

(Individual specification)

```
C:\>iSMsc_restore -bv ld_name -bvflg ld -sv ld_name -svflg ld

iSMsc_restore:Info: iSM19030: iSMsc_restore has normally terminated.
   BV:ld_name                    type
      Volume Name    : volume name
      Path           : path
   SV:ld_name                    type
      Generation     : generation
      Status         : snap_sts [YYYY/MM/DD hh:mm:ss]

C:\>
```

Description of messages:

 iSMsc_restore: Info: iSM19030: iSMsc_restore has normally terminated.

Snapshot restoration end message

 BV: ld_name   type

Volume Name: volume name

Path: path

The BV logical disk name, OS type, mount point volume name, and drive letter mounted to the folder of the NTFS volume accessed by users are displayed.

 SV: ld_name   type

Generation: generation

Status: snap_sts [YYYY/MM/DD hh: mm: ss]

The SV logical disk name, OS type, relative generation, and snapshot status (rst/exec, etc.) are displayed. When the status is snap/active or rst/exec, the snapshot creation time of the specified SV is also displayed.

 iSMsc_restore: Info: iSM19125: Snapshot has been nullified.

Ld_name   type

Information indicating that the snapshot data of later generation than the restored one has been deleted. The deleted snapshot's logical disk name and OS type are displayed.

In the derived generation retain mode, upon normal termination of the snapshot restoration for any intermediate generation, the command displays the following information.

(Individual specification)

```
C:\>iSMsc_restore  -bv ld_name    -bvflg ld -sv .-n -svflg relgen -derivsv delete

iSMsc_restore:Info: iSM19030: iSMsc_restore has normally terminated.
    BV:ld_name                    type
        Volume Name      : volume name
        Path             : path
    SV:ld_name                    type
        Generation       : generation
        Status           : snap_sts [YYYY/MM/DD  hh:mm:ss]

iSMsc_restore:Info: iSM19125: Snapshot has been nullified.
        ld_name1                  type
        ld_name2                  type
        ......

C:\>
```

Description of messages:

 iSMsc_restore: Info: iSM19030: iSMsc_restore has normally terminated.

Snapshot restoration end message

 BV: ld_name   type

Volume Name: volume name

Path: path

The BV logical disk name, OS type, mount point volume name, and drive letter mounted to the folder of the NTFS volume accessed by users are displayed.

 SV: ld_name   type

Generation: generation

Status: snap_sts [YYYY/MM/DD hh: mm: ss]

The SV logical disk name, OS type, relative generation, and snapshot status (rst/exec, etc.) are displayed. When the status is snap/active or rst/exec, the snapshot creation time of the specified SV is also displayed.

 iSMsc_restore: Info: iSM19129: Snapshot data is kept.

Ld_name   type

Information retained as derived generation of the snapshot data of later generation than the restored one. The retained snapshot's logical disk name and OS type are displayed.

iSMsc_wait

Name

iSMsc_wait Waits for snapshot state

Synopsis

iSMsc_wait-cond condition

-bv volume -bvflg bv_flg

[-sv volume -svflg sv_flg]

[-interval interval_time]

[-limit limit_time]

iSMsc_wait-cond condition

-file file_name

[-interval interval_time]

[-limit limit_time]

iSMsc_wait -ver

iSMsc_wait -help

iSMsc_wait -?(Windows)

Description

The iSMsc_wait command waits till the snapshot state changes to the snapshot active for the specified pair.

Options

The iSMsc_wait command recognizes the following options:

-cond conditionSpecify a wait end condition. This argument cannot be omitted. In condition, you can specify the following value:

  active: Waits till the snapshot status changes to active

(snapshot/active).

-bv volumeSpecify the volume of the BV.

In volume, specify a logical disk name, special file name, drive letter, mount point volume name, NTFS folder name, volume group for the file system using LVM, or disk group for the file system using VxVM.

-bvflg bv_flgSpecify the type of the volume specified in -bv.

In bv_flg, one of the following can be specified.

  ldLogical disk name

Windows system

  drvDrive letter

  mvolMount point volume name

  mdirNTFS folder name

This argument must be specified when -bv is specified.

If a volume group or disk group is specified, the same disk configuration as -sv must be specified in -bv.

Also, if a volume group or disk group is specified, that specified volume group or disk group must be active.

If the BV cannot be identified by the host on which the command is executed (the BV has not been registered in the volume list), only ld (logical disk name) can be specified.

-sv volumeSpecify the volume of the SV.

As the volume, specify a logical disk name or relative generation.

When specifying a relative generation, use .-1 as the latest generation, with the subsequent generations represented by .-n (where n = 2 to 16).

If the number of generations is 1 (the BV and SV correspond on a one-to-one basis), -sv and -svflg options can be omitted.

-svflg sv_flgSpecify the type of the volume specified in -sv.

In sv_flg, one of the following can be specified.

 ldLogical disk name

 relgen Relative generation

This argument must be specified when -sv is specified. For a derived SV without a generation number, only ld (logical disk name) can be specified.

-interval interval_time

Specify, in seconds, the intervals at which the snapshot state is monitored.

1 to 30 seconds (integer) can be specified.

You can change this value by using the operation option setting file (Windows).

By default, the snapshot status is monitored at intervals of 5 seconds.

limit limit_timeSpecify waiting limit time.

In limit_time, you can specify any of the following:

 NumeralWaits from waiting start to the specified time. 0 to 86400

seconds (integer) can be specified.

 nolimWaits endlessly.

If the end condition specified in the -cond option is not met during the period from waiting start to the specified time, the iSMsc_wait command cancels waiting and ends abnormally.

If this argument is omitted, you can change waiting limit time by using the operation option setting file (Windows). By default, the iSMsc_wait command waits endlessly.

file file_name Specify sets of BVs and SVs in file_name if it is necessary to specify more than one set.

If an error occurs in any of the specified sets when multiple sets are specified, the iSMsc_wait command outputs the error message and continues processing till all the sets are completed without interrupting processing.

verDisplays the version information of this command.

?Displays the usage of this command (Windows).

Displayed Information

Windows system

Upon normal termination, the command displays the following information.

(Individual specification)

```
C:\> iSMsc_wait  -cond active  -bv ld_name  -bvflg ld -sv ld_name  -svflg ld
Waiting....
iSMsc_wait:Info:  iSM19050:  iSMsc_wait has normally terminated.
    BV:ld-name                            type
        Volume  Name  : volume  name
        Path            : path
    SV:ld-name                            type
        Generation      : generation
        Status          : snap_sts  [YYYY/MM/DD  hh:mm:ss]

C:\>
```

Description of messages:

Waiting....

Waiting message

You can suppress the output of this message via option settings.

iSMsc_wait: Info: iSM19050: iSMsc_wait has normally terminated.

Waiting termination message

BV: ld-name type

  Volume Name: volume name

  Path: path

The BV logical disk name, OS type, mount point volume name, and drive letter mounted to the folder of the NTFS volume accessed by users are displayed.

SV: ld-name type

  Generation: generation

  Status: snap_sts [YYYY/MM/DD hh: mm: ss]

The SV logical disk name, OS type, relative generation, and snapshot status are displayed. The snapshot creation time of the specified SV is also displayed.

Upon abnormal termination, the command displays the following information.

(Individual specification)

```
C:\> iSMsc_wait  -cond active  -bv ld_name  -bvflg ld -sv ld_name  -svflg ld -llimit limit_time
Waiting....
iSMsc_wait:Error:iSM19409:  Specified time limit has been reached.  (limit_time sec)
iSMsc_wait:Info:  iSM19052:  iSMsc_wait has abnormally  terminated.
    BV:volume  name
    SV:volume  name
C:\>
```

Description of messages:

Waiting....

Waiting message

The command displays the following error messages:

iSMsc_wait: Error: iSM19409: Specified time limit has been reached.

(limit_time sec)

iSMsc_wait: Info: iSM19052: iSMsc_wait has abnormally terminated.

BV: volume name

SV: volume name

The logical disk name, drive letter, mount point volume name, NTFS folder name, or SV relative generation number of the BV/SV specified on the command line is displayed.

iSMsc_svguard

Name

iSMsc_svguard   Sets/cancels SV guard classification.

Synopsis

iSMsc_svguard-bv volume -bvflg bv_flg

[-sv volume -svflg sv_flg | -all]

mode {set|cancel}

iSMsc_svguard-file file_name

mode {set|cancel}

iSMsc_svguard-ver

iSMsc_svguard-help

iSMsc_svguard-?(Windows)

Description

The iSMsc_svguard command sets/cancels guard classification of the specified SV.

The volume for guard classification's set/cancel needs to be SV.

Options

The iSMsc_svguard command recognizes the following options.

bv volumeSpecify the volume of the BV.

In volume, specify a logical disk name, special file name, drive letter, mount point volume name, NTFS folder name, or volume group for the file system using LVM or disk group for the file system using VxVM.

bvflg bv_flgSpecify the type of the volume specified in -bv.

In bv_flg, one of the following can be specified.

  ldLogical disk name

For Windows only

  drvDrive letter

  mvolMount point volume name

  mdir NTFS folder name

This argument must be specified when -bv is specified.

If a volume group or disk group is specified, the same disk configuration as -sv must be specified for -bv.

Also, if a volume group or disk group is specified, that specified volume group or disk group must be active.

If the BV cannot be identified by the host on which the command is executed (the BV has not been registered in the volume list), only an ld (logical disk name) can be specified.

sv volume Specify the volume of the SV.

As the volume, specify a logical disk name or relative generation.

When specifying a relative generation, use .-1 as the latest generation, with the subsequent generations represented by .-n (where n = 2 to 16).

If the number of generations is 1 (the BV and SV correspond on a one-to-one basis), -sv/-svflg and -all options can be omitted.

svflg sv_flgSpecify the type of the volume specified in -sv.

In sv_flg, one of the following can be specified.

- ldLogical disk name
- relgen Relative generation

The argument must be specified whenever -sv is specified.

For a derived SV without a generation number, only ld (logical disk name) can be specified.

mode {set|cancel}Specify whether to set or cancel the guard classification.

One of the following can be specified.

- set Sets the guard classification of a specified SV.
- cancel Cancels the guard classification of a specified SV.
- all Cancels all SV guard classifications under a BV together.

If the number of generations is 1 (the BV and SV correspond on a one-to-one basis), -sv/-svflg and -all options can be omitted together.

This option is specifiable only when cancel is specified for -mode.

file file_nameSpecify sets of BVs and SVs in file_name if it is necessary to specify more than one set.

Snapshot Operation File

If an error occurs with any set when multiple sets are specified, an error message is output and the processing continues until all specified sets are done.

ver Displays the version information of this command.

help Displays the usage of this command (for system).

? Displays the usage of this command (for Windows system).

Displayed Information

Windows System

Upon normal termination, the command displays the following information.

(Individual specification)

```
C:\>iSMsc_svguard  -bv ld_name -bvflg ld -sv ld_name -svflg ld -mode set

iSMsc_svguard:Info: iSM19040: iSMsc_svguard has normally terminated.
   BV:ld_name                      type
        Volume Name    : volume name
        Path              : path
   SV:ld_name                      type
        Generation    : generation
        Status          : snap_status [YYYY/MM/DD  hh:mm:ss]


C:\>
```

Description of messages:

iSMsc_svguard:Info: iSM19040: iSMsc_svguard has normally terminated.

Message about the guard classification successfully set or canceled

BV:ld_name type

Volume Name volume name

Path: path

The BV logical disk name, OS type, mount point volume name, and drive letter mounted to the folder of the NTFS volume accessed by users are displayed.

SV:ld_nametype

Generation: generation

Status: snap_sts [YYYY/MM/DD hh:mm:ss]

The SV logical disk name, OS type, relative generation, and snapshot status (snap/active, etc.) are displayed. When the status is snap/active, rst/exec, or rst/preparing, the snapshot creation time of the specified SV is also displayed.

(2)Upon abnormal termination, the command displays the following information.

```
C:\>iSMsc_svguard-bv ld_name -bvflg ld -sv ld-name -svflg ld -mode set

iSMsc_svguard:ErroriSM19104: The volume is not paired cannot be specified.
iSMsc_svguard:Info:  iSM19042: iSMsc_svguard has abnormally terminated.
        BV:volume name
        SV:volume name


C:\>
```

Description of messages:

The following error messages are output.

iSMsc_svguard:Error:iSM19104: The volume is not paired cannot be specified.

iSMsc_svguard:Info :iSM19042: iSMsc_svguard has abnormally terminated.

BV:volume name

SV:volume name

The logical disk name, drive letter, mount point volume name, NTFS folder name, or SV relative generation number of the BV/SV specified on the command line is displayed.

Upon normal termination of the batch cancellation of all guard classifications with all option, the command displays the following information.

```
C:\>iSMsc_svguard -bv ld_name -bvflg ld -all -mode cancel

iSMsc_svguard:Info: iSM19040: iSMsc_svguard has normally terminated.
    BV:ld_name                  type
        Volume Name   : volume name
        Path               : path

    LD Name                Type     Generation      Status
    SV:ld_name1            type            -xx      status
    SV:ld_name2            type            -xx      status

C:\>
```

Description of messages:

iSMsc_svguard:Info: iSM19040: iSMsc_svguard has normally terminated.

Message about the guard classification successfully set or canceled

BV:ld_name type

Volume Name: volume name

Path: path

LD Name	Type	Generation	Status
SV:ld_name1	type	-xx	status
SV:ld_name2	type	-xx	status

The BV logical disk name, OS type, mount point volume name, drive letter mounted to the folder of the NTFS volume accessed by users, guard-classification-canceled SV logical disk names, OS types, relative generations, and snapshot statuses are displayed.

All the guard-classification-canceled SVs are displayed for all option.

Usage

The command is executed for a specific BV and SV specified.

```
#iSMsc_svguard -bv dev001 -bvflg Id -sv dev101 -svflg Id -mode set

iSMsc_svguard:Info: iSM19040: iSMsc_svguard has normally terminated.
    BV:dev001                 NX
        Special File : /dev/rdsk/c0t1d0
    SV:dev101                 NX
        Generation : -1
        Status      : snap/active[2003/09/01 08:52:36]

#
```

The command is executed with all BVs and SVs specified.

```
#iSMsc_svguard -file volume_file -mode cancel

iSMsc_svguard:Info: iSM19040: iSMsc_svguard has normally terminated.
    BV:dev001                 NX
        Special File : /dev/rdsk/c0t1d0
    SV:dev101                 NX
        Generation : -1
        Status      : snap/active [2003/09/01 08:52:36]

iSMsc_svguard:Info: iSM19040: iSMsc_svguard has normally terminated.
    BV:dev002                 NX
        Special File : /dev/rdsk/c0t2d0
    SV:dev102                 NX
        Generation : -2
        Status      : snap/active [2003/09/01 08:53:11]

iSMsc_svguard:Info: iSM19040: iSMsc_svguard has normally terminated.
    BV:dev003                 NX
        Special File : /dev/rdsk/c0t3d0
    SV:dev103                 NX
        Generation : -1
        Status      : snap/active [2003/09/01 08:53:31]

#
```

The activity state of the target volume must be snapshot-active or being restored.

The disk array storing the target volume must not be in the freeze state.

The following notes do not apply to joint operation with SnapSAN Manager.

The target BV must be registered in the volume list.

If the target BV is not registered in the volume list, the following conditions must be satisfied:

The LV associated with the target BV must be registered in the volume list.

If the target BV is paired as the RV for replication, the MV to be paired with the RV must be registered in the volume list.

The volume list must not be being created.

When specifying the combination of a volume group or a disk group with a logical disk name, the same number of logical volumes as those constituting a volume group or disk group must be specified to SV on the side where the logical disk name is specified. In this case, SV guard classifications are set or canceled in the specified order.

When a volume group is specified, the target volume group must be active.

When a disk group is specified, the target disk group must be active.

Return Values

0: The command terminated normally.

1: Operation for all pairs failed.

2: Operation for some pairs failed.

3: Although there are some or all SVs already handled, the command terminated normally.

iSMsc_query

Name

iSMsc_query   Displays the snapshot status.

Synopsis

iSMsc_query -bv volume -bvflg bv_flg

[-sv volume -svflg sv_flg]

[-summary | -detail]

iSMsc_query -sv volume -svflg sv_flg

[-summary | -detail]

iSMsc_query -file file_name

[-summary | -detail]

iSMsc_query -ver

iSMsc_query -help

iSMsc_query -?(Windows)

Description

The iSMsc_query command displays the status of the specified volume.

Options

The iSMsc_query command recognizes the following options.

The BV and SV can be specified in one of the following combinations.

BV and SV: Displays the volume status of the specified BV and SV.

BV only: Displays the volume status of all generations associated with the BV.

SV only: Displays the volume status in the same way as when the BV and SV are both specified.

bv volumeSpecify the volume of the BV.

As the volume, specify a logical disk name, special file name, drive letter, mount point volume name, NTFS folder name, or volume group name for the file system using LVM or disk group for the file system using VxVM.

bvflg bv_flgSpecify the type of the volume specified in -bv.

In bv_flg, one of the following can be specified.

  ldLogical disk name

For Windows

  drv Drive letter

  mvol Mount point volume name

  mdir NTFS folder name

This argument must be specified together with -bv.

If a volume group or disk group is specified, the same disk configuration as -bv must be specified in -sv.

Also, if a volume group or disk group is specified, that specified volume group or disk group must be active.

sv volumeSpecify the volume of the SV.

As the volume, specify a logical disk name, relative generation, special file name, drive letter, mount point volume name, NTFS folder name, or volume group name for the file system using LVM or disk group for the file system using VxVM.

If this argument is omitted, the command displays the status of SVs of all generations associated with the BV.

Depending on whether the volume is linked or not, the specifiable SV volume types differ as follows.

Volume Type	SV Not Linked	SV Linked
Logical disk name	✓	✓
Relative generation	✓	✓
Special file name	-	✓ (U)
Volume group name	-	✓ (U)
Disk group name	-	✓ (U)
Drive letter	-	✓ (W)
Mount point volume name	-	✓ (W)
NTFS folder name	-	✓ (W)

(W)Specifiable on the Windows system

(U)Specifiable on the system

svflg sv_flgSpecify the type of the volume specified in -sv.

In sv_flg, one of the following can be specified.

  ld Logical disk name

  relgen Relative generation

For Windows

drv Drive letter

mvol Mount point volume name

mdirNTFS folder name

This argument must be specified when -sv is specified.

For a derived SV without a generation number, only ld (logical disk name) can be specified.

If a volume group or disk group is specified, the same disk configuration as -bv must be specified in -sv.

Also, if a volume group or disk group is specified, that specified volume group or disk group must be active.

summarySpecify this option to display a summary of snapshot volume data. This option cannot be specified simultaneously with the -detail option.

detailSpecify this option to display detailed snapshot volume data. This option cannot be specified simultaneously with the -summary option.

If the -summary and -detail options are both omitted, the command behaves in the same way as when the -summary option is specified.

file file_nameSpecify sets of BVs and SVs in file_name if it is necessary to specify more than one set.

Snapshot Operation File.

If an error occurs with any set when multiple sets are specified, an error message is output and the processing continues until all specified sets are done.

ver Displays the version information of this command.

help Displays the usage of this command (for system).

? Displays the usage of this command (for Windows system).

Displayed Information

Windows system

The -detail option is specified to display detailed link information.

```
C:\>iSMsc_query -bv bv_ld_name -bvflg ld -detail

BV Information
    LD Name       : bv_ld_name
    Type          : bv_type
    Volume Name : volume_name
    Path          : path
    State         : bv_state

Pair Information
    SV:LD Name              : sv_ld_name
        Type                : sv_type
        Generation(Attribute) : -n (eeeeee)
        Snap State          : aaaaaaaa [YYYY/MM/DD hh:mm:ss]
        State Start Time    : YYYY/MM/DD hh:mm:ss
        State End Time      : YYYY/MM/DD hh:mm:ss
        Processing Data Size : bbbbbbbbKB
        Snapshot Data Size  : ddddddddKB
        SV Guard            : preserve_mode
        LV Link Status      : link_sts
    LV:LD Name              : lv_ld_name
        Type                : lv_type
        Volume Name         : volume_name
        Path                : path
        LV Access           : access_mode

C:\>
```

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Description of messages:

 BV Information

The BV information is displayed.

LD NameLogical disk name

TypeOS type

Volume NameMount point volume name

PathNTFS folder name

StateBV state

 normal: Normal

 restore fault: Restore fault

 SV fault: Snapshot fault

 Pair Information

The detailed information about the generation (SV) for the BV and the LV is displayed.

SVIndicates the SV information.

LD NameLogical disk name

TypeOS type

Generation(Attribute)

Generation displays the SV relative generation. The latest generation is represented as -1, with the subsequent generations represented by -n (where n = 2 to 16).

If no snapshot has been created, or if a derived SV does not have a generation number, is displayed for the generation number.

The volume classification is displayed for Attribute. The derived classification is displayed as derived and the normal generation is displayed as normal.

Snap State [YYYY/MM/DD hh: mm: ss]

If the snapshot operation state is snap/active, rst/exec, rst/suspended, or rst/preparing, the snapshot creation time of the specified SV is displayed.

snap/activeSnapshot active

snap/inactiveSnapshot inactive

rst/execRestore execution

rst/suspendedRestore suspended

snap/deletingDeleting

snap/faultSnapshot fault

rst/preparingRestore preparing

snap/preparingSV preparing

snap/prepare-faultSV prepare fault

State Start Time

Displays the start time of the last snapshot operation (create, restore, or delete). In State, Create, Restore, or Delete is displayed. This is not displayed if no operation has been performed.

State End TimeDisplays the end time of the last snapshot operation (restore or delete). In State, Restore, or Delete is displayed. This is not displayed during snapshot creation or if no operation has been performed.

Processing Data Size

Displays in KB the amount of copied data different from the original when restoring data or the amount of deleted data when deleting data.

Snapshot Data Size

Displays the size of the SV difference management area.

* Depending on the size, the unit changes (KB, MB, GB, or TB).

SV GuardDisplays the guard mode.

onGuarded

offNot guarded

LV Link StatusDisplays the link status.

linkLink established

unlinkLink not established

LVIndicates the LV information. When the SV link status is link, the information about the link-volume (LV) linked with the specified SV is displayed.

LD NameLogical disk name

TypeOS type

Volume NameMount point volume name

PathNTFS folder name

LV AccessDisplays the LV access restrictions.

rwThe LV can be accessed both for input and output.

roThe LV can be accessed for reference only.

nrThe LV cannot be accessed.

The SVs are displayed in the following order.

Snapshot fault (snap/fault)

Restore suspended (rst/suspended)

SV prepare fault (snap/prepare-fault)

Snapshots created (snap/active, rst/exec, and rst/preparing) in descending order of snapshot creation time

Snapshot deleting (snap/deleting)

Snapshot inactive (snap/inactive)

SV preparing (snap/preparing)

The -summary option is specified to display summary information.

```
C:\>iSMsc_query -bv bv_ld_name -bvflg ld -summary

BV Information
     LD Name        : bv_ld_name
     Type           : bv_type
     Volume Name    : volume_name
     Path           : path
     State          : bv_state

SV Information
*   Type:LdName1     (---)  snap/state [YYYY/MM/DD hh:mm:ss] link_sts
*   Type:LdName2     ( -1)  snap/state [YYYY/MM/DD hh:mm:ss] link_sts
    Type:LdName3     ( -m)  snap/state [YYYY/MM/DD hh:mm:ss] link_sts
    Type:LdName4     ( -n)  snap/state [YYYY/MM/DD hh:mm:ss] link_sts

C:\>
```

Description of messages:

 BV Information

The BV information is displayed.

LD NameLogical disk name

TypeOS type

Volume NameMount point volume name

PathNTFS folder name

StateBV state

 normal: Normal

 restore fault: Restore fault

 SV fault: Snapshot fault

 SV Information

A summary of the generation (SV) information for the BV is displayed.

*If the derived classification is granted to the SV, it is indicated by *.

TypeOS type

LdName1(-n)Logical disk name (relative generation)

If the snapshot is not active or for a derived SV without a generation number, --is displayed for the relative generation.

snap/state [YYYY/MM/DD hh: mm: ss]

Displays the snapshot operation state.

If the state is snap/active, rst/exec, rst/suspended, or rst/preparing, the snapshot creation time of the specified SV is displayed.

snap/activeSnapshot active

snap/inactiveSnapshot inactive

rst/execRestore execution

rst/suspendedRestore suspended

snap/deletingDeleting

snap/faultSnapshot fault

rst/preparingRestore preparing

snap/preparingSV preparing

snap/prepare-faultSV prepare fault

link_stsDisplays the link status.

linkLink established

unlinkLink not established

The SVs are displayed in the following order.

Snapshot fault (snap/fault)

Restore suspended (rst/suspended)

SV prepare fault (snap/prepare-fault)

Snapshots created (snap/active, rst/exec, and rst/preparing) in descending order of snapshot creation time

Snapshot deleting (snap/deleting)

Snapshot inactive (snap/inactive)

SV preparing (snap/preparing)

Link Operations

iSMsc_link

Name

iSMsc_link   Establishes an LV link.

Synopsis

iSMsc_link -lv volume -lvflg lv_flg

bv volume -bvflg bv_flg

[-lvacc lv_access]

iSMsc_link -lv volume -lvflg lv_flg

sv volume -svflg sv_flg

[-lvacc lv_access]

iSMsc_link -file file_name

[-lvacc lv_access]

iSMsc_link -ver

iSMsc_link -help

iSMsc_link -?(Windows)

Description

The iSMsc_link command establishes a link from a specified LV to a specified volume.

The target volume must be registered in advance in the link control list (LCL).

Options

The iSMsc_link command recognizes the following options.

-lv volumeSpecify the volume of the LV.

As the volume, specify a logical disk name.

lvflg lv_flgSpecify the type of the volume specified in -lv.

In lv_flg, one of the following can be specified.

  ldLogical disk name

This argument must be specified together with -lv.

bv volume When linking the volume as the BV, specify the volume of the BV.

As the volume, specify a logical disk name, special file name, drive letter, mount point volume name, or NTFS folder name.

If the volume specified in this option is not the BV, the command terminates abnormally.

bvflg bv_flgSpecify the type of the volume specified in -bv.

In bv_flg, one of the following can be specified.

  ldLogical disk name

For Windows

  drvDrive letter

  mvolMount point volume name

  mdirNTFS folder name

This argument must be specified together with -bv.

sv volumeSpecify the volume of the SV.

As the volume, specify an SV logical disk name or BV volume name + relative generation.

If the volume specified in this option is not the SV, the command terminates abnormally.

svflg sv_flgSpecify the type of the volume specified in -sv.

In sv_flg, one of the following can be specified.

  ldLogical disk name

  ld.relgen BV logical disk name + relative generation

<>

  sfn.relgen BV special file name + relative generation

<Windows>

  drv.relgen BV drive letter + relative generation

  mvol.relgen BV mount point volume name + relative generation

  mdir.relgenBV NTFS folder name + relative generation

This argument must be specified together with -sv.

For a derived SV without a generation number, only ld (logical disk name) can be specified.

lvacc lv_accessSpecify the LV access restrictions.

In lv_access, one of the following can be specified.

rw The LV can be accessed for both input and output.

ro The LV can be accessed for reference only.

nr The LV cannot be accessed.

If this argument is omitted, the command behaves in the same way as when rw is specified.

file file_nameSpecify sets of BVs and SVs in file_name if it is necessary to specify more than one set.

Snapshot Operation File.

If an error occurs with any set when multiple sets are specified, an error message is output and the processing continues until all specified sets are done.

ver Displays the version information of this command.

? Displays the usage of this command (for Windows system).

[DISPLAYED INFORMATION]
    Upon normal termination of the link establishment, the following information is displayed.

```
C:\>iSMsc_link -lv ld_name -lvflg ld   -sv ld_name -svflg ld

iSMsc_link:Info:  iSM20020:  iSMsc_link has normally terminated.

C:\>
```

Description of messages:
    iSMsc_link:Info: iSM20020: iSMsc_link has normally terminated.
        Displays the command execution result.

[USAGE]
    (1) The link is established with an LV and a BV specified.
    (Individual specification)

```
C:\>iSMsc_link -lv LV01 -lvflg ld -bv BV01 -bvflg ld

iSMsc_link:Info:  iSM20020:  iSMsc_link has normally terminated.

C:\>
```

    (2) The link is established with an LV and an SV specified.

(Individual specification)

```
C:\>iSMsc_link -lv LV01 -lvflgId -sv SV01 -svflgId

iSMsc_link:Info: iSM20020:  iSMsc_link has normally terminated.

C:\>
```

(3) The link is established with an LV and an SV (BV + relative generation)
specified.
(Individual specification)

```
C:\>iSMsc_link -lv LV01 -lvflgId -sv BV01.-3 -svflgId.relgen

iSMsc_link:Info: iSM20020:  iSMsc_link has normally terminated.

C:\>
```

(4) The link is established through batch specification.
(Batch specification)

```
C:\>iSMsc_link -file volume_file

iSMsc_link:Info: iSM20020:  iSMsc_link has normally terminated.

iSMsc_link:Info: iSM20020:  iSMsc_link has normally terminated.

iSMsc_link:Info: iSM20020:  iSMsc_link has normally terminated.

C:\>
```

(5) If part of the operation fails while the link is established through batch
specification.
(Batch specification)

```
C:\>iSMsc_link -file volume_file

iSMsc_link:Info : iSM20020:  iSMsc_link has normally terminated.

iSMsc_link:Error iSM20022:  iSMsc_link has abnormally terminated.

iSMsc_link:Info : iSM20020:  iSMsc_link has normally terminated.

C:\>
```

The target volume must be registered in advance in the link control list.

The logical disk capacity and OS type of the specified LV must match those of the
destination-volume.

The specified LV has not been linked.

The specified destination-volume has not been linked.

The specified destination-volume must be a BV or SV.

If the specified destination-volume is an SV, the operation state on the destination SV must
be the Snapshot active state.

If the specified destination-volume is a BV, it must not be being restored or prepared for restoration.

If the specified destination-volume is a BV, the replication status must not be Replicate Preparing, Restore Preparing, or Separate Preparing.

If the specified destination-volume is paired as RV for replication, replication state must be the Separated state.

If the specified destination-volume is a BV, it must not be in the update prevention state.

Data of the target BV is not in the data migration state (that is, the target BV is neither a source nor destination-volume for the data migration).

The disk array storing the target volume must not be in the freeze state.

The following notes do not apply to joint operation with SnapSAN Manager.

The target LV must be a volume controlled by the local host.

The volume list must not be being created.

Return Values

0: The command terminated normally.

1: Operation for all volumes failed.

2: Operation for some volumes failed.

iSMsc_unlink

Name

iSMsc_unlink   Releases an LV link.

Synopsis

iSMsc_unlink -lv volume -lvflg lv_flg

[-bv volume -bvflg bv_flg]

iSMsc_unlink -lv volume -lvflg lv_flg

[-sv volume -svflg sv_flg]

iSMsc_unlink -file file_name

iSMsc_unlink -ver

iSMsc_unlink -help

iSMsc_unlink -?(Windows)

Description

The iSMsc_unlink command releases the link to the volume set for a specified LV.

Options

The iSMsc_unlink command recognizes the following options.

-lv volumeSpecify the volume of the LV.

As the volume, specify a logical disk name.

-lvflg lv_flgSpecify the type of the volume specified in -lv.

In lv_flg, the following can be specified.

ldLogical disk name

This argument must be specified together with -lv.

-bv volumeSpecify the volume of the BV.

As the volume, specify a logical disk name, special file name, drive letter, mount point volume name, or NTFS folder name.

If this argument is omitted, the command releases the link to the currently linked volume.

If the volume specified in this option is not the BV, the command terminates abnormally.

-bvflg bv_flgSpecify the type of the volume specified in -bv.

In bv_flg, one of the following can be specified.

ldLogical disk name

For Windows

drvDrive letter

mvolMount point volume name

mdirNTFS folder name

This argument must be specified together with -bv.

-sv volumeSpecify the volume of the SV.

As the volume, specify an SV logical disk name or BV volume name + relative generation.

If this argument is omitted, the command releases the link to the currently linked volume.

If the volume specified in this option is not the SV, the command terminates abnormally.

-svflg sv_flgSpecify the type of the volume specified in -sv.

In sv_flg, one of the following can be specified.

ldLogical disk name

ld.relgenBV logical disk name + relative generation

For Windows

drv.relgenBV drive letter + relative generation

mvol.relgenBV mount point volume name + relative generation

mdir.relgenBV NTFS folder name + relative generation

This argument must be specified together with -sv.

For a derived SV without a generation number, only ld (logical disk name) can be specified.

For Windows-file file_nameSpecify sets of BVs and SVs in file_name if it is necessary to specify more than one set.

Snapshot Operation File.

If an error occurs with any set when multiple sets are specified, an error message is output and the processing continues until all specified sets are done.

For Windows-helpDisplays the usage of this command (for system).

For Windows-?Displays the usage of this command (for Windows system).

[DISPLAYED INFORMATION]

Upon normal termination of the link release operation, the following information is displayed.

```
C:\>iSMsc_unlink -lv ld_name -lvflg ld

iSMsc_unlink:Info : iSM20030: iSMsc_unlink has normally terminated.

C:\>
```

Description of messages:

- iSMsc_unlink:Info: iSM20030: iSMsc_unlink has normally
                          terminated.
  Displays the command execution result.

[USAGE]

(1) Release the link with an LV specified.
    (Individual specification)

```
C:\>iSMsc_unlink -lv LV01 -lvflg ld

iSMsc_unlink:Info : iSM20030: iSMsc_unlink has normally terminated.

C:\>
```

(2) Release the link with an LV and a BV specified.
    (Individual specification)

```
C:\>iSMsc_unlink -lv LV01 -lvflg ld -bv BV01 -bvflg ld

iSMsc_unlink:Info : iSM20030: iSMsc_unlink has normally terminated.

C:\>
```

(3) Release the link with an LV and an SV specified.
    (Individual specification)

```
C:\>iSMsc_unlink -lv LV01 -lvflg ld -sv SV01 -svflg ld

iSMsc_unlink:Info : iSM20030: iSMsc_unlink has normally terminated.

C:\>
```

For Windows

(4) Release the link with an LV and an SV (BV + relative generation) specified.
(Individual specification)

```
C:\>iSMsc_unlink -lv LV01 -lvflg ld -sv BV01.-3 -svflg ld.relgen

iSMsc_unlink:Info : iSM20030:  iSMsc_unlink has normally terminated.

C:\>
```

(5) Release the link through batch specification.
(Batch specification)

```
C:\>iSMsc_unlink -file volume_file

iSMsc_unlink:Info : iSM20030:  iSMsc_unlink has normally terminated.

iSMsc_unlink:Info : iSM20030:  iSMsc_unlink has normally terminated.

iSMsc_unlink:Info : iSM20030:  iSMsc_unlink has normally terminated.

C:\>
```

(6) If part of the operation fails while the link release operation is performed through batch specification
(Batch specification)

```
C:\>iSMsc_unlink -file volume_file

iSMsc_unlink:Info : iSM20030:  iSMsc_unlink has normally terminated.

iSMsc_unlink:Info : iSM20032:  iSMsc_unlink has abnormally terminated.

iSMsc_unlink:Info : iSM20030:  iSMsc_unlink has normally terminated.

C:\>
```

The specified volume must be linked.

The disk array storing the target volume must not be in the freeze state.

The following notes do not apply to joint operation with SnapSAN Manager.

The target LV must be registered in the volume list.

The volume list must not be being created.

Return Values

0: The command terminated normally.

1: Operation for all volumes failed.

2: Operation for some volumes failed.

iSMsc_linkinfo

Name

iSMsc_linkinfo   Displays the LV link information.

Synopsis

iSMsc_linkinfo -vol volume -volflg vol_flg [-lcl]

iSMsc_linkinfo -file file_name [-lcl]

iSMsc_linkinfo -ver

iSMsc_linkinfo -help

iSMsc_linkinfo -?(Windows)

Description

The iSMsc_linkinfo command displays the link information of the specified volume.

Options

The iSMsc_linkinfo command recognizes the following options.

-vol volumeSpecify the volume of the LV or the destination-volume.

As the volume, specify a logical disk name, special file name, drive letter, mount point volume name, or NTFS folder name.

As the destination-volume, a BV or SV can be specified. Also, as the SV, specify an SV logical disk name or a BV volume name + relative generation.

-volflg vol_flgSpecify the type of the volume specified in -vol.

In vol_flg, one of the following can be specified.

  ldLogical disk name

  ld.relgenBV logical disk name + relative generation

Windows System

If the volume specified in the -vol option is an LV, the command displays a summary list of the volumes (BVs or SVs) that can be linked from the LV specified in the -lcl option.

```
C:\>iSMsc_linkinfo-vol lv_ld_name -volflg ld -lcl

    Specified Volume Information
    aa: LD Name       : lv_ld_name
        Type          : lv _type
        Volume Name   : volume_name
        Path          : path
        State         : link_sts (ld_name)
        Mode          : access_mode

    Destination Volume Information
        bb:ld_name      type      link_state      (ld_name)   access_mode
        bb:ld_name      type      link_state      (ld_name)   access_mode

C:\>
```

Description of messages:

Specified Volume Information

Displays the information of the specified volume.

aa Displays the type (LV) of the specified volume.

LD Name Logical disk name

Type OS type

Volume Name Mount point volume name

Path NTFS folder name

State Link state

link Linked

unlink Not linked

If the link state is link, the logical disk name of the destination-volume is also displayed.

Mode Access restrictions of the source volume

rw Both input and output allowed

ro Only reference allowed

nr Access not allowed

If the link is not established, is displayed.

Destination Volume Information

If the specified volume is an LV, the information of the destination-volume (BV or SV) is displayed.

bb Displays the type (BV/SV) of the destination-volume.

ld_name Logical disk name

type OS type

link_state Link state

link Linked

unlink Not linked

If the link state is link, the logical disk name of the source volume is also displayed.

access_mode Access restrictions of the destination-volume

rw Both input and output allowed

nr Access not allowed

If the volume specified in the -vol option is an LV, the command displays the link information of the specified LV.

```
C:\>iSMsc_linkinfo -vol lv_ld_name -volflg ld

  Specified Volume Information
aa: LD Name      : lv_ld_name
    Type         : lv _type
    Volume Name  : volume_name
    Path         : path
    State        : link_sts (ld_name)
    Mode         : access_mode

C:\>
```

Description of messages:

 Specified Volume Information

Displays the information of the specified volume.

aa Displays the type (LV) of the specified volume.

LD Name Logical disk name

Type OS type

Volume Name Mount point volume name

Path NTFS folder name

State Link state

link Linked

unlink Not linked

If the link state is link, the logical disk name of the destination-volume is also displayed.

Mode Access restrictions of the source volume

rw Both input and output allowed

ro Only reference allowed

nr Access not allowed

If the link is not established, is displayed.

If the volume specified in the -vol option is the destination-volume, the command displays a list of the volumes (LVs) that can be linked to the destination-volume specified in the -lcl option.

```
C:\>iSMsc_linkinfo -vol sv_ld_name -volflg ld -ld

   Specified Volume Information
   aa: LD Name        : sv_ld_name
       Type           : sv_type
       Volume Name    : volume_name
       Path           : path
       State          : link_sts (ld_name)
       Mode           : access_mode

   Destination Volume Information
       bb:ld_name     type     link_state     (ld_name)     access_mode
       bb:ld_name     type     link_state     (ld_name)     access_mode
       bb:ld_name     type     link_state     (ld_name)     access_mode

C:\>
```

Description of messages:

Specified Volume Information

Displays the information of the specified volume.

aa Displays the type (BV/SV) of the specified volume.

LD Name Logical disk name

Type OS type

Volume Name Mount point volume name

Path NTFS folder name

State Link state

link Linked

unlink Not linked

If the link state is link, the logical disk name of the source volume is also displayed.

Mode Access restrictions of the destination-volume

rw Both input and output allowed

nr Access not allowed

Destination Volume Information

If the specified volume is the destination-volume, the LV information is displayed.

bb Indicates a link-volume (LV).

ld_name Logical disk name

type OS type

link_state Link state

link Linked

unlink Not linked

If the link state is link, the logical disk name of the source volume is also displayed.

access_mode Access restrictions of the source volume

rw Both input and output allowed

ro Only reference allowed

nr Access not allowed

If the link is not established, is displayed.

(4)If the volume specified in the -vol option is the destination-volume, the command displays the link information of the specified destination-volume.

```
C:\>iSMsc_linkinfo-vol sv_ld_name -volflg ld

  Specified Volume Information
  aa: LD Name       : sv_ld_name
       Type          : sv_type
       Volume Name   : volume_name
       Path          : path
       State         : link_sts (ld_name)
       Mode          : access_mode

C:\>
```

Description of messages:

 Specified Volume Information

Displays the information of the specified volume.

aa Displays the type (BV/SV) of the specified volume.

LD Name Logical disk name

Type OS type

Volume Name Mount point volume name

Path NTFS folder name

State Link state

link Linked

unlink Not linked

If the link state is link, the logical disk name of the source volume is also displayed.

Mode Access restrictions of the destination-volume

rw Both input and output allowed

nr Access not allowed

Data Retention Function

Retention Operation File

To perform batch setting of paired volumes by a data retention function command with the -file option, use the data retention operation file.

The data retention operation file is described below.

File Location And Name

Can be freely specified.

Description

The data retention operation file is used to perform batch setting of multiple pairs by using a data replication command.

Synopsis

This file is described in the following synopsis:

VOL_Type: VOL

To describe the target volume, use a colon (:) to connect the volume type (VOL_Type) with the volume identifier (VOL).

Specifying volume types

The following values can be specified as a volume type (VOL_Type) by using either a numerical value or a character string.

Target Volume	Volume Types		Target System
	By Number	By Characters	Windows
Logical disk name	0	ld	✓
Special file name	1	sfn	-
Physical disk number	3	dskn	✓
Mount point volume name	6	mvol	✓

Specifying a Volume

Specify the name of the target volume that has an attribute specified as a volume type.

The maximum number of characters is as follows:

Target Volume	Maximum Number of Characters
Logical disk name	32 single-byte characters
Special file name	
Physical disk number	3 single-byte characters (0 to 255)
Mount point volume name	52 single-byte characters

Rules

Start description from the first column of the line.

A line break shall be a partition of records.

Up to 1,024 single-byte characters can be described per record.

One volume can be described per record.

Text displayed from the sharp (#) character to the end of the record is recognized as a comment.

If there is an error in the file syntax, operations to all volumes described in the file become invalid.

The following is an example of a description of a volume in the data retention operation file:

```
#Type:VOL
ld:dev000
0:dev001
ld:dev006
mvol:\\?\Volume{o621c48b-1234-11d8-5678-00e018fa017d}
dskn:12
```

Data Retention Operation

iSMpc_protect

Name

iSMpc_protect - Sets or changes the volume protection settings

Synopsis

iSMpc_protect-vol volume -volflg vol_flg

[-set protection_state]

[-expire expire_time]

[-mode retention_mode]

iSMpc_protect -file file_name

[-set protection_state]

[-expire expire_time]

[-mode retention_mode]

iSMpc_protect -ver

iSMpc_protect -help(Linux)

iSMpc_protect -?(Windows)

Description

The iSMpc_protect command sets or changes the volume protection settings.

Options

The iSMpc_protect command recognizes the following options.

-vol volumeSpecifies volume name.

The logical disk name or the physical disk number or the mount point volume name can be specified in volume.

-volflg vol_flgSpecify the volume type specified in -vol by vol_flg.

One of the following can be specified.

  ldLogical disk name

For Linux only sfnSpecial file name

<For Windows only>

  dsknPhysical disk number

  mvolMount point volume name

This argument must be specified with -vol.

-set protection_stateSpecifies protection state.

One of the following can be specified in protection_state.

   ro   Sets protection state to ReadOnly

   na   Sets protection state to NotAccessible

If the current retention mode is normal or secure, protection state can be changed to either ro or na. If the current retention mode is strict, protection state cannot be changed.

If this argument is omitted, protection state will be set to ro if the target volume is not protected, or remains unchanged if the target volume is being protected.

-expire expire_timeSpecifies retention period.

One of the following can be specified in expire_time.

  YYYYMMDD

Specifies year, month, date of the retention date.

A maximum year of 9999 can be specified.

Do not omit zeros

A month of 01-12 can be specified.

Do not omit zeros.

A date of 01-12 can be specified.

Do not omit zeros.

+[xxY][xxM][xxxD]

Specifies year, month, day of the retention period.

The retention date is the current date plus the specified retention period.

A maximum number of 99 years can be specified. Add a character of 'Y' or 'y' after the number.

A maximum number of 99 months can be specified.Add a character of 'M' or 'm' after the number.

A maximum number of 999 days can be specified. Add a character of 'D' or 'd' after the number.

permanent

Retention will not expire.

Retention expires at 24: 00 on the specified retention date.

If the current retention mode is normal, retention period can either be shortened or lengthened. If the current retention mode is secure, retention period can only be lengthened. If the current retention mode is strict, retention period cannot be changed.

If this argument is omitted, retention period will be set to zero if the target volume is not protected, or remains unchanged if the target volume is being protected.

For example, if +3y6m is specified at April 1, 2005, the retention date is set to October 1, 2008. If +1m is specified at January 31,2005, the retention date is set to February 28, 2005.

-mode retention_modeSpecifies retention mode.

One of the following can be specified in retention_mode.

  normalnormal mode

  securessecure mode

  strictstrict mode

If the current retention mode is normal, retention mode can be changed to either secure or strict. If the current retention mode is secure, retention mode can be changed to strict. If the current retention mode is strict, retention mode cannot be changed.

If this argument is omitted, retention mode will be set to normal if the target volume is not protected, or remains unchanged if the target volume is being protected.

-file file_nameTo specify multiple volumes, describe the volume names in file_name.

When multiple volumes are specified, if an error occurs in some volumes, the process is continued until it is terminated in all the specified volumes.

-ver Displays the version information of this command.

-help Displays the usage of this command (Linux).

-? Displays the usage of this command (Windows).

Displayed Information

Windows System

Upon normal termination of volume protection setting, the command displays the following information.

(Individual specification)

```
C:\>iSMpc_protect -vol ld-name -volflg ld -set ro -expire YYYYMMDD -mode secure

iSMpc_protect:Info: iSM21010: iSMpc_protect has normally terminated.
VOL:ld-name
         Protection State    : RO
         Retention Mode      : secure
         Begin Date          : YYYY/MM/DD
         Retention Date      : YYYY/MM/DD

C:\>
```

Description of messages:

iSMpc_protect: Info: iSM21010: iSMpc_protect has normally terminated.

Message indicating that volume protection setting has normally terminated

VOL: ld-name

Protection State: RO

Retention Mode: secure

Begin Date: YYYY/MM/DD

Retention Date : YYYY/MM/DD

The name of volume to be protected, protection state, retention mode, begin date, and retention date are displayed.

Upon abnormal termination of volume protection setting, the command displays the following information.

(Individual specification)

```
C:\> iSMpc_protect -vol ld-name -volflg ld -set ro -expire YYYYMMDD -mode secure

iSMpc_protect:Error: iSM21100:  Specified volume cannot be protected. VOL: ld-name
iSMpc_protect:Info:   iSM21012:  iSMpc_protect has abnormally terminated.

C:\>
```

Description of messages:

 The following error messages are output.

- iSMpc_protect: Error: iSM21100: Specified volume cannot be protected. VOL: ld-name
- iSMpc_protect: Info: iSM21012: iSMpc_protect has abnormally terminated.

Message indicating that volume protection setting has abnormally terminated

Upon normal termination of volume protection changing, the command displays the following information.

(Individual specification)

```
C:\>iSMpc_protect -vol ld-name -volflg ld -set na -expire YYYY/MM/DD -mode strict

iSMpc_protect:Info: iSM21010: iSMpc_protect has normally terminated.
    VOL:ld-name
    Before change:
        Protection State      : RO
        Retention Mode        : secure
        Begin Date            : YYYY/MM/DD
        Retention Date        : YYYY/MM/DD
    After change:
        Protection State      : NA
        Retention Mode        : strict
        Begin Date            : YYYY/MM/DD
        Retention Date        : YYYY/MM/DD

C:\>
```

Description of messages:

iSMpc_protect: Info: iSM21010: iSMpc_protect has normally terminated.

Message indicating that changing volume protection setting has normally terminated

 VOL: ld-name

Before change:

Protection State: RO

Retention Mode: secure

Begin Date: YYYY/MM/DD

Retention Date: YYYY/MM/DD

After change:

Protection State: NA

Retention Mode : strict

Begin Date : YYYY/MM/DD

Retention Date : YYYY/MM/DD

The name of volume to be protected, protection state before and after changing the volume protection setting, retention mode, begin date, and retention date are displayed.

Upon abnormal termination of volume protection changing, the command displays the following information.

(Individual specification)

```
C:\> iSMpc_protect -vol ld-name -volflg ld -set ro -expire YYYYMMDD -mode normal

iSMpc_protect:Error: iSM21107:  The volume's retention mode cannot be changed.
(mode=secure) VOL:ld-name
iSMpc_protect:Info:   iSM21012:  iSMpc_protect has abnormally terminated.

C:\>
```

Description of messages:

The following error messages are output.

- iSMpc_protect: Error: iSM21107: The volume's retention mode cannot be changed. (mode=secure) VOL: ld-name
- iSMpc_protect: Info: iSM21012: iSMpc_protect has abnormally terminated.

Message indicating that changing volume protection setting has abnormally terminated

VOL: ld-name

A logical disk name, physical disk number, or mount point volume name of a volume specified at a command line is displayed.

Linux System

Upon normal termination of volume protection setting, the command displays the following information.

(Individual specification)

Description of messages:

iSMpc_protect: Info: iSM21010: iSMpc_protect has normally terminated.

Message indicating that volume protection setting has normally terminated

 VOL: ld-name

Protection State: RO

Retention Mode: secure

Begin Date: YYYY/MM/DD

Retention Date: YYYY/MM/DD

The name of volume to be protected, protection state, retention mode, begin date, and retention date are displayed.

Upon abnormal termination of volume protection setting, the command displays the following information.

(Individual specification)

```
#iSMpc_protect -vol ld-name -volflg ld -set ro -expire YYYYMMDD -mode secure

iSMpc_protect:Error: iSM21100:  Specified volume cannot be protected. VOL: ld-name
iSMpc_protect:Info:   iSM21012:  iSMpc_protect has abnormally terminated.

#
```

Description of messages:

The following error messages are output.

- iSMpc_protect: Error: iSM21100: Specified volume cannot be protected. VOL: ld-name
- iSMpc_protect: Info: iSM21012: iSMpc_protect has abnormally terminated.

Message indicating that volume protection setting has abnormally terminated

Upon normal termination of volume protection changing, the command displays the following information.

(Individual specification)

```
#iSMpc_protect -vol ld-name -volflg ld -set na -expire YYYY/MM/DD -mode strict

iSMpc_protect: Info: iSM21010: iSMpc_protect has normally terminated.
VOL: ld-name
Before change:
        Protection State        : RO
        Retention Mode          : secure
        Begin Date              : YYYY/MM/DD
        Retention Date          : YYYY/MM/DD
After change:
        Protection State        : NA
        Retention Mode          : strict
        Begin Date              : YYYY/MM/DD
        Retention Date          : YYYY/MM/DD

#
```

Description of messages:

The following error messages are output.

- iSMpc_protect: Error: iSM21100: Specified volume cannot be protected. VOL: ld-name
- iSMpc_protect: Info: iSM21012: iSMpc_protect has abnormally terminated.

Message indicating that volume protection setting has abnormally terminated

Upon normal termination of volume protection changing, the command displays the following information.

(Individual specification)

```
#iSMpc_protect -vol ld-name -volflg ld -set na -expire YYYY/MM/DD -mode strict

iSMpc_protect: Info: iSM21010: iSMpc_protect has normally terminated.
VOL: ld-name
Before change:
        Protection State        : RO
        Retention Mode          : secure
        Begin Date              : YYYY/MM/DD
        Retention Date          : YYYY/MM/DD
After change:
        Protection State        : NA
        Retention Mode          : strict
        Begin Date              : YYYY/MM/DD
        Retention Date          : YYYY/MM/DD

#
```

Description of messages:

 iSMpc_protect: Info: iSM21010: iSMpc_protect has normally terminated.

Message indicating that changing volume protection setting has normally terminated

 VOL: ld-name

Before change:

Protection State: RO

Retention Mode: secure

Begin Date: YYYY/MM/DD

Retention Date: YYYY/MM/DD

After change:

Protection State: NA

Retention Mode: strict

Begin Date: YYYY/MM/DD

Retention Date: YYYY/MM/DD

The name of volume to be protected, protection state before and after changing the volume protection setting, retention mode, begin date, and retention date are displayed.

Upon abnormal termination of volume protection changing, the command displays the following information.

(Individual specification)

```
#iSMpc_protect -vol ld-name -volflg ld -set ro -expire YYYYMMDD -mode normal

iSMpc_protect:Error: iSM21107:  The volume's retention mode   cannot be changed.
(mode=secure) VOL:ld-name
iSMpc_protect:Info:   iSM21012:  iSMpc_protect has abnormally terminated.


#
```

Description of messages:

The following error messages are output.

iSMpc_protect: Error: iSM21107: The volume's retention mode cannot be changed. (mode=secure) VOL: ld-name

iSMpc_protect: Info: iSM21012: iSMpc_protect has abnormally terminated.

Message indicating that changing volume protection setting has abnormally terminated

Usage

Volume vol1 will be protected until January 1, 2008.

```
#iSMpc_protect -vol vol1 -volflg ld -set ro -expire 20080101  -mode secure

iSMpc_protect:Info: iSM21010: iSMpc_protect has normally terminated.
VOL:vol1
        Protection State   : RO
        Retention Mode   : secure
        Begin Date         : 2005/03/01
        Retention Date     : 2008/01/01

#
```

   (2)   Volume vol2 will be protected for 3 years.

```
#iSMpc_protect -vol vol2 -volflg ld -set ro -expire +3y -mode secure

iSMpc_protect:Info: iSM21010: iSMpc_protect has normally terminated.
VOL:vol2
        Protection State   : RO
        Retention Mode   : secure
        Begin Date         : 2005/03/01
        Retention Date     : 2008/03/01

#
```

   (3)   Volume vol3 will be protected for 60 days.

```
#iSMpc_protect -vol vol3 -volflg ld -set ro -expire +60d -mode secure

iSMpc_protect:Info: iSM21010: iSMpc_protect has normally terminated.
VOL:vol3
        Protection State   : RO
        Retention Mode   : secure
        Begin Date         : 2005/03/01
        Retention Date     : 2008/04/30

#
```

```
#iSMpc_protect -vol vol4 -volflg Id -set ro -expire +3y3m3d -mode secure

iSMpc_protect:Info: iSM21010: iSMpc_protect has normally terminated.
VOL:vol4
        Protection State   : RO
        Retention Mode     : secure
        Begin Date         : 2005/03/01
        Retention Date     : 2008/06/04

#
```

(5)   Volume vol5 will be protected in normal mode without the retention date specification.

```
#iSMpc_protect -vol vol5 -volflg Id -set ro -mode normal

iSMpc_protect:Info: iSM21010: iSMpc_protect has normally terminated.
VOL:vol5
        Protection State   : RO
        Retention Mode     : normal
        Begin Date         : 2005/03/01
        Retention Date     : -

#
```

(6)   Volume vol6 will be protected indefinitely.

```
#iSMpc_protect -vol vol6 -volflg Id -set ro -expire permanent -mode secure

iSMpc_protect:Info: iSM21010: iSMpc_protect has normally terminated.
VOL:vol6
        Protection State   : RO
        Retention Mode     : secure
        Begin Date         : 2005/03/01
        Retention Date     : permanent

#
```

```
C:\>iSMpc_protect -vol vol1 -volflg ld -set na

iSMpc_protect:Info: iSM21010: iSMpc_protect has normally terminated.
VOL:vol1                      [WN]
Before change:
        Protection State      : RO
        Retention Mode        : secure
        Begin Date            : 2005/03/01
        Retention Date        : 2008/01/01
After change:
        Protection State      : NA
        Retention Mode        : secure
        Begin Date            : 2005/03/01
        Retention Date        : 2008/01/01

#
```

(8) Retention date of volume vol1 is changed to January 1, 2010.

```
#iSMpc_protect -vol vol1 -volflg ld -expire 20100101

iSMpc_protect:Info: iSM21010: iSMpc_protect has normally terminated.
VOL:vol1
Before change:
        Protection State      : NA
        Retention Mode        : secure
        Begin Date            : 2005/03/01
        Retention Date        : 2008/01/01
After change:
        Protection State      : NA
        Retention Mode        : secure
        Begin Date            : 2005/03/01
        Retention Date        : 2010/01/01

#
```

(11) Two or more volume is specified to be protected at the same time.

```
#iSMpc_protect -file volume_file -set ro -expire 20100101  -mode secure

iSMpc_protect:Info: iSM21010: iSMpc_protect has normally terminated.
VOL:vol8
        Protection State        : RO
        Retention Mode          : secure
        Begin Date              : 2005/03/01
        Retention Date          : 2010/01/01

iSMpc_protect:Info: iSM21010: iSMpc_protect has normally terminated.
VOL:vol9
        Protection State        : RO
        Retention Mode          : secure
        Begin Date              : 2005/03/01
        Retention Date          : 2010/01/01

iSMpc_protect:Info: iSM21010: iSMpc_protect has normally terminated.
VOL:vol10
        Protection State        : RO
        Retention Mode          : secure
        Begin Date              : 2005/03/01
        Retention Date          : 2010/01/01

#
```

The end messages are displayed in the order the volume protection setting terminates.

- The content of volume_file is as follows.

```
#Type:VOL
Id:vol8
Id:vol9
Id:vol10
```

Notes

A volume being used by the snapshot function cannot be operated.

The target volume must be unmounted.

If the target volume is paired as MV or RV for replication, replication must be in the Separated state.

A volume that is registered in an ATgroup cannot be operated.

A volume that is being moved by for performance optimization cannot be operated.

A volume that is not in use by the power saving function cannot be operated.

A control volume cannot be operated.

The target volume must not be a dynamic disk volume (for Windows only).

The target volume must be registered in the volume list.

Alternatively, if the target volume is paired as RV for replication, the MV to be paired with the RV must be registered in the volume list.

The volume list must not be being created or updated.

The SnapSAN Manager-only special file must not be being created (for Linux only).

Return Values

0: The command terminated normally.

1: Operation for all volumes failed.

2: Operation for some volumes failed.

iSMpc_release

Name

iSMpc_release - Cancels the volume protection settings

Synopsis

iSMpc_release-vol volume -volflg vol_flg

[-reinit]

iSMpc_release-file file_name

[-reinit]

iSMpc_release-ver

iSMpc_release-help(Linux)

iSMpc_release-?(Windows)

Description

The iSMpc_release command releases protection state of the specified volume. If the target volume is not being used by the data replication function, users may also re-initialize the target volume to clear all data on the volume at protection release. If the current retention mode is normal, protection state can be released at anytime. If the current retention mode is secure or strict, protection state cannot be released within retention period.

Options

The iSMpc_release command recognizes the following options.

-vol volumeSpecifies volume name.

The logical disk name or the physical disk number or the mount point volume name can be specified in volume.

-volflg vol_flgSpecifies the volume type specified in -vol by vol_flg.

One of the following can be specified.

  ldLogical disk name

For Linux only

  sfnSpecial file name

For Windows only

  dsknPhysical disk number

  mvolMount point volume name

This argument must be specified with -vol.

-reinit Reinitializes the volume and clears the data while releasing volume protection.

This argument cannot be specified for a volume being used by the data replication function. If this argument is omitted, data will not be cleared when protection state is released.

-file file_name To specify multiple volumes, describe the volume names in file_name.

When multiple volumes are specified, if an error occurs in some volumes, the process is continued until it is terminated in all the specified volumes.

-ver Displays the version information of this command.

-help Displays the usage of this command (Linux).

-? Displays the usage of this command (Windows).

Displayed Information

Windows system

Upon normal termination of volume protection releasing, the command displays the following information.

(Individual specification)

Description of messages:

```
C:\>iSMpc_release -vol ld-name -volflg ld

iSMpc_release:Info: iSM21020: iSMpc_release has normally terminated.
VOL:ld-name
        Reinitialize        : No

C:\>
```

 SMpc_release: Info: iSM21010: iSMpc_release has normally terminated.

Message indicating that volume protection releasing has normally terminated

 VOL: ld-name

Reinitialize: No

The name of volume for which protection is released and whether the volume will be reinitialized or not are displayed.

Upon abnormal termination of volume protection releasing, the command displays the following information.

(Individual specification)

```
C:\>iSMpc_release -vol ld-name -volflg ld

iSMpc_release: Error:iSM21101:  The  volume which is not protected cannot be specified.
VOL:ld-name
iSMpc_release: Info: iSM21022:   iSMpc_release has abnormally terminated.

C:\>
```

Description of messages:

The following error messages are output.

iSMpc_protect: Error: iSM21101: The volume which is not protected cannot be specified. VOL: ld-name

iSMpc_protect: Info: iSM21022: iSMpc_protect has abnormally terminated.

Message indicating that volume protection releasing has abnormally terminated

Linux system

Upon normal termination of volume protection releasing, the command displays the following information.

(Individual specification)

```
#iSMpc_release -vol ld-name -volflg ld

iSMpc_release:Info: iSM21020: iSMpc_release has normally terminated.
VOL:ld-name
        Reinitialize         : No

#
```

Description of messages:

 SMpc_release: Info: iSM21010: iSMpc_release has normally terminated.

Message indicating that volume protection releasing has normally terminated

 VOL: ld-name

Reinitialize: No

The name of volume for which protection is released and whether the volume will be reinitialized or not are displayed.

Upon abnormal termination of volume protection releasing, the command displays the following information.

(Individual specification)

```
#iSMpc_release -vol ld-name -volflg ld

iSMpc_release: Error:  iSM21101: The volume which is not protected cannot be specified.
VOL:ld-name
iSMpc_release: Info:    iSM21022: iSMpc_release has abnormally terminated.

#
```

Description of messages:

The following error messages are output.

iSMpc_protect: Error: iSM21101: The volume which is not protected cannot be specified. VOL: ld-name

iSMpc_protect: Info: iSM21022: iSMpc_protect has abnormally terminated.

Message indicating that volume protection releasing has abnormally terminated

Usage

Protection for volume vol1 is released. Its data is not deleted.

```
#iSMpc_release -vol vol1 -volflg ld

iSMpc_release:Info: iSM21020: iSMpc_release has normally terminated.
VOL:vol1
        Reinitialize      : No

#
```

Protection for volume vol1 is released. Its data is deleted.

```
#iSMpc_release -vol vol2 -volflg ld -reinit

iSMpc_release:Info: iSM21020: iSMpc_release has normally terminated.
VOL:vol2
        Reinitialize      : Yes

#
```

Protection for two or more volumes is specified to be released at the same time.

```
#iSMpc_release -file volume_file

iSMpc_release:Info: iSM21020: iSMpc_release has normally terminated.
VOL:vol3
         Reinitialize        : No

iSMpc_release:Info: iSM21020: iSMpc_release has normally terminated.
VOL:vol4
         Reinitialize        : No

iSMpc_release:Info: iSM21020: iSMpc_release has normally terminated.
VOL:vol5
         Reinitialize        : No


#
```

The end messages are displayed in the order the volume protection setting terminates.

The content of volume_file is as follows.

```
#Type:VOL
Id:vol3
Id:vol4
Id:vol5
```

Notes

A volume being used by the snapshot function cannot be operated.

The target volume must be protected.

The target volume must be unmounted.

If the target volume is paired as MV or RV for replication, replication must be in the Separated state.

A volume that is registered in an ATgroup cannot be operated.

A volume being used by the data replication function cannot be reinitialized.

A volume that is not in use by the power saving function cannot be operated.

The target volume must not be a dynamic disk volume (for Windows only).

The target volume must be registered in the volume list.

Alternatively, if the target volume is paired as RV for replication, the MV to be paired with the RV must be registered in the volume list.

The volume list must not be being created or updated.

The SnapSAN Manager-only special file must not be being created (for Linux only).

Return Values

0: The command terminated normally.

1: Operation for all volumes failed.

2: Operation for some volumes failed.

Power Saving Function

Saving File

To perform batch setting of volumes by the power saving function command with the -file option, use the power saving operation file.

The power saving operation file is described below.

File Location and Name

Can be freely specified.

Description

The power saving operation file is used to perform batch setting of multiple volumes by using the power saving command.

Synopsis

This file is described in the following synopsis:

VOL_Type: VOL

Target Volume	Volume Types		Target System	
	By Number	By Characters	Windows	
Logical disk name	0	ld	P	P
Special file name	1	sfn	-	P
Drive letter	4	drv	P	-
Mount point volume name	6	mvol	P	-
NTFS folder name	7	mdir	P	-

Specifying a volume

Specify the name of the target volume that has an attribute specified as a volume type.

The maximum number of characters is as follows:

Target Volume	Maximum Number of Characters
Logical disk name	32 single-byte characters
Special file name	
Drive letter	
Mount point volume name	52 single-byte characters
NTFS folder name	260 single-byte characters

Rules

Start description from the first column of the line.

A line break shall be a partition of records.

Up to 1,024 single-byte characters can be described per record.

One volume can be described per record.

Text displayed from the sharp (#) character to the end of the record is recognized as a comment.

If there is an error in the file syntax, all operations to volumes described in the file become invalid.

If a character string, such as an NTFS folder name, includes a blank space ( ), colon (:), or period (.), enclose the entire character string in double quotation marks .

Pool cannot be specified.

The following is an example of a description of a volume in the power saving operation file:

On the Windows system

```
#Type:VOL
ld:vol1
0:vol2
ld:vol3
mvol:\\?\Volume{c521c48b-1234-11d8-5678-00e018fa017d}
```

On the Linux system

```
#Type:VOL
ld:vol1
0:vol2
sfn:/dev/sdd
1:/dev/sdf
ld:vol3
```

Power Saving Operation

iSMec_start

Name

iSMec_start - Starts using volumes or starts rotation of a pool

Synopsis

iSMec_start -vol volume -volflg vol_flg

iSMec_start -file file_name

iSMec_start -pool poolnum -arrayname diskarray [-reset]

iSMec_start -ver

iSMec_start -help

iSMec_start -?(Windows)

Description

The iSMec_start command starts using the specified volume or starts rotation of the specified pool. If the pool to which the specified volume belongs is in the rotation stop state, the command starts rotation of the pool.

Options

The iSMec_start command recognizes the following options.

-vol volumeSpecify the volume name.

A logical disk name, special file name, drive letter, mount point volume name, or NTFS folder name can be specified in volume.

-volflg vol_flgSpecify the volume type specified in -vol by vol_flg.

One of the following can be specified.

  ldLogical disk name

<For only>

  sfnSpecial file name

<For Windows only>

  drv Drive letter

  mvol Mount point volume name

  mdir NTFS folder name

This argument must be specified with -vol.

-file file_nameTo specify multiple volumes, describe the volume names in file_name.

When multiple volumes are specified, if an error occurs in some volumes, an error message is output and the process is continued until it is terminated in all the specified volumes.

-pool poolnumSpecify the pool.

For poolnum, specify the pool number.

-arrayname diskarraySpecify the target disk array name (nickname).

This argument must be specified with -pool.

-resetChanges the use state of the all volumes configured in the specified pool to in use.

This argument must be specified with -pool.

-verDisplays the version information of this command.

-helpDisplays the usage of this command .

-?Displays the usage of this command (Windows).

Displayed Information

Windows System

Upon normal termination of the start of using volumes, the command displays the following information.

```
(Individual specification)
C:\>iSMec_start -vol Id-name -volflg Id

iSMec_start:Info: iSM25030: Starting Pool:poolnum Disk Array:diskarray...
iSMec_start:Info: iSM25031: Rotation started for pool. Pool:poolnum
Disk Array:diskarray
iSMec_start:Info: iSM25010: iSMec_start has normally terminated.

C:\>
```

Description of messages:

" The following error messages are output.

iSMec_start:Error:iSM25103: Specified volume does not exist.

iSMec_start:Info: iSM25012: iSMec_start has abnormally terminated.

Message indicating abnormal termination of the start of using volumes

Upon normal termination of the rotation start of the pool, the command displays the following information.

```
C:\>iSMec_start -pool poolnum -arrayname diskarray

iSMec_start:Info:   iSM25030:  Starting Pool:poolnum Disk Array:diskarray...
iSMec_start:Info:   iSM25031:  Rotation started for pool. Pool:poolnum
Disk Array:diskarray
iSMec_start:Info:   iSM25011:  iSMec_start has normally terminated.

C:\>
```

Description of messages:

" The following error messages are output.

iSMec_start:Error:iSM25103: Specified volume does not exist.

iSMec_start:Info: iSM25012: iSMec_start has abnormally terminated.

Message indicating abnormal termination of the start of using volumes

Upon normal termination of the rotation start of the pool, the command displays the following information.

```
C:\>iSMec_start -pool poolnum -arrayname diskarray

iSMec_start:Info:   iSM25030:  Starting Pool:poolnum Disk Array:diskarray...
iSMec_start:Info:   iSM25031:  Rotation started for pool. Pool:poolnum
Disk Array:diskarray
iSMec_start:Info:   iSM25011:  iSMec_start has normally terminated.

C:\>
```

```
C:\>iSMec_start -pool poolnum -arrayname diskarray

iSMec_start:Info:   iSM25030:  Starting Pool:poolnum Disk Array:diskarray...
iSMec_start:Info:   iSM25031:  Rotation started for pool. Pool:poolnum
Disk Array:diskarray
iSMec_start:Info:   iSM25011:  iSMec_start has normally terminated.

C:\>
```

Description of messages:

iSMec_start:Info: iSM25030: Starting Pool:poolnum Disk Array:diskarray...

iSMec_start:Info: iSM25031: Rotation started for pool. Pool:poolnum

Disk Array:diskarray

iSMec_start:Info: iSM25011: iSMec_start has normally terminated.

Message indicating the rotation start of the pool

Pool:poolnum

The pool number of the specified pool is displayed.

Disk Array:diskarray

The disk array name of the disk array in which the specified pool is configured is displayed.

Upon normal termination of the rotation start of the pool with the -reset option specified, the command displays the following information.

```
C:\>iSMec_start -pool poolnum -arrayname diskarray -reset

iSMec_start:Info:   iSM25030:  Starting Pool:poolnum Disk Array:diskarray...
iSMec_start:Info:   iSM25031:  Rotation started for pool. Pool:poolnum
Disk Array:diskarray
iSMec_start:Info:   iSM25032:  The use state of all volumes in specified pool will be reset to in
use. Pool:poolnum
iSMec_start:Info:   iSM25010:  iSMec_start has normally terminated.

C:\>
```

iSMec_start:Info: iSM25030: Starting Pool:poolnum Disk Array:diskarray...

iSMec_start:Info: iSM25031: Rotation started for pool. Pool:poolnum

Disk Array:diskarray

iSMec_start:Info: iSM25032: The use state of all volumes in specified pool will be reset to in use. Pool:poolnum

iSMec_start:Info: iSM25010: iSMec_start has normally terminated.

Message indicating the rotation start of the pool when the -reset option is specified

Pool:poolnum

The pool number of the specified pool is displayed.

Disk Array:diskarray

The disk array name of the disk array in which the specified pool is configured is displayed.

Upon abnormal termination of the rotation start of the pool, the command displays the following information.

```
C:\>iSMec_start -pool poolnum -arrayname diskarray

iSMec_start:Error:  iSM25110:  Specified diskarray does not exist.
Disk Array:diskarray
iSMec_start:Info:   iSM25012:  iSMec_start has abnormally terminated.

C:\>
```

Description of messages:

The following error messages are output.

iSMec_start:Error:iSM25110: Specified diskarray does not exist.

Disk Array:diskarray

iSMec_start:Info: iSM25012: iSMec_start has abnormally terminated.

Message indicating abnormal termination of the rotation start of the pool

Disk Array:diskarray

The disk array name of the disk array in which the specified pool is configured is displayed.

iSMec_stop

Name

iSMec_stop - Stops using volumes

Synopsis

iSMec_stop -vol volume -volflg vol_flg

iSMec_stop -file file_name

iSMec_stop -ver

iSMec_stop -help

iSMec_stop -?(Windows)

Description

The iSMec_stop command stops using the specified volumes. If all the volumes configured in the pool to which the specified volume belongs are not in use, rotation is stopped for the pool.

Options

The iSMec_stop command recognizes the following options.

-vol volume

Specify the volume name.

A logical disk name, special file name, drive letter, mount point volume name, or NTFS folder name can be specified in volume.

-volflg vol_flg

Specify the volume type specified in -vol by vol_flg.

One of the following can be specified.

drv Drive letter

  mvol Mount point volume name

  mdir NTFS folder name

This argument must be specified with -vol.

-file file_name

To specify multiple volumes, describe the volume names in file_name.

When multiple volumes are specified, if an error occurs in some volumes, an error message is output and the processsis continued until it is terminated in all the specified volumes.

-ver Displays the version information of this command.

-help Displays the usage of this command .

-? Displays the usage of this command (Windows).

Displayed Information

Windows System

Upon normal termination of the stop of using volumes, the command displays the following information.

(Individual specification)

```
C:\>iSMec_stop -vol ld-name -volflg ld

iSMec_stop:Info:  iSM25020:  iSMec_stop has normally terminated.

C:\>
```

Description of messages:

iSMec_stop:Info: iSM25020: iSMec_stop has normally terminated.

Message indicating termination of the stop of using volumes

Upon normal termination of the rotation stop of the pool because the volumes are not in use, the command displays the following information.

(Individual specification)

```
C:\>iSMec_stop -vol ld-name -volflg ld

iSMec_stop:Info:  iSM25033:  Rotation will stop for pool. Pool:poolnum
Disk Array:diskarray
iSMec_stop:Info:  iSM25020:  iSMec_stop has normally terminated.

C:\>
```

Description of messages:

iSMec_stop:Info: iSM25033: Rotation will stop for pool. Pool:poolnum

Disk Array:diskarray

iSMec_stop:Info: iSM25020: iSMec_stop has normally terminated.

Message indicating rotation stop of the pool because volumes are not in use

Pool:poolnum

The pool number of the pool in which the specified volume is configured is displayed.

Disk Array:diskarray

The disk array name of the disk array in which the specified volume is configured is displayed.

Upon abnormal termination of the stop of using volumes, the command displays the following information.

(Individual specification)

```
C:\>iSMec_stop -vol ld-name -volflg ld

iSMec_stop:Error:iSM25103:  Specified volume does not exist.
iSMec_stop:Info:  iSM25022:  iSMec_stop has abnormally terminated.

C:\>
```

Description of messages:

The following error messages are output.

iSMec_stop:Error:iSM25103: Specified volume does not exist.

iSMec_stop:Info: iSM25022: iSMec_stop has abnormally terminated.

Message indicating abnormal termination of the stop of using volumes

iSMec_sense

Name

iSMec_sense - Displays the use state and rotation state

Synopsis

iSMec_sense -vol volume -volflg vol_flg

iSMec_sense -file file_name

iSMec_sense -pool poolnum -arrayname diskarray [-all]

iSMec_sense -ver

iSMec_sense -help

iSMec_sense -?(Windows)

Description

The iSMec_sense command displays the use state of the specified volume or rotation state of the specified pool.

Options

The iSMec_sense command recognizes the following options.

-vol volumeSpecify the volume name.

A logical disk name, special file name, drive letter, mount point volume name, or NTFS folder name can be specified in volume.

-volflg vol_flgSpecify the volume type specified in -vol by vol_flg.

One of the following can be specified.

  ldLogical disk name

<For only>

  sfnSpecial file name

<For Windows only>

drvDrive letter

mvolMount point volume name

mdirNTFS folder name

This argument must be specified with -vol.

-file file_nameTo specify multiple volumes, describe the volume names in file_name.

When multiple volumes are specified, if an error occurs in some volumes, an error message is output and the process is continued until it is terminated in all the specified volumes.

-pool poolnumSpecify the pool.

For poolnum, specify the pool number.

-arrayname diskarraySpecify the target disk array name (nickname).

This argument must be specified with -pool.

-allLists the use state of all the volume configured in the specified pool.

This argument must be specified with -pool.

-verDisplays the version information of this command.

-helpDisplays the usage of this command .

-?Displays the usage of this command (Windows).

Displayed Information

Windows System

For displaying the use state of a volume, the command displays the following information.

```
C:\>iSMec_sense -vol ld-name -volflg ld

Volume Rotation Information
        LD Name              ld_name
        Pool Num             poolnum
        Disk Array Name      diskarray
        Rotation State       rotation_state
        Use State            use_state
        Access State         access_state

C:\>
```

Description of messages:

Volume Rotation Information

Displays the information related to the use state of volume.

LD NameLogical disk name

Pool NumPool number

Disk Array NameDisk array name

Rotation StateRotation state of pool

Ready: Normal state

Attn.(stop): Rotation stop

Use StateUse state of volume

In use: In use

Not in use: Not in use

Access StateAccess state

Accessible: Accessible

NotAccessible: Not accessible

For displaying the rotation state of a pool, the command displays the following information.

```
C:\>iSMec_sense -pool poolnum -arrayname diskarray

Pool Rotation Information
        Pool Num              poolnum
        Disk Array Name       diskarray
        Rotation State        rotation_state
        Eco Mode              eco_mode

C:\>
```

```
C:\>iSMec_sense -pool poolnum -arrayname diskarray -all

Pool Rotation Information
        Pool Num              poolnum
        Disk Array Name       diskarray
        Rotation State        rotation_state
        Eco Mode              eco_mode

Volume Rotation Information List
        LD Name               Use StateAccess State
        ld_name               use_stateaccess_state

C:\>
```

Description of messages:

Pool Rotation Information

Displays the information related to the rotation state of a pool.

Pool Num Pool number

Disk Array Name Disk array name

Rotation State Rotation state of pool

Eco Mode Eco mode

On: Eco mode is enabled.

Off: Eco mode is disabled.

Volume Rotation Information List

Displays the information related to the use state of all the volumes configured in the pool.

LD Name Logical disk name

Use State Use state of volume

Access State Access state

Operation Setting

Operation Option

Windows System

Various operations can be specified for individual ControlCommand commands by using the operation option setting file.

The operation option setting file corresponds to the replication operation option setting file for ReplicationControl, the option setting file for SnapControl, the option setting file for PowerControl, and the option setting file for ProtectControl.

In a Windows Server 2008 environment in which User Account Control (UAC) is enabled, to log on as a user other than the user belonging to the OS local system administrators group and edit the option setting file, start the text editor or the like to be used by the system administrator and then perform the task.

The operation option setting file is described below.

File Location and Name

%SystemRoot%\ismvol\iSMrpl.ini

There is a shortcut for the above file in %SystemRoot%\iSMrpl.ini.

Description

TRACELOG section

Specifies operations regarding event log, command trace, and operation trace for ControlCommand commands.

Event log

- RPLSYSLOG=0
  - Outputs the event log (default).
  - If you want to output the event log, you do not have to set RPLSYSLOG.
- RPLSYSLOG=1
  - Doesn't output the event log.
- Error level
  Specify whether or not to output the event log for each error severity level.
  This is valid only when event log output has been set.

RPLSYSLOGLV=EWI

- Outputs informational, warning, and error messages to the event log (default).

RPLSYSLOGLV=EW

- Outputs warning and error messages to the event log.

RPLSYSLOGLV=E

- Outputs error messages to the event log.

Command Trace

RPLTRACEFILENUM=Number of log files

- Specify the maximum number of log files that can be saved as command trace.

- If the size of a log file reaches the upper file size limit specified in RPLTRACEFILEMAXSIZE, the use of the file is discontinued, and another file is put in use. This switching is sequential and automatic. The switching occurs within the maximum specified number of log files.

- If you do not want to have any operation trace output, specify the number of log files as 0.

- If RPLTRACEFILENUM is omitted, up to 5 (default) log files are created and put in use sequentially.

RPLTRACEFILEMAXSIZE=Log file size

- Specify the maximum size (in kilobyte units) of a log file to be saved as command trace.

- Specify a value greater than or equal to 200 (kilobytes) as the maximum log file size. If a value less than 200 is specified, each created log file will have a size of 200 kilobytes.

- The size of a log file is checked at the start of command execution. If the log file is larger than specified, a new log file is put in use. For this reason, the actual file size becomes larger than specified.

- If RPLTRACEFILEMAXSIZE is omitted, each created log file will have a maximum size of 200 kilobytes (default).

- If RPLTRACEFILEMAXSIZE is specified as 0, no command trace log data is output.

Operation Trace

RPLLOGFILENUM=Number of log files

- Specify the maximum number of log files that are stored as the operation trace.

- When the size of the log file becomes the upper limit of the file size specified by the RPLLOGFILEMAXSIZE environment variable, the system automatically uses another file within the specified maximum number of files.

- If you do not want the operation trace to be output, specify 0for the number of log files.

- If neither RPLLOGFILENUM nor RPLLOG is specified, up to 10 (default) log files are created, and each log file is used sequentially.

RPLLOGFILEMAXSIZE=Log file size

- Specify the maximum log file size, in units of kilobytes, that is stored as the operation trace.

- Specify a value that is equal to or greater than 200 (kilobytes). If a value less than 200 (kilobytes) is specified, log files of up to 200 kilobytes (default) each are created.

- The system checks the size of the log file at the start of executing each command, and if the size is beyond the preset value, the system changes the value. Accordingly, the file size may not be quite the same as the specified value.

- If the RPLLOG setting is valid, the RPLLOGFILEMAXSIZE setting is ignored.

- If RPLLOGFILEMAXSIZE is not specified, the system creates log files of up to 400 kilobytes (default) each.

- If you specify 0for RPLLOGFILEMAXSIZE, the operation trace log data will not be output.

RPLLOG=Number of days

- This setting becomes valid if RPLLOGFILENUM is omitted. This parameter setting is ignored if RPLLOGFILENUM is specified.

- In Number of Days, specify the expiration date to delete data saved in the trace file.

- Data for which the period specified in RPLLOG has elapsed since the day the data was recorded is deleted at execution of the command.

- If RPLLOG is specified as 0, no operation trace log file is output.

- When RPLLOG is specified, an overhead for searching or deleting log files occurs at execution of command immediately after the date is changed. Therefore, for controlling the output amount of trace file, using RPLLOGFILENUM and RPLLOGFILEMAXSIZE is recommended.

IOCONTROL section

Specifies operations regarding various I/O issue controls to the disk array for individual ControlCommand functions.

I/O Issue Path

Specify the I/O issue path to the disk array. This parameter setting is invalid for the data retention operation (iSMpc_protect and iSMpc_release commands) so that it always operates with the default value (DIRECT).

IOPATH=DIRECT

Directly issues the replication operation I/O to the disk array.

This is the default value when the IOPATH parameter is not specified.

IOPATH=MANAGER

Connects to the SnapSAN Manager currently in operation on the same server and allows the SnapSAN Manager issue the I/O to the disk array.

Connection Port Number

Specify a socket port number for connecting to the SnapSAN Manager.

IOPORT_MANAGER=socket port number

- This setting is valid when MANAGER is specified as IOPATH.

- This setting is valid for logical disk information display (iSMrc_ldlist and iSMrc_sense commands), replication operation (iSMrc_replicate, iSMrc_separate, iSMrc_restore, iSMrc_change, iSMrc_wait, iSMrc_query, and iSMrc_rvmode commands), pair operation (iSMrc_pair command), ATgroup building (iSMrc_atg command), and disk array operation (iSMrc_arrayinfo command).

- If the IOPORT_MANAGER parameter is not specified, the system uses socket port number 8030 (default).

- The socket port number to be specified must be the same as the environment setting on the SnapSAN Manager side (port number to be used by the replication management).

SNAP_IOPORT_MANAGER=socket port number

- This setting is valid when MANAGER is specified as IOPATH.

- This setting is valid for the snapshot operation (iSMsc_create, iSMsc_delete, iSMsc_restore, iSMsc_wait, iSMsc_svguard, and iSMsc_query commands), link operation (iSMsc_link, iSMsc_unlink, and iSMsc_linkinfo commands).
- If the SNAP_IOPORT_MANAGER parameter is not specified, the system uses socket port number 8060 (default).
- The socket port number to be specified must be the same as the environment setting on the SnapSAN Manager side (port number to be used by the snapshot management).

Data Being Received Message Output

Specify whether or not to output the message indicating that data is being received from the SnapSAN Manager when the iSMrc_ldlist command is executed in joint operation with SnapSAN Manager.

RPL_RECV_MSG=USE

- Does not output the Data Being Received message (default).
- The default value when the RPL_RECV_MSG parameter is not specified.

RPL_RECV_MSG=UNUSE

- Does not output the Data Being Received message.

WAIT section

Specifies operations regarding process wait.

Monitoring Time Interval

RPL_WATCHDEV=second

- A value as a monitoring time interval is determined for second of the -wait second option of the iSMrc_replicate, iSMrc_separate, iSMrc_restore, iSMsql_snapshotbkup, and iSMsql_snapshotrst commands, or the -interval second option of the iSMrc_wait command.
- A value 1 to 30 seconds can be specified.
- If the RPL_WATCHDEV parameter is not specified, the default is 5 seconds.

SNAP_WATCHDEV=second

- A value as a monitoring time interval is determined for second of the -interval second option of the iSMsc_wait command.
- A value 1 to 30 seconds can be specified.
- If the SNAP_WATCHDEV parameter is not specified, the default is 5 seconds.

Wait limit time

RPL_LIMWATCHDEV=second

- Specify a wait time limit (in seconds) to be used if the -limit option is omitted from the iSMrc_wait command.
- If RPL_LIMWATCHDEV parameter is omitted, no limit is placed on the wait process.

SNAP_LIMWATCHDEV=second

- Specify a wait time limit (in seconds) to be used if the -limit option is omitted from the iSMsc_wait command.
- If SNAP_LIMWATCHDEV parameter is omitted, no limit is placed on the wait process.

Wait process message output

Determine whether to output a wait process message when the -wait option of iSMrc_replicate, iSMrc_separate, iSMrc_restore, iSMsql_snapshotbkup, and iSMsql_snapshotrst commands are specified or when iSMrc_wait command is executed.

Message Replicating...that is out by the iSMrc_replicate command

Message Separating...that is out by the iSMrc_separate command

Message Restoring...that is out by the iSMrc_restore command

Message Waiting...that is out by the iSMrc_wait command

Message Separating.that is out by the iSMsql_snapshotbkup command

Message Restoring.that is out by the iSMsql_snapshotrst command

RPL_WAITMSG=USE

- Outputs a wait process message.
- The default value when the RPL_WAITMSG parameter is not specified.

RPL_WAITMSG=UNUSE

- Does not output a wait process message.

Determine whether to output messages during the iSMsc_wait command execution wait process.

SNAP_WAITMSG=USE

- Outputs a wait process message.
- The default value when the SNAP_WAITMSG parameter is not specified.

SNAP_WAITMSG=UNUSE

- Does not output a wait process message.

CHECK section

Specifies operations regarding disk operations.

The number of partitions

Specifies a restriction on the number of partitions.

A disk containing only one partition or only one logical volume is called single partition. A disk containing two or more partitions or logical volumes is called multiple partitions.

PARTITION=SINGLE

- Enables the command only for single partition.
- The default value when the PARTITION parameter is not specified.

PARTITION=MULTI

- Enables the command for multiple partitions.

To ensure data consistency for all the partitions on the disk, be very careful in executing the command.

GPT disk

Specifies a restriction on the GPT disk.

GPTDISK=UNUSE

- Operations for the GPT disk are not allowed. (A default value when the setting is omitted.)

GPTDISK=USE

- Operations for the GPT disk are allowed. (An initial value when ControlCommand is installed.)

FILESYSTEMOPERATION section

Specifies operations regarding file system operations.

 RV access restriction operation

Specifies the RV access restriction and mount point operations related to the iSMrc_umount, iSMrc_mount, and iSMrc_scan commands.

UMOUNT_RVACC=KEEP

- Neither unmounting nor mounting an RV changes its access restriction (default).

UMOUNT_RVACC=NOTREADY

- On Windows 2000, the iSMrc_umount command unmounts an RV after deleting its mount point and changing its access restriction to the Not Ready state. When an RV is mounted, the iSMrc_mount command is used to release it from the Not Ready state automatically. Specifying a mount point volume name and mount point (drive letter or NTFS folder name) together for the target volume makes the volume mounted at the specified point.When unmounting an RV volume in a multiple-partition configuration, to unmount the specified volume, volumes in other partitions are internally unmounted before the access restriction of the specified RV is set to the Not Ready state. It becomes impossible to reference or update any volume (partitions) on the disk of interest. From this time on, it is impossible to access other partitions on the disk for reference or update purposes and to operate them, using the iSMrc_flush command. Therefore, care must be taken in following the procedure of use and operation. When re-starting a server with an RV unmounted, the RV in the Not Ready state cannot be recognized by OS. In this case, note that it is necessary to make OS recognize the RV with the iSMrc_scan command after a server is started.

  The iSMrc_umount command terminates normally if the access restriction of the RV of interest is already the Not Ready state.

- On Windows Server 2003 or Windows Server 2008, the iSMrc_umount command unmounts an RV after deleting its mount point to make it impossible to mount. When an RV is mounted, the iSMrc_mount command is used to specify a mount point volume name and a mount point (drive letter or NTFS folder name) together so that the volume can be mounted at the specified mount point.

- Only one mount point (drive letter or NTFS folder name) must have been specified for the target volume. A volume cannot be unmounted if no mount point is specified for it or if more than one mount point is specified for it. Therefore, this setting cannot be applied to an operation procedure such as deleting all mount points of the volume using the D option of the MOUNTVOL command before unmounting. In addition, if more than one mount point has been set for a volume, it is necessary to delete all but one mount point using the D option of the MOUNTVOL command before unmounting. When using this setting, check the operation procedure and review it as required.

- Before scanning a device, the iSMrc_scan command releases volumes from the Not Ready state if their access restriction has been set to the Not Ready state in unmounting.

RETRY section

Specifies how to control retry if a failure occurs at disk operation.

Retry Operation Specification of the iSMrc_mount Command

Specifies retry operations to be performed if an attempt to execute the iSMrc_mount command fails.

MOUNTRTCOUNT=count

- In count, specify the number of retries of the iSMrc_mount command.
- The default value is 3.

MOUNTRTTIME=time

- In time, specify the retry time interval of the iSMrc_mount command in seconds.
- The default value is 3 seconds.

Retry Operation Specification of the iSMrc_umount coMmand

Specifies operations regarding retry performed when the execution of the iSMrc_umount command fails.

UMOUNTRTCOUNT=count

- In count, specify the number of retries of the iSMrc_umount command.
- The default value is 3.

UMOUNTRTTIME=time

- In time, specify the retry time interval of the iSMrc_umount command in seconds.
- The default value is 3 seconds.

Retry control for Remote Replication on low-speed line

There is no guarantee of line quality for a best-effort line, and a temporary link failure of the Remote Replication might occur. At the same time, the command that performs the Remote Replication operation is in error during a link failure.

The iSMrc_replicate, iSMrc_restore, iSMrc_separate, iSMrc_query, and iSMrc_wait commands provide a retry control function to enhance the continuity a command operation until the link automatically recovers, by performing a retry operation within the command (supported when IOPATH=DIRECT is specified and not supported when IOPATH=MANAGER is specified).

To use the retry control, an instruction from a user by setting this operation is required. This instruction is available only for an Remote Replication pair that uses a low-speed line and a remote operation, but is ignored by DDR, which does not perform remote operation, or Remote Replication using a normal line.

RPL_LIM_RETRY_FOR_LOW_SPEED_LINK = time

- Specify the target of a retry timeout in seconds for a command retry control after a link failure occurs on a low-speed line.
- The specifiable range is 0 to 86400 seconds.
- If the RPL_LIM_RETRY_FOR_LOW_SPEED_LINK parameter is not specified, the default value is 0 seconds.
- This parameter instructs a value assuming a recovery waiting time after a link failure. It is not for instructing an end time of a command.

RPL_SCSI_RETRY_CNT_FOR_LOW_SPEED_LINK = count

- Specify the number of additional retries, using the same control path, to perform immediately after the control I/O fails within the command due to link failure.

- The specifiable range is 0 to 20 times.
- If the RPL_SCSI_RETRY_CNT_FOR_LOW_SPEED_LINK parameter is not specified, the default value is 11 times (Windows).
- Because load increases if the number of retries is left to the default value, reconsider the value to about 3 times when instructing to perform the retry control.

RPL_SCSI_RETRY_INTERVAL_FOR_LOW_SPEED_LINK = retry time interval

- Specify the retry time interval in seconds when the control I/O fails within the command due to link failure.
- The specified range is 0 to 600 seconds.
- If the RPL_SCSI_RETRY_INTERVAL_FOR_LOW_SPEED_LINK parameter is not specified, the default value is 0 seconds.
- Because load increases if the retry time interval is left to the default value, reconsider the value to about 5 seconds when instructing to perform the retry control.

The retry control is performed as follows:

RPL_SCSI_RETRY_INTERVAL_FOR_LOW_SPEED_LINK (interval: seconds) × (RPL_SCSI_RETRY_CNT_FOR_LOW_SPEED_LINK + 1 (number of times)) × number of logical paths that issued I/O

The above count is considered as one set of retries. If the link failure does not resolve during this one set of retries, this one set of retries is additionally performed until the timeout specified by RPL_LIM_RETRY_FOR_LOW_SPEED_LINK is reached.

If this specification is used, the starting of a replication operation within the command or the command response might be delayed depending on the specified value and the line state. Therefore, before using this specification, check the time restriction of the command caller job or whether there is enough operating time.

SQL Option, Replication Navigator, and other software products that use ControlCommand may also be affected. Some software products have restrictions on the command response time (for example, the separate timeout for Replication Navigator for Windows is 30 seconds). When instructing to perform the retry control, be sure that the retry control will keep the restrictions.

SCAN_WAITTIME section

Specifies operations regarding the iSMrc_scan command.

Waiting operation specification of the iSMrc_scan command

Specifies the waiting time for issuing the iSMrc_scan command.

RPLSCAN_WAITTIME=time

- Specifies the waiting time after executing the scan command in seconds.
- If RPLSCAN_WAITTIME parameter is not specified, the default value is 30 seconds.

RESTORE section

Specifies operation performed when Restore is executed.

RV operation mode

Specify an operation mode for RV when restoration is executed by the iSMrc_restore command.

MODE=UPDATE

- Restoration is performed while the updated data of the MV is being reflected into the RV.
- The default is UPDATE.

MODE=PROTECT

- Restoration is performed without the updated data of the MV being reflected into the RV. The updated data is managed as difference.

  On completion of restoration, it is automatically separated and transited into the Separated state. To use this function, you need to purchase Volume Cloning   or Replication and Mirroring   and then unlock the license of the products.

Operation rEgarding Derived Generation

Specify whether to retain or automatically delete the derived generation at restoration by the iSMsc_restore command.

SNAP_RST_DERIVED=DELETE

- The derived generation auto delete mode. When restoration from SV of any intermediate generation is executed, the SVs of later generation than the restored one (derived generations) are automatically deleted.

SNAP_RST_DERIVED=KEEP

- The derived generation retain mode. When restoration from SV of any intermediate generation is executed, the SVs of later generation than the restored one (derived generations) are retained.

SNAP_RST_DERIVED=DEFAULT

- Whether to automatically delete or retain the derived generations depends on the disk array function setting. (Default)
- The default value at Snapshots is the derived generation retain mode (KEEP) and the default value at versions prior to it is the derived generation auto delete mode (DELETE).
- The default value when the SNAP_RST_DERIVED parameter is not specified.

SEPARATE section

Specifies operation performed when Separate is executed.

RV use start time

Determine when to make the RV available after Separate execution by the iSMrc_separate and iSMsql_snapshotbkup commands.

RVUSE=IMMEDIATE

- After Separate execution, the RV is immediately available while the difference between the MV and RV contents is being reflected into the RV. This function is available only for the DDR pair, and to use it, you need to purchase Volume Cloning and then unlock the license of the products.

RVUSE=COMPLETE

- After Separate execution, the RV becomes available when the difference between the MV and RV contents has been reflected into the RV.

The default is COMPLETE.

ATGROUP section

Specifies changes to the operation regarding the ATgroup operation of ReplicationControl/DisasterRecovery.

Pair information outputting at processing start and end

Specify the operation regarding the pair information output at processing start and end for the messages, which are output to the console when the processing is started by the ATgroup operations by the iSMrc_replicate, iSMrc_separate, iSMrc_restore, iSMrc_change, and iSMrc_wait commands or when the wait processing is terminated.

RPL_ATGPAIRMSG=OUTPUT

Outputs the information on the pair of the target ATgroup at start/end of processing for the ATgroup to the console. (Default value at ReplicationControl/DisasterRecovery Ver3.4 or earlier)

RPL_ATGPAIRMSG=NOOUTPUT

Does not output the information on the pair of the target ATgroup at start/end of processing for the ATgroup to the console. (Default value at ControlCommand Ver4.1 or later)

SQL Option section

Specifies changes to the operation of the ReplicationControl SQL Option.

Database freeze start/end message output control

Specify whether to output a message indicating the start or end of database freeze state.

DBFREEZELOG=ON

Outputs a start message (iSM13238) and end message (iSM13239) to an event log file when the database, respectively, enters and exits the freeze state.

DBFREEZELOG=OFF

Does not outputs a start message (iSM13238) or end message (iSM13239) to an event log file when the database, respectively, enters and exits the freeze state (default).

Environment Variables

The system uses environment variables to specify various operations for the individual ControlCommand commands.

The environment variables are described below.

The man command environment variable (LANG)

Specify an environment variable compatible with a language and characters to be used.

The syslog message environment variable

RPLSYSLOG

- Specify whether to output the syslog message.
- When you want the syslog message to be output, do not specify this environment variable (default) or specify 0for this environment variable.
- If you do not want the syslog message to be output, specify 1for this environment variable.

Command trace environment variables

RPLTRACEFILENUM

- Specify the maximum number of log files that can be saved as command trace.
- If the size of a log file reaches the upper file size limit specified in RPLTRACEFILEMAXSIZE, the use of the file is discontinued, and another file is put in use. This switching is sequential and automatic. The switching occurs within the maximum specified number of log files.
- If you do not want the operation trace to be output, specify 0for this environment variable.
- If this environment variable is omitted, up to 5 (default) log files are created and put in use sequentially.

RPLTRACEFILEMAXSIZE

- Specify the maximum size (in kilobyte units) of a log file to be saved as command trace. This setting is valid if RPLTRACEFILENUM is specified as 1 or greater.
- Specify a value greater than or equal to 200 (kilobytes) as the maximum log file size. If a value less than 200 is specified, each created log file will have a size of 200 kilobytes.
- The size of a log file is checked at the start of command execution. If the log file is larger than specified, a new log file is put in use. For this reason, the actual file size becomes larger than specified.
- If this environment variable is omitted, each created log file will have a maximum size of 200 kilobytes (default).
- If this environment variable is specified as 0, no command trace log data is output.

Operation trace environment variables

RPLLOGFILENUM

- Specify the maximum number of log files that are stored as the operation trace.
- When the size of the log file becomes the upper limit of the file size specified by the RPLLOGFILEMAXSIZE environment variable, the system automatically uses another file within the maximum number of specified files.
- If you do not want the operation trace to be output, specify 0for this environment variable.
- If neither this environment variable nor RPLLOG is specified, up to 10 (default) log files are created, and each log file is used sequentially.

RPLLOGFILEMAXSIZE

- Specify the maximum log file size, in units of kilobytes, that is stored as the operation trace. This setting is valid when a value that is equal to or greater than one is specified for the RPLLOGFILENUM environment variable.
- Specify a value that is equal to or greater than 200 (kilobytes). If a value less than 200 (kilobytes) is specified, log files of up to 200 kilobytes (default) each are created.
- The system checks the size of the log file at the start of executing each command, and if the size is beyond the preset value, the system changes the value. Accordingly, the file size may not be quite the same as the specified value.
- The setting of this environment variable is ignored if the setting of the RPLLOG environment variable is valid.
- If this environment variable is not specified, the system creates log files of up to 400 kilobytes (default) each.

- If you specify 0for this environment variable, the operation trace log data will not be output.

RPLLOG

- This setting is valid if RPLLOGFILENUM is omitted. This parameter setting is ignored if RPLLOGFILENUM is specified.

- In Number of Days, specify the expiration date for the log data stored in the operation trace file.

- Data that has been logged in the operation trace file and whose specified data storage period has been expired is deleted when the command is executed.

- If you specify 0for this environment variable, the operation trace log data will not be output.

- When RPLLOG is specified, an overhead for searching or deleting log files occurs at execution of command immediately after the date is changed. Therefore, for controlling the output amount of trace file, using RPLLOGFILENUM and RPLLOGFILEMAXSIZE is recommended.

Environment variables regarding I/O issue control

RPL_IOPATH

- Specify the I/O issue path to the disk array.

- One of the following can be specified:

  DIRECT Directly issues the I/O to the disk array. This is the default value when this environment variable is not specified.

  MANAGER Connects to the SnapSAN Manager currently in operation on the same server and allows the SnapSAN Manager issue the I/O to the disk array.

This environment variable is invalid for the data retention operation (iSMpc_protect and iSMpc_release commands) so that it always operates with the default value (DIRECT).

RPL_IOPORT_MANAGER

- Specify a socket port number for connecting to the SnapSAN Manager if the RPL_IOPATH environment variable is specified as MANAGER.

- This setting is valid for logical disk information display (iSMrc_ldlist and iSMrc_sense commands), replication operation (iSMrc_replicate, iSMrc_separate, iSMrc_restore, iSMrc_change, iSMrc_wait, iSMrc_query, and iSMrc_rvmode commands), pair operation (iSMrc_pair command), ATgroup building (iSMrc_atg command) and disk array operation (iSMrc_arrayinfo command).

- If this environment variable is not specified, the system uses socket port number 8030 (default).

- The socket port number to be specified must be the same as the environment setting on the SnapSAN Manager side (port number to be used by the replication management).

SNAP_IOPORT_MANAGER

- Specify a connection port number of the socket for connecting to the iSM, if MANAGER is specified as RPL_IOPATH.

- This setting is valid for the snapshot operation (iSMsc_create, iSMsc_delete, iSMsc_restore, iSMsc_wait, iSMsc_svguard, and iSMsc_query commands) and link operation (iSMsc_link, iSMsc_unlink, and iSMsc_linkinfo commands).

- If this environment variable is not specified, the system uses socket port number 8060 (default).

- The socket port number to be specified must be the same as the environment setting on the SnapSAN Manager side (port number to be used by the snapshot management).

RPL_RECV_MSG

Specify whether to output the following receive processing message indicating that data is being received from the SnapSAN Manager when the iSMrc_ldlist command is executed in joint operation with iSM.

The Receiving...message output by the iSMrc_ldlist command

One of the following can be specified:

UNUSE Does not output the Data Being Received message.

USE Outputs the Data Being Received message. This is the default value when this environment variable is not specified.

 Environment variables regarding wait process controls

 RPL_WATCHDEV

- If the -wait option of the iSMrc_replicate, iSMrc_separate, or iSMrc_restore command is omitted, specify a value from 1 to 30, by the second, as the monitoring time interval.
- If the -interval option of the iSMrc_wait command is omitted, specify a value from 1 to 30, by the second, as the monitoring time interval.
- If this environment variable is not specified, the monitoring time interval is five seconds (default).

 SNAP_WATCHDEV

- If the -interval option of the iSMsc_wait command is omitted, specify a value from 1 to 30, by the second, as the monitoring time interval.
- If this environment variable is not specified, the monitoring time interval is five seconds (default).

 RPL_LIMWATCHDEV

- Specify a wait limit time in seconds if the -limit option is omitted from the iSMrc_wait command.
- If this environment variable is omitted, no limit is placed on the wait process (default).

 SNAP_LIMWATCHDEV

- Specify a wait limit time in seconds if the -limit option is omitted from the iSMsc_wait command.
- If this environment variable is omitted, no limit is placed on the wait process (default).

 RPL_WAITMSG

- Specify whether to output the following wait process messages when the -wait option of the iSMrc_replicate, iSMrc_separate, or iSMrc_restore command is specified and when the iSMrc_wait command is issued.

 The Replicating...message output by the iSMrc_replicate command

 The Separating...message output by the iSMrc_separate command

 The Restoring...message output by the iSMrc_restore command

 The Waiting...message output by the iSMrc_wait command

One of the following can be specified:

UNUSE Does not output a wait process message.

USE Outputs a wait process message. This is the default value when this environment variable is not specified.

SNAP_WAITMSG

- Specify whether to output the following wait process message when the iSMsc_wait command is issued.

Waiting...message output by the iSMsc_wait command

- One of the following can be specified:

 UNUSE Does not output a wait process message.

 USE Outputs a wait process message. This is the default value when this environment variable is not specified.

Environment Variables Regarding the Retry Control for Rdr on Low-speed Line

There is no guarantee of line quality for a best-effort line, and a temporary link failure of the Remote Replication might occur. At the same time, the command that performs the Remote Replication operation is in error during a link failure.

The iSMrc_replicate, iSMrc_restore, iSMrc_separate, iSMrc_query, and iSMrc_wait commands provide a retry control function to enhance the continuity a command operation until the link automatically recovers, by performing a retry operation within the command (supported when IOPATH=DIRECT is specified and not supported when IOPATH=MANAGER is specified).

To use the retry control, an instruction from a user by setting this operation is required. This instruction is available only for an Remote Replication pair that uses a low-speed line and a remote operation, but is ignored by DDR, which does not perform remote operation, or Remote Replication using a normal line.

RPL_LIM_RETRY_FOR_LOW_SPEED_LINK

- Specify the target of a retry timeout in seconds for a command retry control after a link failure occurs on a low-speed line.
- The specifiable range is 0 to 86400 seconds.
- If the RPL_LIM_RETRY_FOR_LOW_SPEED_LINK environment variable is not specified, the default value is 0 seconds.
- This parameter instructs a value assuming a recovery waiting time after a link failure. It is not for instructing an end time of a command.

RPL_SCSI_RETRY_CNT_FOR_LOW_SPEED_LINK

- Specify the number of additional retries, using the same control path, to perform immediately after the control I/O fails within the command due to link failure.
- The specifiable range is 0 to 20 times.
- If the RPL_SCSI_RETRY_CNT_FOR_LOW_SPEED_LINK environment variable is not specified, the default value is 5 times .
- Because load increases if the number of retries is left to the default value, reconsider the value to about 1 time when instructing to perform the retry control.

RPL_SCSI_RETRY_INTERVAL_FOR_LOW_SPEED_LINK

- Specify the retry time interval in seconds when the control I/O fails within the command due to link failure.
- The specified range is 0 to 600 seconds.
- If the RPL_SCSI_RETRY_INTERVAL_FOR_LOW_SPEED_LINK environment variable is not specified, the default value is 0 seconds.

- Because load increases if the retry time interval is left to the default value, reconsider the value to about 5 seconds when instructing to perform the retry control.

The retry control is performed as follows:

RPL_SCSI_RETRY_INTERVAL_FOR_LOW_SPEED_LINK (interval: seconds) × (RPL_SCSI_RETRY_CNT_FOR_LOW_SPEED_LINK + 1 (number of times)) × number of logical paths that issued I/O

The above count is considered as one set of retries. If the link failure does not resolve during this one set of retries, this one set of retries is additionally performed until the timeout specified by RPL_LIM_RETRY_FOR_LOW_SPEED_LINK is reached.

If this specification is used, the starting of a replication operation within the command or the command response might be delayed depending on the specified value and the line state. Therefore, before using this specification, check the time restriction of the command caller job or whether there is enough operating time.

FileSystem Option, Replication Navigator, and other software products that use ControlCommand may also be affected. Some software products have restrictions on the command response time (in the case of FileSystem Option, for example, the filesystem freeze timeout at separation is 60 seconds). When instructing to perform the retry control, be sure that the retry control will keep the restrictions.

An environment variable regarding the Restore function

RPL_RST_MODE

- Specify operations regarding RV operation mode conducted when the -mode option is omitted from the iSMrc_restore command or when the default value is specified in the -mode option.

- One of the following can be specified:

  UPDATE Performs Restore while reflecting the updated data of the MV into the RV. When the Restore is completed, the state changes to Sync State (rst/sync). This is the default value when this environment variable is not specified.

  PROTECT Performs Restore without reflecting the updated data of the MV into the RV. When the Restore is completed, Separate is automatically executed and then the state changes to the Separated state. To use this function, you need to purchase Volume Cloning   or Replication and Mirroring   and then unlock the license of the products.

SNAP_RST_DERIVED

- Specify operations regarding derived generation at restoration by the iSMsc_restore command.

- One of the following can be specified:

  DELETE The derived generation auto delete mode. When restoration from SV of any intermediate generation is executed, the SVs of later generation than the restored one (derived generations) are automatically deleted.

  KEEP The derived generation retain mode. When restoration from SV of any intermediate generation is executed, the SVs of later generation than the restored one (derived generations) are retained.

  DEFAULT Whether to automatically delete or retain the derived generations depends on the disk array function setting. The default value at Snapshots Ver3 is the derived generation retain mode (KEEP) and the default value at versions prior to it is the derived generation auto delete mode (DELETE). The default value when the environment variable is not specified.

An environment variable regarding the Separate function

RPL_SEP_RVUSE

- Specify operations regarding RV available time conducted when the -rvuse option is omitted from the iSMrc_separate command or when the default value is specified in the -rvuse option.
- One of the following can be specified:

IMMEDIATE After Separate execution, the RV is immediately available while the difference between the MV and RV contents is being reflected into the RV. This function is available only for the DDR pair, and to use it, you need to purchase Volume Cloning   and unlock the license of the product.

COMPLETE After Separate execution, the RV becomes available when the difference between the MV and RV contents has been reflected into the RV. This is the default value when this environment variable is not specified.

An Environment Variable Regarding the Sense Function

RPL_SENSE_VERTICAL_INDICATE

- Specify the display format of the information when the -protect option is omitted from the iSMrc_sense command.
- One of the following can be specified:

OFF Displays the display items horizontally. They are displayed in the same format as ReplicationControl and SnapControl at Ver3.4 or earlier. (Default value)

ON Different display item is displayed in a different line. They are displayed vertically.

An Environment Variable Regarding the Atgroup Operation

RPL_ATGPAIRMSG

- Specify the operation regarding the pair information output at processing start and end for the messages, which are output to the console when the processing is started by the ATgroup operations by the iSMrc_replicate, iSMrc_separate, iSMrc_restore, iSMrc_change, and iSMrc_wait commands or when the wait processing is terminated.
- One of the following can be specified:

OUTPUT Outputs the information on the pair of the target ATgroup at start/end of processing for the ATgroup to the console. (Default value at Ver3.4 or earlier)

NOOUTPUT Does not output the information on the pair of the target ATgroup at start/end of processing for the ATgroup to the console. (Default value at Ver4.1 or later)

Link Function

SQL Server Linkage

Database Operation File

To perform batch setting of databases by a ReplicationControl SQL Option command with the -dbfile option, use the database operation file.

The database operation file is described below.

File Location and Display

Can be freely specified.

Description

The database operation file is used to perform batch setting of multiple databases by using a ReplicationControl SQL Option command.

Synopsis

This file is described in the following synopsis:

db:db_name [Option_Type:[value]] [...]

For description, use a colon (:) to connect db with a database name (db_name) and to connect an option type (Option_Type) with the preset value (value).

Description of each option can be omitted or can be in arbitrary order.

Specifying a database name (db_name)

Specify a name of the database which is a Snapshot Backup or Snapshot Restore target with a character string within 128 bytes.

If the database name includes any of the following eleven characters, an error occurs.

\ / : , ; * ? < > |

Specifying an option type (Option_Type) and a preset value (value)

The following character strings can be specified as an option type.

Option Type	Description
uid	Specify a user ID for connecting to the Microsoft SQL Server.
pass	Specifies a password for the user ID for connecting to the Microsoft SQL Server.
input	Specifies for entering a user ID and a password from the input screen.

Option Type	Description
dmkpass	When the database master key of an encrypted database is encrypted with a password, specify that password.
server	Specify a computer name and an instance name for connecting to a named instance.
remod	Specify the mode during the database recovery. Description of this option is effective only during Snapshot Restore execution, and becomes invalid during Snapshot Backup execution.
refile	Specifies the standby database file. Description of this option is effective only during Snapshot Restore execution, and becomes invalid during Snapshot Backup execution.
move	When executing Restore by using a physical file that has a different path from the backed up physical file, specify the data file path name and the log file path name. Description of this option is effective only during Snapshot Restore execution, and becomes invalid during Snapshot Backup execution.

Specify the following preset values for each option type:

uid:user_idSpecify a user ID for connecting to the Microsoft SQL Server with a character string within 128 bytes. Specify the pass option together with this option.

If this option is omitted, the system uses a user name and a password for the Windows login account.

This option and the input option cannot be simultaneously specified.

pass:[password]Specify a password for connecting to the Microsoft SQL Server with a character string within 128 bytes. If the password is omitted, the system recognizes that there is no password. Specify the uid option together with this option.

This option and the input option cannot be simultaneously specified.

input: Enters a user ID and a password from the input screen when connecting to the Microsoft SQL Server. This option does not have a preset value.

This option and the uid and pass options cannot be simultaneously specified.

dmkpass :dmkpassword If the database is encrypted and the database master key is also encrypted with a password, specify that password with a character string within 128 bytes.

If this option is omitted, the system will operate assuming that the master database key is not encrypted with a password or the database is not encrypted.

server:instance_name Specify a computer name and an instance name in the following format with a character string within 272 bytes when connecting to a named instance.

Specify the computer name within 255 bytes and instance name within 16 bytes.

computer_name\instance_name

If this option is omitted, a connection is made to the predetermined instance.

The computer name must be either a local computer name, or a virtual computer name in the MSCS (Microsoft Cluster Server) or MSFC (Microsoft Failover Cluster) environment.

remod:{recovery | norecovery | standby}

Specify the mode during the database recovery.

recovery Executes a command and simultaneously recovers the database.

norecoveryRecovers the target database in the state so that the transaction log is applicable.

standbyRecovers the database as a standby database. A standby database file is specified by the refile option.

If this option is omitted, the operation is the same as the operation when recovery is specified.

refile:restore_fileSpecify a standby database undo file (standby file) with a character string within 256 bytes.

This option can be specified only when standby is specified by the remod option. If recovery or norecovery is specified, or if the remod option is omitted, an error occurs.

move:os_file_name[,...]When executing Snapshot Restore by the -norestore option and when executing Restore by using a physical file that has a different path from the backed up physical file, specify the database's data file path name and log file path name with a character string within 512 bytes. Specify the database's data file and log file in the absolute path by separating them by a comma.

Rules

- Start description from the first column of the line.
- A line break shall be a partition of records.
- Up to 1,024 single-byte characters can be described per record.
- Information of one database can be described per record.
- The same option type cannot be specified twice per record.
- Description of the database name cannot be omitted.
- The operation target database must be unique.
- Use a blank space or a tab character to separate the descriptions of the database name or the option type.
- Text displayed from the sharp (#) character to the end of the record is recognized as a comment.
- If there is an error in the file syntax, operations to all databases described in the file become invalid.
- If a character string includes a blank space ( ), enclose the entire character string in double quotation marks .

The following is an example of a description of the database operation file:

```
# db:db_name
db:db01

# db:db_name      uid:user_id      pass:password
# db:db_name      uid:user_id      pass:password          dmkpass:dmkpassword
# db:db_name      uid:user_id      pass:password          server:instance_name
db:db01      uid:sa           pass:sapass
db:db02      uid:sa           pass:sapass          dmkpass:dmk_strongpassword
db:db03      uid:sa           pass:sapass          server:localmachine\user_inst

# db:db_name      input:
db:db01      input:

# db:db_name      remod:restore_mode
# db:db_name      remod:restore_mode      refile:restore_file
db:db01      remod:norecovery
db:db03      remod:standby           refile:"d:\db_folder\db03_standby.dat"

# db:db_name      move:os_file_name[,...]
db:db01      move:"f:\db folder\db01_Data2.mdf,g:\db_folder\db01_Log2.ldf"
```

iSMsql_snapshotbkup (Windows)

Name

iSMsql_snapshotbkup - Makes a copy of the Microsoft SQL Server database.

Synopsis

iSMsql_snapshotbkup-db dbname -metafile metafile_name

[-server instance_name]

[{-uid userid -pass [password]| -input}]

[-dmkpass dmkpassword]

[-nocheck]

[{-mv volume -mvflg mv_flg [-rv volume -rvflg

rv_flg] | -file file_name }]

[-rvuse rv_use] [-rvacc rv_access]

[{-wait [second] | -nowait}]

iSMsql_snapshotbkup-dbfile dbfile_name -metafolder metafolder_name

[-nocheck]

[{-mv volume -mvflg mv_flg [-rv volume

-rvflg rv_flg] | -file file_name }]

[-rvuse rv_use] [-rvacc rv_access]

[{-wait [second] | -nowait}]

iSMsql_snapshotbkup-db dbname -metafile metafile_name

[-server instance_name]

[{-uid userid -pass [password]| -input}]

[-dmkpass dmkpassword]

[-nocheck]

[{-bv volume -bvflg bv_flg [{ -sv volume -svflg

sv_flg | -cyclic }] | -file file_name }]

iSMsql_snapshotbkup-dbfile dbfile_name -metafolder metafolder_name

[-nocheck]

[{-bv volume -bvflg bv_flg [{ -sv volume -svflg

sv_flg | -cyclic }] | -file file_name }]

iSMsql_snapshotbkup-ver

iSMsql_snapshotbkup-?

Description

The iSMsql_snapshotbkup command freezes the update I/O to the Microsoft SQL Server database, creates a metafile in the specified path and records the database configuration and the state of the transaction log.

If the data replication is in use, the command separates the MV from the RV and makes a copy of the MV on the RV to store the specified database. If the snapshot function is in use, a snapshot of a BV is created on an SV to store the specified database.

After separation or snapshot creation, the Microsoft SQL Server creates history information on the MSDB.

Options

The iSMsql_snapshotbkup command recognizes the following options.

db dbnameSpecify a database name.

dbfile dbfile_nameTo simultaneously perform Snapshot Backup on multiple databases, describe the database names and the option specification for each database in dbfile_name.

When multiple databases are specified, Snapshot Backup is simultaneously performed on all of the databases.

When multiple databases are specified, if an error occurs in any of the databases, the process is canceled.

metafile metafile_nameSpecify the name of the file that stores the metafile with its absolute path name.

The metafile can be created in any shared disk, MV, or local disk.

However, it cannot be created in the volume in which data files and log files for the Snapshot Backup target database are located.

metafolder metafolder_nameTo simultaneously perform Snapshot Backup on multiple databases, specify the name of the folder that stores the metafile with its absolute path name.

Immediately under the specified folder, a metafile is created for each database with the name database name_metafile.dat.

The metafile can be created in any shared disk, MV, or local disk.

However, it cannot be created in the volume in which data files and log files for the Snapshot Backup target database are located.

server instance_name Specify a computer name and an instance name in connecting to a named instance. Specify the computer name and the instance name in the following format.

computer_name\instance_name

If this option is omitted, a connection is made to the predetermined instance. The computer name must be either a local computer name, or a virtual computer name in the MSCS (Microsoft Cluster Server) or MSFC (Microsoft Failover Cluster) environment.

uid useridSpecify a user ID for connecting to the Microsoft SQL Server.

If this option is omitted, the system uses a user name and a password used for the Windows login account.

pass [password]Specify a password for connecting to the Microsoft SQL Server.

This option must be specified when uid is specified.

When password is omitted, the system recognizes that there is no password.

inputEnter a user ID and a password from the input screen when connecting to the Microsoft SQL Server.

A password can be hidden.

dmkpass dmkpasswordIf the database is encrypted and the database master key is also encrypted with a password, specify that password.

If this option is omitted, the system will operate assuming that the master database key is not encrypted with a password or the database is not encrypted.

nocheck Used if only some databases placed on an MV or BV are to be operated. No check is made to see if all databases on the MV or BV have been specified as targets of operation. If the data replication function is in use, the databases are frozen without making sure that the MV and RV are in the sync state.

verDisplays the version information of the command.

?Displays the usage of this command.

If the data replication function is to be used, the following options are recognized.

mv volumeSpecify the volume of MV.

For a pair in which MV and RV are configured by 1 to 1, this option can be omitted.

mvflg mv_flgSpecify the volume type specified in -mv.

This argument must be specified together with -mv.

rv volumeSpecify the volume of RV.

For a pair in which MV and RV are configured by 1 to 1, this option can be omitted.

rvflg rv_flgSpecify the volume type specified in -rv.

This argument must be specified together with -rv.

file file_nameTo specify multiple pairs, describe pairs of MVs and RVs in file_name.

It is impossible to specify a pair for data replication and pair for snapshot as operation targets together.

When multiple pairs are specified, if an error occurs in any of the pairs, the process is canceled.

rvuse rv_useDetermine when to make the RV available. This option is effective only when the activity state of the target pair is Replicate.

One of the following can be specified in rv_use.

immediateMakes the immediate use of the RV possible while reflecting the difference between the MV and the RV after Separate has been executed (Separate(immediate)). This function can be specified only for DDR pair.

completeAllows the RV to be used after Separate has been executed and the difference between the MV and the RV has been reflected (Separate(completion)).

defaultUses the setting stored in the replication operation option setting file.

If this option is omitted, the operation is the same as the operation when default is specified.

rvacc rv_accessSpecify the access restriction for RV.

One of the following can be specified in rv_access.

roOnly reference can be performed for RV.

rwReference and update can be performed for RV.

If this argument is omitted, the operation is the same as the operation when rw is specified.

wait [second] | -nowaitSpecify whether to wait until separation is completed.

Specifying -wait causes the state of processing to be monitored at regular intervals while waiting until separation is completed.

When a value is specified in second, the monitoring time interval of the disk array becomes the specified value. The available values are 1 to 30 seconds (integer). This value can be changed in the replication operation option setting file.

When the disk array monitoring interval is not specified, the default value is 5 seconds.

Specifying -nowait does not cause separation to be waited for.

If this option is omitted, the operation is the same as the operation when -nowait is specified.

If snapshot is used, the following options are recognized.

bv volumeSpecify a BV volume.

This option can be omitted if there is only one generation (BVs and SVs correspond to each other on a 1-to-1 basis).

bvflg bv_flgSpecify the type of the volume specified with the -bv option.

This option must be specified together with the -bv option.

sv volumeSpecify an SV volume.

The SV volume must be specified by logical disk name or relative generation number.

The relative generation number must be .-n format. The expression .-1 means the latest generation. Older generations can be specified in a range of .-2 to .-16.

It is possible to omit specifying the SV in this option or the -cyclic option if there is only one generation (BVs and SVs correspond to each other on a 1-to-1 basis).

For a derived SV without a generation number, only logical disk name can be specified.

svflg sv_flgSpecify the type of the volume specified with the -sv option.

Either of the following SV volume types can be specified.

ldThe SV is specified by logical disk name.

relgenThe SV is specified by relative generation number.

This option must be specified together with the -sv option.

cyclicSelects automatically an SV for which no snapshot has been created. If there are two or more SVs for which no snapshot has been created, the SV that has the lowest logical disk number is used. If snapshots have been created for all SV generations, the SV of the oldest generation except the protected SV and derived SVs without a generation number (SV of the oldest generation through time among the SVs including the derived SVs with a generation number) is selected.

It is possible to omit specifying SV by this option, or by the -sv and -svflg options if there is only one generation (BVs and SVs correspond to each other on a 1-to-1 basis).

file file_nameSpecify sets of BVs and SVs in file_name to specify more than one set.

It is impossible to specify a pair for data replication and a pair for snapshot together as operation targets.

If an error occurs in any of the specified sets, processing is discontinued.

Displayed Information

The following information is displayed if a backup is created after a difference between the MV and RV is reflected on the RV, using the data replication function.

```
C:\> iSMsql_snapshotbkup -db db_name -metafile metafile_name -wait

SnapshotBackup    Start           YYYY/MM/DD  hh:mm:ss
    DataBase    db_name
    MV:disk_number              ld_name                 type
        volume_name
        path
    RV:disk_number              ld_name                 type
        volume_name
        path
iSMsql_snapshotbkup: Info:      iSM13238: Freeze of database  is started. YYYY/MM/DD
hh:mm:ss
Flush               Start       YYYY/MM/DD  hh:mm:ss
Flush               Normal End  YYYY/MM/DD  hh:mm:ss
Separate            Start       YYYY/MM/DD  hh:mm:ss
iSMsql_snapshotbkup: Info:      iSM13239: All of database  were thawed. YYYY/MM/DD
hh:mm:ss
Separating.....
Separate            Normal End  YYYY/MM/DD  hh:mm:ss
SnapshotBackup      Normal End  YYYY/MM/DD  hh:mm:ss
    DataBase    db_name
    MV:disk_number              ld_name                 type
        volume_name
        path
    RV:disk_number              ld_name                 type
        volume_name
        path

C:\>
```

Description of messages:

SnapshotBackup StartYYYY/MM/DD hh:mm:ss

Snapshot Backup start message and start date

DataBase db_name

Database name

MV:disk_numberld_nametype

MV physical disk number, logical disk name, OS type

volume_name

MV mount point volume name

path

MV drive letter or NTFS folder path name

RV:disk_numberld_nametype

RV physical disk number, logical disk name, OS type

volume_name

RV mount point volume name

path

RV drive letter or NTFS folder path name

iSM13238: Freeze of database is started. YYYY/MM/DD hh:mm:ss

Message indicating that database freezing has started, and date and time of the start

Flush   StartYYYY/MM/DD hh:mm:ss

Flush start message and start date

Flush   Normal EndYYYY/MM/DD hh:mm:ss

Flush end message and end date

Separate   StartYYYY/MM/DD hh:mm:ss

Separate start message and start date

Separating.....

Message that appears during execution of Separate

Separate Normal EndYYYY/MM/DD hh:mm:ss

Separate end message and end date

iSM13239: All of database were thawed. YYYY/MM/DD hh:mm:ss

Message indicating that all databases have been thawed, and date and time of thawing

SnapshotBackup Normal EndYYYY/MM/DD hh:mm:ss

Snapshot Backup end message and end date

(2)The following information is displayed if a backup is performed by using the snapshot
function to create a snapshot from the BV to the SV.

```
C:\> iSMsql_snapshotbkup -db db_name   -metafile metafile_name

SnapshotBackup    Start          YYYY/MM/DD hh:mm:ss
   DataBase    db_name
      BV:ld_name                 type
         volume_name
         path
      SV:ld_name                 type      (generation) attribute
Delete             Start          YYYY/MM/DD hh:mm:ss
iSMsql_snapshotbkup: Info:      iSM13250: Snapshot has been deleted. SV:ld_name
Delete             Normal End     YYYY/MM/DD hh:mm:ss
iSMsql_snapshotbkup: Info:      iSM13238: Freeze of database is started. YYYY/MM/DD
hh:mm:ss
Flush              Start          YYYY/MM/DD hh:mm:ss
Flush              Normal End     YYYY/MM/DD hh:mm:ss
Create             Start          YYYY/MM/DD hh:mm:ss
Create             Normal End     YYYY/MM/DD hh:mm:ss
iSMsql_snapshotbkup: Info:      iSM13239: All of database were thawed. YYYY/MM/DD
hh:mm:ss
SnapshotBackup    Normal End     YYYY/MM/DD hh:mm:ss
   DataBase    db_name
      BV:ld_name                 type
         volume_name
         path
      SV:ld_name                 type      (generation)

C:\>
```

Description of messages:

SnapshotBackup StartYYYY/MM/DD hh:mm:ss

Message indicating that snapshot backup has been started, and date and time of the start

DataBase db_name

Database name

BV:ld_nametype

BV logical disk name, OS type

volume_name

BV mount point volume name

path

BV drive letter or NTFS folder path name

SV:ld_nametype(generation) attribute

SV logical disk name, OS type, relative generation number, and generation attribute

The relative generation number of SV displayed at the start of snapshot backup is the one before the snapshot has been created.

The relative generation number of SV displayed at the end of snapshot backup is the one after the snapshot has been created. -1 is always displayed, indicating the latest generation.

If the SV has the derived attribute, an asterisk (*) is displayed for the generation attribute.

At start of snapshot backup, it is displayed if the derived attribute is granted to the target SV. However, on completion of the snapshot backup, the generation attribute is not displayed because the SV does not have the derived attribute due to the snapshot creation.

iSM13250: Snapshot has been deleted. SV:ld_name

Message indicating that a snapshot has been deleted, and the logical disk name of the target SV

If a snapshot has been created on the target SV, it is deleted before the requested snapshot is created.

iSM13238: Freeze of database is started. YYYY/MM/DD hh:mm:ss

Message indicating that database freezing has stated, and date and time of the start

Delete   StartYYYY/MM/DD hh:mm:ss

Message indicating that snapshot deletion has started, and date and time of the start

The message appears if there is a snapshot to be deleted.

Delete   Normal EndYYYY/MM/DD hh:mm:ss

Message indicating that snapshot deletion has ended, and date and time of the end

The message appears if there is a snapshot to be deleted.

Flush   StartYYYY/MM/DD hh:mm:ss

Message indicating that flushing has started, and date and time of the start

Flush   Normal EndYYYY/MM/DD hh:mm:ss

Message indicating that flushing has ended, and date and time of the end

Create   StartYYYY/MM/DD hh:mm:ss

Message indicating that snapshot creation has started, and date and time of the start

Create   Normal EndYYYY/MM/DD hh:mm:ss

Message indicating snapshot creation has ended, and date and time of the end

iSM13239: All of database were thawed. YYYY/MM/DD hh:mm:ss

Message indicating that all database freezing has ended, and date and time of the end

SnapshotBackup Normal EndYYYY/MM/DD hh:mm:ss

Message indicating that snapshot backup has ended, and date and time of the end

Using the data replication function

The target MV and RV must be set as a pair.

The target MV must already be registered in the volume list.

The command cannot be executed if the data replication function of the disk array that contains the target MV and RV is in the freeze state.

The command can be executed only when the activity state of the target pair is the Rst/sync or Replicate state.

The command cannot be executed if the target MV is used as the BV and the MV is in the restore state or the restore fault state for snapshot.

Separate(immediate) function is not available for Remote Replication pair.

The target MV must contain all data files and log files included in the database.

The specified database name must be unique.

A disk specified to hold a metafile must be other than the disk that contains the data files or log files of the target database.

The disk on which a metafile is to be created must have a free space enough to hold the metafile.

The command cannot be executed if the volume list is being created or updated.

A dynamic disk cannot be used.

The command cannot be used for pairs registered with an ATgroup.

The command cannot be used in joint operation with iSM.

<Using the snapshot function>

The target BV and SV must be in a pair.

The target BV volume must have been registered in the volume list.

The command cannot be executed if the data replication function of the disk array in which the target BV and SV are stored is in the freeze state.

The command cannot be executed if the snapshot state of any SV paired with the target BV is Rst/exec.

The command cannot be executed if the data replication function of the target BV is Restore.

The command cannot be executed if the target BV is in the snapshot fault state or the restore fault state.

The command cannot be executed if the target SV is connected with an LV.

The command cannot be executed if the target SV is protected.

The command can be executed only when the target SV is in the Not Ready state.

The target BV must contain all data files and log files included in the database.

The specified database name must be unique.

A disk specified to hold a metafile must be other than the disk that contains the data files or log files of the target database.

The disk on which a metafile is to be created must have a free space enough to hold the metafile.

The command cannot be executed if the volume list is being created or updated.

A dynamic disk cannot be specified.

The command cannot be used in joint operation with iSM.

Return Values

0:Normal termination

1:Abnormal termination

This command terminates abnormally in the following cases.

- An option or parameter is invalid.
- A condition for operation is not satisfied.
- The instruction fails due to a disk array error.

• The instruction to the Microsoft SQL Server fails.

iSMsql_snapshotrst (Windows)

Name

iSMsql_snapshotrst -Recovers the Microsoft SQL Server database.

Synopsis

iSMsql_snapshotrst-db dbname -metafile metafile_name

[-server instance_name]

[{-uid userid -pass [password] | -input}]

[-dmkpass dmkpassword]

[-remod restore_mode [-refile restore_file]]

[-norestore [-move os_file_name[,...]]]

[-nocheck]

[{-mv volume -mvflg mv_flg [-rv volume -rvflg

rv_flg] | -file file_name }]

[-cprange copy_range] [-cpmode copy_mode]

[-mode operation_mode] [-rvacc rv_access]

[{-wait [second] | -nowait}]

iSMsql_snapshotrst-dbfile dbfile_name -metafolder metafolder_name

[-norestore]

[-nocheck]

[{-mv volume -mvflg mv_flg [-rv volume -rvflg

rv_flg] | -file file_name }]

[-cprange copy_range] [-cpmode copy_mode]

[-mode operation_mode] [-rvacc rv_access]

[{-wait [second] | -nowait}]

iSMsql_snapshotrst-db dbname -metafile metafile_name

[-server instance_name]

[{-uid userid -pass [password] | -input}]

[-dmkpass dmkpassword]

[-remod restore_mode [-refile restore_file]]

[-norestore [-move os_file_name[,...]]]

[-nocheck]

[{-bv volume -bvflg bv_flg [-sv volume -svflg

sv_flg] | -file file_name}]

[{-wait | -nowait}]

[-derivsv derivsv_mode]

iSMsql_snapshotrst-dbfile dbfile_name -metafolder metafolder_name

[-norestore]

[-nocheck]

[{-bv volume -bvflg bv_flg [-sv volume -svflg

sv_flg] | -file file_name}]

[{-wait | -nowait}]

[-derivsv derivsv_mode]

iSMsql_snapshotrst-ver

iSMsql_snapshotrst-?

Description

The iSMsql_snapshotrst command identifies the recovery target database from the specified metafile. It also restores from the RV to the MV if the data replication function is in use or from the SV to the BV if the snapshot function is in use.

After Restore has been completed, this command recovers the Microsoft SQL Server database.

Options

The iSMsql_snapshotrst command recognizes the following options.

- db dbnameSpecify the database name.
- dbfile dbfile_nameTo simultaneously perform Snapshot Restore on multiple databases, describe the database names and the option specification for each database in dbfile_name.

When multiple databases are specified, Snapshot Restore is simultaneously performed on all of the databases.

When multiple databases are specified, if an error occurs in any of the databases, the process is canceled.

- metafile metafile_nameSpecify the name of the file that stores the metafile with its absolute path name.

It is, however, impossible to specify a metafile that is on the same disk as for the data files or log files of the snapshot restore target database.

- metafolder metafolder_nameTo simultaneously perform Snapshot Restore on multiple databases, specify the name of the folder that stores the metafile with its absolute path name.

It is, however, impossible to specify a metafile that is on the same disk as for the data files or log files of the snapshot restore target database.

- server instance_nameSpecify a computer name and an instance name for connecting to a named instance. Specify the computer name and the instance name in the following format.

computer_name\instance_name

If this option is omitted, a connection is made to the predetermined instance. The computer name must be either a local computer name, or a virtual computer name in the MSCS (Microsoft Cluster Server) or MSFC (Microsoft Failover Cluster) environment.

- uid useridSpecifies the user ID for connecting to the Microsoft SQL Server.

If this option is omitted, the system uses the user name and password for the Windows login account.

- pass [password]Specify a password for connecting to the Microsoft SQL Server.

This option must be specified when -uid is specified.

When password is omitted, the system recognizes that there is no password.

- inputEnter a user ID and a password from the input screen when connecting to the Microsoft SQL Server.

The password can be hidden.

- dmkpass dmkpasswordIf the database is encrypted and the database master key is also encrypted with a password, specify that password.

If this option is omitted, the system will operate assuming that the master database key is not encrypted with a password or the database is not encrypted.

- remod restore_modeSpecify the mode during database recovery.

One of the following can be specified in restore_mode.

recoveryRecovers the target database.

norecoveryRecovers the target database in the state so that the transaction log is applicable.

standbyRecovers the target database as a standby database.

If this option is omitted, the operation is the same as the operation when recovery is specified.

- refile restore_fileSpecify the standby database undo file (standby file) .

This option must be specified when standby is specified in -remod.

- norestoreUsed to recover the database without restoring the MV or BV.

Specifying this option causes the following options related to the data replication and snapshot functions to be ignored.

Options related to the data replication function:

- mv, -mvflg, -rv, -rvflg, -file, -mode, -cprange, -cpmode, -rvacc, -wait, -nowait

Options related to the snapshot function:

- bv, -bvflg, -sv, -svflg, -file, -wait, -nowait, -derivsv
- move os_file_name[,...]When the -norestore option is specified, this command executes Restore by using a physical file that has a different path name from the backed up physical file.

As a file name specified in os_file_name, specify the database's data file and log file with their absolute path names by separating them by a comma.

- nocheckUsed if only some databases placed on an MV or BV are to be operated. No check is made to see if all databases on the MV or BV have been specified as targets of operation.
- verDisplays the version information of the command.
- ?Displays the usage of this command.

If data replication is to be used, the following options are recognized.

- mv volumeSpecify the volume of MV.

For a pair in which MV and RV are configured by 1 to 1, this option can be omitted.

- mvflg mv_flgSpecify the volume type specified in -mv.

This argument must be specified together with -mv.

- rv volumeSpecify the volume of RV.

For a pair in which MV and RV are configured by 1 to 1, this option can be omitted.

- rvflg rv_flgSpecify the volume type specified in -rv.

This argument must be specified together with -rv.

- file file_nameTo specify multiple pairs, describe pairs of MVs and RVs in file_name.

It is impossible to specify a pair for data replication and pair for snapshot as operation targets together.

When multiple pairs are specified, if an error occurs in any of the pairs, the process is canceled.

- cprange copy_rangeSpecify the range of Restore from the RV to the MV.

One of the following can be specified in copy_range.

diffRestores only updates to the RV since Separate from the MV to the RV.

fullRestores all area of the RV to the MV regardless of updates to the RV since Separate.

If this argument is omitted, the operation is the same as the operation when diff is specified.

- mode operation_modeSpecify the RV operation mode during Restore execution.

One of the following can be specified in operation_mode.

updateRestores the updates to the MV while reflecting the update to the RV. After Restore has been completed, the mode switches to the Sync State(rst/sync).

protectRestores the update to the MV without reflecting the update to the RV. After Restore has been completed, the RV is automatically separated and the mode switches to the Separated state.

defaultUses the setting stored in the replication operation option setting file.

If this argument is omitted, the operation is the same as the operation when default is specified.

- cpmode copy_modeSpecify the Copy Control State for reflecting updates to the MV to the RV.

One of the following can be specified in copy_mode.

syncSynchronous mode

semiSemi-synchronous mode

bgBackground copy mode

If this argument is omitted, the operation is the same as the operation when sync is specified.

- rvacc rv_accessSpecify the access restriction for the RV.

One of the following can be specified in rv_access.

nrAccess to the RV is not allowed.

roOnly reference can be performed for the RV.

If this argument is omitted, the operation is the same as the operation when nr is specified.

- wait [second] | -nowaitSpecify whether to wait for the completion of Restore.

Specifying -wait causes the state of processing to be monitored at regular intervals while waiting until restoration is completed.

If a value is specified in second, the monitoring time interval of the disk array becomes the specified value. The available values are 1 to 30 seconds (integer). This value can be changed in the replication operation option setting file.

When the disk array monitoring interval is not specified, the default value is 5 seconds.

Specifying -nowait does not cause a wait to occur for the completion of separation.

If this option is omitted, the operation is the same as the operation when -nowait is specified.

If snapshot is used, the following options are recognized.

- bv volumeSpecify a BV volume.

This option can be omitted if there is only one generation (BVs and SVs correspond to each other on a 1-to-1 basis).

- bvflg bv_flgSpecify the type of the volume specified with the -bv option.

This option must be specified together with the -bv option.

- sv volumeSpecify an SV volume.

The SV volume must be specified by logical disk name or relative generation number.

The relative generation number must be .-n format. The expression .-1 means the latest generation. Older generations can be specified in a range of .-2 to .-16.

It is possible to omit specifying the SV in this option if there is only one generation (BVs and SVs correspond to each other on a 1-to-1 basis).

For a derived SV without a generation number, only logical disk name can be specified.

- svflg sv_flgSpecify the type of the volume specified with the -sv option.

Either of the following SV volume types can be specified.

ldThe SV is specified by logical disk name.

relgenThe SV is specified by relative generation number.

This option must be specified together with the -sv option.

- file file_nameSpecify sets of BVs and SVs in file_name to specify more than one set.

It is impossible to specify a pair for data replication and a pair for snapshot as operation targets together.

If an error occurs in any of the specified sets, processing is discontinued.

- wait | -nowait Specify whether to wait until restoration is completed.

Specifying -wait causes the completion of restoration to be waited for.

Specifying -nowait starts restoration but does not cause the completion of restoration to be waited for.

If this option is omitted, the command behaves in the same manner as when -wait is specified.

If the data replication function is used, specifying -wait allows a monitoring time interval for the disk array to be specified in seconds. If the snapshot function is in use, no monitoring time interval need to be specified. An attempt to specify one is ignored.

- derivsv derivsv_modeSpecify whether to retain the snapshot data of derived generation. Either of the following can be specified in derivsv_mode.

keepRetains the snapshot data of the derived generation.

deleteAutomatically deletes the snapshot data of the derived generation.

defaultUses the setting stored in the replication operation option setting file.

If this argument is omitted, the operation is the same as the operation when default is specified.

Displayed Information

The following information is displayed if database recovery is performed by waiting until restoration from the RV to the MV is completed, using the data restoration function.

```
C:\> iSMsql_snapshotrst -db db_name   -metafile metafile_name -wait

SnapshotRestore  Start                  YYYY/MM/DD  hh:mm:ss
   DataBase    db_name
     MV:disk_number                     ld_name        type
        volume_name
        path
     RV:disk_number                     ld_name        type
        volume_name
        path
Restore          Start                  YYYY/MM/DD  hh:mm:ss
Restoring.....
Restore          Normal End             YYYY/MM/DD  hh:mm:ss
SnapshotRestore  Normal End             YYYY/MM/DD  hh:mm:ss
   DataBase    db_name
     MV:disk_number                     ld_name        type
        Volume_name
        Path
     RV: disk_number                    ld_name        type
        Volume_name
        Path

C:\>
```

Description of messages:

Snapshot Restore StartYYYY/MM/DD hh:mm:ss

Snapshot Restore start message and start date

DataBase db_name

Database name

MV:disk_numberld_nametype

MV physical disk number, logical disk name, OS type

volume_name

MV mount point volume name

path

MV drive letter or NTFS folder path name

RV:disk_numberld_nametype

RV physical disk number, logical disk name, OS type

volume_name

RV mount point volume name

path

RV drive letter or NTFS folder path name

Restore StartYYYY/MM/DD hh:mm:ss

Message indicating the start of restoration for which the data replication function is used, and date and time of the start

Restoring.....

Message indicating that restoration is in progress, using the data replication function

The message appears if the completion of restoration is waited for.

Restore Normal EndYYYY/MM/DD hh:mm:ss

Restore end message and end date

SnapshotRestore Normal EndYYYY/MM/DD hh:mm:ss

Snapshot Restore end message and end date

The following information is displayed when database recovery is performed using the snapshot function for restoration from the SV to the BV.

```
C:\> iSMsql_snapshotrst -db db_name   -metafile metafile_name

SnapshotRestore  Start              YYYY/MM/DD hh:mm:ss
   DataBase    db_name
     BV:ld_name                 type
          volume_name
          path
     SV:ld_name                 type       (generation) attribute
Restore          Start              YYYY/MM/DD hh:mm:ss
Restore          Normal End         YYYY/MM/DD hh:mm:ss
SnapshotRestore Normal End          YYYY/MM/DD hh:mm:ss
   DataBase    db_name
     BV:ld_name type
          volume_name
          path
     SV:ld_name                 type       (generation) attribute

C:\>
```

Description of messages:

SnapshotRestore StartYYYY/MM/DD hh:mm:ss

Message indicating the start of snapshot restoration, and date and time of the start

DataBase db_name

Database name

BV:ld_nametype

BV logical disk name and OS type

volume_name

BV mount point volume name

path

BV drive letter or NTFS folder path name

SV:ld_nametype(generation) attribute

SV logical disk name, OS type, and relative generation number, and generation attribute

If the SV has the derived attribute, an asterisk * is displayed for the generation attribute.

Restore StartYYYY/MM/DD hh:mm:ss

Message indicating the start of snapshot-based restoration, and date and time of the start

Restore Normal EndYYYY/MM/DD hh:mm:ss

Message indicating the end of snapshot-based restoration, and date and time of the end

This message appears if the completion of restoration is waited for.

SnapshotRestore Normal EndYYYY/MM/DD hh:mm:ss

Message indicating the end of snapshot restoration, and date and time of the end

Notes]

Using the data replication function

- The target MV and RV must be set as a pair.
- The target MV must already be registered in the volume list.
- The command cannot be executed if the data replication function of the disk array in which the target MV and RV are stored is in the freeze state.
- The activity state of the target pair is Separate State. The command can be executed only when the activity state of the target pair is Separated.
- If the target MV is used as the BV for the snapshot function, the snapshot state for all SVs paired with the BV must be snapshot-inactive.
- The command cannot be executed if the target MV is used as the BV and the MV is in the restore state or the restore fault state for snapshot.
- The semi-Overland Mirroring cannot be specified for the pair volumes that are allocated in the same disk array. To specify the semi-Overland Mirroring, use the pair volumes that are allocated in different disk arrays.
- Performing restoration requires that the target RV must contain all data files and log files included in the database.
- The specified database name must be unique.
- A disk specified to hold a metafile must be other than the disk that contains the data files or log files of the target database.
- The command cannot be executed if the volume list is being created or updated.
- A dynamic disk cannot be used.
- The target MV and RV must have been unmounted.
- The command cannot handle any pairs registered with the ATgroup.
- The command cannot be used in joint operation with iSM.

Using the snapshot function

- The target BV and SV must be in a pair.
- The target BV volume must have been registered in the volume list.
- The command cannot be executed if the data replication function of the disk array in which the target BV and SV are stored is in the freeze state.
- The snapshot state of the target BV and SV must be snapshot-active.
- The command cannot be executed if the target BV is in the snapshot fault state or the restore fault state.
- If there is a protected SV whose generation is newer than the target SV, the command cannot be executed with the specification that the snapshot data of the derived generation is automatically deleted.
- If the command was executed with the specification that the snapshot data of the derived generation is automatically deleted, it automatically deletes the snapshot data of generations newer than the target SV.
- If the target BV is used as the MV and in the Replication or Restore state of data replication function, the command cannot be executed.
- The command cannot be executed if the target BV or SV is linked to an LV.
- The command can be executed only when the SV is in the Not Ready state.
- Performing restoration requires that the target SV must contain all data files and log files included in the database.
- The specified database name must be unique.
- A disk specified to hold a metafile must be other than the disk that contains the data files or log files of the target database.
- The command cannot be executed if the volume list is being created or updated.
- A dynamic disk cannot be used.
- The target BV must have been unmounted.
- The command cannot be used in joint operation with iSM.

Return Values

Normal termination

Abnormal termination

This command terminates abnormally in the following cases.

- An option or parameter is invalid.
- A condition for operation is not satisfied.
- The instruction fails due to a disk array error.
- The instruction to the Microsoft SQL Server fails.

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