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Hitachi Command Suite

Replication Manager
Application Agent CLI Reference Guide

◎ Hitachi Data Systems

MK-90HC181-15

Contents

Preface

This document describes how to use Hitachi Replication Manager Application Agent (abbreviated hereafter to *Application Agent*).

This preface includes the following information:

☐ Intended audience

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☐ Related documents

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☐ Conventions for storage capacity values

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Intended audience

This document is intended for those who want to learn more about the syntax and precautions for extended commands and basic commands in Application Agent. Readers of this document should have a basic knowledge of the contents of the Replication Manager Application Agent CLI User Guide.

Product version

This document revision applies to Replication Manager version 8.1.3 or later.

Release notes

Read the release notes before installing and using this product. They may contain requirements or restrictions that are not fully described in this document or updates or corrections to this document.

Document organization

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

Chapter	Description
Chapter 1, Extended commands on page 1-1	Describes the extended commands provided by Application Agent.
Chapter 2, Basic commands on page 2-1	Describes the basic commands provided by Application Agent.

Related documents

The following related Hitachi Command Suite documents are available on the documentation CD:

- *Replication Manager User Guide*, MK-99HC166
- *Replication Manager Configuration Guide*, MK-98HC151
- *Replication Manager Application Agent CLI User Guide*, MK-90HC189
- *Hitachi Command Suite Messages*, MK-90HC178

Document conventions

This document uses the following typographic conventions:

Convention	Description
Bold	Indicates text on a window, other than the window title, including menus, menu options, buttons, fields, and labels. Example: Click **OK**.
Italic	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: `copy source-file target-file` *Note:* Angled brackets (< >) are also used to indicate variables.
`Monospace`	Indicates text that is displayed on screen or entered by the user. Example: `# pairdisplay -g oradb`
< > angled brackets	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: `# pairdisplay -g <group>` *Note:* Italic font is also used to indicate variables.
[ ] square brackets	Indicates optional values. Example: [a | b] indicates that you can choose a, b, or nothing.
{ } braces	Indicates required or expected values. Example: { a | b } indicates that you must choose either a or b.
| vertical bar	Indicates that you have a choice between two or more options or arguments. Examples: [a | b] indicates that you can choose a, b, or nothing. { a | b } indicates that you must choose either a or b.

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

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

Conventions for storage capacity values

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

Physical capacity unit	Value
1 kilobyte (KB)	1,000 (10^3) bytes
1 megabyte (MB)	1,000 KB or $1,000^2$ bytes

Physical capacity unit	Value
1 gigabyte (GB)	1,000 MB or $1,000^3$ bytes
1 terabyte (TB)	1,000 GB or $1,000^4$ bytes
1 petabyte (PB)	1,000 TB or $1,000^5$ bytes
1 exabyte (EB)	1,000 PB or $1,000^6$ bytes

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

Logical capacity unit	Value
1 block	512 bytes
1 KB	$1,024 (2^{10})$ bytes
1 MB	1,024 KB or $1,024^2$ bytes
1 GB	1,024 MB or $1,024^3$ bytes
1 TB	1,024 GB or $1,024^4$ bytes
1 PB	1,024 TB or $1,024^5$ bytes
1 EB	1,024 PB or $1,024^6$ bytes

Accessing product documentation

The Replication Manager user documentation is available on the Hitachi Data Systems Portal: https://portal.hds.com. Check this site for the most current documentation, including important updates that may have been made after the release of the product.

Getting help

Hitachi Data Systems Support Portal is the destination for technical support of your current or previously-sold storage systems, midrange and enterprise servers, and combined solution offerings. The Hitachi Data Systems customer support staff is available 24 hours a day, seven days a week. If you need technical support, log on to the Hitachi Data Systems Support Portal for contact information: https://portal.hds.com.

Hitachi Data Systems Community is a new global online community for HDS customers, partners, independent software vendors, employees, and prospects. It is an open discussion among these groups about the HDS portfolio of products and services. It is the destination to get answers, discover insights, and make connections. The HDS Community complements our existing Support Portal and support services by providing an area where you can get answers to non-critical issues and questions. **Join the**

conversation today! Go to `community.hds.com`, register, and complete your profile.

Comments

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

Thank you!

Hitachi Replication Manager Application Agent CLI Reference Guide

1

Extended commands

This chapter describes the extended commands provided by Application Agent.

☐ Overview of extended commands

☐ Before reading the extended command descriptions

☐ Extended command specifications (File system backups)

☐ Extended command specifications (Common commands)

☐ Extended command specifications (Tape-related commands)

☐ Extended command specifications (SQL Server database backups)

☐ Extended command specifications (Exchange database backups)

Overview of extended commands

An *extended command* is used to reduce the effort required to perform data protection operations, such as backup or restoration. You can use extended commands to automatically perform backup and restoration, without needing to specify further complicated operations.

For example, suppose that you want to back up data to a tape device by using Application Agent commands. In this case, you must execute a separate command for each of the following operations:

1. Unlock the secondary volume.
2. Mount the secondary volume.
3. Unmount the secondary volume.
4. Lock the secondary volume.
5. Back up data to the secondary volume.
6. Check the execution results of the backup.
7. Export the backup information to a temporary file.
8. Lock the primary volume.
9. Transfer the temporary file, control files, or VDI metafile to the backup server.
10. Import the backup information from the temporary file.
11. Check the execution results of the import.
12. Back up the data of the secondary volume to a tape device.
13. Check the execution results of the tape backup.
14. Unlock the primary volume.

For the preceding operations, specifying the resource information to be operated on and the related backup information is complicated. This kind of information is predefined in extended commands. You can automatically execute extended commands by using a tool such as operation management software, and by doing so, you can perform a backup without having to work with complex processes. Using extended commands reduces the effort required for data protection operations.

List of extended commands

The following tables display the extended commands provided by Application Agent and provide a general explanation for each command.

Table 1-1 List of extended commands (File system backups)

Extended command name	Explanation
EX_DRM_FS_BACKUP	Backs up a file system.
EX_DRM_FS_DEF_CHECK	Checks the contents of an operation definition file and automatically creates a temporary directory.

Extended command name	Explanation
EX_DRM_FS_RESTORE	Restores a file system from its backup to the primary volume.

Table 1-2 List of extended commands (Common commands)

Extended command name	Explanation
EX_DRM_BACKUPID_SET	Generates a backup ID file.
EX_DRM_CG_DEF_CHECK	Checks the contents of a copy-group list file.
EX_DRM_DB_EXPORT	Exports backup information to a file.
EX_DRM_DB_IMPORT	Imports backup information from a file.
EX_DRM_FTP_GET	Acquires a backup information file from the backup server. Also acquires an VDI metafile if you are backing up an SQL Server database.
EX_DRM_FTP_PUT	Transfers a backup information file to the backup server. Also transfers an VDI metafile if you are backing up an SQL Server database.
EX_DRM_HOST_DEF_CHECK	Checks the contents of a host environment settings file.
EX_DRM_RESYNC	Resynchronizes a copy group.

Table 1-3 List of extended commands (Tape-related commands)

Extended command name	Explanation
EX_DRM_CACHE_PURGE	Clears the cache of the secondary volume.
EX_DRM_MOUNT	Mounts a secondary volume.
EX_DRM_TAPE_BACKUP	Backs up data of a secondary volume to a tape device. The command also acquires an VDI metafile if you are backing up an SQL Server database.
EX_DRM_TAPE_RESTORE	Restores data from a backup tape device to the secondary volume. The command also restores an VDI metafile if you are backing up an SQL Server database.
EX_DRM_UMOUNT	Unmounts a secondary volume.

Table 1-4 List of extended commands (SQL Server database backups)

Extended command name	Explanation
EX_DRM_SQL_BACKUP	Backs up an SQL Server database.
EX_DRM_SQL_DEF_CHECK	Checks the contents of an operation definition file and automatically creates a temporary directory.
EX_DRM_SQL_RESTORE	Restores the SQL Server database from its backup to the primary volume.

Extended command name	Explanation
EX_DRM_SQL_TLOG_BACKUP	Backs up the SQL Server transaction log.
EX_DRM_SQLFILE_EXTRACT	Deploys VDI metafiles to the directory to be backed up to a tape device.
EX_DRM_SQLFILE_PACK	Backs up VDI metafiles.

Table 1-5 List of extended commands (Exchange database backups)

Extended command name	Explanation
EX_DRM_EXG_BACKUP	Backs up an Exchange database.
EX_DRM_EXG_DEF_CHECK	Checks the contents of an operation definition file and automatically creates a temporary directory.
EX_DRM_EXG_RESTORE	Restores the Exchange database from its backup to the primary volume.
EX_DRM_EXG_VERIFY	Verifies the consistency of an Exchange database.

Before reading the extended command descriptions

Note the following points before reading the extended command descriptions.

Do not forcibly terminate an extended command that is being executed. If you do so, the backup catalog or the pair status of the copy group might enter an unexpected status.

OS administrator permissions and access permissions for databases are required to execute Application Agent commands. For details, see the description of permissions for command executions in the *Replication Manager Application Agent CLI User Guide*.

Extended command path

Installation directory of extended commands
Extended commands are installed in the following location:
Application-Agent-installation-folder\DRM\script\bin\

Extended command formats

All arguments that can be specified are described in this section. If multiple argument conditions exist, the formats are described separately for each condition. Do not mix separate formats.

Viewing the format

To display the extended command format, execute an extended command by specifying the -h option after the extended command name. You can specify the -h option with the following commands:

- `EX_DRM_FS_DEF_CHECK`
- `EX_DRM_CG_DEF_CHECK`
- `EX_DRM_HOST_DEF_CHECK`
- `EX_DRM_SQL_DEF_CHECK`
- `EX_DRM_EXG_DEF_CHECK`

Correspondence to Replication Manager GUI terms

Some terms used in the Application Agent command line interface have different meanings from those used in the Replication Manager GUI. The following table describes the correspondence between these terms.

Table 1-6 Correspondence of Replication Manager GUI and Application Agent command line interface terms

Replication Manager GUI term	Application Agent command line interface term	Meaning
Copy pair	Copy group	A primary volume and secondary volume pair that is synchronized or split by the volume replication functionality and the CCI function. Note that in the Replication Manager GUI, a *copy group* means a group of copy pairs.
Label	Backup comment	A character string used to identify a replica or backup
Replica	Backup	Data copied from the primary volume to the secondary volume
Replica catalog	Backup catalog	A collection of information necessary for managing the history of backup operations and managing backup generations
Primary site	Local site	The site where business tasks are running and where the primary volume is used as the copy source.
Secondary site	Remote site	A site used to continue tasks if the local site becomes unavailable because of, for example, maintenance or a disaster at the local site.

The *Replication Manager User Guide* and the *Replication Manager Configuration Guide* use the Replication Manager GUI terms. This document (*Replication Manager Application Agent CLI Reference Guide*) uses the Application Agent command line interface terms.

Correspondence for a term in messages output by Replication Manager

Replace the following term in this manual with the term shown in the following table.

Table 1-7 Correspondence for a term in messages output by Replication Manager

Term in this manual	Term in the message output by Replication Manager
CCI	RAID Manager

Extended command specifications (File system backups)

This section explains the extended command specifications that apply to file system backup and restore operations.

EX_DRM_FS_BACKUP (Backs up a file system)

Formats

To perform an online backup:
```
EX_DRM_FS_BACKUP operation-ID
                    [ -mode online ] [-comment backup-comment ]
                    [ -rc [ name-identifying-the-generation ]]
                    [ -pf copy-parameter-definition-file ]
                    [ -script user-script-file-name ]
                    [ -s backup-server-name
                      [ -auto_import
                        [ -auto_mount [ mount-point-directory-name ]]
                      ]
                      [ -svol_check ]
                    ]
```

To perform a cold backup:
```
EX_DRM_FS_BACKUP operation-ID
                    -mode cold [ -comment backup-comment ]
                    [ -rc [ name-identifying-the-generation ]]
                    [ -pf copy-parameter-definition-file ]
                    [ -script user-script-file-name ]
                    [ -s backup-server-name
                      [ -auto_import
                        [ -auto_mount [ mount-point-directory-name ]]
                      ]
                      [ -svol_check ]
                    ]
```

To perform a VSS backup:
```
EX_DRM_FS_BACKUP operation-ID
                    -mode vss
                    [ -comment backup-comment ]
                    [ -rc [ name-identifying-the-generation ]]
                    [ -pf copy-parameter-definition-file ]
                    [ -vf VSS-definition-file-name ]
                    [ -script user-script-file-name ]
                    [ -s backup-server-name
                      [ -auto_import
                        [ -auto_mount [ mount-point-directory-name ]]
                      ]
```

```
                    [ -svol_check ]
                ]
```

Description

This extended command backs up a file system from the primary volume to the secondary volume; the file system has the operation ID specified by executing the `drmfsbackup` command. At this time, the `EX_DRM_FS_BACKUP` command generates a backup ID.

Prerequisites

The prerequisite for executing this extended command is as follows:

- An operation definition file linked to the specified operation ID has been provided.

Arguments

operation-ID

A character string that uniquely identifies the operation to be performed. Information in the operation definition file corresponding to the specified operation ID is used when executing the extended command.

-mode online

Specify this option to perform online backup. The online backup method backs up a file system without unmounting it.

If you specify online backup for a file system, this extended command only synchronizes the file system before the online backup. To ensure consistency in the backup data, you need to suppress the updating of data before backup processing.

Even if you omit this option, an online backup is the default.

-mode cold

Specify this option to perform cold backup.

Use a cold backup for a mounted file system. When executed, this extended command unmounts the specified file system and backs up the volume in offline mode. After backup processing has finished, the command mounts the file system again. If unmounting of the file system fails, the command displays an error message and cancels backup processing. If the target volume has already been unmounted, the command cancels backup processing.

If executed on a server with a cluster configuration, this extended command takes the target disk resource offline instead of unmounting the file system, and then backs up the volume. When backup processing is completed, the command brings the target disk resources online again.

Backup processing is canceled if the command is executed in the following cases:

- An attempt to take the disk resource offline fails.
- The disk resource is already offline.

`-mode vss`

Specify this option to perform VSS backup.

To use this option, the Protection Manager service must be running on the backup server.

`-comment` *backup-comment*

Specify this option to register a backup comment in the backup catalog. The conditions for specifying a value in the *backup-comment* parameter are as follows:

- The value must be 64 bytes or less.
- The value can include alphanumeric, reserved, one-byte space, and multi-byte characters.
- The value is case sensitive.
- When a reserved character or a one-byte space character is used, the entire value must be enclosed in double quotation marks (").
- If the value contains a reserved character, but is not enclosed in double quotation marks, the reserved character is not correctly interpreted as a part of the backup comment, and is parsed as a reserved character.
- The following reserved characters cannot be used in backup comments:
  `\ / ` | < > " * ? & ; ( ) $`

A hyphen (`-`) cannot appear as the first character in the backup comment. If you specify two consecutive double quotation marks ("") after the `-comment` option, no backup comment will be registered in the backup catalog.

`-rc` *name-identifying-the-generation*

Use this option to specify the name identifying the generation of the copy group to be backed up. For *name-identifying-the-generation*, specify the `GEN-NAME` value displayed by executing the `drmfsdisplay` command with the `-cf` option specified. For single volumes, a hyphen (`-`) is displayed. In this case, the `-rc` option cannot be specified.

Always specify this option when backing up from a primary volume to a secondary volume on the remote side. If this option is omitted, the secondary volume on the local side is backed up.

If you omit the *name-identifying-the-generation* parameter, the secondary volume that has the smallest value among the generation numbers on the remote side becomes the backup destination. In this case, the generation number is `remote_n`, where `n` is the smallest generation number.

`-pf` *copy-parameter-definition-file*

Specify this option to use the number of retries and the retry interval defined in the copy parameter definition file. Specify the *copy-parameter-*

definition-file parameter as a file name only; do not specify the parameter as a path.

If this option is omitted, the value in the CCI-linkage definition file (`DEFAULT.dat`) is used. The values in this file are used for any parameters that are not coded in the copy parameter definition file.

You can create a copy parameter definition file by using a name of your choice. Specify the file name by using an alphanumeric character string that is 64 bytes or less. You must save the copy parameter definition file in the following location:

`Application-Agent-installation-folder\DRM\conf\raid`

`-vf` *VSS-definition-file-name*

Specify this option to switch the backup settings used for each VSS backup. You can specify this option only when you are using VSS to perform a backup.

Specify the *VSS-definition-file-name* parameter as a file name only; do not specify the parameter as a path. You must save the VSS definition file specified in this option in the following folder:

`Application-Agent-installation-folder\DRM\conf\vss`

If you omit this option, the command uses the following file as the VSS definition file:

`Application-Agent-installation-folder\DRM\conf\vsscom.conf`

For details about the VSS definition file, see the *Replication Manager Application Agent CLI User Guide*.

`-script` *user-script-file-name*

Specify this option to execute a user script. Specify *user-script-file-name* as an absolute path. The conditions for specifying the value in the *user-script-file-name* parameter are as follows:

- The value must be 255 bytes or less.
- The value can include alphanumeric, one-byte space, and multi-byte characters.
- The value is case sensitive.
- If the value contains space characters, the entire value must be enclosed in double quotation marks (").
- The following reserved characters cannot be used in the value: \ / : * ? | < > "

For details about creating user script files, see the *Replication Manager Application Agent CLI User Guide*.

If you specified `LOCATION=REMOTE` in the user script file, you must also specify the `-s` option.

`-s` *backup-server-name*

Specify this option to connect to a remote backup server to perform a backup. Specify the *backup-server-name* value by using the host name or the IP address of the backup server. Specify the host name by using a character string that is 255 bytes or less. You can specify the IP address in IPv4 or IPv6 format.

If you specify a backup server by using the `-s` option, the backup server names specified in the VSS definition file (`vsscom.conf`) and in the VSS definition file specified by using the `-vf` option are ignored, and the backup server name specified in the `-s` option is used.

`-auto_import`

Specify this option to automatically transfer a backup catalog to a backup server after backing up a volume. This option must be specified together with the `-s` option.

`-auto_mount` *mount-point-directory-name*

Specify this option to automatically mount a secondary volume on a backup server after backing up a volume. This option must be specified together with the `-s` and `-auto_import` options.

Specify the *mount-point-directory-name* value by using a character string that is 64 bytes or less.

If you omit the *mount-point-directory-name* parameter, a mount destination for a secondary volume is automatically determined. This destination is determined in the same way as when using the `drmmount` command without specifying a mount point.

Execute the `drmumount` command to unmount the mounted secondary volume. In the argument of the `drmumount` command, specify the backup ID.

`-svol_check`

Specify this option to check the status of a secondary volume on a backup server. You must specify this option together with the `-s` option. Checking the status of a secondary volume prevents backup or restoration failures. The items, volumes, and conditions to be checked are described in the following table.

Table 1-8 Status check of a secondary volume

Check item	Volume to be checked	Check condition
A secondary volume is hidden from a backup server	All secondary volumes defined for a backup-target primary volume	Checked when a primary volume is defined in pairs with secondary volumes of multiple generations and any of the following items is applicable: • A primary volume is a cluster resource. • A backup by using VSS is performed.
A secondary volume is not	The secondary volume to be the	Always checked.

Check item	Volume to be checked	Check condition
mounted on a backup server	next backup destination	

⚠ **Note:** Each piece of backup information in the backup catalog is managed by using a copy group as a key. Depending on the backup method, you might not be able to perform a restoration, even though the backup data exists on the secondary volume.

For notes on using Application Agent, see the *Replication Manager Application Agent CLI User Guide*.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the definition file linked to the operation ID.
- A specified Application Agent command option cannot be specified as an extended command option.
- The system fails to record a backup ID in the backup ID record file.
- A command executed inside the extended command encounters an error.
- Information cannot be acquired from the host environment settings file.
- No storage directory for extended-command temporary files is specified in the operation definition file.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Examples

- In this example, the extended command is used to back up the file system specified by the operation ID `operation01` to the secondary volume, using the cold backup method:

  `EX_DRM_FS_BACKUP operation01 -mode cold`

- In this example, the extended command is used to back up the file system specified by the operation ID `operation01` to the secondary volume, using the VSS backup method:

  `EX_DRM_FS_BACKUP operation01 -mode vss`

EX_DRM_FS_DEF_CHECK (Checks the contents of an operation definition file and automatically creates a temporary directory)

Formats

To check the contents of an operation definition file for a file server:

`EX_DRM_FS_DEF_CHECK operation-ID -db`

To check the contents of an operation definition file for a backup server:

`EX_DRM_FS_DEF_CHECK operation-ID -bk`

Description

This extended command checks the contents of an operation definition file, and if no problem is found, automatically creates a temporary directory that will be used by subsequent extended commands.

The definition file-checking tool must be re-executed in the following cases:

- The path to the directory where dictionary map files are stored was changed on the file server.
- The directory path assigned to `FTP_HOME_DIR` was changed on the backup server.

When checking the contents of the operation definition file, the command first checks whether the operation definition file exists, and then checks the entries in the operation definition file for the following:

- An item and corresponding value have been specified.[#]
- The specified item appears only once.
- The number of specified characters does not exceed the maximum allowable for the item.

[#]
    Do not specify a value for `TARGET_NAME`.

In addition, the command checks the contents of the operation definition file for the items listed in the table below.

Table 1-9 Contents checked in the operation definition file

Item name	Details to be checked
`BACKUP_OBJECT`	`FILESYSTEM` is specified.
`DB_SERVER_NAME`	If `SET_DRM_HOSTNAME` is set to `1`, the value of `DB_SERVER_NAME` must match the file server name specified in `DRM_DB_PATH` of the Application Agent configuration definition file `init.conf`.
`INSTANCE_NAME`	• The mount point directory specified in `INSTANCE_NAME` must exist.

Item name	Details to be checked
	• If a mount point list file is specified, both the specified file and the mount point's directory defined in it must exist.
TARGET_NAME	Do not specify a value for this item by specifying TARGET_NAME=.
FTP_HOME_DIR	• The specified directory must exist.[#1, #2] • The absolute path must be specified.
FTP_SUB_DIR	• The specified directory name must not contain a delimiter character (\). • The directory name must not be specified as only one period (.) or two periods (..). • The root directory must not be specified.
SET_DRM_HOSTNAME	A value of 0 or 1 is specified.

#1

   Directory names are not case sensitive.

#2

   This item is checked only if the -bk option is specified.

The table below lists the directories that are automatically created by the checking tool.

Table 1-10 Directories automatically created by EX_DRM_FS_DEF_CHECK

Where EX_DRM_FS_DEF_CHECK is executed	Temporary directory for extended commands
File server	*script_work-directory-at-the-same-level-as-the-dictionary-map-files-storage-directory*\operation-ID\DB (Example) When the directory where dictionary map files are stored is H:\PTM and the operation ID is Operation_A, the temporary directory for extended commands is H:\script_work\Operation_A\DB.
Backup server	*directory-specified-for-FTP_HOME_DIR*\directory-specified-for-FTP_SUB_DIR\operation-ID\BK

Prerequisites

The prerequisites for executing this extended command are as follows:

• The command is executed on the server that contains the target file.

• The mount point directory specified in the operation definition file that is stored on the file server is on the same host.

Arguments

operation-ID

A character string that uniquely identifies the operation to be performed. Information in the operation definition file corresponding to the specified operation ID is used when executing the extended command.

`-db`

Specify this option to check the contents of an operation definition file for a file server.

`-bk`

Specify this operation to check the contents of an operation definition file for a backup server.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The operation definition file specified in the argument does not exist, or the system cannot access the file.
- An error is detected while the contents of the file are being checked.
- The command fails to create a temporary directory.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Examples

- In this example, the extended command is used to check the definition file `C:\Program Files\drm\SCRIPT\conf\_OP0001.dat` for a file server:
  `EX_DRM_FS_DEF_CHECK OP0001 -db`
- In this example, the extended command is used to check the definition file `C:\Program Files\drm\SCRIPT\conf\_OP0001.dat` for a backup server :
  `EX_DRM_FS_DEF_CHECK OP0001 -bk`

EX_DRM_FS_RESTORE (Restores a file system to the primary volume)

Format

```
EX_DRM_FS_RESTORE operation-ID -resync [ -force ]
                            [ -target directory-name
                             | -f list-file-name ]
                            [ -pf copy-parameter-definition-file]
```

Description

This extended command executes the `drmfsrestore` command to restore a specified file system from its backup data from the secondary volume to the primary volume.

Prerequisites

The prerequisites for executing this extended command are as follows:

- An operation definition file linked to the specified operation ID has been provided.
- `EX_DRM_BACKUPID_SET` or `EX_DRM_DB_IMPORT` has been executed, and the backup ID has been stored in the backup ID record file.

Arguments

`operation-ID`

A character string that uniquely identifies the operation to be performed. Information in the operation definition file corresponding to the specified operation ID is used when executing the extended command.

`-resync`

Specify this option to restore the data from the secondary volume to the primary volume by resynchronizing the volumes. The contents of the primary volume become the same as the contents of the secondary volume.

`-force`

Specify this option to restore data from the secondary volume to the primary volume by forcibly resynchronizing the volumes.

You can perform a forced resynchronization if the copy group name of the primary volume (obtained when backup processing was performed on the file server or database server) matches the information on the file server or the database server. You can perform a forced resynchronization even though the LDEV and SERIAL numbers do not match the LDEV and SERIAL numbers when backup processing was performed.

`-target directory-name`

Specify this option to restore a file system that contains a specific directory. *directory-name* indicates a mount point directory name, drive letter, or

volume mount point name. If multiple `directory-name` parameters are specified, a comma must be used to separate each parameter. Specify `directory-name` by using an absolute path.

The specified directory name must have been registered in the backup catalog. However, if the specified directory has already been backed up, it does not need to be registered in the backup catalog to restore the file system.

If you omit this option together with the `-f` option, the command restores the entire file system.

`-f list-file-name`

Specify this option to restore a file system that contains multiple files or directories. Specify the name of the file that contains a list of absolute paths of the files or directories. Specify `list-file-name` as an absolute path.

If you omit this option together with the `-target` option, the command restores the entire file system.

`-pf copy-parameter-definition-file`

Specify this option to use the number of retries and the retry interval defined in the copy parameter definition file. Specify the `copy-parameter-definition-file` parameter as a file name only, without specifying a path.

If you omit this option, the value in the CCI-linkage definition file (`DEFAULT.dat`) is used. The values in the CCI-linkage definition file (`DEFAULT.dat`) are used for any parameters that are not included in the copy parameter definition file.

You can create a copy parameter definition file by using a name of your choice. Specify the file name by using an alphanumeric character string that is 64 bytes or less. You must save the copy parameter definition file to the following location:

`Application-Agent-installation-folder\DRM\conf\raid`

⚠️ **Note:**

- The backup information in the backup catalog is managed by using a copy group as a key. Depending on the backup method, you might not be able to perform restoration, even though the backup data exists on the secondary volume. For further information, see the notes on running Application Agent in the *Replication Manager Application Agent CLI User Guide*.

- In a Windows Server Failover Clustering environment, you can restore a volume within a cluster group while the cluster resources are online if `CLU_MSCS_RESTORE` is set to `ONLINE` in the Application Agent configuration definition file (`init.conf`).

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the definition file linked to the operation ID.
- A specified Application Agent command option cannot be specified as an extended command option.
- Acquisition of information from the backup ID record file fails.
- A command executed inside the extended command encounters an error.
- The acquisition of the result of a command executed inside the extended command fails.
- Information cannot be acquired from the host environment settings file.
- No storage directory for extended-command temporary files is specified in the operation definition file.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Example

- In this example, the extended command is used to restore the file system specified by the operation definition file `operation01`. The command restores by resynchronizing the primary and secondary volumes:

  ```
  EX_DRM_FS_RESTORE operation01 -resync
  ```

Extended command specifications (Common commands)

EX_DRM_BACKUPID_SET (Generates a backup ID file)

Format

```
EX_DRM_BACKUPID_SET operation-ID -backup_id backup-ID
```

Description

This extended command is used to generate a backup ID file that contains the specified backup ID. The command stores the file in the temporary directory for extended commands.

Execute this extended command as preparation for restoring the backed up file system or the database to the primary volume. Execute the command by specifying the backup ID to be used for restoring (the backup ID generated when you backed up the file system or the database to the secondary volume).

Prerequisites

The prerequisites for executing this extended command are as follows:

- An operation definition file corresponding to the specified operation ID has been created.
- You have confirmed the backup ID to be specified with this extended command by viewing the backup catalog information. This information can be obtained by using one of the following commands:

  - When backing up a file system, use the `drmfscat` command.
  - When backing up an SQL Server database, use the `drmsqlcat` command.
  - When backing up an Exchange database, use the `drmexgcat` command.

Arguments

`operation-ID`

A character string that uniquely identifies the operation to be performed.

`-backup_id backup-ID`

Specify the backup ID to be used when restoring the backed up file system or database to the primary volume. A backup ID uniquely identifies backup data, and is registered in the backup catalog during the backup operation.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the operation definition file linked to the operation ID.
- The backup ID cannot be recorded in the backup ID file.
- A command executed inside the extended command encounters an error.
- Information cannot be acquired from the host environment settings file.
- No storage directory for extended-command temporary files is specified in the operation definition file.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Extended commands

Example

- In this example, the extended command is used to create a backup ID file that contains the backup ID `0000000001`:

  ```
  EX_DRM_BACKUPID_SET operation01 -backup_id 0000000001
  ```

EX_DRM_CG_DEF_CHECK (Checks the contents of a copy-group list file)

Formats

```
EX_DRM_CG_DEF_CHECK -cg_file copy-group-list-file-name
```

Description

This extended command is used to check the contents of a copy-group list file. The command first checks to see if the file specified in the argument exists. If it does, the command then checks all the copy groups set in the copy-group list file to make sure that:

- One copy group name is coded on each line.
- There is no duplication of copy group names in the file.
- The copy group names in the file are included in the list of copy groups displayed by the `drmcgctl` command.

Copy group names are case sensitive.

Prerequisites

The prerequisite for executing this extended command is as follows:

- The extended command must be executed on the machine that contains the copy-group list file to be checked.

Arguments

`-cg_file copy-group-list-file-name`

Use an absolute path to specify the copy-group list file to be checked.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.

- The file specified in the argument does not exist, or the system cannot access the file.
- An error is detected in the copy-group list file.
- A command executed inside the extended command encounters an error.

Example

- In this example, the extended command is used to check the copy-group list file `C:\WORK\CGDEF.txt`:

  ```
  EX_DRM_CG_DEF_CHECK -cg_file C:\WORK\CGDEF.txt
  ```

EX_DRM_DB_EXPORT (Exports backup information to a file)

Format

```
EX_DRM_DB_EXPORT operation-ID
```

Description

This extended command executes the `drmdbexport` command to export the backup information corresponding to the specified operation ID. The backup information that was exported is recorded in the backup information file of the temporary directory for extended commands.

The backup ID is used to specify the backup information to be exported during the `drmdbexport` command execution from the backup ID file in the temporary directory for extended commands.

Prerequisites

The prerequisites for executing this extended command are as follows:

- An operation definition file linked to the specified operation ID has been provided.
- The backup ID to be referenced by this extended command has already been stored in the backup ID file by executing one of the following extended commands:

  ○ When backing up a file system, use the `EX_DRM_FS_BACKUP` or `EX_DRM_TAPE_RESTORE` command.

  ○ When backing up an SQL Server database, use the `EX_DRM_SQL_BACKUP` or `EX_DRM_TAPE_RESTORE` command.

  ○ When backing up an Exchange database, use the `EX_DRM_EXG_BACKUP` or `EX_DRM_TAPE_RESTORE` command.

Arguments

```
operation-ID
```

A character string that uniquely identifies the operation to be performed. Information in the operation definition file corresponding to the specified operation ID is used when executing the extended command.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the operation definition file linked to the operation ID.
- Information cannot be acquired from the host environment settings file.
- No storage directory for extended-command temporary files is specified in the operation definition file.
- Information cannot be acquired from the backup ID file.
- A command executed inside the extended command encounters an error.
- The execution results of a command executed inside the extended command cannot be acquired.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Example

- In this example, the extended command is used to export backup information that is identified by the operation ID `operation01`:

  `EX_DRM_DB_EXPORT operation01`

EX_DRM_DB_IMPORT (Imports backup information from a file)

Format

`EX_DRM_DB_IMPORT operation-ID`

Description

This extended command executes the `drmdbimport` command to import the backup information corresponding to the specified operation ID. This extended command also generates a backup ID and records it in a backup ID file in the temporary directory for extended commands.

The backup information to be imported by executing the `drmdbimport` command is obtained from the backup information file of the temporary directory for extended commands.

Prerequisites

The prerequisites for executing this extended command are as follows:

- An operation definition file linked to the specified operation ID has been provided.
- The backup information file to be imported by executing this extended command has been generated by executing the `EX_DRM_FTP_PUT` or `EX_DRM_FTP_GET` extended command.

Arguments

`operation-ID`

A character string that uniquely identifies the operation to be performed. Information in the operation definition file corresponding to the specified operation ID is used when executing the extended command.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the operation definition file linked to the operation ID.
- The copy source folder of the file to be copied does not exist.
- The backup ID cannot be recorded in the backup ID file.
- A command executed inside the extended command encounters an error.
- Information cannot be acquired from the host environment settings file.
- No storage directory for extended-command temporary files is specified in the operation definition file.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Example

- In this example, the extended command is used to import backup information, based on the settings specified in the operation definition file `operation01`:

  `EX_DRM_DB_IMPORT operation01`

EX_DRM_FTP_GET (Acquires a backup information file from the backup server)

Format

```
EX_DRM_FTP_GET operation-ID -server FTP-server
                    -user FTP-user -password FTP-password
```

Description

The `EX_DRM_FTP_GET` command transfers the backup information file corresponding to the operation ID specified in the arguments from the temporary directory for extended commands on the FTP server to the temporary directory for extended commands on the FTP client. At this time, it deletes old backup information files stored in the directories of the FTP client before transferring the new file. The command also transfers the VDI metafile (when the backup is of an SQL Server database) at the same time.

Prerequisites

The prerequisites for executing this extended command are as follows:

- An operation definition file linked to the specified operation ID has been provided.
- This extended command is executed on the FTP client.
- The files that this extended command will transmit have already been generated by executing the `EX_DRM_DB_EXPORT` extended command.
- The `EX_DRM_FS_DEF_CHECK` command has been executed to create a directory on the FTP server that will contain the transferred files.

Arguments

Specify the arguments of this extended command in the following order: *operation-ID*, `-server` *FTP-server*, `-user` *FTP-user*, and `-password` *FTP-password*.

operation-ID

A character string that uniquely identifies the operation to be performed. Information in the operation definition file corresponding to the specified operation ID is used when executing the extended command.

`-server` *FTP-server*

In *FTP-server*, specify the host name or the IP address of the FTP server from which you want to transmit the files. You can specify the IP address in IPv4 or IPv6 format. For details on systems that support the IPv6 format, see the descriptions about operating systems that support the IPv6 format when using FTP in the *Replication Manager Application Agent CLI User Guide*.

`-user` *FTP-user*

For *FTP-user*, specify the FTP user name used when connecting to the FTP server.

```
-password FTP-password
```

For *FTP-password*, specify the FTP user password used when connecting to the FTP server.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- Information cannot be acquired from the operation definition file corresponding to the operation ID.
- A connection to the FTP server or file transmission fails.
- A command executed inside the extended command encounters an error.
- The backup information file to be transferred by this extended command does not exist.
- Information cannot be acquired from the host environment settings file.
- The storage directory for extended-command temporary files specified in the operation definition file does not exist on the file server or the database server.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Example

- In this example, the extended command is used to transfer files from the FTP server to the FTP client, based on the settings in the operation definition file `operation01`. The command uses `serverA` for the FTP server, `ftp_user` for the FTP user, and `ftp_passwd` for the FTP password:
  ```
  EX_DRM_FTP_GET operation01 -server serverA -user ftp_user -
  password ftp_passwd
  ```

EX_DRM_FTP_PUT (Transfers a backup information file to the backup server)

Format

```
EX_DRM_FTP_PUT operation-ID -server FTP-server
                -user FTP-user -password FTP-password
```

Description

The `EX_DRM_FTP_PUT` command transfers the backup information file corresponding to the operation ID specified in the arguments from the temporary directory for extended commands on the FTP client to the temporary directory for extended commands on the FTP server. It deletes old backup information files stored in the directories of the FTP server before transferring the new file. The command also transfers the VDI metafile (when the backup is of an SQL Server database) at the same time.

Prerequisites

The prerequisites for executing this extended command are as follows:

- The operation definition file corresponding to the specified operation ID has been created.
- This extended command is executed on the FTP client.
- The backup information file that this extended command will transmit has already been generated by executing the `EX_DRM_DB_EXPORT` extended command.
- The `EX_DRM_FS_DEF_CHECK` command has been executed to create a directory on the FTP server that will contain the transferred files.

Arguments

Specify the arguments of this extended command in the following order: *operation-ID*, `-server` *FTP-server*, `-user` *FTP-user*, and `-password` *FTP-password*.

operation-ID

A character string that uniquely identifies the operation to be performed. Information in the operation definition file linked to the specified operation ID is used when executing an extended command.

`-server` *FTP-server*

For *FTP-server*, specify the host name or the IP address of the FTP server to which you want to transmit the files. You can specify the IP address in IPv4 or IPv6 format. For details on systems that support the IPv6 format, see the descriptions about operating systems that support the IPv6 format when using FTP in the *Replication Manager Application Agent CLI User Guide*.

`-user` *FTP-user*

For *FTP-user*, specify the FTP user name used when connecting to the FTP server.

`-password` *FTP-password*

For *FTP-password*, specify the FTP user password used when connecting to the FTP server.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the operation definition file linked to the operation ID.
- A connection to the FTP server or file transmission fails.
- A command executed inside the extended command encounters an error.
- The backup information file to be transferred by this extended command does not exist.
- Information cannot be acquired from the host environment settings file.
- The storage directory for extended-command temporary files specified in the operation definition file does not exist on the file server or the database server.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Example

- In this example, the command performs file transmission from the FTP client to the FTP server, based on the settings in the operation definition file `operation01`. The command uses `serverA` for the FTP server, `ftp_user` for the FTP user, and `ftp_passwd` for the FTP password:

  ```
  EX_DRM_FTP_PUT operation01 -server serverA -user ftp_user -
  password ftp_passwd
  ```

EX_DRM_HOST_DEF_CHECK (Checks the contents of a host environment settings file)

Formats

To check the contents of a host environment settings file on the file server or the database server:

```
EX_DRM_HOST_DEF_CHECK -db -f environment-settings-file-name
```

To check the contents of a host environment settings file on the backup server:

```
EX_DRM_HOST_DEF_CHECK -bk -f environment-settings-file-name
```

Description

This extended command is used to check the contents of a host environment settings file. The extended command first checks whether the specified file exists. If the file exists, the extended command checks that the contents of the `HOST_ROLE` and `MAX_LOG_LINES` entries in the host environment settings file are set as described in the table below.

Table 1-11 Items checked in the host environment settings file

Item	Items checked
`HOST_ROLE`	• Both the name and value of the item are specified. • Only one item is specified. • The length of the value in characters does not exceed the maximum value. • If the `-db` argument is specified in the extended command, `DB` is specified as the item. • If the `-bk` argument is specified in the extended command, `BK` is specified as the item.
`MAX_LOG_LINES`	• Both the name and value of the item are specified. • Only one item is specified. • The length of the value in characters does not exceed the maximum value. • The specified value is an integer in the range from 1,000 to 100,000.
`MSG_OUTPUT`[#]	• Only one item is specified. • The length of the value in characters does not exceed the maximum value. • Either `NORMAL` or `DETAIL` is specified.

\#

If the item name and value are not specified, the default value (`NORMAL`) is applied.

Prerequisites

The prerequisite for executing this extended command is as follows:

• This extended command is executed on the machine that contains the host environment settings file to be checked.

Arguments

`-db`

Specify this option to check the contents of a host environment settings file on the file server or the database server.

`-bk`

Specify this option to check the contents of a host environment settings file on the backup server.

```
-f environment-settings-file-name
```

For `environment-settings-file-name`, specify the absolute path of the host environment settings file you want to check.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The file specified in the argument does not exist, or the system cannot access the file.
- The check of the contents of the file for setting up the host environment detects an abnormality.

Examples

- In this example, the extended command is used to check the contents of the host environment settings file `C:\Program Files\drm\SCRIPT\conf\host.dat` that is placed on the file server or the database server:

  ```
  EX_DRM_HOST_DEF_CHECK -db -f "C:\Program Files\drm\SCRIPT\conf\host.dat"
  ```

- In this example, the extended command is used to check the contents of the host environment settings file `C:\Program Files\drm\SCRIPT\conf\host.dat` that is placed on the backup server:

  ```
  EX_DRM_HOST_DEF_CHECK -bk -f "C:\Program Files\drm\SCRIPT\conf\host.dat"
  ```

EX_DRM_RESYNC (Resynchronizes a copy group)

Formats

To resynchronize the copy group when usual operation is in the pair status:
```
EX_DRM_RESYNC operation-ID
    [ -copy_size copy-track-size ]
    [ -pf copy-parameter-definition-file ]
```

To resynchronize more than one copy group when usual operation is in the split state:
```
EX_DRM_RESYNC operation-ID
    { -cg copy-group | -cg_file copy-group-list-file }
    [ -copy_size copy-track-size ]
    [ -pf copy-parameter-definition-file ]
```

Description

The `EX_DRM_RESYNC` command executes the `drmresync` command and resynchronizes copy groups. Executing this extended command before you back up a file system or the database to the secondary volume increases the speed of backup processing.

When usual operation is in the pair status, the specified copy group is resynchronized based on the backup ID created when data is backed up from the primary volume to the secondary volume. When usual operation is in the split state, you need to specify the copy group to be resynchronized because the copy group needs to be resynchronized before the backup. The copy group to be resynchronized is selected from the execution result of the `drmcgctl` or `drmfscat` command.

If there is a copy group that has not been used for backup processing, the extended command automatically specifies that copy group. If none of the copy groups has been used for backup processing, the command specifies the first copy group in the pair definitions.

If all copy groups have been used for backup processing, the command specifies the oldest copy group used for backup processing.

When performing a backup to a secondary volume, if there is a large difference in the amount of data on the primary and secondary volumes (and ShadowImage is used with the HUS100 series, Hitachi AMS2000 series or Hitachi AMS/WMS series), the volumes must be resynchronized.

Prerequisites

The prerequisites for executing this extended command are as follows:

- The operation definition file corresponding to the specified operation ID has been created.
- The copy-group list file has already been created when copy groups are resynchronized by using the copy-group list file.
- When usual operation is in the pair status, the file system or the database has been backed up to the secondary volume by using the commands below, and the backup ID file has already been created.

  - When backing up a file system, use the `EX_DRM_FS_BACKUP` command.
  - When backing up an SQL Server database, use the `EX_DRM_SQL_BACKUP` command.
  - When backing up an Exchange database, use the `EX_DRM_EXG_BACKUP` command.

Arguments

Specify the arguments of this extended command in the following order: *operation-ID*, `-cg` *copy-group*, `-cg_file` *copy-group-list-file*, `-copy_size` *copy-track-size*.

operation-ID

A character string that uniquely identifies the operation to be performed. Information in the operation definition file linked to the specified operation ID is used when executing an extended command.

`-cg` *copy-group*

When usual operation is in the split state, specify the name of the copy group you want to resynchronize. Specify the copy group to be used at the next backup.

`-cg_file` *copy-group-list-file*

When usual operation is in the split state, specify the absolute path of the copy-group list file that contains the copy group you want to resynchronize. Use this item if you want to resynchronize many copy groups at once. Specify the copy group to be used at the next backup.

`-copy_size` *copy-track-size*

For *copy-track-size*, specify a numeric value in the range from 1 to 15 as the copy track size to be used for copy group resynchronization. If you do not specify this option, the extended command uses the copy track size specified in the `DRM_COPY_SIZE` environment variable of Application Agent.

`-pf` *copy-parameter-definition-file*

Specify this option to use the number of retries and the retry interval defined in the copy parameter definition file. Specify the *copy-parameter-definition-file* parameter as a file name only; do not specify the parameter as a path.

If you omit this option, the value in the CCI-linkage definition file (`DEFAULT.dat`) is used. The values in `DEFAULT.dat` are used for any parameters that are not included in the copy parameter definition file.

You can create a copy parameter definition file by using a name of your choice. Specify the file name by using an alphanumeric character string that is 64 bytes or less. You must save the copy parameter definition file to the following location:

Application-Agent-installation-folder`\DRM\conf\raid`

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the operation definition file linked to the operation ID.

- Information cannot be acquired from the backup ID file (when no copy group is specified).
- Information cannot be acquired from the copy-group list file (when the file is specified).
- An invalid copy track size is specified.
- A command executed inside the extended command encounters an error.
- The acquisition of the result of a command executed inside the extended command fails.
- Information cannot be acquired from the host environment settings file.
- No storage directory for extended-command temporary files is specified in the operation definition file.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Examples

- In this example, the extended command is used to resynchronize the pair volume of the copy group `CG001,dev01`:

  `EX_DRM_RESYNC operation01 -cg CG001,dev01`

- In this example, the extended command is used to resynchronize the pair volumes of the copy group specified in the list file `C:\temp\CGLIST.txt` in batch mode:

  `EX_DRM_RESYNC operation01 -cg_file C:\temp\CGLIST.txt`

- In this example, the extended command is used to resynchronize the pair volume of the copy group corresponding to the backup ID recorded in the backup ID file:

  `EX_DRM_RESYNC operation01`

Extended command specifications (Tape-related commands)

EX_DRM_CACHE_PURGE (Clears the cache of the secondary volume)

Formats

To clear the cache of the secondary volume when usual operation is in the pair status:

`EX_DRM_CACHE_PURGE operation-ID`

To clear the cache of the secondary volume when usual operation is in the split state:

```
EX_DRM_CACHE_PURGE operation-ID
      { -cg copy-group | -cg_file copy-group-list-file }
```

Description

This extended command sequentially executes the `drmmount` and `drmumount` commands to clear the cache of the secondary volume.

When usual operation is in the pair status, the cache of the secondary volume for the specified copy group is cleared based on the backup ID created when data is backed up from the primary volume to the secondary volume. When usual operation is in the split state, you need to specify the copy group to clear the cache of the secondary volume because the cache needs to be cleared before the backup.

Prerequisites

The prerequisites for executing this extended command are as follows:

- An operation definition file linked to the specified operation ID has been provided.

- During ordinary paired operation, the file system or the database has been backed up to a secondary volume by one of the following extended commands, and a backup ID record file has been generated:

    - When backing up a file system, use the `EX_DRM_FS_BACKUP` command.

    - When backing up an SQL Server database, use the `EX_DRM_SQL_BACKUP` command.

    - When backing up an Exchange database, use the `EX_DRM_EXG_BACKUP` command.

Arguments

operation-ID

A character string that uniquely identifies the operation to be performed. Information in the operation definition file linked to the specified operation ID is used when executing an extended command.

-cg copy-group

When usual operation is in the split state, specify the name of the copy group to clear the cache of the secondary volume. When the copy group to be used for the next backup can be identified, specify that copy group. When the copy group to be used for the next backup cannot be identified, specify all copy groups.

-cg_file copy-group-list-file

When usual operation is in the split state, use an absolute path to specify the copy-group list file that records the copy group for which you want to clear the cache of the secondary volume. Use this option if you want to clear the caches for many copy groups at the same time. When the copy group to be used for the next backup can be identified, specify that copy group. When the copy group to be used for the next backup cannot be identified, specify all copy groups.

Note: Before you attempt to back up the file system or the database to a secondary volume, execute this extended command for all secondary volumes of resources to be backed up. If you back up data without clearing the cache of the secondary volume, when you mount the secondary volume, the existing cache is overwritten to the secondary volume, and the backup data might be lost.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the operation definition file linked to the operation ID.
- The backup ID cannot be acquired from the backup ID file (when the copy group is not specified).
- Information cannot be acquired from the copy-group list file (when the file is specified).
- Information cannot be acquired from the host environment settings file.
- No storage directory for extended-command temporary files is specified in the operation definition file.
- A command executed inside the extended command encounters an error.
- The acquisition of the result of a command executed inside the extended command fails.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Examples

- In this example, the extended command is used to clear the cache of the secondary volume that belongs to the `CG001,dev01` copy group:

  `EX_DRM_CACHE_PURGE operation01 -cg CG001,dev01`

- In this example, the extended command is used to clear the cache of the secondary volume that belongs to the copy group specified in the `C:\temp\CGLIST.txt` copy-group list file:

  `EX_DRM_CACHE_PURGE operation01 -cg_file C:\temp\CGLIST.txt`

- In this example, the extended command is used to clear the cache of the secondary volume that belongs to the copy group corresponding to the backup ID recorded in the backup ID file:

  `EX_DRM_CACHE_PURGE operation01`

EX_DRM_MOUNT (Mounts a secondary volume)

Formats

To mount a volume in a basic disk configuration:
```
EX_DRM_MOUNT operation-ID [ -copy_group copy-group-name | -force ]
        [ -mount_pt mount-point-directory-name ]
```

Description

The `EX_DRM_MOUNT` command mounts a secondary volume and locks the appropriate copy group. Use this command as follows:

- Mount the secondary volume to be backed up or restored.
- Clear the system cache before backing up the secondary volume.
- Mount the secondary volume that is unmounted after it has been backed up or restored.

If the copy group mount definition file exists, the mount point specified in this file is used as the mount point for the secondary volume. For details about the copy group mount definition file, see the settings for mounting a secondary volume in the *Replication Manager Application Agent CLI User Guide*.

The copy group locked by `EX_DRM_MOUNT` is unlocked by the `EX_DRM_UMOUNT` command. Therefore, if a secondary volume was mounted using the `EX_DRM_MOUNT` command, make sure that you unmount it by using the `EX_DRM_UMOUNT` command.

You cannot mount the secondary volume if it has not been formatted as a file system, nor can you mount mirrored secondary volumes.

In the following cases, the `EX_DRM_MOUNT` command outputs a message and results in an error, without mounting the secondary volume:

- The command is executed on a host where the secondary volume cannot be referenced.
- The copy group name, LDEV number, and DKC serial number of the primary volume obtained at backup execution do not match the current backup server information.
- The command is executed for a paired secondary volume (PAIR).

Arguments

operation-ID

A character string that uniquely identifies the operation to be performed.

-copy_group copy-group-name

Specifies the name of the copy group to be mounted. You must clear the system cache before backing up data. When doing so, specify a copy group from the backup server and mount the secondary volume. Then, when you

unmount the secondary volume with the `EX_DRM_UMOUNT` command, the system cache is cleared.

`-mount_pt` *mount-point-directory-name*

Specifies the name of the mount point directory on which the secondary volume is to be mounted. Specify the *mount-point-directory-name* parameter as an absolute path.

Specify a mount point directory name with a drive letter, or as an absolute path beginning with a drive letter.

The conditions for specifying a mount point directory name are as follows:

- Maximum number of characters: Path lengths to be specified must comply with the specifications of the mount and unmount functions provided by CCI.
- Available characters: Characters that can be used in a directory name in Windows (excluding space characters)

If you specify a drive letter as the mount point directory name, the `EX_DRM_MOUNT` command searches for unused drives in alphabetical order using the specified drive as a base point, and mounts the appropriate secondary volume.

If you specify an absolute path beginning with a drive letter as the mount point directory name, and then specify a copy group name, the `EX_DRM_MOUNT` command mounts the secondary volume corresponding to the specified absolute path.

Even if the absolute path does not end with a backslash (\), the command assumes that a backslash has been specified. For example, `D:` is assumed to be the same drive as `D:\`. Similarly, `D:\MOUNTDIR` is assumed to be the same directory as `D:\MOUNTDIR\`.

If you omit this option, the following mount point is used:

drive-not-used-when-the-EX_DRM_MOUNT-command-is-executed

`-force`

Specify this option when you want to forcibly mount the secondary volume. If the specified backup ID matches the copy group name of the mount volume, the command forcibly mounts the secondary volume even if the LDEV number or DKC serial number of the secondary volume does not match.

⚠ **Note:** If you specify the `-force` option, data might be corrupted, because the command mounts the secondary volume without checking the LDEV number and DKC serial number.

`-conf`

Specify this option to extract copy group mount definition information from the mounted secondary volume to create or update the copy group mount definition file.

This option must be specified with the operation ID.

The created copy group mount definition file name is shown below:

Application-Agent-installation-folder\DRM\conf\vm\CG_MP.conf

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

EX_DRM_TAPE_BACKUP (Backs up data such as a secondary volume to a tape device)

Formats

```
EX_DRM_TAPE_BACKUP operation-ID
                    [ -exopt [ -mount_pt mount-point-directory-name ]
                     [ -raw ][ -force ] [ -bup_env configuration-
definition-file-name ]]
```

The command can also be executed in the following format:

```
EX_DRM_TAPE_BACKUP operation-ID
                    [ -mount_pt mount-point-directory-name ][ -raw]
```

Description

This extended command executes the `drmmount`, `drmmediabackup`, and `drmumount` commands, mounts the secondary volume at a specific mount point on the backup server, and then backs up data from the secondary volume to a tape device. When backup to a tape device finishes, the secondary volume that was mounted is automatically unmounted. The command also backs up the VDI metafile (when the backup is of an SQL Server database) to a tape device.

When the `drmmount` command terminates normally, the `drmumount` command is executed regardless of the `drmmediabackup` command result.

Prerequisites

The prerequisites for executing this extended command are as follows:

- An operation definition file linked to the specified operation ID has been provided.
- Tape backup management software is used with Application Agent.
- The backup ID has been stored in the backup ID file by executing the `EX_DRM_DB_IMPORT` extended command.
- The mount point directory has been created.

Take the command retry period into consideration when you execute more than one `EX_DRM_TAPE_BACKUP` command concurrently. For details about the settings, see notes on command execution in the *Replication Manager Application Agent CLI User Guide*.

Arguments

operation-ID

A character string that uniquely identifies the operation to be performed. Information in the operation definition file corresponding to the specified operation ID is used when executing the extended command.

`-exopt`

Specify this option when you want to use extended functions. You must specify `-exopt` to specify another option. However, you can omit `-exopt` if you specify neither the `-force` nor `-bup_env` options.

`-mount_pt` *mount-point-directory-name*

Specify the name of the mount point directory on which the secondary volume is to be mounted. The secondary volume is mounted at the specified mount point, and data is backed up from the secondary volume to a tape device.

Specify the mount point directory name by using an absolute path or a drive letter.

The mount point directory name must satisfy the following:

- Maximum number of characters: Path lengths to be specified must comply with the specifications of the mount and unmount functions provided by CCI.
  Make sure that the length of the path on which the backup-target output volume has been mounted in the disk backup, as well as the length of the path on which the secondary volume is to be mounted in the tape device backup, are within the above limits.
- Characters: Characters that can be used for directory names in Windows (excluding space characters)

If you specify a drive for the mount point directory name, the command searches for unused drive names in alphabetical order beginning from the specified drive, and then mounts the secondary volume on the first drive found.

If you specify an absolute path from the drive letter as the mount point directory name, the command mounts the secondary volume on the following location:

absolute-path-specified-for-mount-point-directory-name\drive-letter-for-primary-volume\absolute-path-for-primary-volume

(Example)
  When a primary volume is mounted on `C:\p_mnt\` and the mount point directory name specified for the `-mount_pt` option is `D:\s_mnt\`, the mount destination of the secondary volume is `D:\s_mnt\C\p_mnt\`.

Even if the path does not end with a backslash (`\`), the command assumes that a backslash has been specified. For example, `D:` and `D:\` are assumed to

be the same drive. `D:\MOUNTDIR` and `D:\MOUNTDIR\` are assumed to be the same directory.

If you omit this option, the following mount point is used:

Any drive not being used when the extended command is executed.

`-raw`

Specify this option when you want to back up the secondary volume as a raw device. When this extended command backs up the secondary volume as a raw device, the command does not mount the secondary volume and performs a backup for each logical volume.

When this option is omitted, the extended command backs up the secondary volume as a file system (or a database).

`-force`

Specify this option to forcibly mount the secondary volume. If you specify this option and the copy group name of the primary volume obtained during backup processing on the file server (or the database server) matches the file server (or the database server) information, the extended command forcibly mounts the secondary volume, even if the LDEV or SERIAL numbers do not match.

If you omit this option, the extended command terminates with an error without mounting if the following condition also holds: the copy group name, LDEV number, and SERIAL number of the primary volume, which were obtained when the file server or database server was backed up, do not match the information on the file server or database server.

Specify this option when you need to forcibly mount a secondary volume using only the copy group name of the primary volume as a key. Examples include cases when the secondary volume is to be replaced because of a failure or other reason, or when an LDEV number or SERIAL number was changed. Data might be lost if you specify this option for a normal backup operation.

`-bup_env` *configuration-definition-file-name*

Specify this option if you want to use a startup parameter in a user-created configuration definition file when backing up to or restoring from a tape device.

If you omit this option, the default configuration definition file is used. As such, you will need to create the default configuration definition file in advance.

Create the configuration definition file in the same directory as the default configuration definition file. For further information, see the description of configuration definition file creation in the *Replication Manager Application Agent CLI User Guide*.

The specified configuration definition file name must fulfill the following requirements:

Maximum number of characters (total length of the directory name and file name): 255 bytes

Available characters: Characters that can be used for file names in Windows

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the definition file linked to the operation ID.
- The arguments of this extended command include an option of an Application Agent command that cannot be used for this extended command.
- Information cannot be acquired from the backup ID file.
- A command executed inside the extended command encounters an error.
- The acquisition of the result of a command executed inside the extended command fails.
- Information cannot be acquired from the host environment settings file.
- No storage directory for extended-command temporary files is specified in the operation definition file.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Examples

- In this example, the extended command is used to back up the secondary volume as a raw device, based on the settings in the operation definition file `operation01`:

  `EX_DRM_TAPE_BACKUP operation01 -exopt -raw`

- In this example, the extended command is used to forcibly mount the secondary volume identified by the operation ID `operation01` and execute a tape device backup:

  `EX_DRM_TAPE_BACKUP operation01 -exopt -backup -force`

EX_DRM_TAPE_RESTORE (Restores data from backup tape to the secondary volume)

Formats

```
EX_DRM_TAPE_RESTORE operation-ID -backup_id backup-ID
                [ -exopt [ -mount_pt mount-point-directory-name][ -
```

```
raw ]
                [ -force ] [ -bup_env configuration-definition-file-
name] ]
```

The command can also be executed in the following format:
```
EX_DRM_TAPE_RESTORE operation-ID -backup_id backup-ID
                [ -mount_pt mount-point-directory-name][ -raw ]
```

Description

This extended command executes the `drmmount`, `drmmediarestore`, and `drmumount` commands and restores backup data from a tape device to the secondary volume. The extended command creates a backup ID record file containing the backup ID. The command also restores the VDI metafile (when the backup is of an SQL Server database).

When you execute `EX_DRM_TAPE_RESTORE`, the `drmmediarestore` command is executed, and a window opens. During this processing, the window on which the extended command was started is in the `WAIT` status.

If Backup Exec is in use, a message will appear in the window where the `drmmediarestore` command was started. Follow the instructions contained in the message to perform restoration.

After restoration, enter one of the following keywords:

- YES (normal termination)
- NO (termination with an error)
- CANCEL (operation canceled)

After restoration with Backup Exec finishes, enter the correct keyword.

If NetBackup is in use, the window closes after the `drmmediarestore` command execution terminates.

Perform subsequent processing in the window where the extended command was started.

When the `drmmount` command terminates normally, the `drmumount` command is executed, regardless of the `drmmediarestore` command results.

Prerequisites

The prerequisites for executing this extended command are as follows:

- An operation definition file linked to the specified operation ID has been provided.
- Tape backup management software is used with Application Agent.
- The backup ID to be specified in this extended command has already been determined by executing the `drmtapecat` command.
- The mount point directory has been created.

Take the command retry period into consideration when you execute more than one `EX_DRM_TAPE_RESTORE` command concurrently. For details about the

settings, see the notes on command execution in the *Replication Manager Application Agent CLI User Guide*.

Arguments

`operation-ID`

A character string that uniquely identifies the operation to be performed. Information in the operation definition file corresponding to the specified operation ID is used when executing the extended command.

`-backup_id backup-ID`

For `backup-ID`, specify the backup ID of the backup you want to use for restoration. The backup ID uniquely identifies backup data and is registered in the backup catalog during backup. To check the desired backup ID, execute the `drmtapecat` command.

`-exopt`

Specify this option before any of the following four options: `-mount_pt`, `-raw`, `-force`, and `-bup_env configuration-definition-file-name`.

`-mount_pt mount-point-directory-name`

Specify the name of the mount point directory on which the secondary volume is to be mounted. The secondary volume is mounted at the specified mount point, and data is restored from a tape device to the secondary volume.

Specify the mount point directory name by using an absolute path or a drive letter.

The mount point directory name must satisfy the following:

- Maximum number of characters: Path lengths to be specified must comply with the specifications of the mount and unmount functions provided by CCI.
- Characters: Characters that can be used for directory names in Windows (excluding space characters)

If you specify a drive for the mount point directory name, the command searches for unused drive names in alphabetical order beginning from the specified drive, and then mounts the secondary volume on the first drive found.

If you specify an absolute path from the drive letter as the mount point directory name, the command mounts the secondary volume on the following location:

`absolute-path-specified-for-mount-point-directory-name\drive-letter-for-primary-volume\absolute-path-for-primary-volume`

(Example)

When a primary volume is mounted on `C:\p_mnt\` and the mount point directory name specified for the `-mount_pt` option is `D:\s_mnt\`, the mount destination of the secondary volume is `D:\s_mnt\C\p_mnt\`.

If a path does not end with a backslash (\), the command assumes a backslash at the end of the path. For example, `D:` and `D:\` are assumed to be the same drive. `D:\MOUNTDIR` and `D:\MOUNTDIR\` are assumed to be the same directory.

When this option is omitted, the following mount point is used:

Any drive not being used when the extended command is executed.

`-raw`

Specify this option when the data to be restored was backed up to a tape device as raw device data.

If the target data has been backed up by the `EX_DRM_TAPE_BACKUP` extended command with the `-raw` option specified, this extended command executes restore processing normally even when this option is omitted. If this option is specified when the target data was backed up without the `-raw` option specified, an error occurs for this extended command.

`-force`

Specify this option to forcibly mount the secondary volume. If you specify this option and the copy group name of the primary volume obtained during backup processing on the file server (or the database server) matches the file server (or the database server) information, the extended command forcibly mounts the secondary volume, even if the LDEV or SERIAL number does not match.

If you omit this option, this extended command terminates with an error without mounting if the following condition also holds: the copy group name, LDEV number, and SERIAL number of the primary volume, which were obtained when the file server or database server was backed up, do not match the information on the file server or database server.

Specify this option when you need to forcibly mount a secondary volume by using only the copy group name of the primary volume as a key. Examples include cases when the secondary volume is to be replaced because of a failure or other reason, or when an LDEV number or SERIAL number was changed. Data might be corrupted if you specify this option for a normal backup operation.

`-bup_env` *configuration-definition-file-name*

Specify this option if you want to use a startup parameter in a user-created configuration definition file when backing up to or restoring from a tape device.

If you omit this option, the default configuration definition file is used. As such, you will need to create the default configuration definition file in advance.

Create the configuration definition file in the same directory as the default configuration definition file. For further information, see the description of configuration definition file creation in the *Replication Manager Application Agent CLI User Guide*.

> ⚠️ **Note:** The value of `NBU_MASTER_SERVER` in the configuration definition file must be the same as the value that was used during the backup.

The specified configuration definition file name must fulfill the following requirements:

Maximum number of characters (total length of the directory name and file name): 255 bytes

Available characters: Characters that can be used for file names in Windows

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the definition file linked to the operation ID.
- A specified Application Agent command option cannot be specified as an extended command option.
- The system cannot acquire information from the backup ID file.
- A command executed inside the extended command encounters an error.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Examples

- In this example, the extended command is used to restore the backup data identified by the operation ID `operation01` from a tape device to the secondary volume.

  `0000000001` is the backup ID that was created when this data was backed up to the tape device. The secondary volume is mounted on drive `E:`.

  `EX_DRM_TAPE_RESTORE operation01 -backup_id 0000000001 -exopt -mount_pt E:`

- In this example, the extended command is used to restore the backup data identified by the operation ID `operation01` from a tape device to the secondary volume by forcibly mounting it at the specified mount point.

  `0000000001` is the backup ID that was created when this data was backed up to the tape device. The secondary volume is mounted on drive `E:`.

```
EX_DRM_TAPE_RESTORE operation01 -backup_id 0000000001 -exopt -
mount_pt E: -force
```

EX_DRM_UMOUNT (Unmounts a secondary volume)

Formats

```
EX_DRM_UMOUNT operation-ID [ -copy_group copy-group-name ]
```

Description

The `EX_DRM_UMOUNT` command unmounts the secondary volume mounted by the `EX_DRM_MOUNT` command and unlocks the appropriate copy group.

If the volume corresponding to the specified copy group name is already unmounted, the `EX_DRM_UMOUNT` command displays a warning message indicating that the volume is already unmounted and continues processing.

If you back up data with the `drmmediabackup` command or restore data with the `drmmediarestore` command, you must use the `EX_DRM_UMOUNT` command to unmount the secondary volume.

Before executing this command, you must also stop all application software using the secondary volume that is to be unmounted.

If the secondary volume has already been mounted by the `EX_DRM_MOUNT` command, executing any of the following commands makes it impossible to unmount the secondary volume with the `EX_DRM_UMOUNT` command.

- `EX_DRM_FS_BACKUP`
- `EX_DRM_RESYNC`
- `EX_DRM_TAPE_RESTORE`

If you cannot unmount the secondary volume by using the `EX_DRM_UMOUNT` command, unlock the copy group by using the `drmcgctl` command, and then unmount the secondary volume by using the following:

- The unmount function provided by CCI

Arguments

operation-ID

A character string that uniquely identifies the operation to be performed.

-copy_group copy-group-name

Specifies the name of the copy group (mounted by the `EX_DRM_MOUNT` command) to be unmounted. You must clear the system cache before backing up data. To do so, specify a copy group from the backup server and mount the secondary volume with the `EX_DRM_MOUNT` command. Then, when you unmount the secondary volume with the `EX_DRM_UMOUNT` command, the system cache is cleared.

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To check the copy group name, execute the `drmfscat` command or the `drmfsdisplay` command.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Extended command specifications (SQL Server database backups)

This section explains the extended command specifications that apply to SQL Server database backup and restore operations.

EX_DRM_SQL_BACKUP (Backs up an SQL Server database)

Format

```
EX_DRM_SQL_BACKUP operation-ID
                    [ -system ]
                    [-comment backup-comment ]
                    [ -rc [ name-identifying-the-generation ]]
                    [ -pf copy-parameter-definition-file ]
                    [ -script user-script-file-name ]
                    [ -s backup-server-name
                      [ -auto_import
                        [ -auto_mount [ mount-point-directory-
name ]]
                      ]
                      [ -svol_check ]
                    ]
```

Description

This extended command executes the `drmsqlbackup` command to back up the SQL Server database of the instance that was specified by the operation ID from the primary volume to the secondary volume. When this extended command performs a backup, a backup ID is generated.

If the data files, databases, and other objects of the resolved instance exist on multiple volumes, all primary volumes will be backed up to the secondary volumes. When an SQL Server instance is backed up, an online backup is performed. If you specify an inactive instance when executing this extended command, an error occurs.

The table below indicates the files that are backed up.

Table 1-12 SQL Server database files that are backed up

Database of interest[1]	File type of interest	Backup file name	Storage destination for backup files
master	Data file	Same as the backup source file name	Secondary volume
	Transaction log file	Same as the backup source file name	Secondary volume
	VDI metafile[2]	Varies depending on the VDI metafile storage directory specified with the `-drmsqlinit` command[3]	
model	Data file	Same as the backup source file name	Secondary volume
	Transaction log file	Same as the backup source file name	Secondary volume
	VDI metafile[2]	Varies depending on the VDI metafile storage directory specified with the `-drmsqlinit` command[3]	
msdb	Data file	Same as the backup source file name	Secondary volume
	Transaction log file	Same as the backup source file name	Secondary volume
	VDI metafile[2]	Varies depending on the VDI metafile storage directory specified with the `-drmsqlinit` command[3]	
User database	Data file	Same as the backup source file name	Secondary volume
	Transaction log file	Same as the backup source file name	Secondary volume
	VDI metafile[2]	Varies depending on the VDI metafile storage directory specified with the `-drmsqlinit` command[3]	
Distribution database	Data file	Same as the backup source file name	Secondary volume
	Transaction log file	Same as the backup source file name	Secondary volume
	VDI metafile[2]	Varies depending on the VDI metafile storage directory specified with the `-drmsqlinit` command[3]	

#1:
　　If you do not specify the `-system` option, only the user database is backed up.

#2:
　　This file is created when the `drmsqlbackup` command is executed.

#3:

> If you registered a VDI metafile storage directory by using the `drmsqlinit` command, the backup file is stored in the registered directory. The file name is *backup-ID_database-ID*`.dmp`. If you did not register a VDI metafile storage directory by using the `drmsqlinit` command, the backup file is stored in the directory that contains the file with the smallest management number (`file_id`) value for the SQL Server in the database file. The file name is `META_`*database-ID*`.dmp`.

Prerequisites

The prerequisites for executing this extended command are as follows:

- An operation definition file linked to the specified operation ID has been provided.

Arguments

operation-ID

A character string that uniquely identifies the operation to be performed. Information in the operation definition file linked to the specified operation ID is used when executing an extended command.

`-system`

Specify this option to specify the system databases (master, model, and msdb) as the databases you want to back up. If this option is specified, SQL Server will stop when the restoration is carried out.

If you specify this option when a database name is assigned to `TARGET_NAME` in the operation definition file linked to the specified operation ID, the extended command will produce an error.

`-comment` *backup-comment*

Specify this option to register a backup comment in the backup catalog. The conditions for specifying a value in the *backup-comment* parameter are as follows:

- The value must be 64 bytes or less.
- The value can include alphanumeric, reserved, one-byte space, and multi-byte characters.
- The value is case sensitive.
- When a reserved character or a one-byte space character is used, the entire value must be enclosed in double quotation marks (").
- If the value contains a reserved character but is not enclosed in double quotation marks, the reserved character is not correctly interpreted as a part of the *backup-comment* string, and is parsed as a reserved character.
- The following reserved characters cannot be used in backup comments:
  `\ / ` | < > " * ? & ; ( ) $`

A hyphen (-) cannot appear as the first character in the backup comment. If you specify two consecutive double quotation marks ("") after the -comment option, no backup comment will be registered in the backup catalog.

-rc *name-identifying-the-generation*

Use this option to specify the name identifying the generation of the copy group to be backed up. Execute the drmsqldisplay command with the -cf option specified, and then specify a value for the displayed GEN-NAME. For single volumes, a hyphen (-) appears. In this case, the -rc option cannot be specified.

Always specify this option when backing up from a primary volume to a secondary volume on the remote side. If you omit this option, the secondary volume on the local side is backed up.

If you omit the *name-identifying-the-generation* parameter, the secondary volume that has the smallest value among the generation numbers on the remote side becomes the backup destination. In this case, the generation number is remote_n, where *n* is the smallest generation number.

-pf *copy-parameter-definition-file*

Specify this option to use the number of retries and retry interval defined in the copy parameter definition file. Specify the *copy-parameter-definition-file* parameter as a file name only; do not specify the parameter as a path.

If you omit this option, the value in the CCI-linkage definition file (DEFAULT.dat) is used. The values in the CCI-linkage definition file (DEFAULT.dat) are used for any parameters that are not included in the copy parameter definition file.

You can create a copy parameter definition file by using a name of your choice. Specify the file name by using an alphanumeric character string that is 64 bytes or less. You must save the copy parameter definition file in the following folder:

Application-Agent-installation-folder\DRM\conf\raid

-script *user-script-file-name*

Specify this option to execute a user script. Specify *user-script-file-name* as an absolute path. The conditions for specifying a value in the *user-script-file-name* parameter are as follows:

- The value must be 255 bytes or less.
- The value can include alphanumeric, one-byte space, and multi-byte characters.
- The value is case sensitive.
- If the value contains space characters, the entire parameter must be enclosed in double quotation marks (").
- The following reserved characters cannot be used in the parameter:
  \ / : * ? | < > "

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If you specify `LOCAL_BACKUP=NO` in the user script file, an error will occur when the command is executed. For details about creating user script files, see the *Replication Manager Application Agent CLI User Guide*.

If you specified `LOCATION=REMOTE` in the user script file, you must also specify the `-s` option.

`-s backup-server-name`

Specify this option to connect to a remote backup server to perform a backup. Specify the `backup-server-name` parameter by using the host name or the IP address of the backup server. Specify the host name by using a character string that is 255 bytes or less. You can specify the IP address in IPv4 or IPv6 format.

`-auto_import`

Specify this option to automatically transfer a backup catalog to a backup server after backing up a volume. You must specify this option together with the `-s` option.

`-auto_mount mount-point-directory-name`

Specify this option to automatically mount a secondary volume on a backup server after backing up a volume. You must specify this option together with the `-s` and `-auto_import` options.

Specify the `mount-point-directory-name` parameter by using a character string that is 64 bytes or less.

If you omit the `mount-point-directory-name` parameter, a mount destination for the secondary volume is automatically determined. This destination is determined in the same way as when using the `drmmount` command without specifying a mount point.

Execute the `drmumount` command to unmount the mounted secondary volume. In the argument of the `drmumount` command, specify the backup ID.

`-svol_check`

Specify this option to check the status of a secondary volume on a backup server. You must specify this option together with the `-s` option. Checking the status of a secondary volume prevents backup or restoration failures. The items, volumes, and conditions to be checked are described in the following table.

Table 1-13 Status check of a secondary volume

Check item	Volume to be checked	Check condition
A secondary volume is hidden from a backup server	All secondary volumes defined for a backup-target primary volume	Checked when a primary volume that is a cluster resource is defined in pairs with multiple generations of secondary volumes.

Check item	Volume to be checked	Check condition
A secondary volume is not mounted on a backup server	The secondary volume to be the next backup destination	Always checked.

> ⚠️ **Note:** Each piece of backup information in the backup catalog is managed by using a copy group as a key. Depending on the backup method, you might not be able to perform restoration, even though the backup data exists on the secondary volume.
> For notes on using Application Agent, see the *Replication Manager Application Agent CLI User Guide*.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the operation definition file linked to the operation ID.
- A specified Application Agent command option cannot be specified as an extended command option.
- The system fails to record a backup ID in the backup ID record file.
- A command executed inside the extended command encounters an error.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Example

- In this example, the extended command is used to back up the system databases (master, model, and msdb) to the secondary volume based on the settings specified in the operation definition file `operation01`:

  `EX_DRM_SQL_BACKUP operation01 -system`

EX_DRM_SQL_DEF_CHECK (Checks the contents of an operation definition file and automatically creates a temporary directory)

Formats

To check the contents of an operation definition file for a database server by specifying an operation ID:

```
EX_DRM_SQL_DEF_CHECK operation-ID -db
```

To check the contents of an operation definition file for a backup server by specifying an operation ID:

```
EX_DRM_SQL_DEF_CHECK operation-ID -bk
```

To check the contents of an operation definition file for a database server by specifying a definition file:

```
EX_DRM_SQL_DEF_CHECK -db -f definition-file-name
```

To check the contents of an operation definition file for a backup server by specifying a definition file:

```
EX_DRM_SQL_DEF_CHECK -bk -f definition-file-name
```

Description

This extended command checks the contents of an operation definition file, and if no problem is found, automatically creates a temporary directory that will be used by subsequent extended commands.

The definition file-checking tool must be re-executed in the following cases:

- The path to the directory where dictionary map files are stored is changed on the database server
- The directory path assigned to FTP_HOME_DIR is changed on the backup server

When checking the contents of an operation definition file, the extended command first checks whether the file specified by the argument exists, and then checks the items in the operation definition file for the following:

- An item and corresponding value have been specified.
- The specified item appears only once.
- The number of characters does not exceed the maximum allowable for the item.

In addition, the command checks the contents of the operation definition file for the items listed in the following table.

Table 1-14 Contents checked in the operation definition file

Entry name	Checked contents
BACKUP_OBJECT	MSSQL is specified
DB_SERVER_NAME	• A database connection can be established by executing a combination of DB_SERVER_NAME and INSTANCE_NAME • The value of DB_SERVER_NAME matches the database server name set in DRM_DB_PATH of the Application Agent configuration definition file init.conf when SET_DRM_HOSTNAME is set to 1

Entry name	Checked contents
INSTANCE_NAME	A database connection can be established by executing a combination of DB_SERVER_NAME and INSTANCE_NAME
TARGET_NAME	• The database name exists (by checking the contents of the sysdatabases table in the master database)[1] • The tempdb database is included in the databases to be backed up
FTP_HOME_DIR	• The specified directory exists[1, 2] • An absolute path is specified
FTP_SUB_DIR	• The specified directory name does not contain a delimiter character (\) • The directory name is not specified as only one period (.) or two periods (..) • The root directory is not specified
SET_DRM_HOSTNAME	A value of 0 or 1 is specified

#1

Database and folder names are not case sensitive.

#2

This item is checked only if the -bk option is specified.

The table below lists the directories that are automatically created by the checking tool.

Table 1-15 Directories automatically created by EX_DRM_SQL_DEF_CHECK

Where EX_DRM_SQL_DEF_CHECK is executed	Temporary directory for extended commands	VDI metafile storage directory
Database server	*script_work-directory-at-the-same-level-as-the-dictionary-map-files-storage-directory**operation-ID*\DB (Example) When the directory where dictionary map files are stored is H:\PTM and the operation ID is Operation_A, the temporary directory for extended commands is H:\script_work\Operation_A\DB.	The VDI metafile storage directory that was registered with the drmsqlinit command, or the directory that contains the smallest file_id of all the SQL Server database data files to be backed up (if the VDI metafile storage directory was not specified for drmsqlinit)
Backup server	*directory-specified-for-FTP_HOME_DIR**directory-specified-for-FTP_SUB_DIR**operation-ID*\BK	*directory-specified-for-FTP_HOME_DIR**directory-specified-for-FTP_SUB_DIR**operation-ID*\AP

Extended commands

Prerequisites

The prerequisites for executing this extended command are as follows:

- The account of the user currently logged into Windows must be allowed to connect to the database server.
- The SQL Server service must be running on the database server.
- The SQL Server instance specified in the file you want to check exists on a host when the command is executed on the database server.
- Queries can be issued to the databases in the same SQL Server instance when the command is executed on the database server.
- The initial settings for the instance specified in `INSTANCE_NAME` have been specified by executing the `drmsqlinit` command.

Arguments

operation-ID

A character string that uniquely identifies the operation to be performed. Information in the operation definition file corresponding to the specified operation ID is used when executing the extended command.

`-db`

Specify this option to check the contents of an operation definition file for a database server.

`-bk`

Specify this option to check the contents of an operation definition file for a backup server.

`-f` *definition-file-name*

Specify this option to designate the operation definition file to be checked. Specify *definition-file-name* as an absolute path.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The file specified in the argument does not exist, or the system cannot access the file.
- The system cannot access the database server (when the `-db` option is specified).
- The system detects an error in the results of the file check.

- The command fails to create a temporary directory.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Examples

- In this example, the extended command is used to check the contents of the operation definition file `C:\Program Files\drm\SCRIPT\conf\_OP0001.dat` for a database server:

  By specifying an operation ID:

  `EX_DRM_SQL_DEF_CHECK OP0001 -db`

  By specifying an operation definition file name:

  `EX_DRM_SQL_DEF_CHECK -db -f "C:\Program Files\drm\script\conf\_OP0001.dat"`

- In this example, the extended command is used to check the contents of the operation definition file `C:\Program Files\drm\SCRIPT\conf\_OP0001.dat` for a backup server:

  By specifying an operation ID:

  `EX_DRM_SQL_DEF_CHECK OP0001 -bk`

  By specifying an operation definition file name:

  `EX_DRM_SQL_DEF_CHECK -bk -f "C:\Program Files\drm\script\conf\_OP0001.dat"`

EX_DRM_SQL_RESTORE (Restores an SQL Server database backup to the primary volume)

Formats

To restore data by resynchronizing the primary and secondary volumes:

```
EX_DRM_SQL_RESTORE operation-ID -resync [ -force ] [ -undo ]
                        [ -nochk_host ]
                        [ -target database-name | -f database-list-
file ]
                        [ -pf copy-parameter-definition-file]
```

To apply only VDI metafiles to the primary volume:

```
EX_DRM_SQL_RESTORE operation-ID -no_resync [ -undo ]
                        [ -nochk_host ]
                        [ -target database-name | -f database-list-
file ]
```

Description

This extended command executes the `drmsqlrestore` command to restore backup data from the secondary volume to the primary volume for a specified database.

Prerequisites

The prerequisites for executing this extended command are as follows:

- An operation definition file linked to the specified operation ID has been provided.
- The backup ID has been stored in a backup ID file by executing either the `EX_DRM_BACKUPID_SET` or `EX_DRM_DB_IMPORT` extended command.

Arguments

operation-ID

A character string that uniquely identifies the operation to be performed. Information in the operation definition file corresponding to the specified operation ID is used when executing the extended command.

`-resync`

Specify this option to restore data from the secondary volume to the primary volume by resynchronizing the volumes. The contents of the primary volume become the same as the contents of the secondary volume.

When executing the extended command with this option specified, stop the program services that reference the Windows performance registry.

`-no_resync`

Specify this option if you want to apply only VDI metafiles to the primary volume without restoring backup data from the secondary volume to the primary volume. Use this option when the target data cannot be restored by using the `drmsqlrestore` command (for example, when the target data must be directly restored to the primary volume because the drive has become corrupted).

`-force`

Specify this option to restore the data from the secondary volume to the primary volume by forcibly resynchronizing the volumes.

You can perform a forced resynchronization if the copy group name of the primary volume, obtained when backup processing was performed on the file server or database server, matches the information on the file server or the database server. You can perform a forced resynchronization even though the LDEV and SERIAL numbers do not match the LDEV and SERIAL numbers when backup processing was performed.

Specify this option only if restoration by resynchronization could not be performed with the `-resync` option, such as when the LDEV number changed when the volume was replaced. If you specify this option for normal restoration, data might be corrupted.

`-undo`

Specify this option to restore the database to standby mode. When you specify this option, the database can be used in the read-only mode after restoration. A temporary file is created for each database in the undo-log file storage directory registered by using the `drmsqlinit` command.

If you do not specify this option, this extended command performs normal restoration. Immediately after normal restoration, the database will be placed in the loading status, in which you cannot use the database.

`-nochk_host`

Specify this option to restore the data to a host other than the one specified in the `drmsqlbackup` command. This option is useful when the host name has been changed, or when the log distribution function in SQL Server is used.

This option is not available when you restore a system database (master, model, msdb, or distribution).

> ⚠️ **Note:** When you specify the `-nochk_host` option, confirm that backup data is restored on the appropriate host, because the validity of the host name in the backup catalog is not checked when restoring backup data.

`-target` *database-name*

Specify this option to restore instances containing the specified databases. The databases you specify must be found in the backup catalog specified by the backup ID. If you specify a database not found in that backup catalog, this extended command does not restore the database. When you want to specify more than one database, use a comma to separate each file or directory name.

If you specify neither this option nor the `-f` option, this extended command restores the entire instance specified by the backup ID.

`-f` *database-list-file*

In the same way as the `-target` option, specify this option to restore the instances containing the specified databases. Unlike `-target`, this option uses an argument that is the name of a file that contains a list of databases you want to restore. This list file must be created beforehand. Specify the *target-definition-file-name* parameter as an absolute path.

If you specify neither this option nor the `-target` option, this extended command restores all the objects contained in the instance specified by the backup ID.

`-pf` *copy-parameter-definition-file*

Specify this option to use the number of retries and the retry interval defined in the copy parameter definition file. Specify the *copy-parameter-definition-file* parameter as a file name only; do not specify the parameter as a path.

If you omit this option, the value of the CCI-linkage definition file (`DEFAULT.dat`) is used. The values in the CCI-linkage definition file (`DEFAULT.dat`) are used for any parameters that are not included in the copy parameter definition file.

You can create a copy parameter definition file by using a name of your choice. Specify the file name by using an alphanumeric character string that

is 64 bytes or less. You must save the copy parameter definition file in the following folder:

Application-Agent-installation-folder\DRM\conf\raid

⚠️ **Note:**

- The backup information in the backup catalog is managed based on the use of a copy group as a key. Depending on the backup method, you might not be able to perform restoration, even though the backup data exists on the secondary volume. For further information, see the notes on running Application Agent in the *Replication Manager Application Agent CLI User Guide*.

- If ONLINE is set in CLU_MSCS_RESTORE in the Application Agent configuration definition file (init.conf), you can perform restoration of a user database while the cluster resources are online by specifying the –resync option. In this case, the cluster resource that manages the instance to be restored cannot be taken offline. However, if the restoration target is a system database (master, model, msdb, or distribution) or a database that contains a system database, restoration will be performed offline.

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the definition file linked to the operation ID.
- A specified Application Agent command option cannot be specified as an extended command option.
- The system cannot acquire information from the backup ID file.
- A command executed inside the extended command encounters an error.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Return Values

0: Normal termination

Any value other than 0: Termination with an error

Example

- In this example, the extended command is used to restore data from the secondary volume to the primary volume by resynchronizing the volumes, based on the settings specified in the operation definition file operation01:

  EX_DRM_SQL_RESTORE operation01 -resync

EX_DRM_SQL_TLOG_BACKUP (Backs up the transaction log of the SQL Server)

Format

```
EX_DRM_SQL_TLOG_BACKUP operation-ID
                [ -no_cat ]
                [ -no_truncate ]
                [ -target database-name | -f list-file-name ]
```

Description

This extended command executes the `drmsqllogbackup` command to back up the SQL Server's transaction log linked to the specified operation ID.

Prerequisites

The prerequisite for executing this extended command is as follows:

- An operation definition file linked to the specified operation ID has been provided.
- None of the transaction log backup functions provided by SQL Server (such as `BACKUP LOG` and the log distribution function) are being used.

Arguments

operation-ID

A character string that uniquely identifies the operation to be performed. Information in the operation definition file linked to the specified operation ID is used when executing an extended command.

-no_cat

Specify this option when the backup catalog for the starting point of the transaction log backup does not exist and the backup is one of the following:

- A backup for which the backup catalog has been deleted by a command that resynchronized the copy group
- A backup for which only a remote backup (not a local backup) was performed

When the transaction log backup obtained by specifying this option is displayed by the `-v` option, a hyphen (-) is displayed for `ORIGINAL-ID` and `BACKUP-ID`.

-no_truncate

Specify this option to perform a backup without truncating the transaction log. If a failure occurs, even if the database data file is damaged (provided that the transaction log is not damaged), the transaction log backup can be obtained by specifying this option.

-target database-name

Specify this option to display information about the specified database. If multiple *database-name* parameters are specified, a comma must be used to separate each parameter. If a *storage-group-name* parameter contains space characters, the entire parameter must be enclosed in double quotation marks (").

When this option is specified, the specification of the TARGET_NAME parameter in the operation definition file is ignored.

-f *list-file-name*

Specify this option to display information about a specific database. Unlike the -target option, by creating a definition file that describes a list of databases to be displayed in advance, and by specifying the file name, you can specify in a single step the databases whose information is to be displayed. Specify *list-file-name* as an absolute path. If a *list-file-name* parameter contains space characters, the entire parameter must be enclosed in double quotation marks (").

When this option is specified, the specification of the TARGET_NAME parameter in the operation definition file is ignored.

Return Values

0: Normal termination

Any value other than 0: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the definition file linked to the operation ID.
- A command executed inside the extended command encounters an error.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Example

- In this example, the command backs up the transaction log for the resource, based on the settings in the operation definition file operation01:

  EX_DRM_SQL_TLOG_BACKUP operation01

EX_DRM_SQLFILE_EXTRACT (Deploys VDI metafiles to the folder to be backed up to a tape device)

Format

```
EX_DRM_SQLFILE_EXTRACT operation-ID
```

Description

This extended command deploys the VDI metafiles from the temporary directory for extended commands to the directory indicated below.

On the database server:

The VDI metafile storage directory that was registered with the `drmsqlinit` command

On the backup server:

```
directory-specified-for-FTP_HOME_DIR\directory-specified-for-
FTP_SUB_DIR\operation-ID\AP
```

When this extended command is executed on the backup server, the system first deletes all VDI metafiles from the copy destination folder. The system then copies the VDI metafiles from the copy source folder to the copy destination folder. By deleting old VDI metafiles, this extended command prevents old VDI metafiles from being backed up to a tape device.

On the database server, all VDI metafiles that are generated when the database is backed up to the secondary volume are protected. Therefore, if this extended command is executed on the database server, VDI metafiles are not deleted.

Prerequisites

The prerequisites for executing this extended command are as follows:

- An operation definition file linked to the specified operation ID has been provided.
- The backup ID file from which this extended command will acquire information has been generated by executing the `EX_DRM_BACKUPID_SET` or `EX_DRM_DB_IMPORT` extended command.

Arguments

```
operation-ID
```

A character string that uniquely identifies the operation to be performed. Information in the operation definition file corresponding to the specified operation ID is used when executing the extended command.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the operation definition file linked to the operation ID.
- The copy destination folder for the target file does not exist.
- A command executed inside the extended command encounters an error.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Example

- In this example, the extended command is used to deploy VDI metafiles based on the settings specified in the operation definition file `operation01`:

  `EX_DRM_SQLFILE_EXTRACT operation01`

EX_DRM_SQLFILE_PACK (Saves VDI metafiles)

Format

`EX_DRM_SQLFILE_PACK operation-ID`

Description

This extended command saves VDI metafiles in the following directory to the temporary directory for extended commands.

On the database server:

> The VDI metafile storage directory that was registered with the `drmsqlinit` command

On the backup server:

> `directory-specified-for-FTP_HOME_DIR\directory-specified-for-FTP_SUB_DIR\operation-ID\AP`

When this command is executed on the database server, all VDI metafiles in the backup-target directory are deleted, and then the VDI metafiles are backed up from the backup-source directory to the backup-target directory.

If this extended command is executed on the backup server, VDI metafiles are not deleted from the temporary folder for extended commands.

Prerequisites

The prerequisites for executing this extended command are as follows:

- An operation definition file linked to the specified operation ID has been provided.
- The temporary folder for extended commands has been created.

Arguments

operation-ID

A character string that uniquely identifies the operation to be performed. Information in the operation definition file corresponding to the specified operation ID is used when executing the extended command.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the definition file linked to the operation ID.
- The copy destination folder for the target file does not exist.
- A command executed inside the extended command encounters an error.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Example

- In this example, the command backs up VDI metafiles based on the settings specified in the operation definition file `operation01`:

  `EX_DRM_SQLFILE_PACK operation01`

Extended command specifications (Exchange database backups)

This section explains the extended command specifications that apply to Exchange database backup and restore operations.

EX_DRM_EXG_BACKUP (Backs up an Exchange database)

Formats

```
EX_DRM_EXG_BACKUP operation-ID -mode vss
                        [ -transact_log_del | -noverify | -
noverify_log_del ]
```

```
                          [ -hostname virtual-server-name ]
                          [ -event_check ] [ -comment backup-comment ]
                          [ -rc [ name-identifying-the-generation ]] [ -
pf copy-parameter-definition-file ]
                          [ -vf VSS-definition-file-name ]
                          [ -script user-script-file-name ]
                          [ -s backup-server-name
                            [ -auto_import
                              [ -auto_mount [ mount-point-directory-
name ]]
                            ]
                            [ -svol_check]
                          ]
```

Description

This extended command executes the `drmexgbackup` command, which backs up the Exchange database that is in the storage group or Information Store specified by the operation ID from the primary volume to the secondary volume. When this extended command performs a backup, a backup ID is generated.

Depending on the version, Exchange Server can back up a database as follows.

Exchange Server 2007:
    The entire database or a storage group can be backed up.

Exchange Server 2010 or Exchange Server 2013:
    The entire database or an Information Store can be backed up.

The table below indicates the files that are backed up.

Table 1-16 Files backed up for an Exchange Server

Option	Database backed up	Files backed up	
The target file type is fixed	Exchange Server storage group	Data files	`*.edb`
		Transaction log files	`*.log`
		Checkpoint files	`*.chk`
The target file type is fixed	Exchange Server Information Store	Data files	`*.edb`
		Transaction log files	`*.log`
		Checkpoint files	`*.chk`

Prerequisites

The prerequisite for executing this extended command is as follows:

• An operation definition file linked to the specified operation ID has been provided.

Arguments

operation-ID

A character string that uniquely identifies the operation to be performed. Information in the operation definition file linked to the specified operation ID is used when executing an extended command.

`-mode vss`

Specify this option to perform a backup of an Exchange database by using VSS.

To use this option, the Protection Manager service must be running on the backup server.

`-transact_log_del`

Specify this option to delete a committed transaction log file. By deleting the transaction log file, you can increase the amount of unused drive capacity.

If you delete a transaction log file, you will no longer be able to use the `-recovery` option to restore any previous backups. Specify this option when you want to restore data other than the most recent backup data without specifying the `-recovery` option.

`-noverify`

Specify this option to skip consistency verification for a database that was backed up by using VSS.

`-noverify_log_del`

Specify this option to skip consistency verification for a database that was backed up by using VSS, and then delete the transaction log file.

`-hostname` *virtual-server-name*

Specify this option to designate an Exchange virtual server to back up. You can also use an operation definition file to designate the server. If you use both an operation definition file and the `-hostname` option, the server specified in the `-hostname` option will be given priority. Specify this option only for cluster environments. This option is enabled only when you set `SET_DRM_HOSTNAME` to `1` in the operation definition file; if you set `SET_DRM_HOSTNAME` to `0`, this option is disabled.

`-event_check`

Specify this option to check whether an event indicating a corrupted database has been recorded. The command executed with this option searches the Windows event log data that was recorded since the last backup of an Exchange database. If no previous backup is available, all data recorded in the Windows event log is searched.

The Windows event log is searched before the copy pair is resynchronized. If an event indicating a corrupt database is detected, the command terminates in an error.

Application Agent determines that a database is corrupt by the following event details:

- Event category: Application
- Type: Error
- Source: ESE
- Event ID: No limitation
- Character string being included: `-1018`, `-1019`, or `-1022`

`-comment` *`backup-comment`*

Specify this option to register a backup comment in the backup catalog. The conditions for specifying a value in the *`backup-comment`* parameter are as follows:

- The value must be 64 bytes or less.
- The value can include alphanumeric, reserved, one-byte space, and multi-byte characters.
- The value is case sensitive.
- When a reserved character or a one-byte space character is used, the entire value must be enclosed in double quotation marks (").
- If the value contains a reserved character, but is not enclosed in double quotation marks, the reserved character is not correctly interpreted as a part of the *`backup-comment`* string, and is parsed as a reserved character.
- The following reserved characters cannot be used in backup comments: `\ / ` | < > " * ? & ; ( ) $`

A hyphen (`-`) cannot appear as the first character in the backup comment. If you specify two consecutive double quotation marks ("") after the `-comment` option, no backup comment will be registered in the backup catalog.

`-rc` *`name-identifying-the-generation`*

Use this option to specify the name identifying the generation of the copy group to be backed up. Execute the `drmexgdisplay` command with the `-cf` option specified, and then specify a value for the displayed `GEN-NAME`. For single volumes, a hyphen (`-`) appears. In this case, the `-rc` option cannot be specified.

Always specify this option when backing up from a primary volume to a secondary volume on the remote side. If you omit this option, the secondary volume on the local side is backed up.

If you omit the *`name-identifying-the-generation`* parameter, the secondary volume that has the smallest value among the generation numbers on the remote side becomes the backup destination. In this case, the generation number is `remote_`*n*, where *n* is the smallest generation number.

`-pf` *`copy-parameter-definition-file`*

Specify this option to use the number of retries and the retry interval defined in the copy parameter definition file. Specify the *`copy-parameter-`*

definition-file parameter as a file name only; do not specify the parameter as a path.

If you omit this option, the value in the CCI-linkage definition file (`DEFAULT.dat`) is used. The values in the CCI-linkage definition file (`DEFAULT.dat`) are used for any parameters that are not included in the copy parameter definition file.

You can create a copy parameter definition file by using a name of your choice. Specify the file name by using an alphanumeric character string that is 64 bytes or less. You must save the copy parameter definition file in the following folder:

Application-Agent-installation-folder\DRM\conf\raid

-vf *VSS-definition-file-name*

Specify this option to switch the backup settings used for each VSS backup. You can specify this option only when using VSS to perform a backup.

Specify the *VSS-definition-file-name* parameter as a file name only; do not specify the parameter as a path. You must save the VSS definition file specified in this option in the following folder:

Application-Agent-installation-folder\DRM\conf\vss

If you omit this option, the command uses the following file as the VSS definition file:

Application-Agent-installation-folder\DRM\conf\vsscom.conf

For details about the VSS definition file, see the *Replication Manager Application Agent CLI User Guide*.

-script *user-script-file-name*

Specify this option to execute a user script. Specify *user-script-file-name* as an absolute path. The conditions for specifying a value in the *user-script-file-name* parameter are as follows:

- The value must be 255 bytes or less.
- The value can include alphanumeric, one-byte space, and multi-byte characters.
- The value is case sensitive.
- If the value contains space characters, the entire parameter must be enclosed in double quotation marks (`"`).
- The following reserved characters cannot be used in the parameter:
  \ / : * ? | < > "

For details about creating user script files, see the *Replication Manager Application Agent CLI User Guide*.

If you specify `LOCATION=REMOTE` in the user script file, you must also specify the `-s` option.

-s *backup-server-name*

Specify this option to connect to a remote backup server to perform a backup. Specify the `backup-server-name` parameter by using the host name or the IP address of the backup server. Specify the host name by using a character string that is 255 bytes or less. You can specify the IP address in IPv4 or IPv6 format.

If you specify a backup server by using the `-s` option, the backup server names specified in the VSS definition file (`vsscom.conf`) and in the VSS definition file specified by using the `-vf` option are ignored, and the backup server name specified in the `-s` option is used.

`-auto_import`

Specify this option to automatically transfer a backup catalog to a backup server after backing up a volume. You must specify this option together with the `-s` option.

`-auto_mount` *mount-point-directory-name*

Specify this option to automatically mount a secondary volume on a backup server after backing up a volume. You must specify this option together with the `-s` and `-auto_import` options.

Specify the *mount-point-directory-name* value by using a character string that is 64 bytes or less.

If you omit the *mount-point-directory-name* parameter, a mount destination for a secondary volume is automatically determined. This destination is determined in the same way as when using the `drmmount` command without specifying a mount point.

Execute the `drmumount` command to unmount the mounted secondary volume. In the argument of the `drmumount` command, specify the backup ID.

`-svol_check`

Specify this option to check the status of a secondary volume on a backup server. You must specify this option together with the `-s` option. Checking the status of a secondary volume prevents backup or restoration failures. The items, volumes, and conditions to be checked are described in the following table.

Table 1-17 Status check of a secondary volume

Check item	Volume to be checked	Check condition
A secondary volume is hidden from a backup server	All secondary volumes defined for a backup-target primary volume	Checked if primary volumes are defined in pairs with multiple generations of secondary volumes and if at least one of the following conditions is satisfied: • A primary volume is a cluster resource. • A backup using VSS is performed.
A secondary volume is not	The secondary volume to be the	Always checked.

Check item	Volume to be checked	Check condition
mounted on a backup server	next backup destination	

> ⚠️ **Note:** Each piece of backup information in the backup catalog is managed by using a copy group as a key. Depending on the backup method, you might not be able to perform restoration, even though the backup data exists on the secondary volume.
>
> For details, see the notes on running Application Agent in the *Replication Manager Application Agent CLI User Guide*.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the operation definition file linked to the operation ID.
- A specified Application Agent command option cannot be specified as an extended command option.
- The system fails to record a backup ID in the backup ID record file.
- A command executed inside the extended command encounters an error.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Examples

- In this example, the extended command is used first to delete the transaction log file based on the settings specified in the operation definition file `operation01`, and then to back up the database to the secondary volume by using VSS:

  ```
  EX_DRM_EXG_BACKUP operation01 -mode vss -transact_log_del
  ```

- In this example, the extended command is used first to delete the transaction log file based on the settings specified in the operation definition file `operation01`, and then to back up the database to the secondary volume:

  ```
  EX_DRM_EXG_BACKUP operation01 -transact_log_del
  ```

EX_DRM_EXG_DEF_CHECK (Checks the contents of an operation definition file and automatically creates a temporary directory)

Formats

To check the contents of an operation definition file for a database server by specifying an operation ID:

```
EX_DRM_EXG_DEF_CHECK operation-ID -db
```

To check the contents of an operation definition file for a backup server by specifying an operation ID:

```
EX_DRM_EXG_DEF_CHECK operation-ID -bk
```

To check the contents of an operation definition file for a database server by specifying a definition file:

```
EX_DRM_EXG_DEF_CHECK -db -f definition-file-name
```

To check the contents of an operation definition file for a backup server by specifying a definition file:

```
EX_DRM_EXG_DEF_CHECK -bk -f definition-file-name
```

Description

This extended command checks the contents of an operation definition file, and if no problem is found, automatically creates a temporary directory that will be used by subsequent extended commands.

The definition file-checking tool must be re-executed in the following cases:

- The path to the directory where dictionary map files are stored is changed on the database server.
- The directory path assigned to `FTP_HOME_DIR` is changed on the backup server.

When checking the contents of an operation definition file, the command first checks whether the file specified by the argument exists, and then checks the entries in the operation definition file for the following:

- An item and corresponding value have been specified.
- The specified item appears only once.
- The number of specified characters does not exceed the maximum allowable for the item.

In addition, the command checks the contents in the operation definition file for the items listed in the table below.

Table 1-18 Contents checked in the operation definition file

Item name	Details to be checked
BACKUP_OBJECT	MSEXCHANGE is specified.

Item name	Details to be checked
DB_SERVER_NAME	• The Exchange Server name or virtual server name exists. • If SET_DRM_HOSTNAME is set to 1, the value of DB_SERVER_NAME matches the database server name set in DRM_DB_PATH of the Application Agent configuration definition file init.conf.
INSTANCE_NAME	A hyphen (-) is specified.
TARGET_NAME	Storage group names and Information Store names of backup targets are not checked.
FTP_HOME_DIR	• The specified directory exists.[1], [2] • An absolute path is specified.
FTP_SUB_DIR	• The specified directory name does not contain a delimiter character (\). • The directory name is not specified as only one period (.) or two periods (..). • The root directory is not specified.
SET_DRM_HOSTNAME	A value of 0 or 1 is specified.

#1

Specification of the folder name is not case sensitive.

#2

This item is checked only if the -bk option is specified.

The table below lists the directories that are automatically created by the checking tool.

Table 1-19 Directories automatically created by EX_DRM_EXG_DEF_CHECK

Where EX_DRM_EXG_DEF_ CHECK is executed	Temporary directory for extended commands
Database server	*script_work-directory-at-the-same-level-as-the-dictionary-map-files-storage-directory\operation-ID*\DB (Example) When the directory where dictionary map files are stored is H:PTM, and the operation ID is Operation_A, the extended command temporary directory is H:\script_work \Operation_A\DB.
Backup server	*directory-specified-for-FTP_HOME_DIR\directory-specified-for-FTP_SUB_DIR\operation-ID*\BK

Prerequisites

The prerequisites for executing this extended command are as follows:

- Application Agent commands can be executed by a user account currently logged on to Windows.
- If the command is executed on the database server, it is able to access the domain controller of the Windows domain that manages the Exchange Server. The DNS service must be running on the database server.

Arguments

`operation-ID`

A character string that uniquely identifies the operation to be performed. Information in the operation definition file corresponding to the specified operation ID is used when executing the extended command.

`-db`

Specify this option to check the contents of an operation definition file for a database server.

`-bk`

Specify this option to check the contents of an operation definition file for a backup server.

`-f definition-file-name`

Specify this option to designate the operation definition file to be checked. Specify `definition-file-name` as an absolute path.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The file specified in the argument does not exist, or the system cannot access the file.
- An irregularity is detected in the contents of the operation definition file.
- The command fails to create a temporary directory.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Examples

- In this example, the extended command is used to check the contents of the operation definition file `C:\Program Files\drm\SCRIPT\conf\_OP0001.dat` for a database server:
  By specifying an operation ID:

```
EX_DRM_EXG_DEF_CHECK OP0001 -db
```
By specifying an operation definition file:
```
EX_DRM_EXG_DEF_CHECK -db -f "C:\Program Files\drm\script\conf
\_OP0001.dat"
```

- In this example, the extended command is used to check the contents of the operation definition file `C:\Program Files\drm\SCRIPT\conf \_OP0001.dat` for a backup server:

  By specifying an operation ID:
  ```
  EX_DRM_EXG_DEF_CHECK OP0001 -bk
  ```
  By specifying the operation definition file:
  ```
  EX_DRM_EXG_DEF_CHECK -bk -f "C:\Program Files\drm\script\conf
  \_OP0001.dat"
  ```

EX_DRM_EXG_RESTORE (Restores an Exchange database backup to the primary volume)

Formats

To restore a storage group (Exchange Server 2007):
```
EX_DRM_EXG_RESTORE operation-ID -resync
                    [ -target storage-group-name ] [ -f target-
definition-file-name ]
                    [ -force ] [ -recovery ]
                    [ -pf copy-parameter-definition-file ]
                    [ -vf VSS-definition-file-name ]
                    [ -ef Exchange-environment-setting-file ]
```

To restore an Information Store (Exchange Server 2007):
```
EX_DRM_EXG_RESTORE operation-ID -resync -recovery
                    [ -target storage-group-name\Information-Store-
name ]
                    [ -f target-definition-file-name ]
                    [ -force ][ -pf copy-parameter-definition-file]
                    [ -vf VSS-definition-file-name ]
                    [ -ef Exchange-environment-setting-file ]
```

To restore an Information Store (Exchange Server 2010 or Exchange Server 2013):
```
EX_DRM_EXG_RESTORE operation-ID -resync
                    [ -target Information-Store-name ] [ -f target-
definition-file-name ]
                    [ -force ] [ -recovery ]
                    [ -pf copy-parameter-definition-file ]
                    [ -vf VSS-definition-file-name ]
                    [ -ef Exchange-environment-setting-file ]
```

Description

This extended command executes the `drmexgrestore` command to restore backup data from the secondary volume to the primary volume for a specified database.

Prerequisites

The prerequisites for executing this extended command are as follows:

- An operation definition file linked to the specified operation ID has been provided.
- The backup ID has been stored in a backup ID file by executing either the `EX_DRM_BACKUPID_SET` or `EX_DRM_DB_IMPORT` extended command.

Arguments

operation-ID

A character string that uniquely identifies the operation to be performed. Information in the operation definition file corresponding to the specified operation ID is used when executing the extended command.

`-resync`

Specify this option to restore data from the secondary volume to the primary volume by resynchronizing the volumes. The contents of the primary volume become the same as the contents of the secondary volume.

`-target` *storage-group-name*

Specify this option to restore a database for a particular storage group. If multiple *storage-group-name* parameters are specified, a comma must be used to separate each parameter. If a *storage-group-name* parameter contains space characters, the entire parameter must be enclosed in double quotation marks ("). If you omit this option, all storage groups on the server on which this command was executed will be restored.

`-target` *Information-Store-name*

Specify this option to restore the database in a particular Information Store.

To specify multiple Information Store names, use a comma to separate each Information Store name. Use double quotation marks (") to enclose any Information Store names that contain at least one space character.

If you omit this option, all Information Stores on the server on which this command is executed will be restored.

`-target` *storage-group-name\Information-Store-name*

Specify this option if you use Exchange Server 2007 to perform restoration on a specific Information Store from backup data obtained by using VSS. Specify the *Information-Store-name* parameter after the *storage-group-name* parameter by separating the two parameters with a backslash (\). If you specify the *Information-Store-name* parameter for backup data other than backup data that was obtained by using VSS, an error occurs.

If multiple *Information-Store-name* parameters are specified, a comma must be used to separate each parameter. If an *Information-Store-name* parameter contains space characters, the entire string must be enclosed in double quotation marks ("). The *Information-Store-name* parameter is not

case sensitive. If you omit this option, all storage groups on the server on which this command was executed will be restored.

`-f` *target-definition-file-name*

As with the `-target` option, specify this option to restore specific storage groups or Information Stores. Unlike the `-target` option, the `-f` option lets you specify a target definition file, which contains all the storage groups or Information Stores to be restored. The target definition file containing the list of storage groups or Information Stores must be created before you use this option. Use an absolute path to specify the target definition file.

Note: If you use Exchange Server 2007 to perform restoration in units of Information Stores from the backup data obtained by using VSS, create a target definition file whose entries are in the form of *storage-group-name* *Information-Store-name* (the same format as that of the value of the `-target` option) and then specify the name of that target definition file.

`-force`

Specify this option to restore data from the secondary volume to the primary volume by forcibly resynchronizing the volumes.

You can perform a forced resynchronization if the copy group name of the primary volume (obtained when backup processing was performed on the file server or database server) matches the information on the file server or the database server. You can perform a forced resynchronization even though the LDEV and SERIAL numbers do not match the LDEV and SERIAL numbers when backup processing was performed.

Specify this option only if restoration by resynchronization could not be performed with the `-resync` option, such as when the LDEV number changed when the volume was replaced. If you specify this option for normal restoration, data might be corrupted.

`-recovery`

Specify this option to perform a recovery by roll-forwarding. When you execute the command with this option specified, transactions recorded after a backup are restored, and the database is returned to its most recent state. To execute this command, all transaction logs, from the time the backup was made to the time the command was executed, must be stored on the Exchange Server.

If you omit this option, the database will return to the state it was in at the time it was backed up.

You must specify this option if you use Exchange Server 2007 to perform restoration in units of Information Stores from backup data obtained by using VSS. If you have specified an Information Store using the `-target` option or `-f` option without specifying the `-recovery` option, the command terminates in an error. However, if all Information Stores within a storage group have been specified, you can restore backup data without specifying the `-recovery` option.

`-pf` *copy-parameter-definition-file*

Extended commands

Specify this option to use the number of retries and the retry interval defined in the copy parameter definition file. Specify the *copy-parameter-definition-file* parameter as a file name only; do not specify the parameter as a path.

If you omit this option, the value of the CCI-linkage definition file (DEFAULT.dat) is used. The values in the CCI-linkage definition file (DEFAULT.dat) are used for any parameters that are not included in the copy parameter definition file.

You can create a copy parameter definition file by using a name of your choice. Specify the file name by using an alphanumeric character string that is 64 bytes or less. You must save the copy parameter definition file in the following folder:

Application-Agent-installation-folder\DRM\conf\raid

-vf *VSS-definition-file-name*

Specify this option to specify the VSS definition file used during a VSS backup. You can specify this option only when restoring backup data that was obtained by using VSS. If you specify this option when restoring data other than backup data obtained by using VSS, this option will be ignored.

Specify the *VSS-definition-file-name* parameter as a file name only; do not specify the parameter as a path. You must save the VSS definition file specified in this option in the following folder:

Application-Agent-installation-folder\DRM\conf\vss

If you omit this option, the command uses the following file as the VSS definition file:

Application-Agent-installation-folder\DRM\conf\vsscom.conf

For details about the VSS definition file, see the *Replication Manager Application Agent CLI User Guide*.

-ef *Exchange-environment-setting-file*

Specify this option to change the parameter used to link with Exchange Server each time a command is executed.

Specify the *Exchange-environment-setting-file* parameter as a file name only; do not specify the parameter as a path.

You must save the specified Exchange environment settings file specified in this option in the following folder:

Application-Agent-installation-folder\conf\exchange

If this option is omitted, the default value is used.

For details about the Exchange environment settings file, see the *Replication Manager Application Agent CLI User Guide*.

⚠ **Note:**

- Note the following when you use Exchange Server 2007 to perform restoration in units of Information Stores from backup data obtained by using VSS:

  - When performing restoration in units of Information Stores, if you specify both an Information Store name and a storage group name at the same time, the following occurs:

    - If you specify both an Information Store and a storage group of the same storage group, an error will occur.

    - If you specify a storage group and an Information Store of different storage groups, the backup data is restored as storage groups and Information Stores respectively.

  - - If you specify an Information Store of data other than backup data obtained by using VSS, an error will occur.

  - - If you specify `storage-group-name\`, an error will occur.

  - - When you want to specify an Information Store name, check the value displayed in `INFORMATIONSTORE` of the `drmexgcat` command and specify exactly the same Information Store name.

  - - At restoration, this command dismounts all Information Stores within the storage group to which the specified Information Store belongs.

  - - If the restoration target drive contains Information Store files that are not restoration targets, an error will occur.

  - - If the restoration target drive contains data from different storage groups, an error will occur.

- If `ONLINE` is set in `CLU_MSCS_RESTORE` in the Application Agent configuration definition file (`init.conf`), restoration can be performed while the cluster resources are online.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the operation definition file linked to the operation ID.
- A specified Application Agent command option cannot be specified as an extended command option.
- The system fails to record a backup ID in the backup ID record file.
- A command executed inside the extended command encounters an error.
- The command fails to obtain the name of the directory where dictionary map files are stored.

Examples

- In this example, the extended command is used to restore data from the secondary volume to the primary volume by resynchronizing the volumes, based on the settings specified in the operation definition file `operation01`:

  `EX_DRM_EXG_RESTORE operation01 -resync`

- In this example, the extended command is used to restore Information Store `IS12` of storage group `SG1`, based on the settings specified in the operation definition file `operation01`:

  `EX_DRM_EXG_RESTORE operation01 -resync -recovery -target SG1\IS12`

EX_DRM_EXG_VERIFY (Verifies the consistency of an Exchange database)

Format

```
EX_DRM_EXG_VERIFY operation-ID
                  [ -mount_pt mount-point-directory-name ] [ -
force ]
```

Description

The `EX_DRM_EXG_VERIFY` extended command executes the `drmmount` command, the `drmexgverify` command, and the `drmumount` command to verify the consistency of an Exchange database that was backed up onto the secondary volume. Note that Exchange databases that can be verified are those that were backed up by using VSS.

When using `EX_DRM_TAPE_BACKUP` to back up the Exchange database from a secondary volume onto a tape device, execute this extended command to prepare for the tape device backup.

If an error is detected in the consistency of the Exchange database, you must re-execute the backup to the secondary volume.

Prerequisites

The prerequisites for executing this extended command are as follows:

- The backup catalog to be verified by this extended command has been imported to the backup server.
- The backup ID of the backup catalog has been set in the backup ID record file by the `EX_DRM_DB_IMPORT` or `EX_DRM_BACKUPID_SET` command.

Arguments

operation-ID

A character string that uniquely identifies the operation to be performed. Information in an operation definition file linked to the specified operation ID is used when executing an extended command.

`-mount_pt` *mount-point-directory-name*

Specifies the name of the mount point directory for mounting the secondary volume. If you specify this option together with the `-force` option, you must specify the options in the following order: `-mount_pt`, `-force`.

When only a drive name is specified, this command searches for unused drives in alphabetical order, and mounts the secondary volume onto the specified drive. When a drive is specified by a path including a drive letter, this command mounts the volume onto *path-specified-in-mount_point* `\`*drive-letter-of-primary-volume*`\`*mount-point-of-primary-volume*. For example, if the primary volume is mounted on `M:\MNT`, and `S:\SVOLMNT` is specified with the `-mount_pt` option, the secondary volume is mounted on `S:SVOLMNT\M\MNT`.

The mount point directory name must satisfy the following:

- Maximum number of characters: Path lengths to be specified must comply with the specifications of the mount and unmount functions provided by CCI.
- Available characters: Characters that can be used in a directory name in Windows (excluding space characters).

If you specify a drive for the mount point directory name, the command searches for unused drive names in alphabetical order, starting with the specified drive, and then performs the mount.

If you specify an absolute path from the drive letter as the mount point directory name, the command mount point is as follows:

absolute-path-specified-for-mount-point-directory-name`\`*primary-volume-drive-letter*`\`*primary-volume-mount-point*

Even if the path does not end with a backslash (`\`), the command assumes that a backslash has been specified. For example, `D:` and `D:\` are assumed to be the same drive. Similarly, `D:\MOUNTDIR` and `D:\MOUNTDIR\` are assumed to be the same directory.

If you omit this option, a drive that is not being used when the extended command is executed is used as the mount point.

`-force`

Specify this option to perform a forced mount. If you specify this option together with the `-mount_pt` option, you must specify the options in the following order: `-mount_pt`, `-force`.

If the copy group name of the primary volume obtained at the time of backup processing on the database server matches the information on the database server, forced resynchronization is performed. This operation is executed even if the LDEV and SERIAL numbers do not match the LDEV and SERIAL numbers from the time backup processing was performed.

Specify this option to perform a forced mount on a secondary volume using only the copy group name of the primary volume as a key. Examples of when you might want to execute this operation include when replacing a secondary volume because of a hardware failure, or when an LDEV number or SERIAL number has changed. If you specify this option for normal restoration, data might be corrupted.

If you omit this option, the extended command terminates with an error without mounting if the copy group name, LDEV number, and SERIAL number of the primary volume do not match the information on the backup server. (These values are acquired when the database is backed up.)

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Conditions Causing an Error

This extended command fails in the following cases:

- An invalid option is specified.
- The system cannot acquire information from the operation definition file linked to the operation ID.
- A command executed inside the extended command encounters an error.

Example

- In this example, the extended command is used to verify the consistency of the Exchange database specified by the operation ID `operation01`:

  `EX_DRM_EXG_VERIFY operation01`

Extended commands

2

Basic commands

This chapter describes the basic commands provided by Application Agent.

☐ List of basic commands

☐ Before reading the basic command descriptions

☐ Basic command specifications (File system backups)

☐ Basic command specifications (Common commands)

☐ Basic command specifications (Tape-related commands)

☐ Basic command specifications (Utility commands)

☐ Basic command specifications (SQL Server database backups)

☐ Basic command specifications (Exchange database backups)

List of basic commands

The table below lists the basic commands that Application Agent provides.

Table 2-1 List of basic commands (file system backups)

Basic command name	Function summary
drmfsbackup	Backs up a file system to a secondary volume.
drmfscat	Displays a list of the backup information for a file system.
drmfsdisplay	• Displays a list of file system information. • Updates the dictionary map files.
drmfsrestore	Restores a file system.

Table 2-2 List of basic commands (common commands)

Basic command name	Function summary
drmappcat	Displays catalog information on a host
drmcgctl	• Locks copy groups. • Unlocks copy groups. • Displays a list of copy groups.
drmdbexport	Exports backup information to a file.
drmdbimport	Imports backup information from a file.
drmdevctl	Conceals or reveals a physical volume.
drmhostinfo	Displays a list of host information.
drmresync	Resynchronizes copy groups.

Table 2-3 List of basic commands (tape-related commands)

Basic command name	Function summary
drmmediabackup	Backs up backup data to a tape device.
drmmediarestore	Restores backup data from a tape device.
drmmount	Mounts a secondary volume.
drmtapecat	Displays a list of backup information for a tape device.
drmtapeinit	Registers the parameters for a backup management product.
drmumount	Unmounts a secondary volume.

Table 2-4 List of basic commands (utility commands)

Basic command name	Function summary
drmdbsetup	Creates or deletes a Protection Manager database.

Table 2-5 List of basic commands (SQL Server database backups)

Basic command name	Function summary
drmsqlbackup	Backs up an SQL Server database to a secondary volume.
drmsqlcat	Displays a list of the backup information for an SQL Server database.
drmsqldisplay	• Displays a listing of SQL Server database information. • Updates the SQL Server database information in the dictionary map files.
drmsqlinit	Registers SQL Server parameters.
drmsqllogbackup	Backs up the SQL Server transaction log file.
drmsqlrecover	Recovers a restored SQL Server database.
drmsqlrecovertool	Recovers a restored SQL Server database by using the GUI.
drmsqlrestore	Restores an SQL Server database.

Table 2-6 List of basic commands (Exchange database backups)

Basic command name	Function summary
drmexgbackup	Backs up an Exchange database.
drmexgcat	Displays a list of the backup information for an Exchange database.
drmexgdisplay	• Displays a list of Exchange database information. • Updates the Exchange database information in the dictionary map files.
drmexgrestore	Restores an Exchange database.
drmexgverify	Verifies the consistency of an Exchange database.

Before reading the basic command descriptions

Note the following before reading the basic command descriptions:

Do not forcibly terminate a basic command that is being executed. If you do so, the pair status of the copy group or the backup catalog might enter an unexpected status. For further information, see the description of permissions

for command execution in the *Replication Manager Application Agent CLI User Guide*.

Basic command path

Basic commands are stored in the following directory:

`Application-Agent-installation-folder\DRM\bin\`

Basic command formats

This section describes all arguments that can be specified. If there are multiple argument conditions, formats are described separately for each condition. Do not use a combination of formats.

Viewing the format

To display the format of a basic command, execute the command with the `-h` option specified.

Conventions for creating a target definition file

When you want to specify multiple files, databases, storage groups, or Information Stores in a basic command option, you can use a *target definition file*. Create a target definition file in advance to specify a list of multiple files, directories, databases, storage groups, or Information Stores all at once.

Basic commands that support a target definition file

You can use a target definition file with the following basic commands:

- `drmexgbackup`
- `drmexgcat`
- `drmexgdisplay`
- `drmexgrestore`
- `drmfsbackup`
- `drmfscat`
- `drmfsdisplay`
- `drmfsrestore`
- `drmsqlbackup`
- `drmsqlcat`
- `drmsqldisplay`
- `drmsqlrecover`
- `drmsqlrestore`
- `drmsqllogbackup`

File name

Use alphanumeric characters to specify the file name.

File contents

The contents of the file must adhere to the following conventions:

- Each parameter (file name, directory name, SQL Server database name, storage group name, or Information Store name) must be specified on one line.
- Lines beginning with a hash mark (#) are assumed to be comment lines. However, if an SQL Server database name, a storage group name, or an Information Store name starts with a hash mark (#), the line beginning with the hash mark is assumed to be an SQL Server database name, storage group name, or Information Store name, and not a comment line.
- File names and directory names must be specified by using absolute paths.

Example of entries in a target definition file:

```
# Example of specifying files
D:\data1\batch_0001\Tokyo_output_dir
D:\data1\batch_0001\Osaka_output_dir
D:\data1\transact.log
```

Coding rules for creating a transaction log target definition file

A transaction log target definition file, when specified as an argument with the `drmsqlrecover` command, specifies the order in which transaction log files are to be applied during recovery.

File name

Use alphanumeric characters to specify the file name.

File contents

The contents of the file must follow these coding rules:

- Enter the name of the database, followed by the name of the transaction log file.
- Enclose the name of the database in square brackets ([and]).
- Enter the transaction log files for each database in the order in which they are to be applied.
- Each transaction log file name must be specified on one line.
- Each transaction log file name must be specified by using an absolute path.
- A transaction log file name must be left-justified with no leading spaces.
- Lines beginning with a hash mark (#) are assumed to be comment lines.

Example of entries in a target definition file:

```
# Protection Manager 3.5
# Log Backup Files
[SQLDB001]
C:\MSSQL\BackupLog\SQLDBLog001.bak
C:\MSSQL\BackupLog\SQLDBLog002.bak
C:\MSSQL\BackupLog\SQLDBLog003.bak

[SQLDB002]
C:\MSSQL\BackupLog\SQLDB2Log001.bak
C:\MSSQL\BackupLog\SQLDB2Log002.bak
C:\MSSQL\BackupLog\SQLDB2Log003.bak
```

Correspondence with Replication Manager GUI terms

Some terms used in the Application Agent command line interface have different meanings from those used in the Replication Manager GUI. The table below describes the correspondence between these terms.

Table 2-7 Correspondence of Replication Manager GUI and Application Agent command line interface terms

Replication Manager GUI term	Application Agent command line interface term	Meaning
Copy pair	Copy group	A primary volume and secondary volume pair that is synchronized or split by the volume replication functionality and CCI functions. Note that in the Replication Manager GUI, *copy group* indicates a group of copy pairs.
Label	Backup comment	A character string used to identify a replica or backup
Replica	Backup	Data copied from the primary volume to the secondary volume
Replica catalog	Backup catalog	A collection of information necessary for managing the history of backup operations and managing backup generations
Primary site	Local site	The site where business tasks are running and where the primary volume is used as the copy source.
Secondary site	Remote site	A site used to continue tasks if the local site becomes unavailable because of, for example, maintenance or a disaster at the local site.

The *Replication Manager User Guide* and the *Replication Manager Configuration Guide* use the Replication Manager GUI terms. This document (*Replication Manager Application Agent CLI Reference Guide*) uses the Application Agent command line interface terms.

Correspondence for a term in messages output by Replication Manager

Replace the following term in this manual with the term shown in the following table.

Table 2-8 Correspondence for a term in messages output by Replication Manager

Term in this manual	Term in the message output by Replication Manager
CCI	RAID Manager

Basic command specifications (File system backups)

drmfsbackup (Backs up a file system to a secondary volume)

Formats

To perform an online backup:
```
drmfsbackup { mount-point-directory-name | mount-point-directory-
target-definition-file-name } [ -mode online ]
          [ -rc [ name-identifying-the-generation ]] [ -pf copy-
parameter-definition-file ]
          [ -comment backup-comment ]
          [ -script user-script-file-name ]
          [ -s backup-server-name
           [ -auto_import
             [ -auto_mount [ mount-point-directory-name ]]
           ]
           [ -svol_check ]
          ]
```

To perform a cold backup:
```
drmfsbackup { mount-point-directory-name | mount-point-directory-
target-definition-file-name } -mode cold
          [ -rc [ name-identifying-the-generation ]] [ -pf copy-
parameter-definition-file ]
          [ -comment backup-comment]
          [ -script user-script-file-name]
          [ -s backup-server-name
           [ -auto_import
             [ -auto_mount [ mount-point-directory-name ]]
           ]
           [ -svol_check ]
          ]
```

To perform a VSS backup:
```
drmfsbackup { mount-point-directory-name | mount-point-directory-
target-definition-file-name } -mode vss
          [ -rc [ name-identifying-the-generation ]] [ -pf copy-
parameter-definition-file ]
          [ -comment backup-comment]
```

```
[ -vf VSS-definition-file-name]
[ -script user-script-file-name ]
[ -s backup-server-name
  [ -auto_import
    [ -auto_mount [ mount-point-directory-name ]]
  ]
  [ -svol_check ]
]
```

Description

The `drmfsbackup` command backs up the volume that contains the file system for the specified mount point directory to the secondary volume. You can back up more than one file system at a time. If the file system for the mount point directory consists of more than one volume, all the primary volumes are backed up to secondary volumes.

Before executing this command, the following operations are needed:

- All application software using the volume to be backed up must be stopped. The volume being used by the OS cannot be backed up.
- The cache of the secondary volume must be cleared. To clear the system cache, mount the secondary volume on the backup server, and then unmount the secondary volume.

When the `drmfsbackup` command is executed on the local site and the pair status is `SMPL`, the command does not automatically create a pair. In this case, if the `PAIR_CREATE` parameter in the CCI-linkage definition file (`DEFAULT.dat`) is set to `ENABLE`, the command automatically creates a pair.

After installation, if the `drmfsbackup` command is executed without executing the `drmfsdisplay` command with the `-refresh` option specified, and no dictionary map files are created, the dictionary map files are created by using the `drmfsbackup` command. In this case, the processing time required to create the dictionary map files is added to the time required to execute the backup command.

Arguments

mount-point-directory-name

Specify the mount point directory for the file system you want to back up. You must specify the drive letter for a mounted file system or the absolute path beginning with the drive letter.

You must specify the drive letter for a mounted file system or the absolute path from the drive letter.

Specify the drive letter of the name of the mount point directory to which the secondary volume is to be mounted, or specify the absolute path from the drive letter.

The mount point directory name must satisfy the following:

- Maximum number of characters: Path lengths to be specified must comply with the specifications of the mount and unmount functions provided by CCI.

  This limitation applies to the length of the path to which the volume subject to cold backup operations has been mounted.

- Characters: Characters that can be used for directory names in Windows (excluding space characters)

Do not specify a backslash (\) at the end of the path.

mount-point-directory-target-definition-file-name

Specify the name of the definition file that specifies the mount point directories for the file systems you want to back up. To specify this file, you must specify the file name alone. The following shows where the target definition file for mount point directories is stored and gives examples of specifying the file.

Location of the file:

```
Application-Agent-installation-folder\DRM\conf\fs
```

Example of specifying the file:

```
D:
E:
F:\MNT
```

Specify the mount point directory name by following the following rules:

- Use an absolute path.
- Do not specify a backslash (\) at the end of the path.

`-mode online`

Specify this option to perform an online backup. This will perform a backup without unmounting the file system.

If you specify an online backup for a file system, only resynchronization processing for the file system will be performed before the online backup. If applications using the file system are not prevented from updating data, the validity of the backed up data cannot be guaranteed.

If you omit this option, online backup is assumed.

`-mode vss`

Specify this option to perform a VSS backup.

To use this option, the Protection Manager service must be running on the backup server.

`-rc` *name-identifying-the-generation*

Use this option to specify the name identifying the generation of the copy group to be backed up. Execute the `drmfsdisplay` command with the `-cf` option, and specify the displayed `GEN-NAME` value. In a single volume, a hyphen (-) appears. In this case, you cannot specify the `-rc` option.

Always specify this option when backing up from a primary volume to a secondary volume on the remote side. If this option is omitted, the secondary volume on the local side is backed up.

When you omit *name-identifying-the-generation*, the secondary volume that has the smallest value among the generation numbers on the remote side becomes the backup destination. In this case, the generation number is `remote_n`, where *n* is the smallest generation number.

-pf *copy-parameter-definition-file*

Specify this option when using the number of retries and the retry interval defined in the copy parameter definition file. Specify only the file name, without specifying the path.

When you omit this option, the value of the CCI-linkage definition file (`DEFAULT.dat`) is used. The `DEFAULT.dat` values are also used for parameters not specified in the copy parameter definition file.

Create the copy parameter definition file with an arbitrary name in the location below. Specify the file name by using an alphanumeric character string that is 64 bytes or less.

Application-Agent-installation-folder\DRM\conf\raid

-mode cold

Specify this option to perform a cold backup.

You can perform a cold backup only for a mounted file system. The command unmounts the file system and performs an offline backup for the volumes containing the file system. When the backup is finished, the command mounts the file system again. If the command cannot unmount the file system, the command displays an error message and cancels backup processing. If the volume to be backed up has been unmounted, the command cancels backup processing.

When the command is executed on a server in a cluster configuration, instead of unmounting the file system, the disk resource to be backed up is taken offline to back up the volume. The disk resource is brought online after the backup is finished.

Backup processing is canceled if the command is executed in the following cases:

- An attempt to take the disk resource offline fails.
- The disk resource is already offline.

-comment *backup-comment*

Specify this option to register a backup comment in the backup catalog.

The *backup-comment* value can be a string of up to 64 bytes consisting of alphanumeric, special, one-byte space, and multi-byte characters. The backup comment is case sensitive. When a special character or a one-byte space character is used, the entire *backup-comment* string must be enclosed in double quotation marks ("). If the *backup-comment* string contains a

special character but is not enclosed in double quotation marks, the special character is not properly handled as a part of the `backup-comment` string and is parsed as a special character.

The following special characters cannot be used in backup comments:

`\ / ` | < > " * ? & ; ( ) $`

Note that the first character must not be a hyphen (`-`). If you specify two double quotation marks after the `-comment` option, as in `-comment ""`, no backup comment will be registered in the backup catalog.

`-vf` *VSS-definition-file-name*

Specify this option to switch the settings to be used for each VSS backup. You can use this option only when using VSS for backup. For *VSS-definition-file-name*, specify a file name only. Do not specify the folder name. The VSS definition file specified in this option must be stored in the following folder:

Application-Agent-installation-folder`\DRM\conf\vss`

If you omit this option, the command uses the following file as the VSS definition file:

Application-Agent-installation-folder`\DRM\conf\vsscom.conf`

For details about VSS definition files, see the *Replication Manager Application Agent CLI User Guide*.

`-script` *user-script-file-name*

Specify this option to execute a user script. Use an absolute path to specify *user-script-file-name*. The conditions for specifying *user-script-file-name* are as follows:

- Maximum number of bytes: 255
- Available characters: Characters that can be used in a file name in Windows. If the name contains one or more space characters, the entire name string must be enclosed in double quotation marks (`"`).

For details about the coding used for a user script file, see the description of how to create a user script in the *Replication Manager Application Agent CLI User Guide*.

If you specified `LOCATION=REMOTE` in the user script file, you must also specify the `-s` option.

`-s` *backup-server-name*

Specify this option to connect to a remote backup server to perform a backup. Specify the host name or the IP address of the backup server by using a character string of up to 255 bytes. You can specify the IP address in IPv4 or IPv6 format.

If you specify a backup server by using the `-s` option, the backup server names specified in the VSS definition file (`vsscom.conf`) and in the VSS

definition file specified by using the `-vf` option are ignored, and the backup server name specified by using the `-s` option is used.

`-auto_import`

Specify this option to automatically transfer a backup catalog to a backup server after backing up a volume. This option must be specified concurrently with the `-s` option.

`-auto_mount` *mount-point-directory-name*

Specify this option to automatically mount a secondary volume on a backup server after backing up a volume. This option must be specified concurrently with the `-s` and `-auto_import` options.

Specify *mount-point-directory-name* by using a character string of up to 64 bytes.

If you omit the *mount-point-directory-name* parameter, the mount destination for the secondary volume is automatically determined. This destination is determined in the same way as when using the `drmmount` command without specifying a mount point.

Execute the `drmumount` command to unmount the mounted secondary volume. In the argument of the `drmumount` command, specify the backup ID.

`-svol_check`

Specify this option to check the status of a secondary volume on a backup server. This option must be specified concurrently with the `-s` option. Checking the status of a secondary volume prevents backup or restoration failures. The items, volumes, and conditions to be checked are described in the following table.

Table 2-9 Status check of a secondary volume

Check item	Volume to be checked	Check condition
A secondary volume is hidden from a backup server	All secondary volumes defined for a backup-target primary volume	Checked when a primary volume is defined in pairs with multiple generations of secondary volumes and any of the following items is applicable: • A primary volume is a cluster resource. • A backup using VSS is performed.
A secondary volume is not mounted on a backup server	The secondary volume to be the next backup destination	Always checked.

Note:

• Make sure that no other volume is mounted on the directory of the volume to be backed up when performing an online backup. If a mounted volume exists, an online backup error occurs.

- The backup information in the backup catalog is managed by using a copy group as a key. Depending on the backup method, you might not be able to perform restoration, even though the backup data exists on the secondary volume. For further information, see the notes on running Application Agent in the *Replication Manager Application Agent CLI User Guide*.
- Backup in a cluster configuration is supported.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to perform a cold backup for the entire D drive:
  ```
  PROMPT> drmfsbackup D: -mode cold
  ```
- In this example, the command is used to perform an online backup concurrently for the mount point directories `D:`, `E:`, and `F:\MNT` specified in the mount point directory target definition file `APP1`:
  ```
  PROMPT> drmfsbackup APP1
  ```
  The location of the mount point directory target definition file:
  Application-Agent-installation-folder`\DRM\conf\fs\APP1`

  Contents of the mount point directory target definition file:
  ```
  D:
  E:
  F:\MNT
  ```
- In this example, the command is used to perform an online backup to a remote site:
  ```
  PROMPT> drmfsbackup F: -rc remote_0
  ```
- In this example, the command is used to back up by using VSS:
  ```
  PROMPT> drmfsbackup H: -mode vss
  KAVX0001-I The drmfsbackup command will now start.
  KAVX0019-I Copying file(s) now...
  KAVX5108-I Resynchronizing a copy group.
          Copy group name = EVS1,EVS1_000
  KAVX0256-I Connecting to the Protection Manager Service is
  performed.
          Host name = BackupServer
  KAVX0040-I The backup ID has been assigned as follows:
          Backup ID = 0000000050
  KAVX0002-I The drmfsbackup command will now end.
  ```

drmfscat (Displays backup information for a file system)

Format

```
drmfscat { mount-point-directory-name | mount-point-directory-target-
definition-file-name }
        [ -target directory-names | -f target-definition-file-name ]
        [ -device device-file-name ][ -l ][ -v ]
        [ -backup_id backup-ID ][ -hostname host-name ]
        [ -comment backup-comment ]
```

Description

The `drmfscat` command displays information about the backups performed for a file system. You can also display information about the backups performed for multiple file systems. The following table lists the displayed items.

Table 2-10 Items displayed by the drmfscat command

Displayed item	Description
INSTANCE	Mount point directory name
BACKUP-COMMENT	Backup comment
BACKUP-ID	Backup ID
BACKUP-MODE	Backup mode (COLD, ONLINE, or VSS)
INSTANCE	Mount point directory name
ORIGINAL-ID	Original backup ID obtained by the `drmfsbackup` command
START-TIME	Start time of a snapshot backup
END-TIME	End time of a snapshot backup
HOSTNAME	Server name where the snapshot backup was performed
T	Object type (F, which means file, is always displayed.)
FILE	File name
FS	Mount point directory name
FSTYPE	File system type (NTFS)
DG	A hyphen (-) is displayed.
LVM-DEVICE	For an environment with a logical volume manager, the name of the logical device file For an environment without a logical volume manager, GUID
DEVICE[#1]	Physical device file name (raw device file name) or Harddisk*n*, where *n* is an integer
COPY-GROUP	The copy group name, displayed as follows:

Displayed item	Description
	CCI-volume-group-name,device-name
PORT#	Port name on the server host side
TID#	Target ID on the server host side
LUN#	Logical unit number on the server host side
MU#	Pair identifier
LDEV#	Logical device number across RAID devices
P/S	Letter identifying whether the volume is primary or secondary: P: Primary volume of a pair S: Secondary volume of a pair
SERIAL#	Serial number across RAID devices
VIRTUAL-SERVERNAME[#2]	Virtual server name (value of the DRM_HOSTNAME environment variable)
DB-PATH[#2]	Name of the directory storing the backup catalog
CATALOG-UPDATE-TIME[#2]	Time when the backup catalog was created
BACKUP-COMMENT	Backup comment

#1

 If this command is executed with the -device option, DEVICE will be displayed after T.

#2

 This information is displayed when the command is executed with the -v option.

A hyphen (-) is displayed for any item that cannot be displayed. If no items can be displayed, an error message is displayed.

Each item is separated by a space.

Arguments

mount-point-directory-name

Specify the drive letter of the file system for which you want to display backup information, or use an absolute path beginning with the drive letter. Do not specify a backslash (\) at the end of the path.

mount-point-directory-target-definition-file-name

Specify the name of the definition file that specifies the mount point directories for the file systems for which you want to display backup information. Specify only the name of the file. The following shows where the target definition file for mount point directories is stored and examples of specifying the file.

The location of the file:

```
Application-Agent-installation-folder\DRM\conf\fs
```

Example of specifying the file:

```
D:
E:
F:\MNT
```

Specify the mount point directory name by following the following rules:

- Use an absolute path.

- Do not specify a backslash (\) at the end of the path.

-target *directory-names*

Specify this option to display for each file system the backup information specified by the *mount-point-directory-name* argument. The directory name represents a mount point directory, a drive, or a volume mount point. You can specify only directories that exist in the backup catalog specified by the *mount-point-directory-name* argument. If you specify a directory that does not exist in the specified backup catalog, backup information for that directory is not displayed.

Use absolute paths to specify the directories. To display information for multiple files or directories, use commas to separate each of the directories. Make sure that the name of each directory is the same as the path returned by the drmfsbackup command. If these names do not completely match, the correct backup information will not be displayed. You cannot specify a backslash (\) at the end of the directory names.

If you specify neither this option nor the -f option, the command displays information for the entire file system specified by *mount-point-directory-name*.

-f *target-definition-file-name*

Specify this option to display backup information for specific files or directories on the file system specified by the *mount-point-directory-name* argument. Create a target definition file that contains a list of absolute paths of the mount point directories, drives, or volume mount points for which you want to display information. By specifying the target definition file name, you can collectively specify all of the targets for which you want to display information. Use an absolute path to specify the target definition file name. Make sure that the name of each folder or file is the same as the path returned by the drmfsbackup command. If these names do not completely match, the correct backup information will not be displayed.

Specify the mount point directory name of the target definition file by following the following rules:

- Use an absolute path.
- Do not specify a backslash (\) at the end of the path.

If you specify neither this option nor the `-target` option, the command displays information for the entire file system specified by *mount-point-directory-name*.

`-device` *device-file-name*

Specify this option to display only the file system information, physical disk information, and logical-volume configuration information about a specific device file.

`-l`

Specify this option to display information in the long format.

`-v`

Specify this option to display information about the backup catalog. The following information is displayed:

- Name of the directory in which the backup catalog is stored
  Displays the path that is set in `DRM_DB_PATH` in the Application Agent configuration definition file (`init.conf`).

  If `DRM_DB_PATH` has not been set, the default storage directory for the dictionary map files, which are created automatically during installation, is displayed.

- Virtual server name (value of the `DRM_HOSTNAME` environment variable)
  If the `DRM_HOSTNAME` environment variable has not been set, a hyphen (-) appears.

- Time when the backup catalog was created
  For each backup ID, displays the time when the backup catalog was created.

`—backup_id` *backup-ID*

Specify this option to display only the backup information of a specific backup ID. A backup ID uniquely identifies backup data and is registered in the backup catalog during backup processing.

`-hostname` *host-name*

Specify this option to display only information pertaining to a specific host.

`-comment` *backup-comment*

Specify this option to display only information on a specific backup comment.

The *backup-comment* value is not case sensitive.

You can use an asterisk (`*`) to specify a wildcard in *backup-comment*. You can specify that only the initial characters match (for example, specify a string such as `XYZ*` to search for strings that begin with one or more specific characters and that end with any character or no characters). When a wildcard, special character, or one-byte space character is used, the entire *backup-comment* string must be enclosed in double quotation marks ("). If the *backup-comment* string contains a special character but is not enclosed in

double quotation marks, the special character is not properly handled as a part of the *backup-comment* string and is parsed as a special character. If you specify `-comment "*"`, the command will display all backup catalogs.

If two double quotation marks are specified after the `-comment` option (as in `-comment ""`), a message is displayed indicating that no backup data exists.

Note: When specifying on the command line a file name or directory name containing space characters for the `-target` option or the `-f` option, you must enclose the file name in double quotation marks (").
Note that using double quotation marks is not necessary for target paths specified in batch definition files.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to display the backup information for the file system of the D drive:
  ```
  PROMPT> drmfscat D:
  INSTANCE: D:
  BACKUP-ID:0000000001 BACKUP-MODE: COLD INSTANCE: D: ORIGINAL-ID:
  0000000001
  START-TIME:2002/06/01 10:00:00 END-TIME: 2002/06/01 10:03:00
  HOSTNAME: FILESERV1
  T FILE   FS  DG  DEVICE      COPY-GROUP
  F -     D:  -   Harddisk1   VG01,dev01
  F -     -   -   -           VG01,dev01
  ```

- In this example, the command is used to display backup information, in the long format, about the file system related to the disk volume `Harddisk1`:
  ```
  PROMPT> drmfscat D: -device Harddisk1 -l
  INSTANCE: D:
  BACKUP-ID: 0000000001 BACKUP-MODE: COLD INSTANCE: D: ORIGINAL-ID:
  0000000001
  START-TIME:2002/06/01 10:00:00 END-TIME: 2002/06/01 10:03:00
  HOSTNAME: FILESERV1
  T FILE               FS FSTYPE DG LVM-
  DEVICE                                          DEVICE    COPY-
  GROUP PORT#  TID# LUN# MU# LDEV# P/S SERIAL#
  F Harddisk1 D:\temp\file1.txt D: NTFS   - \\?
  \Volume{df66a5b0-5583-12d5-a410-806d6172696f}\ harddisk1
  VG01,dev01 CLI-A  2    10   0   10000 P   15044
  F -                  -  -     -
  -                                               -
  VG01,dev01 CLI-A  2    11   0   10001 P   15044
  INSTANCE: D:
  BACKUP-ID: 0000000002 BACKUP-MODE: ONLINE INSTANCE: D: ORIGINAL-
  ID:0000000001
  START-TIME:2002/06/01 10:30:00 END-TIME: 2002/06/01 10:33:00
  HOSTNAME: FILESERV1
  ```

```
T FILE               FS FSTYPE DG LVM-
DEVICE                                      DEVICE    COPY-
GROUP PORT#  TID# LUN# MU# LDEV# P/S SERIAL#
F Harddisk1 D:\temp\file1.txt D: NTFS   -  \\?
\Volume{df66a5b0-5583-12d5-a410-806d6172696f}\ harddisk1
VG01,dev01 CLI-A  2   10   0   10000 P   15044
F -                 -  -      -
-                                                    -
VG01,dev01 CLI-A  2   11   0   10001 P   15044
```

- In this example, the command is used to display backup information about the file system of the D drive. The host name is FILESERV1:

```
PROMPT> drmfscat D: -hostname FILESERV1
INSTANCE: D:
BACKUP-ID:0000000001 BACKUP-MODE: COLD INSTANCE: D: ORIGINAL-ID:
0000000001
START-TIME:2002/06/01 10:00:00 END-TIME: 2002/06/01 10:03:00
HOSTNAME: FILESERV1
T FILE   FS  DG    DEVICE     COPY-GROUP
F -      D:  -     Harddisk1  VG01,dev01
F -      -   -     -          VG01,dev01
```

- In this example, the command is used to display backup information for the file system of the D drive and management information for the backup catalog:

```
PROMPT> drmfscat D: -v
VIRTUAL-SERVERNAME: host1
DB-PATH: D:\Program Files\Hitachi\DRM\db2
INSTANCE: D:
BACKUP-ID:0000000001 BACKUP-MODE: COLD INSTANCE: D: ORIGINAL-ID:
0000000001
START-TIME: 2002/06/01 10:00:00 END-TIME: 2002/06/01 10:03:00
HOSTNAME: FILESERV1
CATALOG-UPDATE-TIME: 2002/06/01 10:02:00
T FILE   FS  DG  DEVICE      COPY-GROUP
F -      D:  -   Harddisk1   VG01,dev01
F -      -   -   -           VG01,dev01
```

- In this example, the command is used to display backup information for the file system of the D drive and management information for the backup catalog (when a backup is not performed):

```
PROMPT> drmfscat D: -v
VIRTUAL-SERVERNAME: host1
DB-PATH: D:\Program Files\Hitachi\DRM\db2
KAVX0024-E The specified backup data does not exist.
```

- In this example, the command is used to display backup information for the file system specified by the mount point D:\MNT:

```
PROMPT> drmfscat D:\MNT
INSTANCE: D:\MNT
BACKUP-ID:0000000001 BACKUP-MODE: COLD INSTANCE: D:\MNT ORIGINAL-
ID:0000000001
START-TIME:2002/06/01 10:00:00 END-TIME: 2002/06/01 10:03:00
HOSTNAME: FILESERV1
T FILE   FS      DG  DEVICE     COPY-GROUP
F -      D:\MNT  -   Harddisk1  VG01,dev02
F -      -       -   -          VG01,dev02
```

- In this example, the command is used to concurrently display the backup information for the file systems in the mount point directories `D:`, `E:`, and `F:\MNT` specified in the mount point directory target definition file `APP1`:

```
PROMPT> drmfscat APP1
INSTANCE: APP1
BACKUP-ID:0000000001 BACKUP-MODE: COLD INSTANCE: APP1 ORIGINAL-
ID:0000000001
START-TIME:2002/06/01 10:00:00 END-TIME: 2002/06/01 10:03:00
HOSTNAME:    FILESERV1
T FILE  FS       DG        DEVICE      COPY-GROUP
F -     D:       -         Harddisk1   VG01,dev01
F -     E:       -         Harddisk2   VG01,dev02
F -     F:\MNT   -         Harddisk3   VG01,dev03
```

drmfsdisplay (Displays or updates file system information)

Formats

To display file system information:

```
drmfsdisplay [ mount-point-directory-name ]
            [ -target file-or-directory-names | -f target-
definition-file-name ]
            [ -device device-file-name ][ -l ] [ -v ][ -cf ]
```

To update the information in the dictionary map files:

```
drmfsdisplay -refresh
```

Description

The `drmfsdisplay` command performs the following three functions:

1. Displays the resource information for the file system on the server where the command is executed.
2. Displays the information, organized by mount point directory, for a file system on the system where the command is executed.
3. Updates the file system information for the dictionary map files. Execute this command before performing a backup.

The following table lists the items displayed by the above functions 1 and 2.

Table 2-11 Items displayed by the drmfsdisplay command

Displayed item	Description
INSTANCE	Mount point directory name
T	Object type (`F`, which means file, is displayed.)
FILE	File name
FS	Mount point directory name
FSTYPE	File system type

Displayed item	Description
	(NTFS)
DG	A hyphen (-) is displayed.
LVM-DEVICE	For an environment with a logical volume manager, the name of the logical device file
	For an environment without a logical volume manager, GUID
DEVICE[#1]	Physical device file name (raw device file name) or Harddisk*n*, where *n* is an integer
COPY-GROUP	The copy group name, displayed as follows:
	CCI-volume-group-name,*device-name*
PORT#	Port name on the server host side
TID#	Target ID on the server host side
LUN#	Logical unit number on the server host side
MU#	Pair identifier
LDEV#	Logical device number across RAID devices
P/S	Letter identifying whether the volume is primary or secondary:
	P: Primary volume of a pair
	S: Secondary volume of a pair
	-: A volume that is not part of a pair
SERIAL#	Serial number across RAID devices
COPY-FUNC	Copy type
	Copy type: The name of the copy type varies depending on the DKC software product (storage system unit) and microcode version.
	-: Indicates a volume where a pair volume has not been configured. (Do not create a program that operates by using this display.)
GEN-NAME	Generation identifier
	local_*n*: A local pair volume (where *n* is a generation number from 0 to 999)
	remote_*n*: A remote pair volume (where *n* is a generation number from 0 to 999)
	-: Indicates a volume where a pair volume has not been configured.
VIRTUAL-SERVERNAME[#2]	Virtual server name (value of the DRM_HOSTNAME environment variable)
DB-PATH[#2]	Name of the directory in which the dictionary map files are stored
CORE-MAPFILE-UPDATE-TIME[#2]	Update time for the core map file
APP.-MAPFILE-UPDATE-TIME[#2]	Update time for the application map file

#1

    If this command is executed with the `-device` option, `DEVICE` will be displayed after `T`.

#2

    If this command is executed with the `-v` option, this information is displayed.

A hyphen (`-`) is displayed for any item that cannot be displayed. If none of the items can be displayed, an error message is displayed.

Each item is separated by a space.

Arguments

mount-point-directory-name

Specify the drive letter of the file system for which you want to display information, or specify its absolute path starting with the drive letter. Do not specify a backslash (`\`) at the end of the path.

If this argument is not specified, the command targets all file systems.

`-target` *file-or-directory-names*

Specify this option to display information about specific files or directories. Use absolute paths to specify the file names or directory names. To display information for multiple files or directories, use commas to separate each file name or directory name that you specify. You cannot specify a backslash (`\`) at the end of the paths.

`-f` *target-definition-file-name*

Specify this option to display information about specific files or directories. Create a target definition file in advance that contains a list of the absolute paths of the files or directories for which you want to display information. By specifying the target definition file name, you can collectively specify all targets for which you want to display information. Use an absolute path to specify the target definition file name.

`-device` *device-file-name*

Specify this option to display only the information about a specific device file. With this option specified, the command displays the information about the specified device file for the file system specified in the *mount-point-directory-name* argument. If you do not specify this option, the command displays information about the specified device file for all file systems.

`-l`

Specify this option to display information in the long format.

`-v`

Specify this option to display management information for the dictionary map files. The following information is displayed:

- Name of the directory in which the dictionary map files are stored

  Displays the path that is set for `DRM_DB_PATH` environment variable in the Application Agent configuration definition file (`init.conf`).

  If the `DRM_DB_PATH` environment variable has not been set, the default storage directory for the dictionary map files, which are created automatically during installation, is displayed.

- Virtual server name (value of the `DRM_HOSTNAME` environment variable)

  If the `DRM_HOSTNAME` environment variable has not been set, a hyphen (-) appears.

- Update time for the dictionary map files

  Displays the update time separately for the core map file and the application map file. The same time is displayed when you execute the `drmfsdisplay` command.

`-cf`

Specify this to display local or remote copy types, or the name identifying the generation corresponding to the copy group name. Remote information is also displayed.

`-refresh`

Specify this option to update the information in the dictionary map files to the latest state. The command updates the information in the dictionary map files for all file systems. At this time, the contents of the core map file are deleted once during the update, and are then updated. Specify this option even if disk information for `snapshot` is set up in the dictionary map files.

The dictionary map files are updated on the database server.

If the disk configuration has changed, always update the dictionary map files.

> ⚠️ **Note:** When specifying on the command line a file name or directory name containing space characters for the `-target` option or the `-f` option, you must enclose the file name in double quotation marks (`"`).
> Note that enclosing with double quotation marks is not necessary for target paths specified in batch definition files.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to display information about the file system on the D drive:

```
PROMPT> drmfsdisplay D:
INSTANCE: D:
T FILE        FS          DG          DEVICE              COPY-GROUP
F -           D:          -           Harddisk1           VG01,dev01
```

- In this example, the command is used to display information about the file system specified by the mount point `D:\MNT`:

```
PROMPT> drmfsdisplay D:\MNT
INSTANCE: D:\MNT
T FILE        FS           DG       DEVICE               COPY-
GROUP
F -           D:\MNT       -        Harddisk1
VG01,dev01
```

- In this example, the command is used to display file system information, in the long format, about the file `D:\temp\file1.txt` on the D drive:

```
PROMPT> drmfsdisplay D: -target D:\temp\file1.txt -l
INSTANCE: D:
T FILE              FS  FSTYPE  DG  LVM-
DEVICE                                      DEVICE    COPY-
GROUP PORT#  TID# LUN# MU# LDEV# P/S SERIAL#
F D:\temp\file1.txt   D:  NTFS   -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk1
VG01,dev01 CL1-A  0    0    0   10000 P   15044
```

- In this example, the command is used to display file system information, in the long format, about the disk volume `Harddisk1`:

```
PROMPT> drmfsdisplay -device Harddisk1 -l
INSTANCE: D:
T DEVICE     FILE                    FS    FSTYPE  DG  LVM-
DEVICE
COPY-GROUP PORT#  TID# LUN# MU# LDEV# P/S SERIAL#
F Harddisk1 D:\temp\file1.txt   D:   NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\ VG01,dev01 CL1-A
0    0    0   10000 P   15044
```

- In this example, the command is used to display information about the file system on the D drive and management information for the dictionary map files:

```
PROMPT> drmfsdisplay D: -v
VIRTUAL-SERVERNAME: host1
DB-PATH: D:\Program Files\Hitachi\DRM\db2
INSTANCE: D:
CORE-MAPFILE-UPDATE-TIME: 2002/06/01 10:00:00
APP.-MAPFILE-UPDATE-TIME: 2002/06/01 10:00:00
T FILE        FS           DG       DEVICE            COPY-GROUP
F -           D:           -        Harddisk1         VG01,dev01
```

- In this example, the command is used to display information about the file system on the D drive and management information for the dictionary map files (when no dictionary map files exist):

```
PROMPT> drmfsdisplay D: -v
VIRTUAL-SERVERNAME: host1
DB-PATH: D:\Program Files\Hitachi\DRM\db2
KAVX0039-E The core map file(s) cannot be found.
```

- In this example, the command is used to display the type (local copy or remote copy) of the file system on the D drive, as well as the name identifying the generation:

```
PROMPT> drmfsdisplay D: -l -cf
INSTANCE: /mnt
T FILE      FS FSTYPE DG  LVM-
DEVICE                                      DEVICE    COPY-
GROUP PORT# TID# LUN# MU# LDEV# P/S SERIAL#  COPY-FUNC   GEN-NAME
```

```
      F D:\file1 D: NTFS   -   \\?\Volume{df67a5b0-5583-11d5-
a410-806d6172696f}\ Harddisk1 VG01,dev01 CL1-A 0    0    0
10000 P   15044   ShadowImage local_0
```

drmfsrestore (Restores a file system from a backup)

Format

```
drmfsrestore backup-ID -resync [ -force ]
            [ -target directory-name | -f target-definition-file-
name ]
            [ -pf copy-parameter-definition-file ]
```

Description

The `drmfsrestore` command is used to restore data from the secondary volume to the primary volume, which resynchronizes the disks. The backup data used for the restoration is specified by a backup ID.

On file systems that consist of multiple physical volumes, all volumes will be restored.

The following explains the command processing for a restoration, which resynchronizes the disks:

1. When the file system to be restored has been mounted, the command automatically unmounts the file system.
   If the file system cannot be unmounted, the command displays an error message and restoration processing fails.
   When the file system has already been unmounted, processing proceeds to the next step.
2. The command confirms that the file system has been unmounted, and then resynchronizes the disks by restoring the backup data from the secondary volume to the primary volume.
3. The command mounts the file system again.

The following explains the command processing for restoration in a cluster configuration:

1. The command automatically takes the disk resource offline when the disk resource in the file system to be restored is brought online.
   If an attempt to take a disk resource offline fails, the command displays an error message and restoration processing fails.
   When the disk resource has already been taken offline, processing proceeds to the next step.
2. The command confirms that the disk resource has been successfully taken offline, and then resynchronizes the disk by restoring the backup data from the secondary volume to the primary volume.
3. The command brings the disk resource online.

In a Windows Server Failover Clustering environment, you can restore a volume within a cluster group while the cluster resources are online if

`CLU_MSCS_RESTORE` is set to `ONLINE` in the Application Agent configuration definition file (`init.conf`).

Restoration overwrites the entire primary volume with the entire secondary volume that contains a backup of the primary volume. Therefore, additions and changes to the primary volume after the backup was created are not applied.

Before executing this command, all application software using the volume to be restored must be stopped. The volume being used by the operating system cannot be restored.

This command should be used to restore the primary volume to the secondary volume. This command should not be used when data is being backed up from the secondary volume to a tape device with the `drmmediabackup` command, when data is being restored from a tape device to the secondary volume with the `drmmediarestore` command, or when the secondary volume is being mounted with the `drmmount` command.

If the partition style of the physical disk is changed after a backup, and the command is then executed, the command result will vary as described in the following table.

Table 2-12 Physical disk partition style and command execution results

| Before a backup | After a backup | | Command execution result |
Primary volume	Primary volume	Secondary volume	Command status
MBR disk	MBR disk	MBR disk	Normal termination
		GPT disk	Error message (KAVX5171-E or KAVX5137-E) After resynchronizing[1]
	GPT disk	MBR disk	Error message (DRM-10337) Before resynchronizing[2]
		GPT disk	Error message (DRM-10337) Before resynchronizing[2]
GPT disk	MBR disk	MBR disk	Error (DRM-10337 message) Before resynchronizing[2]
		GPT disk	Error message (DRM-10337) Before resynchronizing[2]
	GPT disk	MBR disk	Error message (KAVX5171-E or KAVX5137-E) After resynchronizing[1]
		GPT disk	Normal termination

#1

The error message is displayed after resynchronizing.

#2

The error message is displayed before resynchronizing.

Arguments

backup-ID

Specify the backup ID of the backup data you want to use for restoration. A backup ID uniquely identifies backup data. A backup ID is assigned to each backup and stored in the backup catalog. To check backup IDs, execute the `drmfscat` command.

`-resync`

Specify this option to restore the data from the secondary volume to the primary volume by resynchronizing the volumes. The contents of the primary volume become the same as the backup data on the secondary volume.

`-force`

Specify this option to restore the data from the secondary volume to the primary volume by forcibly resynchronizing the volumes.

With this option, forced resynchronization is performed if the copy group name of the primary volume obtained when backup processing was performed on the file server matches the information on the file server, even if the LDEV and SERIAL numbers do not match the LDEV and SERIAL numbers when backup processing was performed.

Specify this option only if restoration, which resynchronizes the disks, cannot be performed with the `-resync` option, such as when the LDEV number changes when the volume is replaced. If this option is specified under a normal restoration, data might be corrupted.

`-target` *directory-name*

Specify this option to restore the file system that contains the specific directory. The *directory-name* argument indicates a mount point directory, a drive, or a volume mount point. The specified directory name must be registered in the backup catalog. However, if the specified directory has already been backed up, it does not need to be registered in the backup catalog to restore the file system.

Use an absolute path to specify the directory name. The data is restored to the same location as that to which it was backed up. As such, make sure that the directory name that you specify completely matches the name of the directory that was backed up. If an incorrect path is specified, restoration will not be performed correctly. To display the information for multiple directories concurrently, use commas to separate each of the directory names that you specify. When you specify a directory name containing space characters, enclose the directory name in double quotation marks ("). You cannot specify a backslash (\) at the end of the path.

If you omit both this option and the `-f` option, the entire file system registered in the backup catalog will be restored.

`-f` *target-definition-file-name*

Specify this option to restore the file system that contains the specific file or directory. Use the file or directory name registered in the backup catalog specified by the backup ID.

Create a target definition file in advance. The target definition file can be used to define a list of the absolute paths of files or directories to be restored. By specifying the target definition file name, you can collectively specify all definition files or directories that you want to restore. Use an absolute path to specify the target definition file name. If the `-target` or `-f` options of the `drmfsbackup` command are specified, specify for this option, for each file or directory name, exactly the same absolute path as specified for the `drmfsbackup` command. If these names do not completely match, the file system will not be restored properly. You cannot specify a backslash (`\`) at the end of the path.

When you specify a target definition file name containing space characters, enclose the target definition file name in double quotation marks (`"`). Note, however, that you do not need to enclose specified paths with double quotation marks (`"`) when the target file name or directory name is specified in the target definition file.

If you omit both this option and the `-target` option, the entire file system registered in the backup catalog will be restored.

`-pf` *copy-parameter-definition-file*

Specify this option to use the number of retries and the retry interval defined in the copy parameter definition file. Specify only the file name, without specifying the path.

When you omit this option, the value in the CCI-linkage definition file (`DEFAULT.dat`) is used. Values in `DEFAULT.dat` are also used for parameters not specified in the copy parameter definition file.

Create a copy parameter definition file by using a name of your choice in the location below. Specify the file name by using an alphanumeric character string of up to 64 bytes.

Application-Agent-installation-folder`\DRM\conf\raid`

⚠️ **Note:**

- The backup information in the backup catalog is managed by using a copy group as a key. Depending on the backup method, you might not be able to perform restoration, even though the backup data exists on the secondary volume. For more information, see the notes on running Application Agent in the *Replication Manager Application Agent CLI User Guide*.

- Restoration in a cluster configuration is supported.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to restore data from the secondary volume to the primary volume, which resynchronizes the disks. The backup data used for restoration is identified by the backup ID `0000000001`.
  ```
  PROMPT> drmfsrestore 0000000001 -resync
  ```

- In this example, the command is used to restore data from the secondary volume to the primary volume, which resynchronizes the disks. The backup data used for restoration is identified by the backup ID `0000000001`. During restoration, the command uses the parameters defined in the copy parameter definition file `remote0.dat`.
  ```
  PROMPT> drmfsrestore 0000000001 -resync -pf remote0.dat
  ```

Basic command specifications (Common commands)

drmappcat (Views catalog information on a host)

Formats

To display backup information for a particular backup ID:
```
drmappcat backup-ID [ -l ][ -hostname host-name ][ -v ]
                            [ -comment backup-comment ][ -template ]
```

To display backup information:
```
drmappcat [ backup-ID ][ -l ][ -hostname host-name ][ -v ]
           [ -comment backup-comment ][ -template ]
```

To delete backup information:
```
drmappcat backup-ID -delete
```

Description

The `drmappcat` command allows to you display backup information, for file systems and applications, that is saved in the backup catalog on the server on which the command was executed.

The following table lists the displayed items.

Table 2-13 Items displayed for the drmappcat command

Displayed item	Description
BACKUP-COMMENT[#1]	Backup comment

Displayed item	Description
BACKUP-ID	Backup ID (10 characters)
ORIGINAL-ID[#2]	The original backup ID
BACKUP-MODE	Backup mode
HOSTNAME[#2]	Name of the server where the snapshot backup was performed
BACKUP-OBJECT	Snapshot backup object type
INSTANCE[#2, #3]	• The name of the instance of the backup target (for a database) • The name of the mount point directory (for a file system)
START-TIME	Start time of a snapshot backup
END-TIME	End time of a snapshot backup
VIRTUAL-SERVERNAME	Virtual server name (value of the DRM_HOSTNAME environment variable)
DB-PATH	Name of the directory storing the backup catalog

#1

When the -comment option is specified, this information is displayed.

#2

When the -l option is specified, these items are displayed.

#3

A hyphen (-) is displayed for Exchange Server.

Arguments

backup-ID

Specify this to display or delete backup information for a particular backup ID. A *backup ID* uniquely identifies backup data, and is registered in the backup catalog during backup.

-l

Specify this option to display the following items:

- ORIGINAL-ID
- HOSTNAME
- INSTANCE

-hostname *host-name*

Specify this option to display only information pertaining to a specific host. This option can be used when, for example, backup information executed on multiple servers is imported to the server on which you are executing the command.

`-v`

Specify this option to display information about the backup catalog.

The following information is displayed:

- Name of the directory storing the backup catalog
  Displays the path that is set in `DRM_DB_PATH` in the Application Agent configuration definition file (`init.conf`).

  If `DRM_DB_PATH` has not been set, the default storage directory for dictionary map files, which are created automatically during installation, is displayed.

- Virtual server name (value of the `DRM_HOSTNAME` environment variable)
  If the `DRM_HOSTNAME` environment variable has not been set, a hyphen (-) appears.

`-comment` *backup-comment*

Specify this option to display only information on a specific backup comment.

The *backup-comment* value is not case sensitive.

You can use an asterisk (`*`) to specify a wildcard in *backup-comment*. You can specify that only the initial characters match (for example, specify a string such as `XYZ*` to search for strings that begin with one or more specific characters and that end with any or no characters). When a wildcard, special character, or one-byte space character is used, the entire *backup-comment* string must be enclosed in double quotation marks ("). If the *backup-comment* string contains a special character but is not enclosed in double quotation marks, the special character is not properly handled as a part of the *backup-comment* string and is parsed as a special character. If you specify `-comment "*"`, the command will display all backup catalogs.

If two double quotation marks are specified after the `-comment` option (as in `-comment ""`), a message is displayed indicating that no backup data exists.

`-template`

Specify this option to display template catalog information.

The times at which the creation of a template catalog starts and ends are displayed in `START-TIME` and `END-TIME`, respectively.

The template catalogs displayed when this option is specified are only those for the SQL Server database for which backup operations are to be performed.

`-delete`

Specify this option to delete the backup information for the backup catalog.

Return Values

`0`: Normal termination

Any value other than 0: Termination with an error

Examples

- In this example, the command, with the host name `stdg7` specified, is used to display the detailed backup catalog list:

```
PROMPT> drmappcat -l -hostname stdg7
BACKUP-ID  ORIGINAL-ID BACKUP-MODE HOSTNAME BACKUP-OBJECT
INSTANCE START-TIME          END-TIME
0000000162 0000000162  ONLINE      stdg7    FILESYSTEM
F:       2003/10/02 18:24:35 2003/10/02 18:59:37
0000000251 0000000251  ONLINE      stdg7    MSSQL
DEFAULT  2003/10/03 18:55:15 2003/10/03 18:59:37
PROMPT>
```

- In this example, the command is used to display the detailed backup catalog list for the backup ID `0000000162`:

```
PROMPT> drmappcat 0000000162 -l -comment "*"
BACKUP-COMMENT BACKUP-ID  ORIGINAL-ID BACKUP-MODE HOSTNAME
BACKUP-OBJECT INSTANCE START-TIME          END-TIME
Comment        0000000162  ONLINE      stdg7    FILESYSTEM
F:       2003/10/02 18:24:35 2003/10/02 18:59:37
PROMPT>
```

- In this example, the command is used to display the backup catalog list and backup catalog management information, with backup comments:

```
PROMPT> drmappcat -v -comment "Comment*"
VIRTUAL-SERVERNAME: host1
DB-PATH: D:\Program Files\Hitachi\DRM
BACKUP-COMMENT BACKUP-ID  BACKUP-MODE BACKUP-OBJECT START-
TIME          END-TIME
Comment1       0000000162 ONLINE      FILESYSTEM    2003/10/02
18:24:35 2003/10/02 18:59:37
Comment2       0000000251 ONLINE      MSSQL         2003/10/03
18:55:15 2003/10/03 18:59:37
PROMPT>
```

- In this example, the command is used to give a displayed display of the catalog created by using `drmsqlbackup -template` command:

```
PROMPT> drmappcat -l -template
BACKUP-ID  ORIGINAL-ID BACKUP-MODE HOSTNAME BACKUP-OBJECT
INSTANCE START-TIME END-TIME
0000000252 0000000252  ONLINE      stdg7    MSSQL
DEFAULT  2003/10/03 18:55:15 2003/10/03 18:59:37
PROMPT>
```

- In this example, the command is used to delete the backup catalog of the backup ID `0000000162`:

```
PROMPT> drmappcat 0000000162 -delete
KAVX0424-I The backup information corresponding to the specified
backup ID has been deleted.
Backup ID = 0000000162
PROMPT>
```

drmcgctl (Locks or unlocks a copy group)

Formats

To list copy groups:
```
drmcgctl
```

To lock or unlock a copy group by specifying a copy group name:

```
drmcgctl -copy_group copy-group-name -mode { lock | unlock }
```

To lock or unlock a copy group by specifying a backup ID:

```
drmcgctl -backup_id backup-ID -mode { lock | unlock }
```

Description

The `drmcgctl` command locks a copy group that contains the backup data so that it is not overwritten the next time a backup is required. This command can also unlock copy groups. Locking copy groups is valid only on the server where this command was executed. Operations from this server to the copy group cannot be performed until the copy group is unlocked.

When you execute this command with no option specified, a list of copy groups will be displayed. This allows you to check the following:

- The lock status of the copy group
- The backup ID (if a backup has been made)

Arguments

`-copy_group copy-group-name`

Specify the name of the copy group you want to lock or unlock.

You can confirm that the logical volumes are the same by executing the `drmfsdisplay` command and checking the items listed for `LVM-DEVICE`.

In environments where one logical volume group comprises multiple copy groups, if the multiple generation backup function is used, the number of generations of all copy groups comprising the logical volume group must match. If the copy group generations do not match, backup generation management cannot be performed correctly in Application Agent.

`-mode { lock | unlock }`

Specify whether to lock or unlock the copy group. To lock the copy group, specify `lock`. To unlock the copy group, specify `unlock`.

`-backup_id backup-ID`

Specify the backup ID associated with the copy groups you want to lock or unlock. By specifying a backup ID, you can lock or unlock all the copy groups used for the backup identified by the specified ID at the same time. Specify the backup ID created when the backup was performed from the primary volume to the secondary volume.

To check backup IDs, execute either of the following commands, according to what was backed up:

- When the backup is of a file system, use the `drmfscat` command.
- When the backup is of an SQL Server database, use the `drmsqlcat` command.
- When the backup is of an Exchange database, use the `drmexgcat` command.

You cannot specify a backup ID that was created when a backup was performed from the secondary volume to a tape device. (You can use the `drmtapecat` command to check such a backup ID.) If such an ID is specified, a command error occurs.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to display a listing of lock information for each copy group:
  ```
  PROMPT> drmcgctl
  COPY GROUP                    LOCK STATUS   BACKUP-ID
  VG01,dev01                    LOCKED        0000000001
  VG01,dev02                    LOCKED        0000000001
  VG01,dev03                    UNLOCKED
  VG02,dev01                    UNLOCKED
  ```
- In this example, the command is used to unlock the copy group `VG01,dev01`:
  ```
  PROMPT> drmcgctl -copy_group VG01,dev01 -mode lock
  ```
- In this example, the command is used to unlock the copy group `VG01,dev01`:
  ```
  PROMPT> drmcgctl -copy_group VG01,dev01 -mode unlock
  ```
- In this example, the command is used to lock the copy groups used for the backup identified by the backup ID `0000000001`:
  ```
  PROMPT> drmcgctl -backup_id 0000000001 -mode lock
  ```
- In this example, the command is used to unlock the copy groups used for the backup identified by the backup ID `0000000001`:
  ```
  PROMPT> drmcgctl -backup_id 0000000001 -mode unlock
  ```

drmdbexport (Exports backup information to a file)

Format

```
drmdbexport backup-ID -f export-destination-file-name
```

Description

The `drmdbexport` command exports backup information from a backup catalog to a file. You can use the `drmdbimport` command to import data into a backup catalog on another server from a file that contains the exported backup information.

Arguments

backup-ID

Specify the backup ID of the backup catalog you want to export. To check backup IDs, execute one of the following commands according to what was backed up:

- When the backup is of a file system, use the `drmfscat` command.
- When the backup is of an SQL Server database, use the `drmsqlcat` command.
- When the backup is of an Exchange database, use the `drmexgcat` command.

`-f` *export-destination-file-name*

Use an absolute path to specify the file to which you want to export the backup information. Use a maximum of 511 bytes for a file name. If the specified export destination file already exists, the existing file is overwritten.

When specifying on the command line a file name or directory name containing space characters for the `-f` option, you must enclose the path in double quotation marks (").

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Example

- In this example, the command is used to export information for the backup with backup ID `0000000001` to the file `D:\tmp\0000000001.drm`:

  `PROMPT> drmdbexport 0000000001 -f D:\temp\0000000001.drm`

drmdbimport (Imports backup information from a file)

Format

`drmdbimport -f` *import-source-file-name*

Description

The `drmdbimport` command imports, into a backup catalog, backup information from a file that was exported by the `drmdbexport` command. Application Agent manages backup information based on copy groups, which are used as a key. If the backup information of the same copy group exists in the backup catalog when you attempt to import the backup information, the old backup information is overwritten.

Arguments

`-f` *import-source-file-name*

Use an absolute path to specify the file whose backup information is to be imported into the backup catalog. Use a maximum of 511 bytes for a file name.

When specifying on the command line a file name or directory name containing space characters for the `-f` option, you must enclose the path in double quotation marks (").

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Example

- In this example, the command is used to import the backup information from the file `D:\tmp\0000000001.drm`:

  ```
  PROMPT> drmdbimport -f D:\temp\0000000001.drm
  ```

drmdevctl (Conceals and reveals a physical volume)

Formats

To conceal the secondary volumes of all copy groups:

```
drmdevctl -detach [ -noscan ]
```

To conceal the secondary volumes of copy groups registered in a backup catalog:

```
drmdevctl backup-ID -detach [ -noscan ]
```

To conceal the secondary volumes of a specified copy group:

```
drmdevctl -copy_group copy-group-name -detach [ -noscan ]
```

To reveal (publish) the secondary volumes of all copy groups:

```
drmdevctl -attach [ -noscan ]
```

To reveal (publish) the secondary volumes of copy groups registered in a backup catalog:

```
drmdevctl backup-ID -attach [ -noscan ]
```

To reveal (publish) the secondary volumes of a specified copy group:

```
drmdevctl -copy_group copy-group-name -attach [ -noscan ]
```

To perform a disk rescan on the OS of the server:
```
drmdevctl -rescan
```

To display the disk signatures of the local volumes of all copy groups:
```
drmdevctl -sigview
```

To display the disk signatures of the local volumes of copy groups registered in a specified backup catalog:

```
drmdevctl backup-ID -sigview
```

To display the disk signature of the local volume of a specified copy group:

```
drmdevctl -copy_group copy-group-name -sigview
```

To update the disk signature of the local volume to the value generated at the time of backup (targeting copy groups registered in a specified backup catalog):

```
drmdevctl backup-ID -sigset
```

To update the disk signature of the local volume to the specified value (targeting a specified copy group):

```
drmdevctl -copy_group copy-group-name -sigset disk-signature
```

Description

This command conceals or reveals physical volumes of storage system devices connected to the server. By concealing physical volumes from the server and controlling access, you can prevent errors caused by user operations.

In addition, you can conceal physical volumes and obtain backups by using Thin Image or Copy-on-Write Snapshot to store multiple generations of these backups on secondary volumes. You can then back up each generation to a tape device via the backup server.

Because you can target all copy groups managed by Application Agent, you can perform an initial setup of a volume-concealed environment for backup servers. By specifying a backup ID and copy group, you can also execute this command after narrowing the list of potential targets.

You can also use this after starting operations, to conceal or reveal physical volumes of storage system devices connected to the server.

When the restoration command is terminated by an error on the file server or database server, the disk signature of the copy group can be displayed and

updated on the backup server. This helps recovery from the error that occurred during the restoration.

Note that you must set `DEVICE_DETACH=ENABLE` in the CCI-linkage definition file (`DEFAULT.dat`) when specifying the `-detach`, `-attach`, or `-rescan` options.

Arguments

backup-ID

Specify the backup ID of a backup catalog. When a backup ID is specified, the target physical volumes are the secondary volumes of the copy groups registered in the backup catalog.

`-copy_group` *copy-group-name*

Specify a valid copy group name. The target physical volumes are the secondary volumes of the copy group specified.

`-detach`

Conceals the physical volumes of the storage system from the server, and instructs the OS of the server to perform a disk rescan.

`-attach`

Reveals (publishes) physical volumes of the storage system that are concealed from the server, and instructs the OS of the server to perform a disk rescan.

`-noscan`

Specify this to stop the OS from being instructed to perform a disk rescan, after a volume is concealed or revealed. Note that if even one volume is concealed or revealed, an OS disk rescan instruction (`-rescan`) is necessary. Because an inconsistency might develop between the OS and the actual disk configuration if no disk rescan instruction is performed, operation is not guaranteed if operations other than `drmdevctl -detach` or `drmdevctl -attach` are executed.

This option must be specified when either the `-detach` or `-attach` option is specified.

`-rescan`

Instructs the OS to perform a disk rescan. A disk rescan is required after a volume is concealed or revealed. The time required to process a disk rescan depends on the hardware configuration, and particularly on the number of connected disks.

This option cannot be specified with other options.

`-sigview`

Displays the disk signatures of the physical volumes. Use this option to restore operation when the KAVX5137-E message is output and the restoration command terminates with an error.

- When a backup ID is specified with the `-sigview` option:

  The disk signature recorded when the backup was made is displayed. You can use this to compare the value of the current disk signature with the value at the time the backup was created.

- When both the `-sigview` option and `-copy_group` *copy-group-name* are specified at the same time, or neither the backup ID for the `-sigview` option nor the `-copy_group` *copy-group-name* is specified, only the current disk signature is displayed. The disk signature registered at backup is displayed as `--------`.

The following table shows the items displayed when the `-sigview` option is specified.

Table 2-14 Items displayed by the drmdevctl -sigview command

Displayed item	Description

COPY_GROUP	When the backup ID is specified:
	    The name of the copy group to be backed up
	When the copy group is specified:
	    The name of the specified copy group
	When none is specified:
	    All copy groups

DEVICE	The physical volume name corresponding to the copy groups. Example: `Harddisk0` `UNKNOWN` is shown when the physical volume is unable to be obtained because the disk is concealed.
TYPE	The partition style of the physical volume displayed on the `DEVICE`. (One of `MBR`, `GPT`, `RAW`, or `---`) When `UNKNOWN` is displayed for DEVICE, `---` is displayed.
CUR_DISKID	The current disk signature (in hexadecimal) of the physical volume displayed for DEVICE. When `UNKNOWN` is displayed for DEVICE, `--------` is displayed.
BKU_DISKID	The disk signature recorded in the backup catalog (in hexadecimal). When the disk signature is not set (for example, because backup was performed in an environment of Protection Manager version 4.1 or earlier), or when the backup ID is not specified, `--------` is displayed.

`-sigset` *disk-signature*

Updates the disk signature of the physical volume. Use this option to restore operation when the KAVX5137-E message is output and the restoration command terminates with an error.

When you specify the `-sigset` option, you must specify either the backup ID or the `-copy_group` *copy-group-name* at the same time.

- When the `-sigset` option and *backup-ID* are specified at the same time, the current disk signature is updated in accordance with the disk signature that was recorded at the time of backup. You cannot specify an arbitrary disk signature.

- When the `-sigset` option and the `-copy_group` *copy-group-name* are specified at the same time, the current disk signature is updated in accordance with the specified disk signature that follows the `-sigset` option. In this case, a disk signature must always be specified.

  The disk signature to be specified differs depending on the partition style.

  The following table lists partition styles and corresponding disk signatures to be specified.

Table 2-15 Partition styles and corresponding disk signatures to be specified

Partition style	Format (Example)	Remarks
MBR	`ABCDEF01`	Hexadecimal, maximum 8 digits
GPT	`ABCDEF01-2345-6789-ABCD-EF0123456789`	GUID (Curly brackets (`{}`) are not used.)

⚠ **Note:** A backup ID and the `-copy_group` option cannot be specified at the same time.

If neither the *backup-ID* option nor the `-copy_group` option is specified, the secondary volumes of all copy groups managed by Application Agent will be targeted.

The CCI instance used by Application Agent is specified in the CCI-linkage definition file (`DEFAULT.dat`) as `HORCMINST=`*n*. Of the two volumes defined as pair volumes in a CCI instance, the volume directly managed by the CCI instance used by Application Agent is the secondary volume.

When a volume is concealed and the disk configuration is rescanned, an error message indicating that a device has been removed is recorded in the Windows event log. We recommend that you periodically delete error messages from the Windows event log.

If this command is executed with the `-detach` option specified, take the physical volume offline from all applications (close the volume). If you leave the volume online, the physical volume will be forcefully concealed from the server even if applications are being used, which might result in unexpected application problems.

If the local volume is not mapped to the physical volume because, for example, the copy group is concealed, the following limitations apply:

- When the command is executed with the `-sigview` option specified, the current disk signature cannot be viewed. The output result of the command is displayed as `--------`.
- When the command is executed with the `-sigset` option specified, the disk signature cannot be updated.
To display and update the current disk signature, the copy group must be displayed and the local volume must be mapped to the physical volume.
If the disk signature is updated with the `-sigset` option specified, execute the command again with the `-sigview` option specified and make sure that the disk signature has been updated properly.
Note that if the updated disk signature already exists on another volume, the disk signature might be updated to a different disk signature set by Windows. If this happens, execute the command by specifying both the `-sigset` option and the copy group of the physical volume whose disk signature you want to update. Update the disk signature to a different value, making sure to avoid duplicating another disk signature.
If an attempt to update the disk signature is made with the `-sigset` option specified when the disk signature format is different from the disk partition style, the KAVX5170-E error message is displayed and the command will terminate with an error.
If this command is executed with both the `-sigview` option and *backup-ID* specified, and the disk signature format registered in the backup catalog is different from the current disk partition style, the KAVX5171-E error message is displayed and the command will terminate with an error.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command conceals the secondary volumes of all copy groups, and performs a drive rescan:
  ```
  PROMPT> drmdevctl -detach
  ```

- In this example, the command conceals the secondary volumes of the copy groups registered in the backup catalog, and performs a drive rescan:
  ```
  PROMPT> drmdevctl 0000000002 -detach
  ```

- In this example, the command is used to execute multiple conceal operations for the secondary volumes of copy groups, and to perform a drive rescan at the end:
  ```
  PROMPT> drmdevctl -copy_group G1,d1 -detach -noscan
  PROMPT> drmdevctl -copy_group G1,d2 -detach -noscan
  PROMPT> drmdevctl -copy_group G1,d3 -detach -noscan
  PROMPT> drmdevctl -rescan
  ```

- In this example, the command is used to reveal (publish) the secondary volumes of all copy groups, and to perform a drive rescan:
  ```
  PROMPT> drmdevctl -attach
  ```

- In this example, the command is used to reveal (publish) the secondary volumes of the copy groups registered in the backup catalog, and to perform a drive rescan:
  ```
  PROMPT> drmdevctl 0000000002 -attach
  ```

- In this example, the command is used to execute multiple reveal (publish) operations for the secondary volumes of copy groups, and to perform a drive rescan at the end:
  ```
  PROMPT> drmdevctl -copy_group G1,d1 -attach -noscan
  PROMPT> drmdevctl -copy_group G1,d2 -attach -noscan
  PROMPT> drmdevctl -copy_group G1,d3 -attach -noscan
  PROMPT> drmdevctl -rescan
  ```

- In this example, the command is used to display the current disk signatures of the local volumes for all copy groups:
  ```
  PROMPT> drmdevctl -sigview
  COPY_GROUP  DEVICE      TYPE CUR_DISKID BKU_DISKID
  VG01,dev01  Harddisk10  MBR  ABCDEF01   --------
  VG01,dev02  Harddisk11  MBR  ABCDEF02   --------
  VG01,dev03  UNKNOWN     ---  --------   --------
  VG02,dev11  Harddisk12  GPT
  ABCDEF01-2345-6789-ABCD-EF0123456701  --------
  VG02,dev12  Harddisk13  GPT
  ABCDEF01-2345-6789-ABCD-EF0123456702  --------
  VG02,dev13  UNKOWN      ---  --------
  --------
  ```

- In this example, the command is used to display the current disk signature of the local volume, and, for the copy group recorded in the backup catalog that corresponds to the backup ID 0000000002, the disk signature at the time of backup:
  ```
  PROMPT> drmdevctl 0000000002 -sigview
  COPY_GROUP  DEVICE      TYPE CUR_DISKID BKU_DISKID
  VG01,dev01  Harddisk10  MBR  ABCDEF01   ABCDEF00
  VG01,dev02  Harddisk11  MBR  ABCDEF02   ABCDEF03
  ```

- In this example, the command is used to display the current disk signature of the local volume for the copy group VG01,dev01:
  ```
  PROMPT> drmdevctl -copy_group VG01,dev01 -sigview
  COPY_GROUP  DEVICE      TYPE CUR_DISKID BKU_DISKID
  VG01,dev01  Harddisk10  MBR  ABCDEF01   --------
  ```

- In this example, for the copy group recorded in the backup catalog that corresponds to the backup ID 0000000002, the command is used to update the disk signature of the local volume to the disk signature at the time of backup:
  ```
  PROMPT> drmdevctl 0000000002 -sigset
  ```

- The examples below update the local volume disk signature for the copy group.

  For an MBR disk:

  This example updates the disk signature to ABCDEF00 for the copy group VG01,dev01:
  ```
  PROMPT> drmdevctl -copy_group VG01,dev01 -sigset ABCDEF00
  ```

  For a GPT disk:

This example updates the disk signature to `ABCDEF01-2345-6789-ABCD-EF0123456701` for the copy group `VG02,dev11`:

```
PROMPT> drmdevctl -copy_group VG02,dev11 -sigset
ABCDEF01-2345-6789-ABCD-EF0123456701
```

drmhostinfo (Displays host information)

Format

```
drmhostinfo [ -i ]
```

Description

The `drmhostinfo` command displays information about Application Agent installed on the host.

Table 2-16 Host information displayed by the drmhostinfo command

Displayed item	Description
PRODUCT	Application Agent internal component name. • Hitachi Replication Manager Application Agent Copy Controller This component provides the basic Application Agent functionality. Use it to back up and restore file systems. • Hitachi Replication Manager Application Agent for SQL Use this component to back up and restore SQL Server databases. • Hitachi Replication Manager Application Agent for Exchange Use this component to back up and restore Exchange databases.

VERSION	Product version.
	If this option is not specified, the information is displayed in the format $VV.R.r.AASS(VV-Rr-as^{\#1})^{\#2}$. The following are examples:
	Hitachi Replication Manager Application Agent Copy Controller 7.0.0-00:
	`07.0.0.0000(07-00)`
	Hitachi Replication Manager Application Agent Copy Controller 7.0.0-01:
	`07.0.0.0001(07-00-01)`
	If the `-i` option is specified, the information is displayed in the format $VV.R.r.AASS^{\#2}$. The following are examples:
	Hitachi Replication Manager Application Agent Copy Controller 7.0.0-00:
	`07.0.0.0000`

Displayed item	Description
	Hitachi Replication Manager Application Agent Copy Controller 7.0.0-01: `07.0.0.0001`
ORGANIZATION	The company name. The organization name set in the OS is displayed.
OWNER	The user name. The user name set in the OS is displayed.
INSTALL_PATH	Installation path for Application Agent internal components. `Application-Agent-installation-folder`\DRM

#1

    If Application Agent is neither a restricted version nor a corrected version, `-as` is not displayed.

#2

    The above table uses the following notation:

    VV: Version number (2 digits)

    R: Revision number (1 digit)

    r: Minor revision number (1 digit)

    AA: Restriction code (2 digits). For a non-restricted version, `00` is displayed.

    SS: Corrected version number (2 digits). For a non-restricted version, `00` is displayed.

    a: Value obtained by converting *AA* (for example, `01`, `02`, or `03`) to a single alphabetic character (for example, `A`, `B`, or `C`). For a non-restricted version, *a* is not displayed.

    s: Last digit of *SS*. For a non-restricted version, *s* is not displayed.

Arguments

`-i`

Specify this option to display product information in CSV format.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

The following are examples of using Application Agent version 7.0.

- In this example, the `drmhostinfo` command is used to display host information:

```
PROMPT> drmhostinfo
PRODUCT                                                        VERSION
Hitachi Replication Manager Application Agent Copy
Controller              07.0.0.0000(07-00)
Hitachi Replication Manager Application Agent for SQL
07.0.0.0000(07-00)
Hitachi Replication Manager Application Agent
Console                          07.0.0.0000(07-00)
PROMPT>
```

- In this example, the `drmhostinfo` command is used to display product information in CSV format:

```
PROMPT> drmhostinfo -i
#PRODUCT,VERSION,ORGANIZATION,OWNER,INSTALL_PATH
"Hitachi Replication Manager Application Agent Copy
Controller","07.0.0.0000","<ORGANIZATION>","<OWNER>","C:\Program
Files\Hitachi\DRM"
"Hitachi Replication Manager Application Agent for
SQL","07.0.0.0000","","","C:\Program Files\Hitachi\DRM"
"Hitachi Replication Manager Application Agent
Console","07.0.0.0000","<ORGANIZATION>","<OWNER>","C:\Program
Files\Hitachi\DRM_CONSOLE"
PROMPT>
```

- In this example, the `drmhostinfo` command is used to output product information to a CSV file:

```
PROMPT> drmhostinfo -i >D:\temp\drmhostinfo.csv
PROMPT>
```

drmresync (Resynchronizes copy groups)

Formats

To resynchronize a copy group:

drmresync -copy_group *copy-group-name* [-pf *copy-parameter-definition-file*]

To resynchronize the copy groups associated with a backup ID:

drmresync -backup_id *backup-ID* [-pf *copy-parameter-definition-file*]

To resynchronize a copy group target definition file:

drmresync -cg_file *copy-group-list-file* [-pf *copy-parameter-definition-file*]

Description

The `drmresync` command resynchronizes the specified copy group or the copy groups associated with the specified backup ID and returns them to the mirror status. The corresponding backup information is then deleted from the backup catalog. Because this command uses the primary volume as the base for synchronization with the secondary volume, the backup data contained in the secondary volume will be overwritten. We recommend that you copy the

contents of the secondary volume to tape or other secondary storage media before executing this command.

Do not use this command when the data is being backed up from a secondary volume to a tape device by using the drmmediabackup command, when the data is being restored from a tape device to a secondary volume by using the drmmediarestore command, or when a secondary volume is being mounted by using the drmmount command.

When you execute the drmresync command while the pair status is SMPL, the system does not automatically execute the paircreate command. The system automatically executes the paircreate command when the PAIR_CREATE parameter in the CCI-linkage definition file (DEFAULT.dat) is set to ENABLE.

Arguments

-copy_group *copy-group-name*

Specify the name of the copy group you want to resynchronize.

To check the copy group name, execute either of the following commands according to what was backed up:

- When the backup is of a file system, use the drmfscat command.
- When the backup is of an SQL Server database, use the drmsqlcat command.
- When the backup is of an Exchange database, use the drmexgcat command.

-backup_id *backup-ID*

Specify the backup ID associated with the copy groups you want to resynchronize. By specifying a backup ID, you can resynchronize all the copy groups used for the backup identified by the specified ID at one time.

To check backup IDs, execute one of the following commands according to what was backed up:

- When the backup is of a file system, use the drmfscat command.
- When the backup is of an SQL Server database, use the drmsqlcat command.
- When the backup is of an Exchange database, use the drmexgcat command.

-cg_file *copy-group-target-definition-file-name*

Specifies the absolute path of the copy group target definition file, in which the copy groups to be resynchronized are listed. If there are multiple target copy groups, specify this to resynchronize all copy groups at the same time.

To check the copy group name, execute either of the following commands according to what was backed up:

- When the backup is of a file system, use the `drmfscat` command.
- When the backup is of an SQL Server database, use the `drmsqlcat` command.
- When the backup is of an Exchange database, use the `drmexgcat` command.

`-pf copy-parameter-definition-file`

Specify this option when using the number of retries and the retry interval defined in the copy parameter definition file. Specify only the file name, without specifying the path.

When you omit this option, the value of the CCI-linkage definition file (`DEFAULT.dat`) is used. The value of the CCI-linkage definition file (`DEFAULT.dat`) is used for parameters that are not coded in the copy parameter definition file.

Create the copy parameter definition file with an arbitrary name in the location below. Specify the file name by using an alphanumeric character string that is 64 bytes or less.

`Application-Agent-installation-folder\DRM\conf\raid`

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to resynchronize the copy group `VG01,dev01`:

  `PROMPT> drmresync -copy_group VG01,dev01`
- In this example, the command is used to lock the copy groups used in the backup identified by the backup ID `0000000001`:

  `PROMPT> drmresync -backup_id 0000000001`

Basic command specifications (Tape-related commands)

drmmediabackup (Backs up data from a secondary volume to a tape device)

Format
```
drmmediabackup backup-ID [ -raw ] [ -bkdir backup-file-directory ]
[ -bup_env configuration-definition-file-name ]
```

Description

The `drmmediabackup` command backs up data to a tape device based on the backup information specified by the backup ID. Before executing this command, you must mount the secondary volume to the mount point directory on the backup server. Use the `drmmount` command to mount the secondary volume, and specify the backup ID in the argument. Additionally, after executing the `drmmediabackup` command, execute the `drmumount` command to unmount the mounted secondary volume.

The `drmmediarestore` command can restore data backed up by the `drmmediabackup` command.

Before executing the `drmmediabackup` command, confirm the following:

- The volume is linked to the backup management product.
- The `drmmount` command has been executed with a backup ID specified and the secondary volume to be backed up has been mounted.
- A definition file for the tape backup has been created.
- The secondary volume is not in the mirror status.

If an error occurs during execution of the `drmmediabackup` command, check the contents of the trace log of the backup management product that is provided by Application Agent. Then, take action for the error according to what was output to the log.

For NetBackup

The trace log is output to the following file:

Application-Agent-installation-folder\DRM\log\drm_nbu_backup.log

For Backup Exec

Application Agent does not provide trace logs for Backup Exec. If an error occurred, check the log provided by Backup Exec, or use the GUI to check the status, and then take appropriate action.

Take the command retry period into consideration when you execute more than one `drmmediabackup` command concurrently. For details about the settings, see notes on command execution in the *Replication Manager Application Agent CLI User Guide*.

Arguments

backup-ID

Specify the backup ID for the secondary volume that contains the backup data to be copied to a tape device. A backup ID uniquely identifies backup data and is registered in the backup catalog during backup.

To check backup IDs, execute one of the following commands according to what was backed up:

- When the backup is of a file system, use the `drmfscat` command.

- When the backup is of an SQL Server database, use the `drmsqlcat` command.
- When the backup is of an Exchange database, use the `drmexgcat` command.

When using the `drmmediabackup` command, make sure that you specify the backup ID for use with the `drmmount` command and perform the mount beforehand. If you use the `drmmount` command to mount with a copy group name specified, you cannot use the `drmmediabackup` command.

`-raw`

Specify this option to back up the secondary volume as a raw device. This backs up data per logical volume.

You can specify this option only for NetBackup.

`-bkdir` *backup-file-directory*

If this option is omitted, the backup will be performed for the directory registered in the backup catalog at the time the command is executed.

The conditions for specifying a backup file directory name are as follows:

Maximum number of characters: 255 bytes

Characters: Characters that can be used for directory names in Windows. Enclose in double quotation marks (") any backup file directory names containing space characters.

You cannot specify a drive as a backup file directory name, nor can you specify a backslash (\) as the last character of a backup file directory name.

Specify this option when the data on the secondary volume that is to be backed up to a tape device is backed up with directories. A backup with directories indicates that backup operations have been performed with one of the following options specified:

- When the backup is of an SQL Server database: the `drmsqlbackup` command was executed with an option other than the `-template` option.

For details on the option, see .

Do not specify the length of the backup file directory with a length that exceeds the maximum backup path length that the backup software (such as NetBackup or Backup Exec) in use can accept.

`-bup_env` *configuration-definition-file-name*

Specify this option to specify a start parameter for the user-defined configuration definition file, when volumes are either backed up to a tape device or restored from a tape device.

If you omit this option, the default configuration definition file is used. So, you need to create the default configuration definition file in advance.

Create a configuration definition file in the directory containing the default configuration definition file. For further information, see the description of configuration definition file creation in the *Replication Manager Application Agent CLI User Guide*.

The conditions for specifying a configuration definition file name are as follows:

Maximum number of characters (total length of the directory name and file name): 255 bytes

Specifiable characters: Those characters specifiable for file names in Windows

---

Note: – will be displayed unless the NetBackup master server, media server, and client server are all configured on the host where the `drmmediabackup` command is executed. Refer to the NetBackup image catalog to check the media label name.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Example

- In this example, the commands are used to mount the secondary volume to the D drive, and then copy the backup data identified by the backup ID `0000000002` from the secondary volume to tape:

```
PROMPT> drmmount 0000000002 -mount_pt D:
PROMPT> drmmediabackup 0000000002
PROMPT> drmumount 0000000002
```

drmmediarestore (Restores data from a tape device to a secondary volume)

Format

`drmmediarestore` *backup-ID* [`-raw`] [`-bup_env` *configuration-definition-file-name*]

Description

The `drmmediarestore` command restores data from tape to the secondary volume according to the backup information specified by the backup ID. Before executing this command, you must mount the secondary volume to the mount point directory on the backup server. Use the `drmmount` command to mount the secondary volume, and specify the backup ID in the argument. Additionally, after executing the `drmmediarestore` command, execute the `drmumount` command to unmount the mounted secondary volume.

The `drmmediarestore` command can restore data that is backed up by the `drmmediabackup` command command.

To restore backed-up data from a tape device in an environment that uses Backup Exec, use the Application Agent commands in the Backup Exec windows.

If you input `BEWS` for the `drmtapeinit` command to link with Backup Exec, the `drmmediarestore` command will mount the secondary volume for restoration, and then display a message. Use the Backup Exec windows to restore the data according to the instructions shown in the message.

After restoration, enter one of the following keywords:

- YES (normal termination)
- NO (termination with an error)
- CANCEL (operation canceled)

After restoration with Backup Exec finishes, enter the correct keyword.

Before executing the `drmmediarestore` command, confirm the following:

- The backup management product has been linked.
- The `drmmount` command has been executed with a backup ID specified and the secondary volume to be backed up has been mounted.
- The secondary volume is not in the mirror status.

If an error occurs during execution of the `drmmediarestore` command, check the contents of the trace log of the backup management product that is provided by Application Agent. Then, take action for the error according to what was output to the log.

For NetBackup

The trace log is output to the following file:

`Application-Agent-installation-folder\DRM\log\drm_nbu_restore.log`

For Backup Exec

Application Agent does not provide trace logs for Backup Exec. If an error occurred, check the log provided by Backup Exec, or use the GUI to check the status, and then take appropriate action.

Take the command retry period into consideration when you execute more than one `drmmediarestore` command concurrently. For details about the settings, see notes on command execution in the *Replication Manager Application Agent CLI User Guide*.

Arguments

`backup-ID`

Specify the backup ID of the backup data to be restored. A backup ID uniquely identifies backup data and is registered in the backup catalog during backup. To check backup IDs, execute the `drmtapecat` command.

When using the `drmmediarestore` command, make sure that you specify the backup ID for use with the `drmmount` command and perform the mount beforehand. If you use the `drmmount` command to mount with a copy group name specified, you cannot use the `drmmediarestore` command.

`-raw`

Indicates that the backup data specified by the backup ID has been backed up as a raw device with the `-raw` option specified. Even if you do not specify this option, if the -raw option is specified at the time of the backup, the command restores the data normally as though this option was specified. However, if the -raw option is not specified at the time of the backup, and this option is specified in an attempt to restore the data from the backup, then a command error occurs and a message is output.

You can specify this option for NetBackup only.

`-bup_env` *configuration-definition-file-name*

Specify this option to specify a start parameter for the user-defined configuration definition file, when either backup operations are performed to tape, or restore operations are performed from tape.

If you omit this option, the default configuration definition file is used. So, you need to create the default configuration definition file in advance.

Create a configuration definition file in the directory containing the default configuration definition file. For further information, see the description of configuration definition file creation in the *Replication Manager Application Agent CLI User Guide*.

> ⚠️ **Note:** The value of `NBU_MASTER_SERVER` in the configuration definition file must be the same as the value that was used during the backup.

The conditions for specifying a configuration definition file name are as follows:

Maximum number of characters (total length of the directory name and file name): 255 bytes

Specifiable characters: Those characters specifiable for file names in Windows

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Example

- In this example, the commands are used to mount the secondary volume to the `D` drive, and restore the backup data identified by the backup ID `0000000002` from tape:

```
PROMPT> drmmount 0000000002 -mount_pt D:
PROMPT> drmmediarestore 0000000002
PROMPT> drmumount 0000000002
```

drmmount (Mounts a secondary volume)

Formats

To mount a secondary volume by specifying the name of a copy group:
```
drmmount -copy_group copy-group-name
         [ -mount_pt mount-point-directory-name ]
```

To mount a secondary volume by specifying the name of a backup ID:
```
drmmount backup-ID
    [ -mount_pt mount-point-directory-name ][ -force ][ -conf ]
```

Description

The `drmmount` command mounts a secondary volume, and locks the corresponding copy group. Use this command in the following cases:

- To mount a secondary volume for backup or restoration
- To clear the system caches before a backup
- To mount the secondary volume that was unmounted after the backup or restoration

If the copy group mount definition file exists, the mount point specified in this file is used as the mount point for the secondary volume. For details about the copy group mount definition file, see the settings for mounting a secondary volume in the *Replication Manager Application Agent CLI User Guide*.

When a backup ID is specified, the copy group corresponding to the specified backup ID is locked. Because copy groups locked by the `drmmount` are unlocked by the `drmumount` command, when you use the `drmmount` command to mount a secondary volume, be sure to use the `drmumount` command to unmount it.

The secondary volume that is not formatted as a file system or that is in the mirror status cannot be mounted.

In the following cases, this command outputs a message, and results in an error without mounting the secondary volume:

- You execute this command on a host that cannot reference the secondary volume.
- The primary volume's copy group name, LDEV number and DKC serial number that were acquired when the backup was executed does not match the information on the current backup server.
- You execute this command on the secondary volume in the paired status (PAIR).

Arguments

`-copy_group` *copy-group-name*

Specify the name of the copy group to mount. The system cache must be cleared before a data backup. Specify the copy group from the backup server to mount the secondary volume, and then unmount the secondary volume by using the `drmumount` command to clear the system cache.

To check the name of a copy group, execute either the `drmfscat` command or the `drmfsdisplay` command.

`-mount_pt` *mount-point-directory-name*

Use an absolute path to specify the mount point directory to which the secondary volume is to be mounted.

Specify the drive letter as the mount point directory name or specify the absolute path from the drive letter.

- Maximum number of characters: Path lengths to be specified must comply with the specifications of the mount and unmount functions provided by CCI.
- Characters: Characters that can be used for directory names in Windows (you cannot use spaces)

If you specify a drive for the mount point directory name, the command searches for unused drive names in alphabetical order beginning from the specified drive, and then mounts the secondary volume on the first found drive.

If you specify an absolute path from the drive letter as the mount point directory name, the command mounts the secondary volume on the following location:

When mounting the secondary volume by specifying the copy group name:

absolute-path-specified-for-mount-point-directory-name

When mounting the secondary volume by specifying the backup ID:

absolute-path-specified-for-mount-point-directory-name\primary-volume-drive-letter\primary-volume-mount-point

If a path does not end with a backslash (\), the command assumes a backslash at the end of the path. For example, `D:` and `D:\` are assumed to be the same drive. `D:\MOUNTDIR` and `D:\MOUNTDIR\` are assumed to be the same directory.

When this option is omitted, the following mount point is used:

Any drive not being used when the `drmmount` command is executed.

backup-ID

Specify the backup ID associated with the copy groups you want to resynchronize. When multiple copy groups were used for the backup

identified by the specified backup ID, the secondary volumes of all the copy groups are mounted.

To check backup IDs, execute one of the following commands according to what was backed up:

- When the backup is of a file system, use the `drmfscat` command.
- When the `drmmount` command is executed, and then a restoration is performed by using the `drmmediarestore` command, use the `drmtapecat` command.
- When the backup is of an SQL Server database, use the `drmsqlcat` command.
- When the backup is of an Exchange database, use the `drmexgcat` command.

`-force`

Specify this option to forcibly mount a secondary volume. If the copy group name of the target volume matches the specified backup ID, the command forcibly mounts that volume even if its LDEV number or DKC serial number does not match the specification.

> ⚠️ **Note:** The `-force` option causes the command to mount the secondary volume without checking its LDEV number and DKC serial number. This might corrupt the data.

`-conf`

Specify this option to extract copy group mount definition information from the mounted secondary volume and then create or update the copy group mount definition file.

This option must be specified with a backup ID.

The name of the copy group mount definition file is created as follows:

Application-Agent-installation-folder\DRM\conf\vm\CG_MP.conf

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to mount the secondary volume identified by the backup ID `0000000001` to `D:`:
  ```
  PROMPT> drmmount 0000000001 -mount_pt D:
  ```
  If several secondary volumes have been backed up with the backup ID `0000000001`, the command searches for an unused drive in alphabetical order beginning from the D drive, and mounts the secondary volume to the first found drive.

- In this example, the command is used to mount the secondary volume identified by the backup ID `0000000001` to `E:\SVOLMNT`:

  ```
  PROMPT> drmmount 0000000001 -mount_pt E:\SVOLMNT
  ```

  If the configuration of the mount point of the primary volume is as follows:

  ```
  P:
  P:\MNT
  Q:
  ```

  Then, the `drmmount` command mounts the secondary volume to the following paths:

  ```
  E:\SVOLMNT\P
  E:\SVOLMNT\P\MNT
  E:\SVOLMNT\Q
  ```

drmtapecat (Displays or deletes backup information in a backup catalog)

Formats

To display information for the backup performed from the secondary volume to a tape device:

```
drmtapecat [ backup-ID ] [ -l ] [ -hostname host-name ] [ -v ] [ -comment
backup-comment ] [ -bkdir ]
```

To display information for the backup performed from the primary volume to the secondary volume:

- When the backup is of a file system:

  ```
  drmtapecat -o FILESYSTEM mount-point-or-drive-name | mount-
  point-directory-target-definition-file-name [ drmfscat-command-
  options ]
  ```

- When the backup is of an SQL Server database:

  ```
  drmtapecat -o MSSQL instance-name [ drmsqlcat-command-options ]
  ```

- When the backup is of an Exchange database:

  ```
  drmtapecat -o MSEXCHANGE [ drmexgcat-command-options ]
  ```

To delete the backup information:

```
drmtapecat backup-ID -delete
```

Description

The `drmtapecat` command lists the backup information about tape backups, which is stored in the backup catalog on the server where the command was executed. The backup catalog displayed is that created with the `drmmediabackup` command. By checking the backup information, you can confirm information about the objects corresponding to the backup ID, and hence confirm the backup ID to be used for restoration.

The backup information for the backup from the primary volume to the secondary volume contains the information about the primary volume that stores objects that were backed up onto a tape device, and the information about the database files that were backed up.

The following table shows the backup information, from the secondary volume to a tape device, which is displayed when the `drmtapecat` command is executed.

Table 2-17 Backup information displayed by the drmtapecat command

Displayed item	Description
BACKUP-COMMENT[#1]	Backup comment
BACKUP-ID	Backup ID (10 characters)
ORIGINAL-ID[#2]	Original backup ID obtained by the `drmmediabackup` command
HOSTNAME[#2]	Server name where the snapshot backup was performed
BACKUP-OBJECT	Snapshot backup object type
INSTANCE[#2]	Name of the instance that was backed up: • When the backup is of a file system, the name of the mount point directory is displayed. • When the backup is of an SQL Server database, the name of the SQL Server instance is displayed. • When the backup is of an Exchange database, – is displayed.
SNAPSHOT TIME	Time when a snapshot backup was performed
EXPIRATION TIME	Duration of the backup data on a tape device
BACKUP-MEDIA[#3]	Name of the media label that the backup management product used when backing up data to a tape device
BACKUP-FILE-DIRECTORY[#4]	The backup file storage directory backed up with the `drmmediabackup` command.
VIRTUAL-SERVERNAME[#5]	Virtual server name (value of the `DRM_HOSTNAME` environment variable)
DB-PATH[#5]	Name of the directory storing the backup catalog
CATALOG-UPDATE-TIME[#6]	Time when the backup catalog was created

#1

When the `-comment` option is specified, these items are displayed.

#2

When the `-l` option is specified, these items are displayed.

#3

– will be displayed unless the NetBackup master server, media server, and client server are all configured on the host where a tape backup is

executed. Refer to the NetBackup image catalog to check the media label name.

#4

When the `-bkdir` option is specified, this information is displayed.

#5

When the `-v` option is specified, this information is displayed.

#6

When the `-v` and `-o` options are specified, this information is displayed.

A hyphen (-) is displayed for any item that cannot be displayed. If none of the items can be displayed, an error message is displayed.

Each item is separated by a space.

This information provides further details than the backup information for a backup from the secondary volume to tape. This same information can also be obtained by using the following:

- When the backup is of a file system, use the `drmfscat` command
- When the backup is of an SQL Server database, use the `drmsqlcat` command
- When the backup is of an Exchange database, use the `drmexgcat` command

Arguments

`backup-ID`

Specify this argument to display the backup information for the specified backup ID, or to delete the backup information for the specified backup ID.

`-l`

Specify this option to display the following items acquired by the `drmmediabackup` command:

- ORIGINAL-ID
- HOSTNAME
- INSTANCE

`-hostname` `host-name`

Specify this option to display only information pertaining to a specific host. This option can be used when, for example, backup information executed on multiple servers is imported to the server on which you are executing the command.

`-v`

Specify this option to display information about the backup catalog.

The following information is displayed:

- VIRTUAL-SERVERNAME

  If the `DRM_HOSTNAME` environment variable has not been set, a hyphen (-) appears.

- DB-PATH

  Displays the path that is set in `DRM_DB_PATH` in the Application Agent configuration definition file (`init.conf`).

  If `DRM_DB_PATH` has not been set, the default storage directory for the dictionary map files, which are created automatically during installation, is displayed.

- CATALOG-UPDATE-TIME

  For each backup ID, displays the time when the backup catalog was created. This information is displayed only when the `-o` option is specified.

`-o FILESYSTEM`

Specify this option to display the information for a backup from a primary volume to a secondary volume, and the type of backup object is a file system.

`-o MSSQL`

Displays detailed information for the backup that was registered when a snapshot backup was performed for the backup information about the instance for the backup object type.

`-o MSEXCHANGE`

Displays detailed information for the backup that was registered when a snapshot backup was performed for the backup information about the instance for the backup object type.

`mount-point-or-drive-name`

Specify the name of the mount point directory or drive for the file system for which you want to display backup information.

`mount-point-directory-target-definition-file-name`

Specify the name of the mount point directory target definition file for the file system or drive for which you want to display backup information.

`instance-name`

Specify the instance name for the database for which you want to display backup information.

`drmfscat-command-options`

You can specify the following options for the `drmfscat` command. For details about the functions of the options, see the description of the `drmfscat` command.

- `-target`
- `-f`

- `-device`
- `-l`
- `-v`
- `-backup_id`
- `-hostname`

drmsqlcat-command-options

You can specify the following options for the `drmsqlcat` command. For details about the functions of the options, see the description of the `drmsqlcat` command.

- `-target`
- `-f`
- `-device`
- `-transact_log`
- `-datafile`
- `-metafile`
- `-l`
- `-v`
- `-backup_id`
- `-hostname`

drmexgcat-command-options

You can specify the following options for the `drmexgcat` command. For details about the functions of the options, see the description of the `drmexgcat` command.

- `-target`
- `-f`
- `-device`
- `-transact_log`
- `-datafile`
- `-l`
- `-v`
- `-backup_id`
- `-hostname`

`-delete`

Specify this option to delete the backup information for the backup catalog. By using this option, you can delete backup information about a tape backup before the record's duration specified by the `drmtapeinit` command expires. You can also delete backup information that is to be stored permanently.

`-comment` *backup-comment*

Specify this option to display only information on a specific backup comment.

The *backup-comment* value is not case sensitive.

You can use an asterisk (`*`) to specify a wildcard in *backup-comment*. You can specify that only the initial characters match (for example, specify a string such as `XYZ*` to search for strings that begin with one or more specific characters and that end with any or no characters). When a wildcard, special character, or one-byte space character is used, the entire *backup-comment* string must be enclosed in double quotation marks ("). If the *backup-comment* string contains a special character but is not enclosed in double quotation marks, the special character is not properly handled as a part of the *backup-comment* string and is parsed as a special character. If you specify `-comment "*"`, the command will display all backup catalogs.

If two double quotation marks are specified after the `-comment` option (as in `-comment ""`), a message is displayed indicating that no backup data exists.

`-bkdir`

Specify this option to display the backup directory that was backed up using the `drmmediabackup` command.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to display the backup information for tape backups performed by a backup management product:

```
PROMPT> drmtapecat
BACKUP-ID   BACKUP-OBJECT   SNAPSHOT TIME          EXPIRATION
TIME      BACKUP-MEDIA
0000000002  FILESYSTEM      2002/02/01 11:00:00  2002/05/01
11:00:00 MEDIA3
0000000003  FILESYSTEM      2002/02/01 11:30:00  2002/05/01
11:30:00 MEDIA4
```

- In this example, the command is used to display the backup information of the backup ID `0000000002`:

```
PROMPT> drmtapecat -backup_id 0000000002
BACKUP-ID   BACKUP-OBJECT   SNAPSHOT TIME          EXPIRATION
TIME      BACKUP-MEDIA
0000000002  FILESYSTEM      2002/02/01 10:30:00  2002/05/01
10:30:00 MEDIA2
```

- In this example, the command is used to display detailed information for the backup backed up to a tape device by the backup management product.

```
PROMPT> drmtapecat -l
BACKUP-ID   ORIGINAL-ID HOSTNAME   BACKUP-OBJECT INSTANCE SNAPSHOT
TIME   EXPIRATION TIME    BACKUP-MEDIA
0000000001 0000000001   FILESV     FILESYSTEM    D:
```

```
                    2002/02/01 10:00:00 2002/05/01 10:00:00 MEDIA1
                    0000000002 0000000001  APPSV     FILESYSTEM    E:
                    2002/02/01 11:00:00 2002/05/01 11:00:00 MEDIA2
```

- In this example, the command, with the host name `FILESV` specified, is used to display the detailed information for tape backups performed by the backup management product:

```
PROMPT> drmtapecat -l -hostname FILESV
BACKUP-ID  ORIGINAL-ID HOSTNAME  BACKUP-OBJECT INSTANCE SNAPSHOT
TIME   EXPIRATION TIME   BACKUP-MEDIA
0000000001 0000000001  FILESV     FILESYSTEM     D:
2002/02/01 10:00:00 2002/05/01 10:00:00 MEDIA1
```

- In this example, the command is used to display the backup catalog information for tape backups performed by a backup management product, and management information for the backup catalogs:

```
PROMPT> drmtapecat -v
VIRTUAL-SERVERNAME: host1
DB-PATH: D:\Program Files\Hitachi\DRM\DB2
BACKUP-ID   BACKUP-OBJECT  SNAPSHOT TIME        EXPIRATION
TIME     BACKUP-MEDIA
0000000001  FILESYSTEM     2002/02/01 10:00:00  2002/05/01
10:00:00 MEDIA1
0000000002  MSSQL          2002/02/01 11:00:00  2002/05/01
11:00:00 MEDIA3
0000000003  MSEXCHANGE     2002/02/01 11:30:00  2002/05/01
11:30:00 MEDIA4
```

- In this example, the command is used to display backup catalogs for tape backups performed by a backup management product, and management information for the backup catalogs (when a backup is not performed):

```
PROMPT> drmtapecat -v
VIRTUAL-SERVERNAME: host1
DB-PATH: D:\Program Files\Hitachi\DRM\DB2
KAVX0024-E The specified backup data does not exist.
```

- In this example, the command is used to display information for the backup performed from the primary volume to the secondary volume:

```
PROMPT> drmtapecat -o FILESYSTEM D:
INSTANCE: D:
BACKUP-ID:0000000010 BACKUP-MODE: COLD INSTANCE: D: ORIGINAL-ID:
0000000001
START-TIME:2002/06/01 10:00:00 END-TIME: 2002/06/01 10:03:00
HOSTNAME: FILESERV1
T FILE  FS  DG  DEVICE      COPY-GROUP
F -     D:  -   Harddisk1   VG01,dev01
F -     -   -   -           VG01,dev01
```

- In this example, the command is used to display information about the backup performed from the primary volume to the secondary volume (when the backup is of an SQL Server database):

```
PROMPT> drmtapecat -o MSSQL -target SQL1
INSTANCE: SQL1
BACKUP-ID: 0000000010 BACKUP-MODE: ONLINE INSTANCE: SQL1
ORIGINAL-ID: 0000000001
START-TIME: 2002/06/01 10:00:00 END-TIME: 2002/06/01 10:03:00
HOSTNAME: DB_SVR1
T   DB   OBJECT    FILE             FS  DG  DEVICE      COPY-GROUP
M   DB1  METAFILE  C:\METADIR\Meta1 C:  -   -           -
```

```
D  DB1  DATAFILE  D:\SQL\data1.mdf  D:  -  Harddisk2  VG02,dev02
-  -    -         -                 -   -  -          VG02,dev02
T  DB1  TRANSACT  D:\SQL\tlog1.ldf  D:  -  Harddisk2  VG02,dev02
-  -    -         -                 -   -  -          VG02,dev02
M  DB2  METAFILE  C:\METADIR\Meta2  C:  -  -          -
D  DB1  DATAFILE  D:\SQL\data2.mdf  D:  -  Harddisk2  VG02,dev02
-  -    -         -                 -   -  -          VG02,dev02
T  DB1  TRANSACT  D:\SQL\tlog2.ldf  D:  -  Harddisk2  VG02,dev02
-  -    -         -                 -   -  -          VG02,dev02
```

- In this example, the command is used to display information about the backup performed from the primary volume to the secondary volume (when the backup is of an Exchange database):

```
PROMPT> drmtapecat -o MSEXCHANGE -target STR1
STORAGEGROUP: /EXCHANGE
BACKUP-ID: 0000000010  BACKUP-MODE: VSS  STORAGEGROUP: /
EXCHANGE  ORIGINAL-ID: 0000000001
START-TIME: 2014/02/01 10:00:00  END-TIME: 2014/02/01 10:01:00
HOSTNAME: EXG_SRV1
T OBJECT         INFORMATIONSTORE
FILE                                  FS   DG   DEVICE      COPY-
GROUP
M MAILBOXSTORE   MAILBOX1        D:
\STR1\priv1.edb                  D:   -    Harddisk1   VG01,dev01
- -              -
-                                -    -    -
VG01,dev01
T TRANSACT       MAILBOX1        E:
\STR1\E00*.log                   E:   -    Harddisk2   VG01,dev02
- -              -
-                                -    -    -
VG01,dev02
C CHECKPOINT     MAILBOX1        E:
\STR1\E00.chk                    E:   -    Harddisk2   VG01,dev02
- -              -
-                                -    -    -
VG01,dev02
```

- In this example, the command is used to display the backup catalog beginning with SQL2-DB:

```
PROMPT> drmtapecat -comment "SQL-DB*"
BACKUP-COMMENT BACKUP-ID  BACKUP-OBJECT SNAPSHOT TIME
EXPIRATION TIME     BACKUP-MEDIA
SQL-DB-1      0000000002 MSSQL        2003/09/05 15:50:54
2003/12/05 15:50:54 C:\NBU_BACKUP\stdg11_1070608229_C1_F1
SQL-DB-2      0000000002 MSSQL        2003/09/05 15:50:54
2003/12/05 15:50:54 C:\NBU_BACKUP\stdg11_1070608250_C1_F1
SQL-DB-3      0000000008 MSSQL        2003/09/06 15:50:54
2003/12/06 15:50:54 C:\NBU_BACKUP\stdg11_1070608251_C1_F1
SQL-DB-4      0000000008 MSSQL        2003/09/06 15:50:54
2004/12/06 15:50:54 C:\NBU_BACKUP\stdg11_1070608252_C1_F1
```

- In this example, the command is used to display the backup file storage directory:

```
PROMPT> drmtapecat -bkdir
BACKUP-ID   BACKUP-OBJECT  SNAPSHOT TIME         EXPIRATION
TIME     BACKUP-MEDIA  BACKUP-FILE-DIRECTORY
0000000001 FILESYSTEM    2002/02/01 10:00:00  2002/05/01
10:00:00 MEDIA1         -
```

```
0000000002  MSSQL          2002/02/01 11:00:00  2002/05/01
11:00:00 MEDIA3        c:\tmp\bkfiledir
0000000003  MSEXCHANGE     2002/02/01 11:30:00  2002/05/01
11:30:00 MEDIA4        -
```

drmtapeinit (Registers parameters for a backup management product)

Formats

To register the parameters for the backup management product:
```
drmtapeinit
```

To display the parameters registered for the backup management product:
```
drmtapeinit -v
```

Description

The `drmtapeinit` command provides an interactive interface that lets you register the parameters for controlling a backup management product that works with Application Agent.

The following shows the location where the parameters registered by this command are stored.

`Application-Agent-installation-folder\DRM\conf\tape\DEFAULT.dat`

The following table lists the parameters for backup management products that can be registered by using this command.

Table 2-18 Parameters for backup management products

Registration item	Description
Name of the backup management product	Specify NBU or BEWS. When using NetBackup, specify NBU. When using Backup Exec, specify BEWS.
Period to store a backup catalog used when backing up to tape	Specify the number of days to store backup information. If you specify 0, the backup information is stored permanently. When 0 is specified, PERMANENT is displayed for this item in the parameter display result of the command with the -v option specified.

Arguments

-v

Specify this option to display the settings of the parameters currently registered.

> **⚠ Note:**
>
> - If you specify a storage period for backup information that is longer than the protection period for the backup management product media, you cannot use the `drmmediarestore` command to restore data from a tape device because the media information in the backup management product will have been deleted. Because of this, specify a storage period for backup information that is shorter than the protection period for the backup management product media.
>
> - If you no longer require a configuration definition file defined for the tape backup management product, directly delete the file. You must also delete this file if you need to change the configuration definition.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to register the parameter settings for working with NetBackup:

```
PROMPT> drmtapeinit
KAVX0411-I Enter the backup management product name: NBU
KAVX0417-I Enter the number of days to store the backup catalog:
1
KAVX0414-I Backup parameters were updated.
PROMPT>
```

- In this example, the command is used to display the parameter settings for working with NetBackup:

```
PROMPT> drmtapeinit -v

Backup application name: NBU

Days to keep the backup catalog: 1

PROMPT>
```

- In this example, the command is used to register the parameters for linking with Backup Exec:

```
PROMPT> drmtapeinit
KAVX0411-I Enter the backup management product
name                      : BEWS
KAVX0417-I Enter the number of days to store the backup catalog:
1
KAVX0414-I Backup parameters were updated
PROMPT>
```

- In this example, the command is used to display the parameters for linking with Backup Exec:

```
PROMPT> drmtapeinit -v

Backup application name: BEWS

Days to keep the backup catalog: 1

PROMPT>
```

drmumount (Unmounts secondary volumes)

Formats

To unmount a secondary volume by specifying the name of a copy group:

```
drmumount -copy_group copy-group-name
```

To unmount a secondary volume by specifying the name of a backup ID:

```
drmumount backup-ID
```

Description

The `drmumount` command unmounts a secondary volume that has been mounted with the `drmmount` command, and unlocks the corresponding copy groups.

If the volume for the specified backup ID or copy group has already been unmounted, the command displays a warning that the target volume has been unmounted, and then continues processing.

If you use the `drmmediabackup` or `drmmediarestore` command to back up or restore data, you must use this command to unmount the secondary volume.

Before executing this command, all application software using the secondary volume to be unmounted must be stopped.

If you execute any of the following commands when the secondary volumes have been mounted by the `drmmount` command, you will no longer be able to use the `drmumount` command to unmount the secondary volumes.

- `drmfsbackup`
- `drmresync`

If the unmount cannot be performed using the `drmumount` command, unlock the copy group corresponding to the backup ID specified for the `drmcgctl` command, and unmount the secondary volume as follows:

- Use the unmount functionality of CCI.

Arguments

`-copy_group copy-group-name`

Specify the name of the copy group to be unmounted (a copy group mounted by using the `drmmount` command). The system cache must be cleared before a data backup. Specify the copy group from the backup server to mount the secondary volume, and then unmount the secondary volume by using the `drmumount` command to clear the system cache.

To check the name of a copy group, execute either the `drmfscat` command or the `drmfsdisplay` command.

`backup-ID`

Specify the backup ID associated with the copy groups you want to unmount. When multiple copy groups were used for the backup identified by the specified backup ID, the secondary volumes of all the copy groups are unmounted.

To check backup IDs, execute the `drmfscat` command.

To check backup IDs, execute one of the following commands according to what was backed up:

- When the backup is of a file system, use the `drmfscat` command.
- When the `drmmount` command was executed, and then restoration was performed by using the `drmmediarestore` command, use the `drmtapecat` command.
- When the backup is of an SQL Server database, use the `drmsqlcat` command.
- When the backup is of an Exchange database, use the `drmexgcat` command.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Example

- In this example, the command is used to unmount the secondary volume identified by the backup ID `0000000001`:
  ```
  PROMPT> drmumount 0000000001
  ```

Basic command specifications (Utility commands)

drmdbsetup (Creates and deletes Application Agent databases)

Formats

To create backup catalog information and the dictionary map files:
```
drmdbsetup -i
```

To delete backup catalog information and the dictionary map files:
```
drmdbsetup -u
```

Make sure that you specify an absolute path when executing the `drmdbsetup` command. The absolute path of this command is as follows:

Application-Agent-installation-folder\DRM\bin\util\drmdbsetup.exe

Description

The `drmdbsetup` command creates and deletes the contents of the dictionary map files. Dictionary map files for creation and deletion are stored as defined by the path information in `DRM_DB_PATH`, in the Application Agent configuration definition file (`init.conf`).

For details about the Application Agent configuration definition file, see the description of Application Agent operation settings in the *Replication Manager Application Agent CLI User Guide*. For details about `DRM_DB_PATH`, see the description of creating the dictionary map files in the same manual.

Arguments

`-i`

Creates backup catalog information and dictionary map files, based on the path information (the value of `DRM_DB_PATH`) specified in the Application Agent configuration definition file. An error will occur if the specified directory already contains the dictionary map files.

`-u`

Deletes created backup catalog information and dictionary map files. Use this option to delete existing dictionary map files.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Basic command specifications (SQL Server database backups)

drmsqlbackup (Backs up an SQL Server database to a secondary volume)

Formats

To back up:
```
drmsqlbackup { instance-name | DEFAULT }
              [ -system | target database-name | -f target-
definition-file-name ]
              [ -rc [ name-identifying-the-generation ]]
              [ -pf copy-parameter-definition-file ]
              [ -comment backup-comment ]
              [ -script user-script-file-name ]
              [ -s backup-server-name
                [ -auto_import
                  [ -auto_mount [ mount-point-directory-name ]]
                ]
```

```
                [ -svol_check ]
            ]
```

To create backup catalog:

```
drmsqlbackup { instance-name | DEFAULT }
            [ -system | target database-name | -f target-
definition-file-name ]
            -template
            [ -comment backup-comment ]
```

Description

The `drmsqlbackup` command takes the volume that contains the specified instance in memory, and backs it up to the secondary volume. If the instance's objects (such as data files and various databases) exist across several volumes, all primary volumes will be backed up to secondary volumes.

When SQL Server instances are backed up, an online backup will be performed. If instances that are not running are specified when executing a command, a command error occurs.

When a command is executed, SQL Server's VDI is used to create a snapshot of the database within the instance.

Snapshot data (VDI metafiles) are stored in one of the following directories, depending on the situation:

- If you registered a VDI metafile storage directory by using the `drmsqlinit` command:

  The VDI metafile is stored in the registered directory. The file name is `backup-ID_database-ID`.dmp.

- If you did not register a VDI metafile storage directory by using the `drmsqlinit` command:

  The VDI metafile is stored in the directory that contains the file with the smallest management number (`file_id`) value for SQL server in the database file. The file name is `META_database-ID`.dmp.

If the VDI metafile storage directory is blank, no VDI metafiles exists in the primary volume after backup finishes. Only the secondary volume contains VDI metafiles.

Do not use `META_database-ID`.dmp as the name of the data file or transaction log file stored in the location where the primary data file is stored. If a file with such a name exists, the backup will fail.

The backup ID used in the VDI metafile is a ten-digit numerical value assigned during command execution. The database ID is a ten-digit numerical value, assigned by the SQL server that identifies a database.

If you specify an instance that is not running, the command fails. All the user databases included in the instance are to be backed up. The system databases (master, model, and msdb) for SQL server are not included. You can back up system databases in either of the following ways:

- To back up all system databases (master, model, and msdb) other than `tempdb`, and all user databases, execute this command with the `-system` option specified.
- To back up only system databases (master, model, and msdb), specify the databases to be backed up for the `-target` option or the `-f` option and then execute the command.

The system cache of the secondary volume must be cleared before executing this command. Mount or unmount the secondary volume on the backup server to clear the system cache.

When you execute this command on the copy group in the paired status (`PAIR`), the status of the copy group is changed to `PSUS`.

When the `drmsqlbackup` command is executed while the pair status is `SMPL`, `paircreate` is not run automatically. Execute the `paircreate` command only when the `PAIR_CREATE` parameter of the CCI-linkage definition file (`DEFAULT.dat`) is set to `ENABLE`.

When the `drmsqlbackup` command is executed on the local site, and the pair status is `SMPL`, the command does not automatically create a pair. In this case, if the `PAIR_CREATE` parameter in the CCI-linkage definition file (`DEFAULT.dat`) is set to `ENABLE`, the command automatically creates a pair.

After installation, if the `drmsqlbackup` command is executed without executing the `drmsqldisplay` command with the `-refresh` option specified, and no dictionary map files are created, dictionary map files are created using the `drmsqlbackup` command. In this case, the processing time required to create the dictionary map files is added to the time required to execute the backup command. Therefore, before you execute the `drmsqlbackup` command, make sure to first execute the `drmsqldisplay` command with the `-refresh` option specified to create the dictionary map files.

One execution of the command can back up a maximum of 64 databases. If you want to back up 65 or more databases, execute the command more than once.

Backups can only be performed for files described in the following table.

Table 2-19 Files for which SQL Server database backup can be performed

Database of interest[#1]	File type of interest	Backup file name	Storage destination for backup files
master	Data file	Same as the backup source file name	Secondary volume
	Transaction log file	Same as the backup source file name	Secondary volume
	VDI metafile [#2]	Varies depending on the VDI metafile storage directory specified with the `-drmsqlinit` command[#3]	

Basic commands

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Database of interest[1]	File type of interest	Backup file name	Storage destination for backup files
model	Data file	Same as the backup source file name	Secondary volume
	Transaction log file	Same as the backup source file name	Secondary volume
	VDI metafile[2]	Varies depending on the VDI metafile storage directory specified with the `-drmsqlinit` command[3]	
msdb	Data file	Same as the backup source file name	Secondary volume
	Transaction log file	Same as the backup source file name	Secondary volume
	VDI metafile[2]	Varies depending on the VDI metafile storage directory specified with the `-drmsqlinit` command[3]	
User database	Data file	Same as the backup source file name	Secondary volume
	Transaction log file	Same as the backup source file name	Secondary volume
	VDI metafile[2]	Varies depending on the VDI metafile storage directory specified with the `-drmsqlinit` command[3]	
Distribution database	Data file	Same as the backup source file name	Secondary volume
	Transaction log file	Same as the backup source file name	Secondary volume
	VDI metafile[2]	Varies depending on the VDI metafile storage directory specified with the `-drmsqlinit` command[3]	

#1:

If you do not specify the `-system` option, the database targeted for backup is the user database only.

#2:

This file is created when the `drmsqlbackup` command is executed.

#3:

If you registered a VDI metafile storage directory by using the `drmsqlinit` command, the backup file is stored in the registered directory. The file name is `backup-ID_database-ID`.dmp. If you did not register a VDI metafile storage directory by using the `drmsqlinit` command, the backup file is stored in the directory that contains the file with the smallest management number (`file_id`) value for SQL Server in the database file. The file name is `META_database-ID`.dmp.

Arguments

instance-name

Specify the database instance to be backed up. If the instance to be backed up is the default, specify `DEFAULT`.

`-system`

Specify this option to back up the system databases (`master`, `model`, and `msdb`), other than the `tempdb` database, and all user databases. If this option is specified, SQL Server will be stopped when the restoration is carried out.

`-target` *database-names*

Specify this option to back up a particular database in the specified instance.

When specifying multiple databases to be backed up, use a comma to separate each database name. If you specify a database name containing a space character, enclose the database name in double quotation marks ("). Make sure that you specify the database in the instance *instance-name*. If you specify databases in separate instances, those databases will not be backed up.

The database names specified in this option will be registered in the backup catalog, and can be checked using the `drmsqlcat` command.

To back up only system databases (master, model, and msdb), specify the databases to be backed up and then execute the command.

`-f` *target-definition-file-name*

Like the `-target` option, this option performs a backup related to specific databases only. Unlike the `-target` option, this option lets you specify a target definition file that collectively specifies all the databases for which a backup is to be performed. The target definition file containing the list of databases must be created before you attempt to use this option. Use an absolute path to specify the target definition file. If you specify a target definition file name containing a space character, enclose the target definition file name in double quotation marks (").

The database specified in the target definition file must exist in the specified instance. If you specify databases in separate instances, those databases will not be backed up.

To back up only system databases (master, model, and msdb), specify the databases to be backed up and then execute the command.

`-rc` *name-identifying-the-generation*

Use this option to specify the name identifying the generation of the copy group to be backed up. Execute the `drmsqldisplay` command with the `-cf` option, and then specify the displayed `GEN-NAME` value. In a single volume, a hyphen (`-`) appears. In this case, you cannot specify the `-rc` option.

Always specify this option when backing up from a primary volume to a secondary volume on the remote side. If this option is omitted, the secondary volume on the local side is backed up.

When you omit `name-identifying-the-generation`, the secondary volume that has the smallest value among the generation numbers on the remote-side becomes the backup destination. In this case, the generation number is `remote_n`, where `n` is the smallest generation number.

`-pf` `copy-parameter-definition-file`

Specify this option when using the number of retries and the retry interval defined in the copy parameter definition file. Specify only the file name, without specifying the path.

When you omit this option, the value of the CCI-linkage definition file (`DEFAULT.dat`) is used. The `DEFAULT.dat` values are also used for parameters not specified in the copy parameter definition file.

Create the copy parameter definition file with an arbitrary name in the location below. Specify the file name by using an alphanumeric character string that is 64 bytes or less.

`Application-Agent-installation-folder\DRM\conf\raid`

`-comment` `backup-comment`

Specify this option to register a backup comment in the backup catalog.

The `backup-comment` value can be a string of up to 64 bytes, consisting of alphanumeric, special, one-byte space, and multi-byte characters. The backup comment is case sensitive. When a special character, or a one-byte space character is used, the entire `backup-comment` string must be enclosed in double quotation marks ("). If the `backup-comment` string contains a special character but is not enclosed in double quotation marks, the special character is not properly handled as a part of the `backup-comment` string and is parsed as a special character.

The following special characters cannot be used for backup comments:

`\ / ` | < > " * ? & ; ( ) $`

Note that the first character must not be a hyphen (`-`). If you specify two double quotation marks after the `-comment` option, as in `-comment ""`, no backup comment will be registered in the backup catalog.

`-script` `user-script-file-name`

Specify this option to execute a user script. Use an absolute path to specify `user-script-file-name`. Conditions for specifying `user-script-file-name` are as follows:

- Maximum number of bytes: 255
- Available characters: Characters that can be used in a file name in Windows. If the name contains one or more space characters, the entire name string must be enclosed in double quotation marks (").

For details about the coding used for a user script file, see the description of how to create a user script in the *Replication Manager Application Agent CLI User Guide*.

If you specified `LOCATION=REMOTE` in the user script file, you must also specify the `-s` option.

`-s` *`backup-server-name`*

Specify this option to connect to a remote backup server to perform a backup. Specify the host name or the IP address of the backup server by using a character string that is no more than 255 bytes. You can specify the IP address in IPv4 or IPv6 format.

`-auto_import`

Specify this option to automatically transfer a backup catalog to a backup server after backing up a volume. This option must be specified concurrently with the `-s` option.

`-auto_mount` *`mount-point-directory-name`*

Specify this option to automatically mount a secondary volume on a backup server after backing up a volume. This option must be specified concurrently with the `-s` and `-auto_import` options.

Specify *`mount-point-directory-name`* by using a character string of up to 64 bytes.

If you omit the *`mount-point-directory-name`* parameter, a mount destination for a secondary volume is automatically determined. This destination is determined in the same way as when using the `drmmount` command without specifying a mount point.

Execute the `drmumount` command to unmount the mounted secondary volume. In the argument of the `drmumount` command, specify the backup ID.

`-svol_check`

Specify this option to check the status of a secondary volume on a backup server. This option must be specified concurrently with the `-s` option. Checking the status of a secondary volume prevents backup or restoration failures. The items, volumes, and conditions to be checked are described in the following table.

Table 2-20 Status check of a secondary volume

Check item	Volume to be checked	Check condition
A secondary volume is hidden from a backup server	All secondary volumes defined for a backup-target primary volume	Checked when a primary volume that is a cluster resource is defined in pairs with multiple generations of secondary volumes.

Check item	Volume to be checked	Check condition
A secondary volume is not mounted on a backup server	The secondary volume to be the next backup destination	Always checked.

`-template`

Specify this option to create only a backup catalog, without resynchronizing or splitting pairs, or freezing databases.

Even if you create a template catalog with the `-template` option specified, the old VDI metafile will be deleted.

For example, in a two-generation environment, suppose that the following commands are executed:

1. Execute `drmsqlbackup default`.

2. Execute `drmsqlbackup default`

3. Execute `drmsqlbackup default -template`

In this case, after performing step 3, the VDI metafile and catalog acquired by performing step 1 are deleted.

This backup catalog can only be used for restoring data backed up remotely.

Note: If you use the `-target` or `-f` option, specify all the databases that are contained in the same logical volume. If this is option is not specified, a command error occurs.
The backup information in the backup catalog is managed based on using the copy group as a key. Depending on the backup method, you might not be able to perform restoration, even though the backup data exists on the secondary volume. For further information, see the notes on running Application Agent in the *Replication Manager Application Agent CLI User Guide*.
When specifying on the command line a file name or directory name containing space characters for the `-target` option or `-f` option, you must enclose the file name in double quotation marks (").
Note that enclosing with double quotation marks is not necessary for target paths specified in batch definition files.
If the following error occurred when you used the `-script` option, an error message is output from the SQL Server following the user script error message because the database was thawed.
- An error occurs in a command specified by `SPLIT_PROC` when `END_CODE` in the user script file is set to `TERMINATE_NZ`.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to perform online backup of all databases in the instance SQLDB:

  ```
  PROMPT> drmsqlbackup SQLDB
  ```

- In this example, the command is used to perform online backup of databases DB01 and DB02 in the instance SQLDB:

  ```
  PROMPT> drmsqlbackup SQLDB -target DB01,DB02
  ```

- In this example, the command is used to perform backup by specifying the backup comment.

  ```
  PROMPT> drmsqlbackup default -comment comment
  KAVX0001-I drmsqlbackup command will now start.
  KAVX1017-I SQL Server information will now be retrieved.
  KAVX1207-I The database is being backed up.
  KAVX0040-I The backup ID has been assigned as follows:
            Backup ID = 0000000021
  KAVX0002-I drmsqlbackup command will now end.
  ```

- In this example, the command is used to create the template of the backup catalog:

  ```
  PROMPT> drmsqlbackup default -template
  KAVX0001-I drmsqlbackup command will now start.
  KAVX1017-I SQL Server information will now be retrieved.
  KAVX0085-I Now making backup information...
  KAVX0086-I The backup information has been assigned as follows:
            Backup ID = 0000000001
  KAVX0002-I drmsqlbackup command will now end.
  ```

- To create backups in the local and remote destinations using the script:

  ```
  PROMPT> drmsqlbackup default -script C:\Uscript.txt
  KAVX0001-I The drmsqlbackup command will now start.
  KAVX1017-I SQL Server information is being collected now.
  KAVX1207-I Backing up the database...
  KAVX0210-I The user script will now start.
            Procedure section = RESYNC_PROC
  KAVX0212-I A command from the user script will now execute.
            Command line = C:\HORCM\etc\pairresync.exe -g TC01 -d
  sql01 -FBC 0
  KAVX0213-I A command from the user script has ended.
            End code = 0
  KAVX0212-I A command from the user script will now execute.
            Command line = C:\HORCM\etc\pairresync.exe -g TC01 -d
  sql02 -FBC 0
  KAVX0213-I A command from the user script has ended.
            End code = 0
  KAVX0211-I Execution of the user script has finished.
  KAVX0210-I The user script will now start.
            Procedure section = SPLIT_PROC
  KAVX0212-I A command from the user script will now execute.
            Command line = C:\HORCM\etc\pairsplit.exe -g TC01 -d
  sql01 -FBC 0
  KAVX0213-I A command from the user script has ended.
            End code = 0
  KAVX0212-I A command from the user script will now execute.
            Command line = C:\HORCM\etc\pairsplit.exe -g TC01 -d
  sql02 -FBC 0
  KAVX0213-I A command from the user script has ended.
            End code  = 0
  ```

```
KAVX0211-I Execution of the user script has finished.
KAVX0040-I The backup ID has been assigned as follows:
          Backup ID = 0000000001
KAVX0002-I The drmsqlbackup command will now end.
PROMPT>
```

- To create a backup only in the remote destination using the script:

```
PROMPT> drmsqlbackup default -script C:\Uscript.txt
KAVX0001-I The drmsqlbackup command will now start.
KAVX1017-I SQL Server information is being collected now.
KAVX1207-I Backing up the database...
KAVX0210-I The user script will now start.
          Procedure section  = RESYNC_PROC
KAVX0212-I A command from the user script will now execute.
          Command line = C:\HORCM\etc\pairresync.exe -g TC01 -d
sql01 -FBC 0
KAVX0213-I A command from the user script has ended.
          End code = 0
KAVX0212-I A command from the user script will now execute.
          Command line = C:\HORCM\etc\pairresync.exe -g TC01 -d
sql02 -FBC 0
KAVX0213-I A command from the user script has ended.
          End code = 0
KAVX0211-I Execution of the user script has finished.
KAVX0210-I The user script will now start.
          Procedure section = SPLIT_PROC
KAVX0212-I A command from the user script will now execute.
          Command line = C:\HORCM\etc\pairsplit.exe -g TC01 -d
sql01 -FBC 0
KAVX0213-I A command from the user script has ended.
          End code = 0
KAVX0212-I A command from the user script will now execute.
          Command line = C:\HORCM\etc\pairsplit.exe -g TC01 -d
sql02 -FBC 0
KAVX0213-I A command from the user script has ended.
          End code = 0
KAVX0211-I Execution of the user script has finished.
KAVX0002-I The drmsqlbackup command will now end.
PROMPT>
```

drmsqlcat (Displays backup information for an SQL Server database)

Format

```
drmsqlcat instance-name
          [ -target database-name | -f target-definition-file-name ]
          [ -transact_log ][ -datafile ][ -metafile ]
          [ -device device-file-name ][ -l ][ -v ]
          [ -backup_id backup-ID ][ -hostname host-name ]
          [ -comment backup-comment ] [ -template ]
          [ -lsn ]
```

Description

The drmsqlcat command displays the backup information of the SQL Server database on the server where the command is executed. The items displayed are as follows:

Table 2-21 Items displayed by the drmsqlcat command

Displayed item	Meaning
INSTANCE	SQL Server instance name
BACKUP-COMMENT	Backup comment
BACKUP-ID	Backup ID
BACKUP-MODE	Backup mode (ONLINE)
ORIGINAL-ID	Original backup ID obtained by the `drmsqlbackup` command
INSTANCE	SQL Server instance name
START-TIME	Snapshot backup start time
END-TIME	Snapshot backup end time
HOSTNAME	Server name where the snapshot backup was performed
T	Object type: `D`: Data file `T`: Transaction log `M`: VDI metafile
DB	SQL Server database name
OBJECT	SQL Server object name: `DATAFILE`: Data file name `TRANSACT`: Transaction file name `METAFILE`: VDI metafile name
FILE	File name
CHECKPOINT-LSN	Log sequence number for the starting point of database recovery when a transaction log backup file is restored.[1]
FULL-BACKUP-TIME	Database full backup end time that was recorded in msdb of SQL Server for a backup execution, displayed as follows: $yyyy/mm/dd\ hh:mm:ss$[1]
FS	Mount point directory name
FSTYPE	File system type (NTFS)
DG	A hyphen (–) is displayed.
LVM-DEVICE	The name of the logical device file (for an environment with a logical volume manager) or `GUID` (for an environment without a logical volume manager)
DEVICE[2]	`Harddiskn` (where n is an integer)
COPY-GROUP	The copy group name, displayed as follows: `CCI-volume-group-name,device name`

Displayed item	Meaning
PORT#	Port name on the host server
TID#	Target-ID on the host server
LUN#	Logical unit number on host server
MU#	Pair ID
LDEV#	Logical device number inside the RAID device
P/S	A letter identifying the primary or secondary volume: P: Primary volume S: Secondary volume -: Others
SERIAL#	Serial number inside the RAID device
VIRTUAL-SERVERNAME[#3]	Virtual server name (value of the DRM_HOSTNAME environment variable)
DB-PATH[#3]	Name of the directory storing the backup catalog
CATALOG-UPDATE-TIME[#3]	Time when the backup catalog was created
BACKUP-COMMENT	Backup comment

#1

A hyphen (-) is displayed if OBJECT is something other than DATAFILE.

A hyphen (-) is displayed for a backup catalog created by a version earlier than Application Agent 6.3.0-00.

A hyphen (-) is displayed if you specify the -template option.

#2

When this command is executed with the -device option specified, this will be displayed after OBJECT.

#3

The command executed with the -v option displays this information.

A hyphen (-) is displayed for any item that cannot be displayed. If none of the items can be displayed, an error message is displayed.

Each item is separated by a space.

Arguments

instance-name

Specify the instance name of the database to display the information for backup. If the instance to be recovered is the default, specify DEFAULT.

-target *database-names*

Displays backup information for a specific database:

- File name
- File system information
- Structural information about the logical volume
- Physical disk information

To display the information for multiple storage groups, use a comma to separate each database name. If you specify a database name containing a space character, enclose the database name in double quotation marks (").

When both this option and the `-f` option are omitted, all database information about the instance specified by the instance name will be displayed.

`-f target-definition-file-name`

Specifies the backup information to be referenced for a specific database. Unlike the `-target` option, this option lets you specify a target definition file that collectively specifies all the databases whose backup information you want to display. The target definition file containing the list of databases must be created before you attempt to use this option. Use an absolute path to specify the target definition file. If you specify a database name containing a space character, enclose the database name in double quotation marks (").

When both this option and the `-target` option are omitted, all information about the instance specified by the instance name will be displayed.

`-transact_log`

Specifies that only information relating to the transaction log file will be displayed. This option will display the following information:

- The name of the transaction log file
- File system information
- Structural information about the logical volume
- Physical disk information

`-datafile`

Specifies that only information relating to the data file will be displayed. This option will display the following information:

- The name of the data file
- File system information
- Logical volume structure information
- Physical disk information

`-metafile`

Specifies that only information relating to the VDI metafile will be displayed. This option will display the following information:

- The name of the VDI metafile
- File system information
- Logical volume structure information

- Physical disk information

`-device` *device-file-name*

Specifies that only the information for the specified device files about the instance *instance-name* will be displayed. This option will display the following information:

- Database information
- The name of the transaction log file
- Data file information
- File system information
- Physical disk information
- Logical volume structure information

`-l`

Specifies that information will be displayed in the long format.

`-v`

Specify this option to display information about the backup catalog.

The following information is displayed:

- Name of the directory storing the backup catalog
  Displays the path that is set in `DRM_DB_PATH` in the Application Agent configuration definition file (`init.conf`).

  If `DRM_DB_PATH` has not been set, the default storage directory for the dictionary map files, which are created automatically during installation, is displayed.

- Virtual server name (value of the `DRM_HOSTNAME` environment variable)
  If the `DRM_HOSTNAME` environment variable has not been set, a hyphen (`-`) appears.

- Time when the backup catalog was created
  For each backup ID, displays the time when the backup catalog was created.

`-backup_id` *backup-ID*

Specifies that backup information for a certain backup ID that will be displayed. A backup ID, which uniquely identifies a certain piece of backup data, is registered in the backup catalog during backup.

`-hostname` *host-name*

Specify this option to display information pertaining a specific host only.

`-comment` *backup-comment*

Specify this option to display only information on a specific backup comment.

The *backup-comment* value is not case sensitive.

You can use an asterisk (`*`) to specify a wildcard in *backup-comment*. You can specify that only the initial characters match (for example, specify a string such as `XYZ*` to search for strings that begin with one or more specific characters and that end with any or no characters). When a wildcard, special character, or one-byte space character is used, the entire *backup-comment* string must be enclosed in double quotation marks ("). If the *backup-comment* string contains a special character but is not enclosed in double quotation marks, the special character is not properly handled as a part of the *backup-comment* string and is parsed as a special character. If you specify `-comment "*"`, the command will display all backup catalogs.

If two double quotation marks are specified after the `-comment` option (as in `-comment ""`), a message is displayed indicating that no backup data exists.

`-template`

Specify this option if you want to display the template catalog to be specified, in a situation where you want to perform restoration, by using a template catalog that was created by executing the `drmsqlbackup` command with the `-template` option specified. The `START-TIME and END-TIME` of a template catalog specified using the `-template` option are the times at which creation of the template catalog started and finished.

`-lsn`

Specify this option if you want to display the log sequence number `CHECKPOINT-LSN` of the log record that is used as the starting point of a recovery when restoring a backup file of the data file indicated by the `DATAFILE` of `OBJECT` and the full backup time `FULL-BACKUP-TIME`.

> ⚠️ **Note:** When specifying on the command line a file name or directory name containing space characters for the `-target` or `-f` option, you must enclose the file name in double quotation marks (").
> Note that enclosing with double quotation marks is not necessary for target paths specified in batch definition files.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to display information about the SQL Server database specified in instance `SQL1`:

```
PROMPT> drmsqlcat SQL1
INSTANCE: SQL1
BACKUP-ID: 0000000001 BACKUP-MODE: ONLINE INSTANCE: SQL1
ORIGINAL-ID: 0000000001
START-TIME: 2002/06/01 10:00:00 END-TIME: 2002/06/01 10:03:00
HOSTNAME: DB_SVR1
T DB          OBJECT    FILE                    FS          DG
DEVICE        COPY-GROUP
```

```
M DB1       METAFILE  C:\METADIR\Meta1    C:          -
-  -         -
D DB1       DATAFILE  D:\SQL\data1.mdf    D:          -
Harddisk2   VG02,dev02
- -         -         -                   -           -
-           VG02,dev02
T DB1       TRANSACT  D:\SQL\tlog1.ldf    D:          -
Harddisk2   VG02,dev02
- -         -         -                   -           -
-           VG02,dev02
M DB2       METAFILE  C:\METADIR\Meta2    C:          -
-  -         -
D DB1       DATAFILE  D:\SQL\data2.mdf    D:          -
Harddisk2   VG02,dev02
- -         -         -                   -           -
-           VG02,dev02
T DB1       TRANSACT  D:\SQL\tlog2.ldf    D:          -
Harddisk2   VG02,dev02
- -         -         -                   -           -
-           VG02,dev02
```

- In this example, the command is used to display two generations of
  backup information, in the long format, about the SQL Server database
  specified in instance `SQL1`:

```
PROMPT> drmsqlcat SQL1 -l
INSTANCE: SQL1
BACKUP-ID: 0000000001 BACKUP-MODE: ONLINE INSTANCE: SQL1
ORIGINAL-ID: 0000000001
START-TIME: 2002/06/01 10:00:00 END-TIME: 2002/06/01 10:03:00
HOSTNAME: DB_SVR1
T DB  OBJECT    FILE              FS FSTYPE  DG  LVM-
DEVICE                                     DEVICE    COPY-
GROUP   PORT#  TID# LUN# MU# LDEV# P/S SERIAL#
M DB1 METAFILE  C:\METADIR\Meta1 C: NTFS     -    \\?
\Volume{df66a5b0-5583-12d5-a410-806d6172696f}\  Harddisk1
VG11,dev01   CLI-A  2    10   0   10010 P   15044
D DB1 DATAFILE  D:\SQL\data1.mdf D: NTFS     -    \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk2
VG12,dev02   CLI-A  2    20   0   10020 P   15044
- -   -       -                  - -      -   -
-                                                 -
VG12,dev02   CLI-A  2    21   0   10021 S   15044
T DB1 TRANSACT  D:\SQL\tlog1.ldf D: NTFS     -    \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk2
VG12,dev02   CLI-A  2    20   0   10020 P   15044
- -   -       -                  - -      -   -
-                                                 -
VG12,dev02   CLI-A  2    21   0   10021 S   15044
M DB2 METAFILE  C:\METADIR\Meta2 C: NTFS     -    \\?
\Volume{df66a5b0-5583-12d5-a410-806d6172696f}\  Harddisk1
VG11,dev01   CLI-A  2    10   0   10010 P   15044
D DB1 DATAFILE  D:\SQL\data2.mdf D: NTFS     -    \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk2
VG12,dev02   CLI-A  2    20   0   10020 P   15044
- -   -       -                  - -      -   -
-                                                 -
VG12,dev02   CLI-A  2    21   0   10021 S   15044
T DB1 TRANSACT  D:\SQL\tlog2.ldf D: NTFS     -    \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk2
```

```
                    VG12,dev02   CLI-A 2   20   0   10020 P   15044
                    - -  -      -          - -     -
                    -                                  -
                    VG12,dev02   CLI-A 2   21   0   10021 S   15044

                    INSTANCE: SQL1
                    BACKUP-ID: 0000000002 BACKUP-MODE: ONLINE INSTANCE: SQL1
                    ORIGINAL-ID: 0000000002
                    START-TIME: 2002/06/02 10:00:00 END-TIME: 2002/06/02 10:03:00
                    HOSTNAME: DB_SVR1
                    T DB  OBJECT    FILE              FS FSTYPE  DG  LVM-
                    DEVICE                                  DEVICE     COPY-
                    GROUP   PORT#  TID# LUN# MU# LDEV# P/S SERIAL#
                    M DB1 METAFILE  C:\METADIR\Meta1 C: NTFS    -   \\?
                    \Volume{df66a5b0-5583-12d5-a410-806d6172696f}\  Harddisk1
                    VG11,dev01   CLI-A 2   10   0   10010 P   15044
                    D DB1 DATAFILE  D:\SQL\data1.mdf D: NTFS    -   \\?
                    \Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk2
                    VG12,dev02   CLI-A 2   20   0   10020 P   15044
                    - -  -      -          - -     -
                    -                                  -
                    VG12,dev02   CLI-A 2   21   0   10021 S   15044
                    T DB1 TRANSACT  D:\SQL\tlog1.ldf D: NTFS    -   \\?
                    \Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk2
                    VG12,dev02   CLI-A 2   20   0   10020 P   15044
                    - -  -      -          - -     -
                    -                                  -
                    VG12,dev02   CLI-A 2   21   0   10021 S   15044
                    M DB2 METAFILE  C:\METADIR\Meta2 C: NTFS    -   \\?
                    \Volume{df66a5b0-5583-12d5-a410-806d6172696f}\  Harddisk1
                    VG11,dev01   CLI-A 2   10   0   10010 P   15044
                    D DB1 DATAFILE  D:\SQL\data2.mdf D: NTFS    -   \\?
                    \Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk2
                    VG12,dev02   CLI-A 2   20   0   10020 P   15044
                    - -  -      -          - -     -
                    -                                  -
                    VG12,dev02   CLI-A 2   21   0   10021 S   15044
                    T DB1 TRANSACT  D:\SQL\tlog2.ldf D: NTFS    -   \\?
                    \Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk2
                    VG12,dev02   CLI-A 2   20   0   10020 P   15044
                    - -  -      -          - -     -
                    -                                  -
                    VG12,dev02   CLI-A 2   21   0   10021 S   15044
```

- In this example, the command is used to display information, in the long format, about the SQL server database in the instance SQL1. The host name is specified as DB_SVR1:

```
PROMPT> drmsqlcat SQL1 -l -hostname DB_SVR1
INSTANCE: SQL1
BACKUP-ID: 0000000001 BACKUP-MODE: ONLINE INSTANCE: SQL1
ORIGINAL-ID: 0000000001
START-TIME: 2002/06/01 10:00:00 END-TIME: 2002/06/01 10:03:00
HOSTNAME: DB_SVR1
T DB  OBJECT    FILE              FS FSTYPE  DG  LVM-
DEVICE                                  DEVICE     COPY-
GROUP   PORT#  TID# LUN# MU# LDEV# P/S SERIAL#
M DB1 METAFILE  C:\METADIR\Meta1 C: NTFS    -   \\?
\Volume{df66a5b0-5583-12d5-a410-806d6172696f}\  Harddisk1
VG11,dev01   CLI-A 2   10   0   10010 P   15044
```

```
D DB1 DATAFILE  D:\SQL\data1.mdf D: NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk2
VG12,dev02  CLI-A 2    20   0   10020 P   15044
- - -        -        - -    -
-                                      -
VG12,dev02  CLI-A 2    21   0   10021 S   15044
T DB1 TRANSACT  D:\SQL\tlog1.ldf D: NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk2
VG12,dev02  CLI-A 2    20   0   10020 P   15044
- - -        -        - -    -
-                                      -
VG12,dev02  CLI-A 2    21   0   10021 S   15044
M DB2 METAFILE  C:\METADIR\Meta2 C: NTFS    -   \\?
\Volume{df66a5b0-5583-12d5-a410-806d6172696f}\  Harddisk1
VG11,dev01  CLI-A 2    10   0   10010 P   15044
D DB1 DATAFILE  D:\SQL\data2.mdf D: NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk2
VG12,dev02  CLI-A 2    20   0   10020 P   15044
- - -        -        - -    -
-                                      -
VG12,dev02  CLI-A 2    21   0   10021 S   15044
T DB1 TRANSACT  D:\SQL\tlog2.ldf D: NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk2
VG12,dev02  CLI-A 2    20   0   10020 P   15044
- - -        -        - -    -
-                                      -
VG12,dev02  CLI-A 2    21   0   10021 S   15044
```

- In this example, the command is used to display information about the
  SQL Server database specified by the instance SQL1 and management
  information for the backup catalog:

```
PROMPT> drmsqlcat SQL1 -v
VIRTUAL-SERVERNAME: DB_SVR1
DB-PATH: D:\Program Files\Hitachi\DRM\db2
INSTANCE: SQL1
BACKUP-ID: 0000000001 BACKUP-MODE: ONLINE INSTANCE: SQL1
ORIGINAL-ID: 0000000001
START-TIME: 2002/06/01 10:00:00 END-TIME: 2002/06/01 10:03:00
HOSTNAME: DB_SVR1
CATALOG-UPDATE-TIME: 2002/06/01 11:00:00
T   DB    OBJECT    FILE             FS  DG  DEVICE    COPY-GROUP
M   DB1   METAFILE  C:METADIR\Meta1  C:  -   -         -
D   DB1   DATAFILE  D:\SQL\data1.mdf D:  -   Harddisk2 VG02,dev02
-   -     -         -                -   -   -         VG02,dev02
T   DB1   TRANSACT  D:\SQL\tlog1.ldf D:  -   Harddisk2 VG02,dev02
-   -     -         -                -   -   -         VG02,dev02
M   DB2   METAFILE  C:METADIR\Meta2  C:  -   -         -
D   DB1   DATAFILE  D:\SQL\data2.mdf D:  -   Harddisk2 VG02,dev02
-   -     -         -                -   -   -         VG02,dev02
T   DB1   TRANSACT  D:\SQL\tlog2.ldf D:  -   Harddisk2 VG02,dev02
-   -     -         -                -   -   -         VG02,dev02
```

- In this example, the command is used to display information about the
  SQL Server database specified by the instance SQL1 and management
  information for the backup catalog (when a backup is not performed):

```
PROMPT> drmsqlcat SQL1 -v
VIRTUAL-SERVERNAME: DB_SVR1
DB-PATH: D:\Program Files\Hitachi\DRM\db2
KAVX0024-E The specified backup data does not exist.
```

- In this example, the command is used to display the backup catalog beginning with SQL2-DR-10.0:

```
PROMPT> drmsqlcat default -comment "SQL2-DR-10.01*"
INSTANCE: default
BACKUP-COMMENT: SQL2-DR-10.01-03:56-001
BACKUP-ID: 0000000010  BACKUP-MODE: ONLINE INSTANCE: default
ORIGINAL-ID: 0000000010
START-TIME: 12.12.03 14:25:40 END-TIME: 12.12.03 14:25:41
HOSTNAME: flora4
T  DB    OBJECT    FILE             FS  DG  DEVICE    COPY-GROUP
M UserDB1  METAFILE   C:\ meta\0000000010_0000000005.dmp   -
-   -       -
D UserDB1   DATAFILE   O:
\UserDB1_Data.MDF                              O:   -
Harddisk3   STD03,sqlstd022
- -       -
-                                              -
-    -         STD03,sqlstd022
T UserDB1   TRANSACT   O:
\UserDB1_Log.LDF                              O:   -
Harddisk3   STD03,sqlstd022
- -       -
-                                              -
-    -         STD03,sqlstd022
```

- In this example, the command is used to display the template catalog:

```
PROMPT> drmsqlcat default -template
INSTANCE: default
BACKUP-ID: 0000000001 BACKUP-MODE: ONLINE INSTANCE: default
ORIGINAL-ID: 0000000002
START-TIME: 04.02.04 13:01:35 END-TIME: 04.02.04 13:02:33
HOSTNAME: flora4
T  DB    OBJECT    FILE             FS  DG  DEVICE    COPY-GROUP
M UserDB1  METAFILE   O:\MSSQL\0000000002_0000000001.dmp   -
-   -       -
D UserDB1   DATAFILE   O:
\UserDB1_Data.MDF                              O:   -
Harddisk4   SI01,sql01
- -       -
-                                              -   -
-         SI01,sql01
T UserDB1   TRANSACT   O:
\UserDB1_Log.LDF                              O:   -
Harddisk4   SI01,sql01
- -       -
-                                              -   -
-         SI01,sql01
```

- In this example, the command is used to display the log sequence number and full backup time of each database registered in the backup catalog:

```
PROMPT> drmsqlcat SQL1 -lsn
INSTANCE: SQL1
BACKUP-ID: 0000000001 BACKUP-MODE: ON-LINE INSTANCE: SQL1
ORIGINAL-ID: 0000000001
START-TIME: 2009/10/01 10:00:00 END-TIME: 2009/10/01 10:03:00
HOSTNAME: DB_SVR1
T DB       OBJECT    FILE             CHECKPOINT-LSN
FULL-BACKUP-TIME      FS        DG       DEVICE    COPY-GROUP
```

```
M DB1        METAFILE  C:\METADIR\Meta1   -
-                      C:        -         -          -
D DB1        DATAFILE  D:\SQL\data1.mdf   49000000018400037
2009/10/01 10:01:00    D:        -         Harddisk2  VG02,dev02
- -          -         -                   -
-                      -         -         -          VG02.dev02
T DB1        TRANSACT  D:\SQL\tlog1.ldf   -
-                      D:        -         Harddisk2  VG02,dev02
- -          -         -                   -
-                      -         -         -          VG02.dev02
M DB2        METAFILE  C:\METADIR\Meta2   -
-                      C:        -         -          -
D DB1        DATAFILE  D:\SQL\data2.mdf   259000000004000089
2009/10/01 10:01:00    D:        -         Harddisk2  VG02,dev02
- -          -         -                   -
-                      -         -         -          VG02.dev02
T DB1        TRANSACT  D:\SQL\tlog2.ldf   -
-                      D:        -         Harddisk2  VG02,dev02
- -          -         -                   -
-                      -         -         -          VG02.dev02
```

drmsqldisplay (Displays or updates information for an SQL Server database)

Formats

To display the information for the SQL Server database:
```
drmsqldisplay [ instance-name ]
              [ -target database-name | -f target-definition-file-
name ]
              [ -transact_log ][ -datafile ]
              [ -device device-file-name ][ -l ][ -v ][ -cf ]
```

To display information with linking for copy groups for both the local site and remote sites:
```
drmsqldisplay [ instance-name ]
              [ -target database-name | -f target-definition-file-
name ]
              [ -transact_log ][ -datafile ]
              [ -v ][ -remote ]
```

To update the information in the dictionary map files:
```
drmsqldisplay [instance-name ] -refresh [ -coremap ]
```

Description

The drmsqldisplay command does the following:

1. Displays the resource information of the SQL Server database on the server on which the command was executed.

2. Displays resource information pertaining to optional instances for the system on which the command was executed.

3. Updates the SQL Server database information of the dictionary map files. Execute this command before performing a backup.

The items displayed in 1 and 2 are shown in the table below.

Table 2-22 Items displayed by the drmsqldisplay command

Displayed item	Meaning
INSTANCE	The name of the SQL server instance
T	The object type: D: Data file T: Transaction log
DB	The name of the SQL server database
OBJECT	The name of the SQL server object: DATAFILE: The name of the data file TRANSACT: The name of the transaction log file
FILE	The file name
FS	The mount point directory name
FSTYPE	The type of file system (NTFS)
DG	A hyphen (-) is displayed.
LVM-DEVICE	The name of the logical device file (for an environment with a logical volume manager) or GUID (for an environment without a logical volume manager)
DEVICE[#1]	Harddisk*n* (where *n* is an integer)
COPY-GROUP	The copy group name, displayed as follows: *CCI-volume-group-name,device-name*
L-COPY-GROUP	The copy group name of the local site, displayed as follows: *CCI-volume-group-name,device-name*
R-COPY-GROUP	The copy group name of the remote site and the pair identifier (MU#) of the SVOL at the remote destination, displayed as follows: *CCI-volume-group-name,device-name-with-remote-destination-SVOL-pair-identifier-(MU#)*
PORT#	The port name on the host server
TID#	The target ID on the host server
LUN#	The logical unit number on the host server
MU#	Paired ID
LDEV#	The logical device number within the RAID setup
P/S	A letter to distinguish the primary volume from the secondary volume: P: Primary volume S: Secondary volume -: A volume that is not part of a pair
SERIAL#	The serial number within the RAID device

Displayed item	Meaning
COPY-FUNC	Copy type
	Copy type: The name of the copy type varies depending on the DKC software product (storage system unit) and microcode version.
	-: Indicates the volume where a pair volume has not been configured.
	(Do not create a program that operates using this display.)
GEN-NAME	Generation identifier
	`local_n`: for a local pair volume (where n is a generation number from 0 to 999)
	`remote_n`: for a remote pair volume (where n is a generation number from 0 to 999)
	-: Indicates a volume where a pair volume has not been configured.
VIRTUAL-SERVERNAME[#2]	Virtual server name (value of the `DRM_HOSTNAME` environment variable)
DB-PATH[#2]	Name of the directory storing the dictionary map files
CORE-MAPFILE-UPDATE-TIME[#2]	Update time for the core map file
APP.-MAPFILE-UPDATE-TIME[#2]	Update time for the application map file

#1

   When this command is executed with the `-device` option specified, this will be displayed after `OBJECT`.

#2

   The command executed with the `-v` option displays this information.

A hyphen (-) will be displayed in columns that contain items that cannot be displayed. An error message will be displayed when none of the items can be displayed.

Each item is separated by space.

Arguments

instance-name

Specify the name of the SQL Server database instance for which information is to be updated or displayed. If the instance to be backed up is the default, specify `DEFAULT`. If the instance name is omitted, use the `drmsqlinit` command to display information for all registered instances.

`-target` *database-names*

Displays the information regarding specific databases of the instance `instance-name`. To display or update information for more than one database, separate the database names using commas. If you specify a database name containing a space character, enclose the database name in double quotation marks (").

`-f target-definition-file-name`

Displays the information regarding specific databases of the instance `instance-name`. Unlike `-target`, this option lets you specify a target definition file that specifies a list of databases for which the information is to be displayed. The target definition file containing the list of databases must be created before you attempt to use this option. Use an absolute path to specify the file name. If you specify a target definition file name containing a space character, enclose the target definition file name in double quotation marks (").

`-transact_log`

Displays information relating to the transaction log file only. This option will display the following information:

- The name of the transaction log file
- File system information
- Logical volume structure information
- Physical disk information

When you specify this option with `instance-name`, only the information about the transaction log of the specified instance will be displayed. When `instance-name` is omitted, information about all of the instance transaction logs will be displayed.

`-datafile`

Displays only the information about the data file of the specified instance. This option will display the following information:

- The name of the data file
- File system information
- Logical volume structure information
- Physical disk information

When you specify this option with `instance-name`, only information about the data file of the specified instance will be displayed. When `instance-name` is omitted, information about the data files of all of the instances will be displayed.

`-device device-file-name`

Displays information relating to the device file only. This option will display the following information:

- The name of the SQL Server database
- The transaction log

- Data file information
- File system information
- Physical disk information
- Logical volume structure information

When you specify this option with *instance-name*, only information about the device files of the specified instance will be displayed. When *instance-name* is omitted, information about the device files of all of the instances will be displayed.

`-l`

Specifies the SQL Server database information that will be displayed in the long format.

`-v`

Specify this option to display management information about the dictionary map files.

The following information is displayed:

- Name of the directory storing the backup catalog
  Displays the path that is set in `DRM_DB_PATH` in the Application Agent configuration definition file (`init.conf`).

  If `DRM_DB_PATH` has not been set, the default storage directory for the dictionary map files, which are created automatically during installation, is displayed.

- Virtual server name (value of the `DRM_HOSTNAME` environment variable)
  If the `DRM_HOSTNAME` environment variable has not been set, a hyphen (`-`) appears.

- Update time for the dictionary map files
  Displays the update time separately for the core map file and the application map file.

`-refresh`

Updates dictionary map files' information to the latest status.

When you specify this option with *instance-name*, only the information about the specified instance in the application map file will be updated. The processing of the core map file differs depending on the following:

- When the core map file already exists, the file is not updated.
- When the core map file does not exist, a new core map file is created.

When *instance-name* is omitted, the core map file and the information about all of the instances in the application map file will be updated. At this time, if the update of the dictionary map files fails, the contents of the core map file are deleted.

The dictionary map files must be updated to the latest status by using this command when any of the following cases apply:

- When an instance of SQL Server is created.

- When the SQL server database configuration has been changed.

- When the CCI configuration definition file has been changed and a pair of volumes has been changed.

- When the mount point has been changed

- When the disk configuration such as adding or removing a hard disk has been changed.

- When the storage location of the dictionary map has been changed by executing the `drmdbsetup` utility.

- When disk information for `snapshot` is set up in the dictionary map files.

`-coremap`

Specify this option to update the core map file. This option is available only when it is specified together with *instance-name*. If the core map file does not exist, a new core map file is created.

At this time, if the update of the dictionary map files fails, the contents of the core map file are deleted.

`-cf`

Specify this to display local or remote copy types, or the name identifying the generation corresponding to the copy group name. The remote information is also displayed.

`-remote`

Specify this option to display information with linking for copy groups for both the local site and all remote sites.

⚠️ **Note:** When specifying on the command line a file name or directory name containing space characters for the `-target` or `-f` option, you must enclose the file name in double quotation marks ("").
Note that enclosing with double quotation marks is not necessary for target paths specified in batch definition files.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to display information about the database `SQL1`:
```
PROMPT> drmsqldisplay SQL1
INSTANCE: SQL1
T DB      OBJECT    FILE                      FS          DG
DEVICE        COPY-GROUP
D DB1     DATAFILE  D:\SQL\data1.mdf     D:          -
Harddisk1     VG01,dev01
```

```
- -         -         -                    -           -
-           VG01,dev01
T DB1    TRANSACT  D:\SQL\tlog1.ldf      D:          -
Harddisk1    VG01,dev01
- -       -        -                    -           -
-           VG01,dev01
D DB2    DATAFILE  E:\SQL\data2.mdf      E:          -
Harddisk2    VG02,dev02
- -       -        -                    -           -
-           VG02,dev02
T DB2    TRANSACT  E:\SQL\tlog2.ldf      E:          -
Harddisk2    VG02,dev02
- -       -        -                    -           -
-           VG02,dev02
```

- In this example, the command is used to display information, in the long format, about the database `SQL1`:

```
PROMPT> drmsqldisplay SQL1 -l
INSTANCE: SQL1
T DB  OBJECT    FILE              FS FSTYPE  DG  LVM-
DEVICE                                     DEVICE     COPY-
GROUP   PORT#  TID# LUN# MU# LDEV# P/S SERIAL#
D DB1 DATAFILE  D:\SQL\data1.mdf D: NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk1
VG01,dev01   CLI-A 2   10   0   10000 P   15044
- -  -       -          - -       -
-                                                        -
VG01,dev01   CLI-A 2   20   0   10020 S   15044
D DB1 DATAFILE  D:\SQL\data2,mdf D: NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk1
VG01,dev01   CLI-A 2   10   0   10000 P   15044
- -  -       -          - -       -
-                                                        -
VG01,dev01   CLI-A 2   20   0   10020 S   15044
T DB1 TRANSACT  D:\SQL\tlog1.ldf D: NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk1
VG01,dev01   CLI-A 2   10   0   10000 P   15044
- -  -       -          - -       -
-                                                        -
VG01,dev01   CLI-A 2   20   0   10020 S   15044
T DB1 TRANSACT  D:\SQL\tlog2.ldf D: NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk1
VG01,dev01   CLI-A 2   10   0   10000 P   15044
- -  -       -          - -       -
-                                                        -
VG01,dev01   CLI-A 2   20   0   10020 S   15044
D DB2 DATAFILE  E:\SQL\data1.mdf E: NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk1
VG02,dev01   CLI-A 2   11   0   10001 P   15044
- -  -       -          - -       -
-                                                        -
VG02,dev01   CLI-A 2   21   0   10021 S   15044
D DB2 DATAFILE  E:\SQL\data2.mdf E: NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk1
VG02,dev01   CLI-A 2   11   0   10001 P   15044
- -  -       -          - -       -
-                                                        -
VG02,dev01   CLI-A 2   21   0   10021 S   15044
T DB2 TRANSACT  E:\SQL\tlog1.ldf E: NTFS    -   \\?
```

```
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk1
VG02,dev01   CLI-A 2   11  0   10001 P   15044
- -   -      -          - -     -
-                                           -
VG02,dev01   CLI-A 2   21  0   10021 S   15044
T DB2 TRANSACT  E:\SQL\tlog2.ldf E: NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk1
VG02,dev01   CLI-A 2   11  0   10001 P   15044
- -   -      -          - -     -
-                                -          VG02,dev01
CLI-A 2   21  0   10021 S   15044
```

- In this example, the command is used to only display information, in the long format, about the data file specified with the instance SQL1:

```
PROMPT> drmsqldisplay SQL1 -l -transact_log
INSTANCE: SQL1
T DB  OBJECT    FILE             FS FSTYPE  DG  LVM-
DEVICE                                       DEVICE    COPY-
GROUP   PORT#  TID# LUN# MU# LDEV# P/S SERIAL#
T DB1 TRANSACT  D:\SQL\tlog1.ldf D: NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk1
VG01,dev01   CLI-A 2   10  0   10000 P   15044
- -   -      -          - -     -
-                                           -
VG01,dev01   CLI-A 2   20  0   10020 S   15044
T DB1 TRANSACT  D:\SQL\tlog2.ldf D: NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk1
VG01,dev01   CLI-A 2   10  0   10000 P   15044
- -   -      -          - -     -
-                                           -
VG01,dev01   CLI-A 2   20  0   10020 S   15044
T DB2 TRANSACT  E:\SQL\tlog1.ldf E: NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk1
VG02,dev01   CLI-A 2   11  0   10001 P   15044
- -   -      -          - -     -
-                                           -
VG02,dev01   CLI-A 2   21  0   10021 S   15044
T DB2 TRANSACT  E:\SQL\tlog2.ldf E: NTFS    -   \\?
\Volume{df67a5b0-5583-11d5-a410-806d6172696f}\  Harddisk1
VG02,dev01   CLI-A 2   11  0   10001 P   15044
- -   -      -          - -     -
-                                           -
VG02,dev01   CLI-A 2   21  0   10021 S   15044
```

- In this example, the command is used to display information about the SQL Server database specified by the instance SQL1 and management information for the dictionary map files:

```
PROMPT> drmsqldisplay SQL1 -v
VIRTUAL-SERVERNAME: host1
DB-PATH: D:\Program Files\Hitachi\DRM\db2
INSTANCE: SQL1
CORE-MAPFILE-UPDATE-TIME: 2002/06/01 10:00:00
APP.-MAPFILE-UPDATE-TIME: 2002/06/01 10:00:00
T DB   OBJECT   FILE             FS DG  DEVICE    COPY-GROUP
D DB1  DATAFILE D:\SQL\data1.mdf D: -   Harddisk1 VG01,dev01
- -    -        -                -  -   -         VG01,dev01
T DB1  TRANSACT D:\SQL\tlog1.ldf D: -   Harddisk1 VG01,dev01
- -    -        -                -  -   -         VG01,dev01
D DB2  DATAFILE E:\SQL\data2.mdf E: -   Harddisk2 VG02,dev02
```

```
- -      -           -                    -   -   -      VG02,dev02
T DB2   TRANSACT  E:\SQL\tlog2.ldf  E:  -   Harddisk2  VG02,dev02
- -      -           -                    -   -   -      VG02,dev02
```

- In this example, the command is used to display information about the SQL Server database specified by the instance `SQL1` and management information for the dictionary map files (when the dictionary map files do not exist):

```
PROMPT> drmsqldisplay SQL1 -v
VIRTUAL-SERVERNAME: host1
DB-PATH: D:\Program Files\Hitachi\DRM\db2
KAVX0039-E The core map file(s) cannot be found.
```

- In this example, this command is used to display the information including the cascade:

```
PROMPT> drmsqldisplay -remote -target UserDB1
INSTANCE: default
T DB         OBJECT     FILE                                    L-COPY-
GROUP   R-COPY-GROUP   PORT#    TID#   LUN#   MU#   LDEV#   P/S
SERIAL#
D UserDB1   DATAFILE   Z:\UserDB1_Data.MDF
-             -                    CL1-A   1      32      -
32      P     116
- -           -            -
SI11,dev01     -                    CL1-A   1      60      0
60      S     116
- -           -            -
TC11,dev11     -                    CL1-A   1      32      0
32      S     600
- -           -            -
TC11,dev11     TC11,dev11#0  -       -      -       0
60      C     600
T UserDB1   TRANSACT   Z:\UserDB1_Log.LDF
-             -                    CL1-A   1      32      -
32      P     116
- -           -            -
SI11,dev01     -                    CL1-A   1      60      0
60      S     116
- -           -            -
TC11,dev11     -                    CL1-A   1      32      0
32      S     600
- -           -            -
TC11,dev11     TC11,dev11#0  -       -      -       0
60      C     600
PROMPT>
```

drmsqlinit (Registers parameters for SQL Server)

Formats

To register parameters for SQL Server:

`drmsqlinit` *instance-name*

To display the parameters registered for SQL Server:

`drmsqlinit -v` *instance-name*

Description

The `drmsqlinit` command provides an interactive interface that lets you register the SQL Server parameters necessary to back up an SQL Server database. You can register parameters for each instance. This command registers the following information.

Table 2-23 Parameters for the SQL Server

Setting	Description
VDI metafile storage directory (optional)[#1]	Use an absolute path to specify the name of the directory for storing a VDI metafile. An existing directory must be specified.
	If you do not specify any value as the VDI metafile storage directory, the VDI metafiles will be stored in the same location as the data files of the SQL Server database. To easily manage VDI metafiles, We recommend that you do not specify a VDI metafile storage directory.
VDI generation timeout interval (in seconds) (required)	The timeout interval in seconds, used when a VDI metafile is generated.
	The specifiable range is from 0 to 3600. When you specify `0`, the waiting status continues indefinitely until a VDI metafile is generated.
UNDO file storage directory (optional)[#2]	Use an absolute path to specify the name of the directory for storing an undo file. An existing directory must be specified.
Transaction log backup file storage directory (optional)[#3]	Specify the backup destination for the transaction log file backed up with the `drmsqllogbackup` command. Use an absolute path to specify the directory name. Specify a location other than a primary volume containing databases and a secondary volume containing databases.

#1

  You cannot specify the directory containing the SQL Server database configuration definition file (*instance-name*.dat, in which parameters are registered) for the VDI metafile storage directory.

#2

  If nothing is specified for the UNDO file storage directory, and the `drmsqlrestore` command or `drmsqlrecover` command is executed with the `-undo` option specified, an error message appears, indicating that no parameters have been specified for the `drmsqlinit` command. The same message will be displayed if Standby is specified for Recovery Mode, in the drmsqlrecovertool dialog box.

  If this error message is displayed, use the `drmsqlinit` command to set the UNDO file storage directory. Note that you cannot specify the directory containing the SQL Server database configuration definition file

(`instance-name.dat`, in which parameters are registered) for the UNDO file storage directory.

#3

If nothing is specified for the transaction log backup file storage directory, and the `drmsqllogbackup` command is executed, an error message appears, indicating that no parameters are set for the `drmsqlinit` command. If this message is displayed, use the `drmsqlinit` command to set the transaction log backup file storage directory.

Whether the directories can be specified depends on how to specify the directories. The following table lists whether the directories can be specified.

Table 2-24 Whether the directories can be specified

Directory type	Local drive	Path mount	UNC[#1]	Network drive[#2]
VDI metafile storage directory	Y	Y	N	N
UNDO file storage directory	Y	Y	N	N
Transaction log backup file storage directory	Y	Y	N	N

Legend

Y: Can be specified

N: Cannot be specified

#1

This method specifies a directory in the following format: `\\IP-address\directory-path` or `\\host-name\directory-path`.

#2

This method specifies a directory for a mount point as the network drive.

Directories in which SQL Server schema definition files (with parameters registered as `instance-name.dat`) are stored cannot be specified as storage directories for VDI metafiles or undo files.

The parameters that this command registers are stored in the following location:

`Application-Agent-installation-folder\DRM\conf\MSSQL\instance-name.dat`

To delete instances that have registered parameters, delete `name-of-instance-to-be-deleted.dat`.

Arguments

`-v`

Displays the registered parameters.

instance-name

Specify the name of the SQL Server instance to be backed up. If the instance to be backed up is the default, specify `DEFAULT`.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to set up the instance `SQL1`:

```
PROMPT> drmsqlinit SQL1
KAVX1100-I Enter the name of the storage directory for VDI
metafiles: D:\MSSQL\Meta
KAVX1101-I Enter the timeout interval for VDI generation (in
seconds, between 0 and 3600): 10
KAVX1102-I Enter the name of the storage directory for undo
files: D:\MSSQL\Undo
KAVX1107-I Enter the name of the storage directory for the
backup-log files: D:\MSSQL\tlog
KAVX1103-I SQL Server information has been updated.
PROMPT>
```

- In this example, the command is used to display the `SQL1` parameters:

```
PROMPT> drmsqlinit -v SQL1
SQL Server meta directory name:        D:\MSSQL\Meta
SQL VDI timeout sec ( 0 - 3600 ):       10
SQL Server undo-file directory name:  D:\MSSQL\Undo
SQL Server backup-log directory name: D:\MSSQL\Log
PROMPT>
```

drmsqllogbackup (Backs up the transaction log of an SQL Server)

Formats

To specify the instance and back up the transaction log:
```
drmsqllogbackup instance-name [ -no_cat ]
                [ -no_truncate ]
                [ -target database-name | -f target-definition-file-
name ]
```

To specify the backup ID and back up the transaction log:
```
drmsqllogbackup backup-ID [ -no_truncate ]
```

To specify the instance and view a list of transaction log backups when the backup catalog exists:
```
drmsqllogbackup instance-name -v
            [BACKUP-ID | -target database-name | -f target-
definition-file-name ]
```

To specify the instance and view a list of transaction log backups when the backup catalog does not exist:

```
drmsqllogbackup instance-name -no_cat -v
            [ -target database-name | -f target-definition-file-
name ]
```

To specify the backup ID and view a list of transaction log backups when the backup catalog exists:
```
drmsqllogbackup backup-ID -v
            [ -target database-name | -f target-definition-file-
name ]
            [-s log-backup-ID ][-e log-backup-ID ]
```

To delete transaction log backups when the backup catalog exists:
```
drmsqllogbackup backup-ID -d
            [ -s log-backup-ID ] [ -e log-backup-ID ]
```

To delete transaction log backups when the backup catalog does not exist:
```
drmsqllogbackup instance-name -d
            [ -s log-backup-ID ] [ -e log-backup-ID ]
```

To display the detailed information of transaction log files in the log backup catalog:
```
drmsqllogbackup instance-name -lsn
```

Description

The `drmsqllogbackup` command backs up the transaction log file of a SQL server database that was backed up by using the `drmsqlbackup` command. Use the `drmsqlinit` command to set the directory to which this file is to be backed up. The backup file of the transaction log file will be named as follows:

database-name_yyyymmddhhmmss_log-backup-ID.bk

This backup ID is used to identify the number of times that the transaction log file has been backed up, for the backup data specified by the backup ID. This value is expressed as a four-digit number in decimal format (for example, `0001` or `1000`).

The preconditions to execute this command are as follows:

- The instance to be backed up is running.
- The contents of the transaction log have not been destroyed.
- The recovery model of the database is Full or Bulk_Logged. (The recovery model Simple of the database is not included.)
- None of the transaction log backup functions provided by SQL Server (such as `BACKUP LOG` and the log distribution function) are being used.

Arguments

instance-name

Specify the name of the SQL Server instance to be backed up. If the SQL Server instance to be backed up is the default, specify `DEFAULT`.

backup-ID

When deleting or displaying a transaction log file or backing up transaction logs, use this option to specify its backup ID.

Specify the latest backup ID when you back up a transaction log.

When the backup catalog that you want to specify is deleted and you cannot specify a backup ID, you can specify an original ID. Add `O:` before the original ID and specify the command arguments as well as the backup ID. The following shows examples:

- In this example, the command views information on the backups of the transaction log backup files with the original ID `0000000001`:
  ```
  PROMPT> drmsqllogbackup O:0000000001 -v
  ```
- In this example, the command deletes information on the backups of the transaction log backup files with the original ID `0000000001`:
  ```
  PROMPT> drmsqllogbackup O:0000000001 -d
  ```

`-v`

Specify this option to display a list of the transaction log files that were backed up. Information on the backups of the transaction log files acquired after the backup ID specified together will be displayed. You can take the information displayed by this option, and use it as a transaction log target definition file.

`BACKUP-ID`

Specify `BACKUP-ID` to display the backup IDs of the backups for the specified instance.

`-no_cat`

Specify this option if you want to back up the transaction log for a database that has not been backed up by using the `drmsqlbackup` command in Application Agent 6.3.0-00 or later, or if the backup catalog for the starting point of a transaction log backup does not exist.

If you specify the `-no_cat` option, a connection cannot be made between the log backup ID and the backup ID in the transaction log.

Specify this option to execute transaction log backup when the backup catalog for the starting point of a transaction log backup does not exist. Specify this option in the following cases:

- A backup for which the backup catalog has been deleted by a command that resynchronized the copy group
- A backup for which only a remote backup (not a local backup) was performed

If the `-v` option is used to display a transaction log backup obtained using this option, a hyphen (`-`) is displayed in `ORIGINAL-ID` and `BACKUP-ID`.

`-no_truncate`

Specify this to perform backup without truncating the transaction log. If the transaction log is not adversely affected even when a failure occurs and

database files are damaged, you can specify this option to obtain a backup of the transaction log.

`-target` *database-names*

Specify this to display the information about the specific database of the instance *instance-name*. To display information about multiple databases, separate the name of each database with a comma. If you specify a database name containing a space character, enclose the database name in double quotation marks (").

`-f` *target-definition-file-name*

Specify this to display the information about the specific database of the instance *instance-name*. Unlike the `-target` option, you can use this option to view information about multiple files with one setting, so long as those files are already contained in a configuration file. Make sure that you specify the path of this configuration file as an absolute path. If you specify a target definition file name containing a space character, enclose the target definition file name in double quotation marks (").

`-d`

Specify this option to delete the backups of the acquired transaction log files.

`-s` *log-backup-ID*

Specify this option to set the start of the range of the transaction log backup files to be deleted or displayed. Use this option together with the `-e` option to specify the start and end of this range. Specifying the `-s` option alone sets the range from the backup ID that was specified with the `-s` option to the last log backup ID.

Possible log backup ID values are `0001` through `9999`.

`-e` *log-backup-ID*

Specify this option to set the end of the range of the transaction log backup files to be deleted or displayed. Use this option with the `-s` option to specify the start and end of this range. Specifying the `-e` option alone sets the range from the first log backup ID to the log backup ID specified with the `-e` option.

Possible log backup ID values are `0001` through `9999`.

`-lsn`

Specify this option to display the detailed information of the transaction log files in the log backup catalog. Transaction log backup information is displayed both for log backup IDs that are associated with a backup ID and for log backup IDs that are not associated with a backup ID.

The displayed items are as follows:

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Table 2-25 Items displayed by drmsqllogbackup -lsn

Displayed item	Meaning
BACKUP-ID	Backup ID (10 digits)[#1]
ORIGINAL-ID	Original ID (10 digits)
LOG-BACKUP-ID	Log backup ID (4 digits)
DB	SQL Server database name (set by MSSQL)
FILE	Transaction log backup file name
FIRST-LSN	First log sequence number in the transaction log backup[#2]
LAST-LSN	Last log sequence number in the transaction log backup[#2]
LAST-FULL-BACKUP-TIME	Database full backup end time that was recorded in msdb of SQL Server when the transaction log was backed up, displayed as follows: ($yyyy/mm/dd\ hh{:}mm{:}ss$)[#2]

#1

A hyphen is displayed if a backup catalog has been deleted.

#2

A hyphen is displayed for a backup catalog created by a version earlier than Application Agent 6.3.0-00.

If a hyphen is displayed for BACKUP-ID, perform the following procedure to check the backup ID:

1. For the record to which a hyphen is displayed for `BACKUP-ID`, check the value of `LAST-FULL-BACKUP-TIME`.

2. Execute drmsqlcat `-lsn`.

3. From the execution result of `drmsqlcat -lsn`, find a record whose value for `FULL-BACKUP-TIME` is the same as the value for `LAST-FULL-BACKUP-TIME` found in step 1.

4. Check the backup ID for the record found in step 3.

> ⚠ **Note:** This command cannot be applied to the system databases (master, msdb, model, tempdb, and distribution).
> After a database has been restored, the log backup for different recovery paths are mixed and displayed.
> For the instance that is the target of this command, if the `drmsqlbackup` command of Application Agent 6.3.0-00 or later has been executed for the instance, you can back up the transaction logs entries associated with a backup ID, regardless of whether the backup catalog exists.
> If the transaction log of SQL Server is backed up from any product other than Application Agent before Application Agent executes the log backup of SQL

Server, `LAST-FULL-BACKUP-TIME` indicates the time at which the backup was executed from the product.

To associate a backup ID with a transaction log backup by using this command when the backup catalog does not exist, all of the following conditions must be satisfied:

- The `drmsqlbackup` command in Application Agent 6.3.0-00 or later is used to back up the target instance. Note that if the `drmsqlbackup` command in Application Agent 6.3.0-00 or later has not been used to back up the target instance (for example, when specific databases only were backed up with the `-target` option), the backup catalog for the target database (created by any version of Application Agent) will exist when the `drmsqlbackup` command of Application Agent 6.3.0-00 or later is executed.

- None of the following options are specified for the `drmsqllogbackup` command: `-no_cat`, `-v`, `-lsn`, or `-d`

- An instance name is specified for the `drmsqllogbackup` command.

If you have deleted an instance, and then registered it again with the same instance name, you need to create a backup catalog with the `drmsqlbackup` command before executing the `drmsqllogbackup` command. If you execute the drmsqllogbackup command without creating a backup catalog, the database name before the re-registration of the instance will be the target of transaction log backup.

You have to back up a transaction log of the SQL Server database from Application Agent. If you back up the transaction log from software other than Application Agent, the log sequence number for the starting point of recovery for the values from `FIRST-LSN` to `LAST-LSN` might not be included. In this case, an attempt to recover from Application Agent will fail because the log sequence number for the starting point cannot be identified.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to back up the transaction log file of the instance `DEFAULT`:

  ```
  PROMPT> drmsqllogbackup DEFAULT
  ```

- In this example, the command is used to display information on the backups of the transaction log backup files with backup ID `0000000020` and with a log backup ID from `0001` to `0003`:

  ```
  PROMPT> drmsqllogbackup 0000000020 -v -s 0001 -e 0003
  [userDB1]
  C:\LogBackup\userDB1_20021106010101_0001.bk
  C:\LogBackup\userDB1_20021106050101_0002.bk
  C:\LogBackup\userDB1_20021106090101_0003.bk
  [userDB2]
  C:\LogBackup\userDB2_20021106010101_0001.bk
  C:\LogBackup\userDB2_20021106050101_0002.bk
  C:\LogBackup\userDB2_20021106090101_0003.bk
  ```

- In this example, the command is used to delete the backups of the transaction log backup files with backup ID `0000000020` and with a log backup ID from `0001` to `0003`:
  ```
  PROMPT> drmsqllogbackup 0000000021 -d -s 0001 -e 0003
  ```

- In this example, the command is used to display information on the backups of the transaction log backup files when two databases in the instance `default` have been backed up at different times with different backup IDs.

  Creating a transaction log target definition file:
  > Backup ID for the database `userDB1`: 0000000002

  > Backup ID for the database `userDB2`: 0000000003
  ```
  PROMPT> drmsqllogbackup DEFAULT -v
  # ORIGINAL-ID:0000000002 BACKUP-ID:0000000002 --> This line is
  handled as a comment line.
  [userDB1]
  C:\LogBackup\userDB1_20021106010101_0001.bk
  C:\LogBackup\userDB1_20021106050101_0002.bk
  C:\LogBackup\userDB1_20021106090101_0003.bk
  # ORIGINAL-ID:0000000003 BACKUP-ID:0000000003 -> This line is
  handled as a comment line.
  [userDB2]
  C:\LogBackup\userDB2_20021106010101_0001.bk
  C:\LogBackup\userDB2_20021106050101_0002.bk
  C:\LogBackup\userDB2_20021106090101_0003.bk
  PROMPT>
  ```
  In this example, the command is used to list information for the backup IDs for the instance:
  ```
  PROMPT> drmsqllogbackup DEFAULT -v BACKUP-ID
  ORIGINAL-ID BACKUP-ID DB
  0000000002 0000000002 userDB1
  0000000003 0000000003 userDB2
  PROMPT>
  ```

- In this example, the command is used to list information for the backup IDs when multiple databases have been backed up at one time for the instance `default`.
  ```
  PROMPT> drmsqllogbackup DEFAULT -v BACKUP-ID
  ORIGINAL-ID BACKUP-ID DB
  0000000002 0000000002 userDB1,userDB2 --> Displays comma-
  separated information.
  0000000003 0000000003 userDB2
  PROMPT>
  ```

- In this example, the command is used to display the backup information of the transaction log obtained with the `-no_cat` option:
  ```
  PROMPT> drmsqllogbackup -no_cat -v
  # ORIGINAL-ID:-   BACKUP-ID:-
  [UserDB3]
  C:\MSSQL\FLORA4\default\tlog\UserDB3_20040116163638_0001.bk
  C:\MSSQL\FLORA4\default\tlog\UserDB3_20040116163640_0002.bk
  # ORIGINAL-ID:-   BACKUP-ID:-
  [UserDB2]
  C:\MSSQL\FLORA4\default\tlog\UserDB2_20040116163637_0001.bk
  C:\MSSQL\FLORA4\default\tlog\UserDB2_20040116163640_0002.bk
  # ORIGINAL-ID:-   BACKUP-ID:-
  ```

```
[UserDB1]
C:\MSSQL\FLORA4\default\tlog\UserDB1_20040116163637_0001.bk
C:\MSSQL\FLORA4\default\tlog\UserDB1_20040116163640_0002.bk
```

- In this example, the command is used to create a transaction log target definition file (`SQLTXLOG.txt`) from the backup information of the transaction log:

```
PROMPT> drmsqllogbackup SQL1 -target DB1 -v > C:\temp
\SQLTXLOG.txt
PROMPT>
```

- In this example, the command is used to obtain a backup of the transaction log when the data files of the database are damaged:

```
PROMPT> drmsqllogbackup default -no_truncate
KAVX0001-I The drmsqllogbackup command will now start.
KAVX0002-I The drmsqllogbackup command will now end.
```

- In this example, this command is used to display the log backup information of the database:

```
PROMPT> drmsqllogbackup SQL2k8 -lsn
BACKUP-ID   ORIGINAL-ID LOG-BACKUP-ID   DB
FILE                                          FIRST-
LSN           LAST-LSN           LAST- FULL-BACKUP-TIME
0000000023  0000000023  0001            USERDB  C:\SQL_LOG\LOG
\USERDB_20091001122024_0001.bk   30000000021600001
30000000024100001   2009/10/01 12:20:24
0000000023  0000000023  0002            USERDB  C:\SQL_LOG\LOG
\USERDB_20091001122024_0002.bk   30000000024100001
30000000024100001   2009/10/01 12:20:24
-           0000000024  0001            USERDB  C:\SQL_LOG\LOG
\USERDB_20091001122024_0001.bk   30000000024100001
30000000024100010   2009/10/01 13:20:24
```

drmsqlrecover (Recovers restored SQL Server databases)

Format

```
drmsqlrecover instance-name
            [ -target database-name | -f target-definition-file-
name ]
            [ -transact_log_list name-of-target-definition-file-
for-transaction-logs ]
            [ -undo | -loading ]
```

Description

The `drmsqlrecover` command recovers a database restored by the `drmsqlrestore` command. This command applies transaction logs that are specified in a target definition file for transaction logs or acquired during backup, and performs roll-forward recovery processing.

During command execution, from another computer such as an application server, you should not connect to the database that was restored. If another server connects to the database during command execution, the command might fail.

Arguments

instance-name

Specify the database instance to be recovered. If the instance to be recovered is the default, specify `DEFAULT`.

`-target` *database-names*

Specify this option to recover specific databases. When specifying multiple databases to be recovered, use a comma to separate each database name. If you specify a database name containing a space character, enclose the database name in double quotation marks (").

When both this option and the `-f` option are omitted, the entire instance will be recovered.

`-f` *target-definition-file-name*

Like the `-target` option, this option restores specific databases during recovery. Unlike the `-target` option, this option lets you specify a target definition file that collectively specifies all the databases to be restored. The target definition file containing the list of databases must be created before you attempt to use this option. Use an absolute path to specify the target definition file. If you specify a target definition file name containing a space character, enclose the target definition file name in double quotation marks (").

Make sure that you specify databases that exist in the specified instance. If you specify databases in separate instances, those databases will not be recovered.

`-transact_log_list` *name-of-target-definition-file-for-transaction-logs*

Specify the order of the transaction log files to be applied during recovery. The order of these transaction log files is listed in the *name-of-target-definition-file-for-transaction-logs*. Make sure that you use an absolute path when specifying the file name. If you specify a *name-of-target-definition-file-for-transaction-logs* name containing a space character, enclose the *name-of-target-definition-file-for-transaction-logs* name in double quotation marks (").

The log to be applied differs, depending on the user operation. Confirm the backup log by using the `drmsqllogbackup` command, and then select the log to be applied.

If this option is omitted, recovery processing by roll-forward is not performed, because the transaction log is not applied. Therefore, the database will return to the latest backup status.

`-undo`

Specifies that the database should be put in standby mode, accessed as read-only, after recovery. Temporary files will be created for each database in the undo file storage directory specified by the `drmsqlinit` command. If the

Basic commands

UNDO file storage directory has not been set using the `drmsqlinit` command, an error message appears, indicating that no parameters are set for the `drmsqlinit` command. Specify the UNDO file storage directory using the `drmsqlinit` command.

If both the `-undo` option and `-loading` option are omitted, the database can be fully accessed after recovery, but any subsequent transaction logs are not applied.

`-loading`

Specify this to place the database in the loading status after recovery. In this status, transaction logs can continue to be applied.

When the `-loading` option is specified, because no temporary files are created as with the `-undo` option, you do not need to create the temporary file storage directory beforehand.

If both the `-undo` option and `-loading` option are omitted, the database can be fully accessed after recovery, but any subsequent transaction logs are not applied.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to recover the entire database identified by `SQLIns`:

  `PROMPT> drmsqlrecover SQLIns`
- In this example, the command is used to recover only the database `DB01` from within the instance identified by `SQLIns`:

  `PROMPT> drmsqlrecover SQLIns -target DB01`

drmsqlrecovertool (Recovers restored SQL Server databases via a GUI)

Format

`drmsqlrecovertool` *instance-name*

Description

The `drmsqlrecovertool` command uses a GUI to recover an SQL Server database that has been restored by the `drmsqlrestore` command.

Arguments

instance-name

Specify the name of the database instance to be recovered. If the SQL Server instance to be recovered is the default, specify `DEFAULT`.

GUI description

The following describes the drmsqlrecovertool dialog box that is activated when the `drmsqlrecovertool` command is executed.
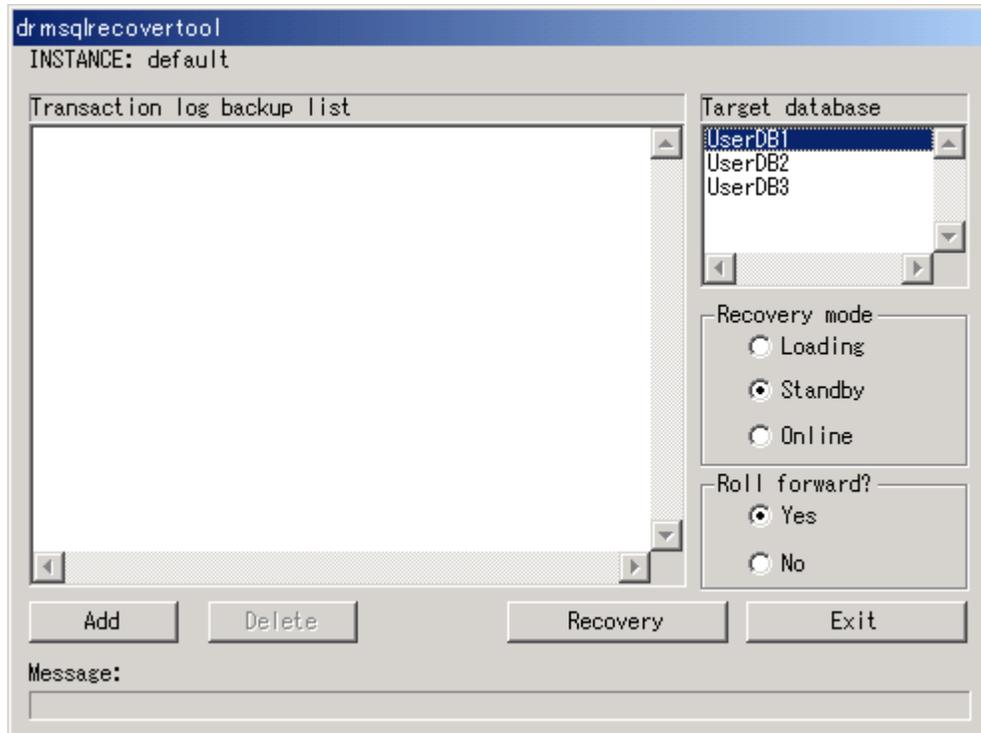
Figure 2-1 drmsqlrecovertool dialog box

`INSTANCE`

Displays the instance name specified for the `drmsqlrecovertool` command. The command will recover this instance. To change the instance, close the drmsqlrecovertool dialog box, and then re-execute the `drmsqlrecovertool` command.

`Transaction log backup list`

Displays a list of transaction log backup files that apply to the database selected in `Target database`. Use the `Add` button to add a file to this list. Use the `Delete` button to delete a file. The files shown in `Transaction log backup list` are sorted each time a new file is added.

A transaction log backup file is displayed in the following format:

`*file-name creation-date-and-timesize`

`creation-date-and-time` is in the `yyyy/mm/dd hh:mm:ss` format, and `size` is in kilobytes.

An asterisk (`*`) is added at the beginning of recovered files.

`Target database`

Displays the database for the instance specified for the `drmsqlrecovertool` command. Select the database to which the transaction log backup files apply. You cannot select more than one database.

The maximum number of databases that can be displayed is 128. If more than 128 databases exist, use the `drmsqlrecover` command to recover those databases that are not displayed.

`Recovery mode`

Select the state of the database after the recovery.

Loading: Changes the status of the database to loading.

Standby: Uses the database in the standby (read-only) mode.

Online: Uses the database in the read and write mode.

Database recovery is complete when the database status becomes Online. After recovery with Online checked, no transaction logs can be applied. Before bringing the database Online, make sure that you apply all necessary transaction logs.

`Roll forward?`

Select whether or not to perform a roll-forward during recovery. If No is selected, the `Transaction log backup list` becomes inactive. Recovery takes place without a roll forward, even when transaction log backup files are displayed.

`Add` button

Choose this button to add a transaction log file to be applied. This button adds the selected file to the files selected in `Transaction log backup list`. The files are sorted by name (not including file extensions and paths) and added.

You cannot add the following files:

- Network files (files whose path begins with \\)
- Files that already exist in `Transaction log backup list` (files do not include extensions and paths).

`Delete` button

Choose this button to delete a transaction log backup file selected in `Transaction log backup list`. You can select multiple backup files. All the selected files are deleted.

`Recovery` button

Choose this button to perform roll-forward recovery on the database. Of the transaction log backup files shown in `Transaction log backup list`, roll-forward recovery will be performed on files without an asterisk (*) for the database selected in `Target database`, beginning from the top file. Roll-

forward recovery is not performed on the files when No is selected for `Roll forward?`.

When the recovery finishes, an asterisk (`*`) is added to the beginning of all the file names in `Transaction log backup list`. If a recovery error occurs, the result is output to the message dialog box or `drm_output.log`.

`EXIT` button

Closes the drmsqlrecovertool dialog box.

`Message`

Displays the progress of the command execution.

Return Values

None

Example

- In this example, the command is used to recover the transaction log to the database for the instance `SQLIns`:
  ```
  PROMPT> drmsqlrecovertool SQLIns
  ```

drmsqlrestore (Restores SQL Server databases from backups to a primary volume)

Formats

To restore data by disk resynchronization:
```
drmsqlrestore backup-ID -resync [ -force ][ -undo ][ -nochk_host ]
                [ -instance name-of-the-SQL-Server-instance ]
                [ -target database-name | -f target-definition-file-
name ]
                [ -pf copy-parameter-definition-file ]
```

To apply only the VDI metafile to the primary volume:
```
drmsqlrestore backup-ID -no_resync [ -undo ][ -nochk_host ]
                [ -instance name-of-the-SQL-Server-instance ]
                [ -target database-name | -f target-definition-file-
name ]
```

To restore backup data on the remote site by resynchronization:
```
drmsqlrestore backup-ID -resync [ -force ][ -undo ][ -nochk_host ]
                [ -instance name-of-the-SQL-Server-instance ]
                [ -target database-name | -f target-definition-file-
name ]
                [ -template ]
                [ -pf copy-parameter-definition-file ]
```

To apply only the VDI metafiles to the primary volume of the remote site:
```
drmsqlrestore backup-ID -no_resync [ -undo ][ -nochk_host ]
                [ -instance name-of-the-SQL-Server-instance ]
```

```
                        [ -target database-name | -f target-definition-file-
name ]
                        [ -template ]
```

Description

The `drmsqlrestore` command lets you use the backup data specified by a backup ID to restore data from the secondary volume to the primary volume by disk resynchronization. The snapshot VDI metafile created by the `drmsqlbackup` command is used for restoration processing.

The following explains the operation of this command for restoration by disk resynchronization:

1. If the restored database was attached, the database will be detached.

    If the detachment of the database fails, an error message will be displayed, and a restoration processing error occurs.
2. The backup data will be restored from the secondary volume to the primary volume by disk resynchronization.
3. The database will be attached.
4. The instance will be started.

The following explains the command processing for restoration in a cluster configuration. The database to be restored cannot be used temporarily because the cluster resource containing the database is taken offline.

1. The command takes the cluster resource containing the database and the disk resource offline when the cluster resource containing the database to be restored is brought online.

    If an attempt to take the cluster resource containing databases and disk resources offline fails, the command displays an error message and the restoration processing fails.
2. The command performs disk resynchronization to restore the backup data from a secondary volume to the primary volume.
3. The command brings the disk resource online, and then brings the cluster resource, including databases, online.

If `ONLINE` is set in `CLU_MSCS_RESTORE` in the Application Agent configuration definition file (`init.conf`), you can perform restoration of a user database while the cluster resources are online by specifying the `-resync` option. In this case, the cluster resource that manages the instance to be restored cannot be taken offline. However, if the restoration target is a system database (master, model, msdb, or distribution) or a database that contains a system database, restoration will be performed offline.

In restoration, data on the primary volume is overwritten by the disk image of the secondary volume at the time a backup is performed. Therefore, data on the primary volume that was created or updated after the backup is invalid.

When you attempt to restore a system database (master, model, msdb, or distribution) for SQL server, the SQL server service to be restored needs to

be stopped to recover the system database. The database to be restored cannot be accessed temporarily.

During command execution, from another computer such as an application server, you should not connect to the database that was restored. If another server connects to the database during command execution, the command might fail.

When you restore an SQL Server system database, to recover the system database, temporarily stop the SQL Server service on which restore operations are to be performed. For this reason, temporarily, you cannot access the database on which restore operations are to be performed. Do not connect to the SQL Server during a restoration. If you connect to a database that is being restored during command execution, the system repeats checking the processing status for the number of times specified in the Application Agent configuration definition file `init.conf` (in the retry count and retry interval used when checking the status of a processing parameter). In this case, if the user is disconnected during repeated checks of the processing status, the command resumes.

When you execute this command to perform a restoration, if the name of the drive making up the SQL Server database has changed since backup was performed, the command will fail. Before performing restoration, with the `drmsqlcat` command or SQL Server management tool, check the corresponding drive name of the restoration destination.

If the physical disk partition style is changed after a backup, and then the command is executed, the command result will vary as follows.

Table 2-26 Physical disk partition style and the command execution result

Before a backup	After a backup		Command execution result
Primary volume	Primary volume	Secondary volume	Command status
MBR disk	MBR disk	MBR disk	Normal termination
		GPT disk	Error (KAVX5171-E or KAVX5137-E message) After resynchronizing[1]
	GPT disk	MBR disk	Error (DRM-10337 message) Before resynchronizing[2]
		GPT disk	Error (DRM-10337 message) Before resynchronizing[2]
GPT disk	MBR disk	MBR disk	Error (DRM-10337 message) Before resynchronizing[2]
		GPT disk	Error (DRM-10337 message) Before resynchronizing[2]

Before a backup	After a backup		Command execution result
Primary volume	Primary volume	Secondary volume	Command status
	GPT disk	MBR disk	Error (KAVX5171-E or KAVX5137-E message)
			After resynchronizing[1]
		GPT disk	Normal termination

#1

 The error message is displayed after resynchronizing.

#2

 The error message is displayed before resynchronizing.

Arguments

backup-ID

Specify the backup ID of the backup data to be restored. A backup ID, which is used to uniquely identify backup data, is registered in the backup catalog during backup. To check a backup ID, execute the `drmsqlcat` command.

`-resync`

Specify this option to restore the data from the secondary volume to the primary volume by resynchronizing the volumes. The contents of the primary volume become the same as the backup data in the secondary volume.

When you execute the command with this option, stop the service of any program viewing the Windows performance registry.

`-force`

Specify this option to restore the data from the secondary volume to the primary volume by forcibly resynchronizing the volumes.

With this option, forced resynchronization is performed if the copy group name of the primary volume obtained when backup processing was performed on the database server matches the information on the database server, even though the LDEV and SERIAL numbers do not match the LDEV and SERIAL numbers when backup processing was performed.

Specify this option only if a restoration by resynchronization could not be performed with the `-resync` option, such as when the LDEV number changes when the volume is replaced. If this option is specified during a normal restoration, data might be corrupted.

`-undo`

Specifies that the database should be restored in standby mode. When this option is specified, the database can be used as read-only after the restoration has finished. Temporary files will be created for each database in

the undo file storage directory registered by the `drmsqlinit` command. If the UNDO file storage directory has not been set using the `drmsqlinit` command, an error message appears, indicating that no parameters are set for the `drmsqlinit` command. Specify the UNDO file storage directory using the `drmsqlinit` command.

When this option is omitted, a regular restoration is performed. In this case, the database will be placed in loading status after the restoration has finished, and will not be usable.

`-nochk_host`

Specify this option to restore the data to a host other than the one specified in the `drmsqlbackup` command. This option is useful when the host name has been changed, or when the log distribution function in SQL Server is used.

This option is not available when you restore a system database (master, model, msdb, or distribution).

⚠ **Note:** When you specify the `-nochk_host` option, confirm that backup data is restored on the appropriate host, because the validity of the host name in the backup catalog is not checked when restoring backup data.

`-instance` *name-of-the-SQL-Server-instance*

Specify this option to restore the data to a SQL Server instance that is different from the SQL Server instance on which you executed the `drmsqlbackup` command. If you specify `DEFAULT` as the SQL Server instance name, you will be connected to the preset instance of the SQL Server. If the restoration targets include a system database (master, model, msdb, or distribution), you cannot specify this option.

`-target` *database-names*

Specify this option to restore a particular database in the specified instance. The specified database needs to exist in the backup catalog specified by the backup ID. When databases that do not exist in the backup catalog are specified, those databases will not be restored. When specifying multiple databases to be restored at the same time, use a comma to separate each database name. If you specify a database name containing a space character, enclose the database name in double quotation marks (").

When both this option and the `-f` option are omitted, the entire instance specified by the backup ID will be restored.

`-f` *target-definition-file-name*

Like the `-target` option, this option restores an instance containing specific databases. Unlike the `-target` option, this option lets you specify a target definition file that collectively specifies all the databases to be restored. The target definition file containing the list of databases must be created before you attempt to use this option. Use an absolute path to specify the target definition file. If you specify a target definition file name containing a space character, enclose the target definition file name in double quotation marks (").

When both this option and the `-target` option are omitted, all the objects included in the instance specified by the backup ID will be restored.

`-no_resync`

Specify this option to apply only the VDI metafiles for the data on the primary volume, without performing restoration processing or backing up data from the secondary volume to the primary volume. Use this option when the restore operation cannot be performed with the `drmsqlrestore` command (for example, when restoring backup data directly from a tape device to the primary volume because of a drive failure).

`-template`

Specify this option to perform restore operations by using a backup catalog that was created by executing the `drmsqlbackup` command with the `-template` option specified. The `START-TIME` and `END-TIME` of a template catalog specified with the `-template` option are the times at which creation of the template catalog started and finished.

`-pf` *copy-parameter-definition-file*

Specify this option when using the number of retries and the retry interval defined in the copy parameter definition file. Specify only the file name, without specifying the path.

When you omit this option, the value of the CCI-linkage definition file (`DEFAULT.dat`) is used. The value of the CCI-linkage definition file (`DEFAULT.dat`) is used for parameters that are not coded in the copy parameter definition file.

Create the copy parameter definition file with an arbitrary name in the location below. Specify the file name by using an alphanumeric character string that is 64 bytes or less.

Application-Agent-installation-folder`\DRM\conf\raid`

⚠ **Note:**

- Specify all the databases that are contained in the logical volume to be restored. If this option is not specified, a command error occurs.

- When you specify this command on the SQL Server database whose name has been changed, make sure that the SQL Server database to be restored is detached. If the SQL Server database is restored without detach processing, the command fails and the SQL Server database might not be able to be used after restoration. If an SQL Server database becomes unusable, detach the database, and then restore it again.

- The backup information in the backup catalog is managed based on using the copy group as a key. Depending on the backup method, you might not be able to perform restoration, even though the backup data exists on the secondary volume. For further information, see the notes on running Application Agent in the *Replication Manager Application Agent CLI User Guide*.

- After a database is restored, the owner of the database is changed to the user who performed the restoration. To change the owner, use the SQL Server management tool to attach the database again, or use the `sp_changedbowner` system stored procedure.

- When the `drmsqlrestore` command executes, it uses SQL Server with minimum startup. If the Windows firewall functionality has been set up in the database server, then when the `drmsqlrestore` command executes to restore databases that include the system databases (master, model, and msdb), a dialog box might be displayed asking if the OS firewall is to block SQL Server communication. If this dialog box is displayed, select Do not block. The `drmsqlrestore` command will continue processing without problems even if you do not respond to this dialog box.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to restore, by disk resynchronization, the backup data identified by the backup ID `0000000001`:

  ```
  PROMPT> drmsqlrestore 0000000001 -resync
  ```

- In this example, the command, using the template catalog, is used to restore the backup data identified with backup ID 0000000002:

  ```
  PROMPT> drmsqlrestore 0000000002 -resync -nochk_host -template
  KAVX0001-I drmsqlrestore command will now start.
  KAVX1316-I Performing restore pre-processing...
  KAVX1000-I Logged on to the SQL Server system.
  KAVX1300-I Restore processing will now start.
  KAVX1000-I Logged on to the SQL Server system.
  KAVX1301-I Restore processing has finished.
  KAVX1318-I Performing restore post-processing...
  KAVX1001-I Logged off from the SQL Server system.
  KAVX0002-I drmsqlrestore command will now end.
  ```

- In this example, the command is used to assume the SQL Server instance at backup is `instA` and the SQL Server instance at the restoration destination is `instB`, and it restores the backup data of the secondary volume identified with backup ID `0000000003`:

  ```
  PROMPT> drmsqlrestore 0000000003 -no_resync -nochk_host -
  instance instB
  ```

Basic command specifications (Exchange database backups)

drmexgbackup (Backs up an Exchange database)

Formats

To perform a backup by using VSS (Exchange Server 2007):
```
drmexgbackup -mode vss
            [ -target storage-group-name | -f target-definition-
file-name ]
            [ -rc [ name-identifying-the-generation ]] [ -pf copy-
parameter-definition-file ]
            [ -transact_log_del | -noverify | -noverify_log_del ]
            [ -event_check ] [ -comment backup-comment ]
            [ -vf VSS-definition-file-name ]
            [ -script user-script-file-name ]
            [ -s backup-server-name
              [ -auto_import
                [ -auto_mount [ mount-point-directory-name ]]
              ]
              [ -svol_check ]
            ]
```

To perform a backup by using VSS (Exchange Server 2010 or Exchange Server 2013):
```
drmexgbackup -mode vss
[ -target  Information-Store-name | -f  target-definition-file-
name ]

            [ -rc [ name-identifying-the-generation ]] [ -pf copy-
parameter-definition-file ]
            [ -transact_log_del | -noverify | -noverify_log_del ]
  [ -event_check ] [ -comment  backup-comment]

            [ -vf VSS-definition-file-name ]
            [ -script user-script-file-name ]
            [ -s backup-server-name
              [ -auto_import
                [ -auto_mount [ mount-point-directory-name ]]
              ]
              [ -svol_check ]
            ]
```

Description

The `drmexgbackup` command backs up the Exchange database of a primary volume to a secondary volume.

Depending on the version, Exchange Server can back up a database as follows.

Exchange Server 2007:

    The entire database or a storage group can be backed up.

Exchange Server 2010 or Exchange Server 2013:

The entire database or an Information Store can be backed up.

Before you execute the `drmexgbackup` command, make sure that the database files and log files are stored in separate copy groups.

Before this command is executed, the system cache of the secondary volume must be cleared. Mount or unmount the secondary volume on the backup server to clear the system cache.

When the `drmexgbackup` command is executed on the local site, and the pair status is `SMPL`, the command does not automatically create a pair. In this case, if the `PAIR_CREATE` parameter in the CCI-linkage definition file (`DEFAULT.dat`) is set to `ENABLE`, the command automatically creates a pair.

After installation, if the `drmexgbackup` command is executed without executing the `drmexgdisplay` command with the `-refresh` option specified, and no dictionary map files are created, the dictionary map files are created using the `drmexgbackup` command. In this case, the processing time required to create the dictionary map files are added to the time required to execute the backup command.

Backup can only be performed for files described in the following table.

Table 2-27 Files backed up as targets of an Exchange Server

Option	Database to be backed up	File to be backed up	
The target file type is fixed	Exchange Server storage groups	Data files	*.edb
		Transaction log file	*.log
		Checkpoint files	*.chk
The target file type is fixed	Exchange Server Information Store	Data files	*.edb
		Transaction log files	*.log
		Checkpoint files	*.chk

Arguments

`-mode vss`

Specify this option to perform a backup by using VSS.

To use this option, the Protection Manager service must be running on the backup server.

`-target storage-group-names`

Specify this option to back up the database resources containing the specific storage group. However, the minimum unit for backup is a physical volume. If a single physical volume contains multiple storage groups, specify all of the storage groups. If you specify only some of the storage groups, a command error occurs.

When specifying multiple storage groups to be backed up, use a comma to separate each storage group name. Use double quotation marks (") to enclose all storage group names that contain at least one space character.

If you omit this option, all storage groups on the server will be backed up.

-target *Information-Store-name*

Specify this option to back up the database resources containing a specific Information Store. However, the minimum unit for backup is a physical volume. If a single physical volume contains multiple Information Stores, specify all of the Information Stores. If you do not specify all of the Information Stores, a command error occurs.

When specifying multiple Information Stores to be backed up, use a comma to separate each Information Store name. Use double quotation marks (") to enclose any Information Store names that contain at least one space character.

If you omit this option, all the Information Stores on the server on which the command is executed will be backed up.

-f *target-definition-file-name*

As with the -target option, specify this option to back up only a particular storage group or Information Store. You must specify this option when multiple storage group data files or Information Store data files exist on one physical volume.

Unlike the -target option, the -f option lets you specify a target definition file, which contains all the storage groups or Information Stores for which backups are to be performed. The target definition file containing the list of storage groups or Information Stores must be created before you use this option. Use an absolute path to specify the target definition file.

-rc *name-identifying-the-generation*

Use this option to specify the name identifying the generation of the copy group to be backed up. Execute the drmexgdisplay command with the -cf option, and specify the displayed GEN-NAME value. In a single volume, a hyphen (-) appears. In this case, you cannot specify the -rc option.

Always specify this option when backing up from a primary volume to a secondary volume on the remote side. If this option is omitted, the secondary volume on the local side is backed up.

If you omit *name-identifying-the-generation*, the secondary volume that has the smallest value among the generation numbers on the remote-side becomes the backup destination. In this case, the generation number is remote_*n*, where *n* is the smallest generation number.

-pf *copy-parameter-definition-file*

Specify this option when using the number of retries and the retry interval defined in the copy parameter definition file. Specify only the file name, without specifying the path.

When you omit this option, the value of the CCI-linkage definition file (`DEFAULT.dat`) is used. The value of the CCI-linkage definition file (`DEFAULT.dat`) is used for parameters that are not coded in the copy parameter definition file.

Create the copy parameter definition file with an arbitrary name in the location below. Specify the file name by using an alphanumeric character string that is 64 bytes or less.

Application-Agent-installation-folder`\DRM\conf\raid`

`-transact_log_del`

Specify this option to delete the committed transaction log files.

When this command is executed, the transaction log file is deleted. This means that you will no longer be able to use the `-recovery` option to perform restoration from backups already performed.

`-noverify`

Specify this option if you do not verify the integrity of a database that is backed up by using VSS.

`-noverify_log_del`

Specify this option if you delete a transaction log file after backing up a database that is backed up by using VSS without verifying its integrity.

`-event_check`

Specify this option to check whether an event indicating a corrupted database has been recorded. The command executed with this option searches the Windows event log data that was recorded since the last backup of an Exchange database. If no previous backup is available, all data recorded in the Windows event log is searched.

The Windows event log is searched before the copy pair is resynchronized. If an event indicating a corrupt database is detected, the command terminates in an error.

Application Agent determines that a database is corrupt by the following event details:

- Event category: Application
- Type: Error
- Source: ESE
- Event ID: No limitation
- Character string being included: `-1018`, `-1019`, or `-1022`

`-comment` *backup-comment*

Specify this option to register a backup comment in the backup catalog.

The *backup-comment* value can be a string of up to 64 bytes, consisting of alphanumeric, special, one-byte space, and multi-byte characters. The backup comment is case sensitive. When a special character, or a one-byte

space character is used, the entire `backup-comment` string must be enclosed in double quotation marks ("). If the `backup-comment` string contains a special character but is not enclosed in double quotation marks, the special character is not properly handled as a part of the `backup-comment` string and is parsed as a special character.

The following special characters cannot be used for backup comments:

`\ / ` | < > " * ? & ; ( ) $`

Note that the first character must not be a hyphen (`-`). If you specify two double quotation marks after the `-comment` option, as in `-comment ""`, no backup comment will be registered in the backup catalog.

`-vf VSS-definition-file-name`

Specify this option to switch the settings to be used for each VSS backup. You can use this option only when using VSS for backups. For `VSS-definition-file-name`, specify a file name only. Do not specify the folder name. The VSS definition file specified in this option must be stored in the following folder:

`Application-Agent-installation-folder\DRM\conf\vss`

If you omit this option, the command uses the following file as the VSS definition file:

`Application-Agent-installation-folder\DRM\conf\vsscom.conf`

For details about the VSS definition file, see the *Replication Manager Application Agent CLI User Guide*.

`-script user-script-file-name`

Specify this option to execute a user script. Use an absolute path to specify `user-script-file-name`. Conditions for specifying `user-script-file-name` are as follows:

- Maximum number of bytes: 255
- Available characters: Characters that can be used in a file name in Windows. If the name contains one or more space characters, the entire name string must be enclosed in double quotation marks (").

For details about the coding used for a user script file, see the description of how to create a user script in the *Replication Manager Application Agent CLI User Guide*.

If you specified `LOCATION=REMOTE` in the user script file, you must also specify the `-s` option.

`-s backup-server-name`

Specify this option to connect to a remote backup server to perform a backup. Specify the host name or the IP address of the backup server by using a character string that is no more than 255 bytes. You can specify the IP address in IPv4 or IPv6 format.

If you specify a backup server by using the `-s` option, the backup server names specified in the VSS definition file (`vsscom.conf`) and in the VSS definition file specified by using the `-vf` option are ignored, and the backup server name specified in the `-s` option is used.

`-auto_import`

Specify this option to automatically transfer a backup catalog to a backup server after backing up a volume. This option must be specified together with the `-s` option.

`-auto_mount` *mount-point-directory-name*

Specify this option to automatically mount a secondary volume on a backup server after backing up a volume. This option must be specified together with the `-s` and `-auto_import` options.

Specify *mount-point-directory-name* by using a character string of up to 64 bytes.

If you omit the *mount-point-directory-name* parameter, a mount destination for a secondary volume is automatically determined. This destination is determined in the same way as when using the `drmmount` command without specifying a mount point.

Execute the `drmumount` command to unmount the mounted secondary volume. In the argument of the `drmumount` command, specify the backup ID.

`-svol_check`

Specify this option to check the status of a secondary volume on a backup server. This option must be specified concurrently with the `-s` option. Checking the status of a secondary volume prevents backup or restoration failures. The items, volumes, and conditions to be checked are described in the following table.

Table 2-28 Status check of a secondary volume

Check items	Volume to be checked	Check conditions
A secondary volume is hidden from a backup server	All secondary volumes defined for a backup-target primary volume	Checked if a primary volume is defined in pairs with secondary volumes of multiple generations and if at least one of the following conditions is satisfied: • A primary volume is a cluster resource. • A backup using VSS is performed.
A secondary volume is not mounted on a backup server	The secondary volume to be the next backup destination	Always checked.

⚠ **Note:**

- The backup information in the backup catalog is managed based on using the copy group as a key. Depending on the backup method, you might not be able to perform restoration, even though the backup data exists on the secondary volume. For further information, see the notes on running Application Agent in the *Replication Manager Application Agent CLI User Guide*.

- When specifying on the command line a file name or directory name containing space characters for the `-target` or `-f` option, you must enclose the file name in double quotation marks (").

  Note that enclosing with double quotation marks is not necessary for target paths specified in batch definition files.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In this example, the command is used to backup a storage group that is specified in the target definition file `C:\temp\BACKUP_DB.txt`:

```
PROMPT> drmexgbackup -mode vss -f C:\temp\BACKUP_DB.txt
KAVX0001-I The drmexgbackup command will now start.
KAVX1805-I The information store will now be dismounted.
          Storage group name = STR1
KAVX1805-I The information store will now be dismounted.
          Storage group name = STR2
KAVX1805-I The information store will now be dismounted.
          Storage group name = STR3
KAVX1600-I Backup processing will now start.
KAVX0040-I The backup ID has been assigned as follows:
          Backup ID = 0000000001
KAVX1601-I Backup processing has finished.
KAVX1806-I The information store will now be mounted.
          Storage group name = STR1
KAVX1806-I The information store will now be mounted.
          Storage group name = STR2
KAVX1806-I The information store will now be mounted.
          Storage-group-name = STR3
KAVX0002-I The drmexgbackup command will now end.
```

- In this example, the command is used to use VSS for backup:

```
PROMPT> drmexgbackup -mode vss
KAVX0001-I Starting the drmexgbackup command.
KAVX0256-I Connecting to the Protection Manager Service is
performed.
          Host name = BackupServer
KAVX1600-I Backup processing will now start.
KAVX1610-I Verification of the database on the backup server
will now be performed.
          Storage group name = STR1
          File size = 6532 [MB]
KAVX1611-I Verification has finished successfully.
KAVX0040-I The backup ID has been assigned as follows.
```

```
              Backup ID = 0000000001
KAVX1601-I Backup processing has finished.
KAVX0002-I The drmexgbackup command will now end.
```

- To perform an online backup using VSS in an Exchange Server 2010 configuration:

```
PROMPT> drmexgbackup –mode vss
KAVX0001-I The drmexgbackup command will now start.
KAVX0256-I A connection to the Protection Manager service will
now be established.
              Host name = BackupServer1
KAVX1600-I Backup processing will now start.
KAVX5108-I Resynchronizing a copy group.
              Copy group name = EXG001,B001
KAVX5108-I Resynchronizing a copy group.
              Copy group name = EXG001,B002
KAVX5108-I Resynchronizing a copy group.
              Copy group name = EXG001,B003
KAVX5108-I Resynchronizing a copy group.
              Copy group name = EXG001,B004
KAVX1625-I The database on the backup server will now be
verified.
              Information store name = Mail01
              File size = 1000[MB]
KAVX1625-I The database on the backup server will now be
verified.
              Information store name = Mail02
              File size = 1000[MB]
KAVX1611-I Verification has finished successfully.
KAVX0040-I The backup ID has been assigned as follows:
              Backup ID = 0000000001
KAVX1601-I Backup processing has finished.
KAVX0002-I The drmexgbackup command will now end.
```

drmexgcat (Displays backup information for an Exchange database)

Format

For Exchange Server 2007:
```
drmexgcat [ -target storage-group-name | -f target-definition-file-
name ]
          [ -transact_log ][ -datafile ]
          [ -device device-file-name ][ -l ][ -v ]
          [ -backup_id backup-ID ][ -hostname host-name ]
          [ -comment backup-comment ]
```

For Exchange Server 2010 or Exchange Server 2013:
```
drmexgcat [ -target Information-Store-name | -f  target-definition-
file-name]
          [ -transact_log ][ -datafile ]
          [ -device device-file-name][ -l ][ -v ]
          [ -backup_id backup-ID  ][ -hostname host-name ]
          [ -comment backup-comment]
```

Description

The `drmexgcat` command displays the backup information of the Exchange database on the server where the command is executed. The displayed items are as follows:

Table 2-29 Items displayed by the drmexgcat command

Displayed item	Meaning
STORAGEGROUP	For Exchange Server 2007: The storage group name
	For Exchange Server 2010 or Exchange Server 2013: `/EXCHANGE`
BACKUP-COMMENT	Backup comment
BACKUP-ID	Backup ID
BACKUP-MODE	Backup mode
ORIGINAL-ID	Original backup ID obtained by the `drmexgbackup` command
START-TIME	Start time of a backup
END-TIME	End time of a backup
HOSTNAME	Name of the server where the snapshot backup was performed
T	Object type:
	`M`: Mailbox store
	`P`: Public folder store
	`T`: Transaction log file
	`C`: Checkpoint file
OBJECT	A type of Exchange Server object and its name:
	`MAILBOXSTORE`: Mailbox store name
	`PUBLICSTORE`: Public folder store name
	`TRANSACT`: Transaction log file name
	`CHECKPOINT`: Checkpoint file name
	If a transaction log file or checkpoint file is set for `OBJECT` when Exchange Server 2010 or Exchange Server 2013 is used, the Information Store name is displayed.
INFORMATIONSTORE	Information store name
FILE[#1]	File name
FS	Mount point directory name
FSTYPE	File system type (NTFS)
DG	A hyphen (`-`) is displayed.
LVM-DEVICE	The name of the logical device file (for an environment with a logical volume manager) or `GUID` (for an environment without a logical volume manager)

Displayed item	Meaning
DEVICE[#2]	`Harddiskn` (where *n* is an integer)
COPY-GROUP	The copy group name, displayed as follows: `CCI-volume-group-name,paired-volume-name`
PORT#	Port name on the host server
TID#	Target-ID on the host server
LUN#	Logical unit number on host server
MU#	Pair ID
LDEV#	Logical device number inside the RAID device
P/S	A letter identifying the primary or secondary volume: `P`: Primary volume `S`: Secondary volume
SERIAL#	Serial number inside the RAID device
VIRTUAL-SERVERNAME[#3]	Virtual server name (value of the `DRM_HOSTNAME` environment variable)
DB-PATH[#3]	Name of the directory storing the backup catalog
CATALOG-UPDATE-TIME[#3]	Time when the backup catalog was created

#1

The display format of information about transaction log files (`*.log`) depends on the Exchange Server version.

Exchange Server 2007:

Information for all files is displayed together in the following format: `mount-point-directory-name\storage-group-name\E00*.log`.

Exchange Server 2010 or Exchange Server 2013:

Information for all files is displayed together in the following format: `mount-point-directory-name\Information-Store-name\E00*.log`.

#2

When this command is executed with the `-device` option specified, this information will be displayed after `OBJECT`.

#3

The command executed with the `-v` option displays this information.

A hyphen (`-`) is displayed for any item that cannot be displayed. If none of the items can be displayed, an error message is displayed.

Each item is separated by a space.

Arguments

`-target storage-group-names`

Specifies that information relating to certain storage groups that will be displayed. When specifying multiple storage groups to be displayed, use a comma to separate each group name. Use double quotation marks (") to enclose all storage group names that contain at least one space character.

`-target` *Information-Store-name*

Specify this option to display information related to a particular Information Store. To display information for multiple Information Stores, use a comma to separate each Information Store name. Use double quotation marks (") to enclose any Information Store names that contain at least one space character.

`-f` *target-definition-file-name*

Specify this option to display information about specific storage groups or Information Stores. Unlike the `-target` option, the `-f` option lets you specify a target definition file, which contains all the storage groups or Information Stores for which information is to be displayed. The target definition file containing the list of storage groups or Information Stores must be created before you use this option. Use an absolute path to specify the target definition file.

`-transact_log`

Specifies that only information relating to the transaction log file that will be displayed. This option will display the following information:

- The name of the transaction log file
- File system information
- Logical volume structure information
- Physical disk information

When you specify this option with the `-target` option or `-f` option, only information pertaining to the transaction log of the specified storage group or Information Store will be displayed when this option is specified. If either the `-target` or the `-f` option is omitted, information pertaining to all transaction logs of all storage groups or Information Stores will be displayed.

`-datafile`

Specifies that only information relating to the data file that will be displayed. This option will display the following information:

- The name of the data file
- File system information
- Logical volume structure information
- Physical disk information

When you specify this option with the `-target` option or `-f` option, only information pertaining to the data file of the specified storage group or Information Store will be displayed when this option is specified. If either the `-target` or the `-f` option is omitted, information pertaining to all data files of all storage groups or Information Stores will be displayed.

```
-device device-file-name
```

Specifies that only information relating to the device file is to be displayed. This option will display the following information:

- The name of the storage group or the name of the Information Store
- File system information
- Physical disk information
- Logical volume information

```
-l
```

Specifies that information related to the storage group or Information Store is to be displayed in the long format.

```
-v
```

Specify this option to display management information for the backup catalog. The following information is displayed:

- Name of the directory storing the backup catalog
  Displays the path that is set in `DRM_DB_PATH` in the Application Agent configuration definition file (`init.conf`).

  If `DRM_DB_PATH` has not been set, the default storage directory for the dictionary map files, which are created automatically during installation, is displayed.
- Virtual server name (value of the `DRM_HOSTNAME` environment variable)

  If the `DRM_HOSTNAME` environment variable has not been set, a hyphen (`-`) appears.
- Time when the backup catalog was created
  For each backup ID, displays the time when the backup catalog was created.

```
-backup_id backup-ID
```

Specify this option to display only the backup information of a specific backup ID. A backup ID uniquely identifies backup data and is registered in the backup catalog during backup processing. To check a backup ID, execute the `drmexgcat` command.

```
-hostname host-name
```

Specify this option to display only information pertaining a specific host.

```
-comment backup-comment
```

Specify this option to display only information on a specific backup comment.

The `backup-comment` value is not case sensitive.

You can use an asterisk (`*`) to specify a wildcard in `backup-comment`. You can specify that only the initial characters match (for example, specify a string such as `XYZ*` to search for strings that begin with one or more specific characters and that end with any or no characters). When a wildcard, special

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character, or one-byte space character is used, the entire *backup-comment* string must be enclosed in double quotation marks ("). If the *backup-comment* string contains a special character but is not enclosed in double quotation marks, the special character is not properly handled as a part of the *backup-comment* string and is parsed as a special character. If you specify `-comment "*"`, the command will display all backup catalogs.

If two double quotation marks are specified after the `-comment` option (as in `-comment ""`), a message is displayed indicating that no backup data exists.

⚠️ **Note:** When specifying on the command line a file name or directory name containing space characters for the `-target` or `-f` option, you must enclose the file name in double quotation marks (").
Note that enclosing with double quotation marks is not necessary for target paths specified in batch definition files.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In the following example, the command is used to display information about the Information Store specified by the storage group `STR1`, which was backed up in VSS backup mode (Exchange Server 2007):

```
PROMPT> drmexgcat -target STR1
STORAGEGROUP: EXG01
BACKUP-ID: 0000000002  BACKUP-MODE: VSS  STORAGEGROUP: STR1
ORIGINAL-ID: 0000000002
START-TIME: 2011/02/18 14:48:19  END-TIME: 2011/02/18 14:58:43
HOSTNAME: EVS1
T OBJECT         INFORMATIONSTORE   FILE             FS   DG
DEVICE      COPY-GROUP
M MAILBOXSTORE   mail               N:\data\mail.edb  N:   -
Harddisk2   EXG,EXG_001
- -             -                  -                -    -
-           EXG,EXG_001
T TRANSACT      -                  M:\log\E01*.log   M:   -
Harddisk1   EXG,EXG_000
- -             -                  -                -    -
-           EXG,EXG_000
C CHECKPOINT    -                  M:\log\E01.chk    M:   -
Harddisk1   EXG,EXG_000
```

- In the following example, the command is used to display information, in long format, about the Information Store specified by the storage group `STR1` (Exchange Server 2007):

```
PROMPT> drmexgcat -target STR1 -l -v
VIRTUAL-SERVERNAME: EVS1
DB-PATH: Z:\PTM
STORAGEGROUP: STR1
BACKUP-ID: 0000000002  BACKUP-MODE: VSS  STORAGEGROUP: STR1
ORIGINAL-ID: 0000000002
```

```
START-TIME: 2011/02/18 14:48:19  END-TIME: 2011/02/18 14:58:43
HOSTNAME: EVS1
T OBJECT          INFORMATIONSTORE   FILE              FS
FSTYPE   DG   LVM-
DEVICE                                          DEVICE     COPY-
GROUP    PORT#    TID#   LUN#   MU#   LDEV#   P/S   SERIAL#
M MAILBOXSTORE   mail               N:\data\mail.edb   N:
NTFS     -    \\?\Volume{222398c5-fb76-11df-b4b7-000fea5058cb}
\   Harddisk2   EXG,EXG_001   CL1-C1   1       114     0
114     P    77010955
- -              -               -                 -
-        -
-                                                          -
EXG,EXG_001   CL1-C   1     138     0      138     S
77010955
T TRANSACT       -                 M:\log\E01*.log    M:
NTFS     -    \\?\Volume{222398bf-fb76-11df-b4b7-000fea5058cb}
\   Harddisk1   EXG,EXG_000   CL1-C1   1       113     0
113     P    77010955
- -              -               -                 -
-        -
-                                                          -
EXG,EXG_000   CL1-C   1     137     0      137     S
77010955
C CHECKPOINT      -                 M:\log\E01.chk     M:
NTFS     -    \\?\Volume{222398bf-fb76-11df-b4b7-000fea5058cb}
\   Harddisk1   EXG,EXG_000   CL1-C1   1       113     0
113     P    77010955
- -              -               -                 -
-        -
-                                                          -
EXG,EXG_000   CL1-C   1     137     0      137     S
77010955
```

- In this example, the command is used to display the backup catalog for the Information Store that was backed up by using VSS, and to display the management information for the backup catalog (Exchange Server 2010):

```
PROMPT> drmexgcat -v
STORAGEGROUP: /EXCHANGE
BACKUP-ID: 0000000001  BACKUP-MODE: VSS  STORAGEGROUP: /
EXCHANGE  ORIGINAL-ID: 0000000001
START-TIME: 2010/01/01 11:00:00  END-TIME: 2010/01/01 11:30:00
HOSTNAME: EXG_SRV1
T OBJECT          INFORMATIONSTORE
FILE                              FS                    DG
DEVICE        COPY-GROUP
M MAILBOXSTORE   Mail1            M:\mount
\VG01\001\Mail1\mail.edb   M:\mount\VG01\001   -
Harddisk3   VG01,VG01_001
- -              -
-                            -                       -
-           VG01,VG01_001
T TRANSACT       Mail1            M:\mount
\VG01\000\Mail1\E00*.log   M:\mount\VG01\000   -
Harddisk2   VG01,VG01_000
- -              -
-                            -                       -
-           VG01,VG01_000
```

```
C CHECKPOINT      Mail1                 M:\mount
\VG01\000\Mail1\E00.chk      M:\mount\VG01\000    -
Harddisk2      VG01,VG01_000
- -               -
-                               -                       -
-               VG01,VG01_000
M MAILBOXSTORE    Mail2                 M:\mount
\VG01\001\Mail2\mail.edb     M:\mount\VG01\001    -
Harddisk3      VG01,VG01_001
- -               -
-                               -                       -
-               VG01,VG01_001
T TRANSACT        Mail2                 M:\mount
\VG01\000\Mail2\E01*.log     M:\mount\VG01\000    -
Harddisk2      VG01,VG01_000
- -               -
-                               -                       -
-               VG01,VG01_000
C CHECKPOINT      Mail2                 M:\mount
\VG01\000\Mail2\E01.chk      M:\mount\VG01\000    -
Harddisk2      VG01,VG01_000
- -               -
-                               -                       -
-               VG01,VG01_000
P PUBLICSTORE     Pub                   M:\mount\VG01\003\Pub
\pub.edb        M:\mount\VG01\003    -    Harddisk5
VG01,VG01_003
- -               -
-                               -                       -
-               VG01,VG01_003
T TRANSACT        Pub                   M:\mount\VG01\002\Pub
\E02*.log       M:\mount\VG01\002    -    Harddisk4
VG01,VG01_002
- -               -
-                               -                       -
-               VG01,VG01_002
C CHECKPOINT      Pub                   M:\mount\VG01\002\Pub
\E02.chk        M:\mount\VG01\002    -    Harddisk4
VG01,VG01_002
- -               -
-                               -                       -
-               VG01,VG01_002
```

- In this example, the command is used to display the backup catalog for
  the Information Store specified by the Information Store `Mail2` (Exchange
  Server 2010):

```
PROMPT> drmexgcat –target Mail2
STORAGEGROUP: /EXCHANGE
BACKUP-ID: 0000000001  BACKUP-MODE: VSS   STORAGEGROUP: /
EXCHANGE   ORIGINAL-ID: 0000000001
START-TIME: 2010/01/01 11:00:00  END-TIME: 2010/01/01 11:30:00
HOSTNAME: EXG_SRV1
T OBJECT          INFORMATIONSTORE
FILE                                FS                      DG
DEVICE        COPY-GROUP
M MAILBOXSTORE    Mail2                 M:\mount
\VG01\001\Mail2\mail.edb     M:\mount\VG01\001    -
Harddisk3      VG01,VG01_001
- -               -
```

```
-                                        -                    -
-              VG01,VG01_001
T TRANSACT       Mail2                    M:\mount
\VG01\000\Mail2\E01*.log     M:\mount\VG01\000    -
Harddisk2     VG01,VG01_000
- -                       -
-                                        -                    -
-              VG01,VG01_000
C CHECKPOINT     Mail2                    M:\mount
\VG01\000\Mail2\E01.chk     M:\mount\VG01\000    -
Harddisk2     VG01,VG01_000
- -                       -
-                                        -                    -
-              VG01,VG01_000
```

drmexgdisplay (Displays or updates information for an Exchange database)

Formats

To display information for a storage group (Exchange Server 2007):

```
drmexgdisplay [ -target storage-group-name | -f target-definition-
file-name ]
              [ -transact_log ][ -datafile ][ -v ]
              [ -device device-file-name ][ -l ][ -cf ]
```

To display the information for an Information Store (Exchange Server 2010 or Exchange Server 2013):

```
drmexgdisplay [ -target Information-Store-name | -f target-
definition-file-name ]
              [ -transact_log ][ -datafile ][ -v ]
              [ -device device-file-name][ -l ][ -cf ]
```

To update the dictionary map files (Exchange Server 2007):

```
drmexgdisplay [ storage-group-name ] -refresh [ -coremap ]
```

To update the dictionary map files to the latest status (Exchange Server 2010 or Exchange Server 2013):

```
drmexgdisplay [ Information-Store-name ] -refresh [ -coremap ]
```

Description

The drmexgdisplay command does the following:

1. Displays resource information for the Exchange database or Information Stores on the server on which the command was executed.

2. Displays resource information for the specified Exchange database in the system in which the command was executed.

3. Updates the information for the Exchange database in the dictionary map files. Execute this command before performing a backup.

The items displayed in 1 and 2 appear in the table below.

Table 2-30 Items displayed by the drmexgdisplay command

Displayed item	Meaning
STORAGEGROUP	For Exchange Server 2007: The storage group name
	For Exchange Server 2010 or Exchange Server 2013: `/EXCHANGE`
T	Object type:
	`M`: Mailbox store
	`P`: Public folder store
	`T`: Transaction log file
	`C`: Checkpoint file
OBJECT	A type of Exchange Server object and its name:
	`MAILBOXSTORE`: *mailbox-store-name*
	`PUBLICSTORE`: *public-folder-store-name*
	`TRANSACT`: *transaction-log-file-name*
	`CHECKPOINT`: *checkpoint-file-name*
	If a transaction log file or checkpoint file is set for `OBJECT` when Exchange Server 2010 or Exchange Server 2013 is used, the Information Store name is displayed.
INFORMATIONSTORE	Information store name
FILE[#1]	File name
FS	Mount point directory name
FSTYPE	File system type (NTFS)
DG	A hyphen (`-`) is displayed.
LVM-DEVICE	A logical device file name (when using a logical volume manager) or a GUID (when logical volume manager has not been implemented)
DEVICE[#2]	`Harddisk`*n* (where *n* is an integer)
COPY-GROUP	The copy group name, displayed as follows:
	CCI-volume-group-name,*paired-volume-name*
PORT#	Port name on the host server
TID#	Target-ID on the host server
LUN#	Logical unit number on host server
MU#	Pair ID
LDEV#	Logical device number inside the RAID device
P/S	A letter identifying the primary or secondary volume
	`P`: Primary volume
	`S`: Secondary volume

Displayed item	Meaning
	-: A volume that is not part of a pair.
SERIAL#	Serial number inside the RAID device
COPY-FUNC	Copy type
	Copy type: The name of the copy type varies depending on the DKC software product (storage system unit) and microcode version.
	-: Indicates the volume where a pair volume has not been configured.
	(Do not create a program that operates using this display.)
GEN-NAME	Generation identifier
	`local_n`: for a local pair volume (where *n* is a generation number from 0 to 999)
	`remote_n`: for a remote pair volume (where *n* is a generation number from 0 to 999)
	-: Indicates a volume where a pair volume has not been configured.
VIRTUAL-SERVERNAME[#3]	Virtual server name (value of the `DRM_HOSTNAME` environment variable)
DB-PATH[#3]	Name of the directory storing the dictionary map files
CORE-MAPFILE-UPDATE-TIME[#3]	Update time for the core map file
APP.-MAPFILE-UPDATE-TIME[#3]	Update time for the application map file

#1

The display format of information about transaction log files (`*.log`) depends on the Exchange Server version.

Exchange Server 2007:
> Information for all files is displayed together in the following format: `mount-point-directory-name\storage-group-name\E00*.log`.

Exchange Server 2010 or Exchange Server 2013:
> Information for all files is displayed together in the following format: `mount-point-directory-name\Information-Store-name\E00*.log`.

#2

When this command is executed with the `-device` option specified, this information will be displayed after `OBJECT`.

#3

The command executed with the `-v` option displays this information.

A hyphen (-) is displayed for any item that cannot be displayed. If none of the items can be displayed, an error message is displayed.

Each item is separated by a space.

Arguments

`-target` *storage-group-names*

Specifies that information relating to a certain storage group that will be displayed. When specifying multiple storage groups to be displayed, use a comma to separate each group name. Use double quotation marks (") to enclose all storage group names that contain at least one space character.

If this option is omitted, information pertaining to all storage groups on the server on which the command was executed will be displayed.

`-target` *Information-Store-name*

Specify this option to display information related to a particular Information Store. To display multiple Information Stores, use a comma to separate each Information Store name. Use double quotation marks (") to enclose any Information Store names that contain at least one space character.

If this option is omitted, information for all Information Stores on the server on which the command is executed will be displayed.

`-f` *target-definition-file-name*

Specify this option to display information related to specific storage groups or Information Stores. Unlike the `-target` option, the `-f` option lets you specify a target definition file, which contains all the storage groups or Information Stores for which information is to be displayed. The target definition file containing the list of storage groups or Information Stores must be created before you use this option. Use an absolute path to specify the target definition file.

`-transact_log`

Specifies that you want to display only information relating to the transaction logs. This option will display the following information:

- The name of the transaction log file
- File system information
- Logical volume structure information
- Physical disk information

When you specify this option with the `-target` option or `-f` option, only information pertaining to the transaction log of the specified storage group or Information Store will be displayed when this option is specified. If either the `-target` or the `-f` option is omitted, information pertaining to all transaction logs of all storage groups or Information Stores will be displayed.

`-datafile`

Specifies that only information relating to the data file will be displayed. This option will display the following information:

- The name of the data file
- File system information

- Logical volume structure information
- Physical disk information

When you specify this option with the `-target` option or `-f` option, only information pertaining to the data file of the specified storage group or Information Store will be displayed when this option is specified. If either the `-target` or the `-f` option is omitted, information pertaining to all data files of all storage groups or Information Stores will be displayed.

`-v`

Specify this option to display management information for the dictionary map files. The following information is displayed:

- Name of the directory storing the dictionary map files
  Displays the path that is set in `DRM_DB_PATH` in the Application Agent configuration definition file (`init.conf`).

  If `DRM_DB_PATH` has not been set, the default storage directory for the dictionary map files, which are created automatically during installation, is displayed.

- Virtual server name (value of the `DRM_HOSTNAME` environment variable)
  If the `DRM_HOSTNAME` environment variable has not been set, a hyphen (`-`) appears.

- Update time for the dictionary map files
  Displays the update time separately for the core map file and the application map file.

`-device device-file-name`

Specifies that only information relating to the device file will be displayed. This option will display the following information:

- The name of the storage group or the name of the Information Store
- File system information
- Physical disk information
- Logical volume information

`-l`

Specifies that information related to the storage group or Information Store will be displayed in the long format.

`-cf`

Specify this option to display local or remote copy types, or the name identifying the generation corresponding to the copy group name. The remote information is also displayed.

`storage-group-name`

Use this option with the `-refresh` option to specify the storage group for which the dictionary map files are to be updated.

Information-Store-name

Use this option with the `-refresh` option to specify the Information Store for which the dictionary map files are to be updated.

`-refresh`

Specify this option to update the dictionary map files.

If you specify this option with *storage-group-name* or *Information-Store-name*, only the information about the specified storage group or Information Store in the application map file will be updated. The processing of the core map file differs depending on the following:

- When the core map file already exists, the file is not updated.
- When the core map file does not exist, a new core map file is created.

If you do not specify *storage-group-name* or *Information-Store-name*, the core map file and the information about all of the storage groups or Information Stores in the application map file will be updated. At this time, if the update of the dictionary map files fails, the contents of the core map file are deleted.

Specify this option when disk information for `snapshot` is set up in the dictionary map files.

`-coremap`

Specify this option to update the core map file. This option is available only when it is specified together with *storage-group-name* or *Information-Store-name*. If the core map file does not exist, a new core map file is created.

At this time, if the update of the dictionary map files fails, the contents of the core map file are deleted.

Note: When specifying on the command line a file name or directory name containing space characters for the `-target` or `-f` option, you must enclose the file name in double quotation marks (`"`).
Note that enclosing with double quotation marks is not necessary for target paths specified in batch definition files.

Return Values

`0`: Normal termination

Any value other than `0`: Termination with an error

Examples

- In the following example, the command is used to display information about the Information Store specified by the storage group `STR1` and management information for the dictionary map files (Exchange Server 2007):

```
PROMPT> drmexgdisplay -target STR1 -v
VIRTUAL-SERVERNAME: -
DB-PATH: D:\Program Files (x86)\HITACHI\DRM\db
STORAGEGROUP: STR1
T OBJECT          INFORMATIONSTORE
FILE                              FS                  DG
DEVICE       COPY-GROUP
M MAILBOXSTORE   mail01           D:\mount
\EXG_001\data1\mail01.edb   D:\mount\EXG_001   -    Harddisk15
EXG,EXG_000
- -              -
-                                 -                   -
-                EXG,EXG_000
T TRANSACT       -                D:\mount
\EXG_002\log1\E00*.log      D:\mount\EXG_002   -    Harddisk16
EXG,EXG_001
- -              -
-                                 -                   -
-                EXG,EXG_001
C CHECKPOINT      -                D:\mount
\EXG_002\system1\E00.chk    D:\mount\EXG_002   -    Harddisk16
EXG,EXG_001
- -              -
-                                 -                   -
-                EXG,EXG_001
```

- In the following example, the command is used to display information, in long format, about the Information Store specified by the storage group STR1 (Exchange Server 2007):

```
PROMPT> drmexgdisplay -target STR1 -l
STORAGEGROUP: STR01
T OBJECT          INFORMATIONSTORE   FILE                FS
FSTYPE   DG   LVM-
DEVICE                                       DEVICE
COPY-GROUP    PORT#   TID#   LUN#   MU#   LDEV#   P/S   SERIAL#
M MAILBOXSTORE   mail              N:\data\mail.edb   N:
NTFS     -    \\?\Volume{222398c5-fb76-11df-b4b7-000fea5058cb}
\   Harddisk2   EXG,EXG_001   CL1-C1   1      114     0
114    P    77010955
- -              -                   -                   -
-        -
-                                                    -
EXG,EXG_001   CL1-C   1      138    0      138    S    77010955
T TRANSACT       -                M:\log\E01*.log    M:
NTFS     -    \\?\Volume{222398bf-fb76-11df-b4b7-000fea5058cb}
\   Harddisk1   EXG,EXG_000   CL1-C1   1      113     0
113    P    77010955
- -              -                   -                   -
-        -
-                                                    -
EXG,EXG_000   CL1-C   1      137    0      137    S    77010955
C CHECKPOINT      -                M:\log\E01.chk     M:
NTFS     -    \\?\Volume{222398bf-fb76-11df-b4b7-000fea5058cb}
\   Harddisk1   EXG,EXG_000   CL1-C1   1      113     0
113    P    77010955
- -              -                   -                   -
-        -
-                                                    -
```

```
                       EXG,EXG_000  CL1-C   1      137    0     137     S
                       77010955
```

- In this example, the command is used to output information about all Information Stores and the management information for the dictionary map files (Exchange Server 2010):

```
PROMPT> drmexgdisplay -v
VIRTUAL-SERVERNAME: -
DB-PATH: C:\Program Files\Hitachi\DRM\db
STORAGEGROUP: /EXCHANGE
CORE-MAPFILE-UPDATE-TIME: 2010/01/01 10:00:00
APP.-MAPFILE-UPDATE-TIME: 2010/01/01 10:00:00
T OBJECT          INFORMATIONSTORE
FILE                                   FS                        DG
DEVICE       COPY-GROUP
M MAILBOXSTORE   Mail1              M:\mount
\VG01\001\Mail1\mail.edb    M:\mount\VG01\001   -
Harddisk3    VG01,VG01_001
- -          -
-                                      -                         -
-            VG01,VG01_001
T TRANSACT       Mail1              M:\mount
\VG01\000\Mail1\E00*.log    M:\mount\VG01\000   -
Harddisk2    VG01,VG01_000
- -          -
-                                      -                         -
-            VG01,VG01_000
C CHECKPOINT     Mail1              M:\mount
\VG01\000\Mail1\E00.chk    M:\mount\VG01\000   -
Harddisk2    VG01,VG01_000
- -          -
-                                      -                         -
-            VG01,VG01_000
M MAILBOXSTORE   Mail2              M:\mount
\VG01\001\Mail2\mail.edb    M:\mount\VG01\001   -
Harddisk3    VG01,VG01_001
- -          -
-                                      -                         -
-            VG01,VG01_001
T TRANSACT       Mail2              M:\mount
\VG01\000\Mail2\E01*.log    M:\mount\VG01\000   -
Harddisk2    VG01,VG01_000
- -          -
-                                      -                         -
-            VG01,VG01_000
C CHECKPOINT     Mail2              M:\mount
\VG01\000\Mail2\E01.chk    M:\mount\VG01\000   -
Harddisk2    VG01,VG01_000
- -          -
-                                      -                         -
-            VG01,VG01_000
P PUBLICSTORE    Pub                M:\mount\VG01\003\Pub
\pub.edb       M:\mount\VG01\003   -    Harddisk5
VG01,VG01_003
- -          -
-                                      -                         -
-            VG01,VG01_003
T TRANSACT       Pub                M:\mount\VG01\002\Pub
\E02*.log      M:\mount\VG01\002   -    Harddisk4
```

```
VG01,VG01_002
- -              -
-                                  -                      -
-            VG01,VG01_002
C CHECKPOINT    Pub                   M:\mount\VG01\002\Pub
\E02.chk        M:\mount\VG01\002   -    Harddisk4
VG01,VG01_002
- -              -
-                                  -                      -
-            VG01,VG01_002
- -              -
-                                  M:\mount\VG01\004    -
Harddisk6    VG01,VG01_004
- -              -
-                                  -                      -
-            VG01,VG01_004
- -              -
-                                  M:\mount\VG01\005    -
Harddisk7    VG01,VG01_005
- -              -
-                                  -                      -
-            VG01,VG01_005
```

- In this example, the command is used to output information for the Information Store specified by the Information Store `Mail2` (Exchange Server 2010):

```
PROMPT> drmexgdisplay -target Mail2
STORAGEGROUP: /EXCHANGE
T OBJECT          INFORMATIONSTORE
FILE                                FS                      DG
DEVICE        COPY-GROUP
M MAILBOXSTORE   Mail2                   M:\mount
\VG01\001\Mail2\mail.edb    M:\mount\VG01\001   -
Harddisk3    VG01,VG01_001
- -              -
-                                  -                      -
-            VG01,VG01_001
T TRANSACT       Mail2                   M:\mount
\VG01\000\Mail2\E01*.log    M:\mount\VG01\000   -
Harddisk2    VG01,VG01_000
- -              -
-                                  -                      -
-            VG01,VG01_000
C CHECKPOINT     Mail2                   M:\mount
\VG01\000\Mail2\E01.chk    M:\mount\VG01\000   -
Harddisk2    VG01,VG01_000
- -              -
-                                  -                      -
-            VG01,VG01_000
```

drmexgrestore (Restores an Exchange database backup to the primary volume)

Formats

To restore backup data in units of storage groups (Exchange Server 2007):

```
drmexgrestore backup-ID -resync
              [ -target storage-group-name,... | -f target-
definition-file-name ]
              [ -force ] [ -recovery ]
              [ -pf copy-parameter-definition-file ]
              [ -vf VSS-definition-file-name ]
              [ -ef Exchange-environment-setting-file-name ]
```

To restore backup data obtained using VSS in units of Information Stores (Exchange Server 2007):

```
drmexgrestore backup-ID -resync -recovery
              [ -target storage-group-name\Information-Store-
name,... | -f target-definition-file-name ]
              [ -force ] [ -pf copy-parameter-definition-file ]
              [ -vf VSS-definition-file-name ]
              [ -ef Exchange-environment-setting-file-name ]
```

To restore backup data in units of Information Stores (Exchange Server 2010 or Exchange Server 2013):

```
drmexgrestore backup-ID -resync
              [ -target Information-Store-name,… | -f target-
definition-file-name ]
              [ -force ] [ -recovery ]
              [ -pf copy-parameter-definition-file ]
              [ -vf VSS-definition-file-name]
              [ -ef Exchange-environment-setting-file-name ]
```

Description

The `drmexgrestore` command performs from the secondary volume, use disk resynchronization to restore the backup data specified by the backup ID to the primary volume.

When restoring the results of the VSS backup, the Protection Manager service must be running on the backup server.

If a database comprises several volumes, all volumes will be restored in order.

The following explains the command processing for restoration in a non-cluster configuration.

1. If the restored database was mounted, the database will be unmounted automatically.
   If the unmount of the file system fails, an error message will be displayed, and restoration processing error occurs.
2. After the database is stopped properly, and the file system confirms that unmount was successful, the backup data will be restored from the secondary volume to the primary volume by disk resynchronization.
3. If the file system was unmounted in step 1, the file system will be mounted.
   If the file system was already unmounted in step 1, the file system will not be mounted.
4. The database unmounted in step 1 will be mounted.

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The following explains the command processing for restoration in a cluster configuration. For this type of restoration, the cluster group containing the storage groups to be restored must be online. If restoration is performed while the cluster group is not online, a restoration error occurs. Because the cluster resources containing the storage groups are offline after restoration, the restored storage groups are temporarily unusable.

1. The disk resources for the storage groups to be restored are automatically set offline.

   If one or more cluster resources depend on a disk resource that is set offline here, these cluster resources are also set offline automatically. If the command is unable to set the disk resources offline, it outputs an error message and a restoration processing error occurs.

2. The command verifies that the disk resources have been normally set offline, and then restores backup data from the secondary volume to the primary volume by resynchronizing the disk.

3. The disk resources are set online.

   If one or more cluster resources have been set offline together with the disk resources, these cluster resources are also set online here.

If `ONLINE` is set in `CLU_MSCS_RESTORE` in the Application Agent configuration definition file (`init.conf`), restoration can be performed while the cluster resources are online.

In restoration, data on the primary volume is overwritten by the disk image of the secondary volume at the time backup is performed. Therefore, data on the primary volume that was created or updated after the backup is invalid.

Arguments

backup-ID

Specify the backup ID of the backup data to be restored. The backup ID is used to uniquely identify backup data, and is registered in the backup catalog during backup. To check a backup ID, execute the `drmexgcat` command.

`-resync`

Specify this option to resynchronize the primary and secondary volumes for restoration. Backup data on the secondary volume is synchronized to the primary volume.

`-target` *storage-group-name*

Specifies that databases related to a particular storage group or storage groups be restored. When multiple storage group names are specified, be sure to separate each one with a comma. Put any storage group names that contain space characters in double quotation marks ("). If this option is omitted, all storage groups on the server on which this command was executed will be restored.

`-target` *Information-Store-name*

Specify this option to restore the database in a particular Information Store.

To specify multiple Information Store names, use a comma to separate each Information Store name. Use double quotation marks (") to enclose any Information Store names that contain at least one space character.

If this option is omitted, all Information Stores on the server on which this command is executed will be restored.

`-target` *storage-group-name\Information-Store-name*

Specify this option if you use Exchange Server 2007 to perform restoration on a specific Information Store from backup data obtained by using VSS. Specify the Information Store name after the storage group name and separate them with a backslash (\). If you specify this Information Store name for backup data other than backup data that was obtained using VSS, an error occurs.

When you want to specify multiple Information Store names, use a comma to separate them. If an Information Store name contains a blank, enclose the entire name in quotation marks. The Information Store name is not case sensitive.

If this option is omitted, all storage groups on the server on which this command was executed will be restored.

`-f` *target-definition-file-name*

As with the `-target` option, specify this option to restore specific storage groups or Information Stores. Unlike the `-target` option, the `-f` option lets you specify a target definition file, which contains all the storage groups or Information Stores to be restored. The target definition file containing the list of storage groups or Information Stores must be created before you use this option. Use an absolute path to specify the target definition file.

If you use Exchange Server 2007 to perform restoration in units of Information Stores from backup data obtained by using VSS, create a target definition file whose entries are in the form of *storage-group-name \Information-Store-name* (the same format as that of the value of the `-target` option) and then specify that target definition file name.

`-force`

Specify this option to restore the data from the secondary volume to the primary volume by forcibly resynchronizing the volumes.

With this option, forced resynchronization is performed if the copy group name of the primary volume obtained when backup processing was performed on the database server matches the information on the database server, even though the LDEV and SERIAL numbers do not match the LDEV and SERIAL numbers when backup processing was performed.

Specify this option only if restoration by resynchronization could not be performed with the `-resync` option, such as when the LDEV number changes when the volume is replaced. If this option is specified under a normal restoration, data might be corrupted.

`-recovery`

Specifies that a recovery will be executed by rolling forward. When the command is executed, post-backup transactions are recovered, and the database is returned to the latest status. However, this is only true if from the time that the backup was acquired until the time that the command was executed, everything was stored properly in Exchange Server.

If this option is omitted, the database will return to the status it was in when the backup was acquired.

You must specify this option if you use Exchange Server 2007 to perform restoration in units of Information Stores from backup data obtained by using VSS. If you have specified an Information Store name in the `-target` option or `-f` option and you have not specified the `-recovery` option, this command terminates with an error. However, if all Information Store names within the storage group that is the restoration target have been specified, you can restore backup data even without specifying the `-recovery` option.

`-pf` *copy-parameter-definition-file*

Specify this option when using the number of retries and the retry interval defined in the copy parameter definition file. Specify only the file name, without specifying the path.

When you omit this option, the value of the CCI-linkage definition file (`DEFAULT.dat`) is used. The value of the CCI-linkage definition file (`DEFAULT.dat`) is used for parameters that are not coded in the copy parameter definition file.

Create the copy parameter definition file with an arbitrary name in the location below. Specify the file name by using an alphanumeric character string that is 64 bytes or less.

Application-Agent-installation-folder`\DRM\conf\raid`

`-vf` *VSS-definition-file-name*

This option specifies the VSS definition file used at VSS backup. You can use this option only when restoring backup data that was obtained using VSS. If you specify this option when restoring data other than backup data obtained using VSS, it will be ignored.

For *VSS-definition-file-name*, specify a file name only. Do not specify the folder name. The VSS definition file specified in this option must be stored in the following folder:

Application-Agent-installation-folder`\DRM\conf\vss`

If you omit this option, the command uses the following file as the VSS definition file:

Application-Agent-installation-folder`\DRM\conf\vsscom.conf`

For details about the VSS definition file, see the *Replication Manager Application Agent CLI User Guide*.

`-ef` *Exchange-environment-setting-file-name*

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Specify this option to change the parameter used for linking with Exchange Server each time a command is executed.

For *Exchange-environment-setting-file-name*, specify a file name only. Do not specify a folder name.

The specified Exchange environment settings file must be stored in the following folder:

Application-Agent-installation-folder\conf\exchange

If this option is omitted, the default value is used.

For details about the Exchange environment settings file, see the *Replication Manager Application Agent CLI User Guide*.

⚠️ **Note:** The backup information in the backup catalog is managed based on using the copy group as a key. Depending on the backup method, you might not be able to perform restoration, even though the backup data exists on the secondary volume. For further information, see the notes on running Application Agent in the *Replication Manager Application Agent CLI User Guide*.
Note the following if you use Exchange Server 2007 to perform restoration in units of Information Stores from backup data obtained by using VSS:
When restoring backup data in units of Information Stores, if you specify both an Information Store name and a storage group name, operations will occur as described below:
- If you specify a storage group name and an Information Store name of the same storage group, an error will occur.
- If you specify a storage group name and an Information Store name of different storage groups, the backup data is restored in units of storage groups and Information Stores respectively.
If you specify an Information Store name of data other than backup data obtained using VSS, an error will occur.
If you omit an Information Store name and specify *storage-group-name*\, an error will occur.
When you want to specify an Information Store name, check the value displayed in INFORMATIONSTORE of the drmexgcat command and specify exactly the same Information Store name.
At restoration, this command dismounts all Information Stores within the storage group to which the specified Information Store belongs.
If the restoration target disk contains Information Store files that are not restoration targets, an error will occur.
If the restoration target disk contains data from different storage groups, an error will occur.

Return Values

0: Normal termination

Any value other than 0: Termination with an error

Examples

- In this example, the command is used to restore, by disk resynchronization, the backup data identified by the backup ID `0000000001`:

```
PROMPT> drmexgrestore 0000000001 -resync
KAVX0001-I The drmexgrestore command will now start.
KAVX1805-I The information store will now be dismounted.
          Storage group name = STR1
KAVX1700-I Restore processing will now start.
KAVX1701-I Restore processing has finished.
KAVX1806-I The information store will now be mounted.
          Storage group name = STR1
KAVX0002-I The drmexgrestore command will now end.
```

- In this example, the command is used to restore, by disk resynchronization, the backup data identified by the backup ID `0000000003`, and then performs roll-forward recovery:

```
PROMPT> drmexgrestore 0000000003 -resync -recovery
KAVX0001-I The drmexgrestore command will now start.
KAVX1805-I The information store will now be dismounted.
          Storage group name = STR1
KAVX1700-I Restore processing will now start.
KAVX1701-I Restore processing has finished.
KAVX1806-I The information store will now be mounted.
          Storage group name = STR1
KAVX0002-I The drmexgrestore command will now end.
```

- In this example, the command is used to restore, by disk resynchronization, the backup data identified by the backup ID `0000000005` with the seed function enabled, and then performs roll-forward recovery:

```
PROMPT> drmexgrestore 0000000005 -resync -recovery -ef
exchange.conf
KAVX0001-I The drmexgrestore command will now start.
KAVX1526-I The Exchange environment configuration file has been
read.
          Exchange environment configuration file =
exchange.conf
KAVX0256-I A connection to the Protection Manager service will
now be established.
          Host name = passive_node_host_name
KAVX0256-I A connection to the Protection Manager service will
now be established.
          Host name = backup_server_host_name
KAVX1732-I The replication function of Exchange Server has
stopped.
          Storage group name = STR1
KAVX1732-I The replication function of Exchange Server has
stopped.
          Storage group name = STR2
KAVX1805-I The information store will now be dismounted.
          Storage group name = STR1
KAVX1805-I The information store will now be dismounted.
          Storage group name = STR2
KAVX1700-I Restore processing will now start.
KAVX5111-I Performing unmounting.
          Mount point name = D:
KAVX5111-I Performing unmounting.
```

```
                  Mount point name = F:
KAVX5108-I Resynchronizing a copy group.
          Copy group name = EXG001,VOL001
KAVX5108-I Resynchronizing a copy group.
          Copy group name = EXG001,VOL003
KAVX5109-I Dividing a copy group in pair.
          Copy group name = EXG001,VOL001
KAVX5109-I Dividing a copy group in pair.
          Copy group name = EXG001,VOL003
KAVX5110-I Performing mounting.
          Mount point name = D:
KAVX5110-I Performing mounting.
          Mount point name = F:
KAVX1701-I Restore processing has finished.
KAVX1806-I The information store will now be mounted.
          Storage group name = STR1
KAVX1806-I The information store will now be mounted.
          Storage group name = STR2
KAVX1736-I The seed processing will now start.
          Storage group name = STR1
KAVX1737-I The seed processing has finished.
          Storage group name = STR1
KAVX1734-I The replication function of Exchange Server has
resumed.
          Storage group name = STR1
KAVX1736-I The seed processing will now start.
          Storage group name = STR2
KAVX1737-I The seed processing has finished.
          Storage group name = STR2
KAVX1734-I The replication function of Exchange Server has
resumed.
          Storage group name = STR2
KAVX0002-I The drmexgrestore command will now end.
PROMPT>
```

- In this example, the command is used to restore, by disk resynchronization, the backup data identified by the backup ID `0000000005` (backup is created for `Mail01` and `Mail02`) with the seed function enabled in a Exchange Server 2010 DAG configuration. It then performs a point-in-time recovery:

```
PROMPT> drmexgrestore 0000000005 -resync -ef exchange.conf
KAVX0001-I The drmexgrestore command will now start.
KAVX1526-I The Exchange environment configuration file has been
read.
          Exchange environment configuration file =
exchange.conf
KAVX0256-I A connection to the Protection Manager service will
now be established.
          Host name = BackupServer1
KAVX1753-I The replication function of Exchange Server has
stopped. If the replication function does not resume
automatically, manually resume the replication function.
          Exchange Server name = DatabaseServer2
          Information store name = Mail01
KAVX1753-I The replication function of Exchange Server has
stopped. If the replication function does not resume
automatically, manually resume the replication function.
          Exchange Server name = DatabaseServer2
          Information store name = Mail02
```

```
KAVX1808-I The information store will now be dismounted.
           Information store name = Mail01
KAVX1808-I The information store will now be dismounted.
           Information store name = Mail02
KAVX1700-I Restore processing will now start.
KAVX5111-I Performing unmounting.
           Mount point name = D:
KAVX5111-I Performing unmounting.
           Mount point name = E:
KAVX5108-I Resynchronizing a copy group.
           Copy group name = EXG001,B001
KAVX5108-I Resynchronizing a copy group.
           Copy group name = EXG001,B002
KAVX5109-I Dividing a copy group in pair.
           Copy group name = EXG001,B002
KAVX5109-I Dividing a copy group in pair.
           Copy group name = EXG001,B001
KAVX5110-I Performing mounting.
           Mount point name = E:
KAVX5110-I Performing mounting.
           Mount point name = D:
KAVX5111-I Performing unmounting.
           Mount point name = F:
KAVX5111-I Performing unmounting.
           Mount point name = G:
KAVX5108-I Resynchronizing a copy group.
           Copy group name = EXG001,B003
KAVX5108-I Resynchronizing a copy group.
           Copy group name == EXG001,B004
KAVX5109-I Dividing a copy group in pair.
           Copy group name = EXG001,B004
KAVX5109-I Dividing a copy group in pair.
           Copy group name = EXG001,B003
KAVX5110-I Performing mounting.
           Mount point name = G:
KAVX5110-I Performing mounting.
           Mount point name = F:
KAVX1701-I Restore processing has finished.
KAVX1809-I The information store will now be mounted.
           Information store name = Mail01
KAVX1809-I The information store will now be mounted.
           Information store name = Mail02
KAVX1757-I Seed processing will now start.
           Exchange Server name = DatabaseServer2
           Information store name = Mail01
KAVX1758-I Seed processing has finished.
           Exchange Server name = DatabaseServer2
           Information store name = Mail01
KAVX1755-I The replication function of Exchange Server has
resumed.
           Exchange Server name = DatabaseServer2
           Information store name = Mail01
KAVX1757-I Seed processing will now start.
           Exchange Server name = DatabaseServer2
           Information store name = Mail02
KAVX1758-I Seed processing has finished.
           Exchange Server name = DatabaseServer2
           Information store name = Mail02
KAVX1755-I The replication function of Exchange Server has
```

```
          resumed.
                Exchange Server name = DatabaseServer2
                Information store name = Mail02
KAVX0002-I The drmexgrestore command will now end.
```

drmexgverify (Verifies the consistency of an Exchange database)

Format

drmexgverify *backup-ID*

Description

The drmexgverify command verifies the integrity of the backup data on a secondary volume.

Note that the Exchange databases that can be verified are those that were backed up by using VSS.

Execute this command on the backup server.

You must complete the following operations before executing this command:

- Install the Exchange Management Console on the backup server. The Exchange Server version to be installed must be the same as the Exchange Server version installed on the database server. If a service pack has been applied for Exchange Server on the database server, then, on the backup server, you must apply the same Exchange Server Service Pack as the one applied on the database server.

  For details on how to install the Exchange Management Console, see the manual for Exchange Server.

- Export and import the backup catalog to transfer it from the database server to the backup server.

- You must mount the secondary volume that stores the Exchange database (*.edb file) to the backup server. Use the drmmount command to mount the secondary volume, and specify the backup ID in the argument. Additionally, after executing the drmexgverify command, execute the drmumount command to unmount the mounted secondary volume.

Arguments

backup-ID

Specify the backup ID of the secondary volume for which you want to verify the integrity. A backup ID has been assigned when a backup catalog was created in the backup server by exporting and importing information.

Return Values

0: Normal termination

Any value other than `0`: Termination with an error

Example

- In this example, the command is used to verify the backup data whose backup ID is `0000000001`:

```
PROMPT> drmexgverify 0000000001
KAVX0001-I The drmexgverify command will now start.
KAVX0076-I The checksum of the Exchange database file was
confirmed.
           Storage group name = STR1
KAVX0002-I The drmexgverify command will now end.
```

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Hitachi Data Systems

Corporate Headquarters
2845 Lafayette Street
Santa Clara, California 95050-2639
U.S.A.
www.hds.com

Regional Contact Information

Americas
+1 408 970 1000
info@hds.com

Europe, Middle East, and Africa
+44 (0)1753 618000
info.emea@hds.com

Asia Pacific
+852 3189 7900
hds.marketing.apac@hds.com

@Hitachi Data Systems

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