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CLI Reference Guide

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MK-94HC091-11

Contents

Preface

This document describes how to use the Hitachi Tiered Storage Manager Command Line Interface (CLI).

This preface includes the following information:

- Intended Audience
- Software Version
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- Document Revision Level
- Document Organization
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- Getting Help
- Comments

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

Intended Audience

This manual is intended for storage administrators who use Hitachi Tiered Storage Manager to operate and manage storage subsystems (disk array devices), and assumes that readers have knowledge of the following:

- Basic knowledge about SANs (Storage Area Networks)
- Basic knowledge of storage subsystems used as domain controllers, such as Universal Storage Platform V/VM and Universal Storage Platform
- Basic knowledge about the operation and management of systems that use Hitachi Device Manager, which is a prerequisite product for Tiered Storage Manager
- Knowledge of Tiered Storage Manager as provided in the Hitachi Tiered Storage Manager User's Guide.
- Basic knowledge about the OSs required for the Tiered Storage Manager CLI

Software Version

This document revision applies to Hitachi Tiered Storage Manager version 6.4.

Release Notes

Release notes can be found on the documentation CD. Release notes contain requirements and more recent product information that may not be fully described in this manual. Be sure to review the release notes before installation.

Document Revision Level

Revision	Date	Description
MK-94HC091-P	May 2005	Preliminary Release
MK-94HC091-00	July 2005	Initial release, supersedes and replaces MK-94HC091-P
MK-94HC091-01	November 2005	Revision 1, supersedes and replaces MK-94HC091-00
MK-94HC091-02	April 2006	Revision 2, supersedes and replaces MK-94HC091-01
MK-94HC091-03	October 2006	Revision 3, supersedes and replaces MK-94HC091-02
MK-94HC091-04	June 2007	Revision 4, supersedes and replaces MK-94HC091-03
MK-94HC091-05	September 2007	Revision 5, supersedes and replaces MK-94HC091-04
MK-94HC091-06	January 2008	Revision 6, supersedes and replaces MK-94HC091-05
MK-94HC091-07	May 2008	Revision 7, supersedes and replaces MK-94HC091-06
MK-94HC091-08	February 2009	Revision 8, supersedes and replaces MK-94HC091-07

Revision	Date	Description
MK-94HC091-09	July 2009	Revision 9, supersedes and replaces MK-94HC091-08
MK-94HC091-10	December 2009	Revision 10, supersedes and replaces MK-94HC091-09
MK-94HC091-11	June 2010	Revision 11, supersedes and replaces MK-94HC091-10

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
Overview of the Tiered Storage Manager CLI	Provides an overview of the Tiered Storage Manager CLI and explains the software components of Tiered Storage Manager, and volume migration using the Tiered Storage Manager CLI.
System Requirements and Software Installation	Explains the system requirements for operating the Tiered Storage Manager CLI, how to install and set up the CLI, and how to subsequently set up the required environment.
Using the Tiered Storage Manager CLI	Explains user permissions, command specification formats, parameter syntaxes, and search condition expressions for the Tiered Storage Manager CLI.
Detailed Command Descriptions	Describes the function, specifiable options and parameters, and output items of each command, and provides a command specification example.
Tiered Storage Manager Properties Files	Explains the options and parameters specified in the properties file. It also explains the properties for the trace log of the Tiered Storage Manager CLI.
Troubleshooting	Explains the actions to take when problems occur with the Tiered Storage Manager CLI.
Notes on Connecting with Earlier Versions of the CLI Client	Describes incompatibilities when Tiered Storage Manager server version 5.0 or later connects with an earlier version of the CLI client.
Changes in the Format of Output Items	Explains the changes in the format of items output by Tiered Storage Manager server version 5.0 or later.
Acronyms and Abbreviations	Defines the acronyms and abbreviations used in this document.
Glossary	Explains terms used in this manual.
Index	Lists the topics in this document in alphabetical order.

Referenced Documents

The following Hitachi referenced documents can be found on the applicable Hitachi documentation CD:

- Hitachi Storage Command Suite Documents:
  - Hitachi Storage Command Suite Server Installation Guide, MK-98HC150
  - Hitachi Tiered Storage Manager User's Guide, MK-94HC090

- Hitachi Tiered Storage Manager Server Configuration and Operation Guide, MK-08HC158
- Hitachi Tiered Storage Manager Messages, MK-94HC092
- Hitachi Device Manager Command Line Interface (CLI) User's Guide, MK-91HC007
- Hitachi Device Manager Server Configuration and Operation Guide, MK-08HC157
- Hitachi Device Manager Agent Installation Guide, MK-92HC019
- Hitachi Device Manager Error Codes, MK-92HC016
- Hitachi Device Manager Getting Started Guide, MK-98HC149
- Hitachi Device Manager Mainframe Agent User's Guide, MK-96HC130

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.
screen/code	Indicates text that is displayed on screen or entered by the user. Example: `# pairdisplay -g oradb`
< > angled brackets	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: `# pairdisplay -g <group>` ***Note:*** Italic font is also used to indicate variables.
[ ] square brackets	Indicates optional values. Example: [a | b] indicates that you can choose a, b, or nothing.
{ } braces	Indicates required or expected values. Example: { a | b } indicates that you must choose either a or b.
| vertical bar	Indicates that you have a choice between two or more options or arguments. Examples: [a | b] indicates that you can choose a, b, or nothing. { a | b } indicates that you must choose either a or b.
underline	Indicates the default value. Example: [a | b]

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

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

Convention for Storage Capacity Values

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

Physical Capacity Unit	Value
1 KB	1,000 bytes
1 MB	$1{,}000^2$ bytes
1 GB	$1{,}000^3$ bytes
1 TB	$1{,}000^4$ bytes
1 PB	$1{,}000^5$ bytes
1 EB	$1{,}000^6$ bytes

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

Logical Capacity Unit	Value
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
1 BLOCK	512 BYTES

Getting Help

The Hitachi Data Systems Support Center staff is available 24 hours a day, seven days a week. To reach us, please visit the support Web site for current telephone numbers and other contact information: http://www.hds.com/services/support/. If you purchased this product from an authorized HDS reseller, contact that reseller for support.

Before calling the Hitachi Data Systems Support Center, please provide as much information about the problem as possible, including:

- The circumstances surrounding the error or failure.
- The exact content of any error message(s) displayed on the host system(s).

Comments

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

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

1

Overview of the Tiered Storage Manager CLI

This chapter provides an overview of the Tiered Storage Manager CLI system configuration and how to migrate volumes using the Tiered Storage Manager CLI. The section on migration explains everything from how to create storage domains to how to create and execute tasks. All the explanations are also accompanied by operations flow charts.

System Configuration of the Tiered Storage Manager CLI

The Tiered Storage Manager CLI enables you to create storage domains, storage tiers, and migration groups as well as migrate, shred, lock, and unlock volumes.

The following figure shows the system configuration when CLI clients are used.

You can operate the CLI on both a management server and a management client.

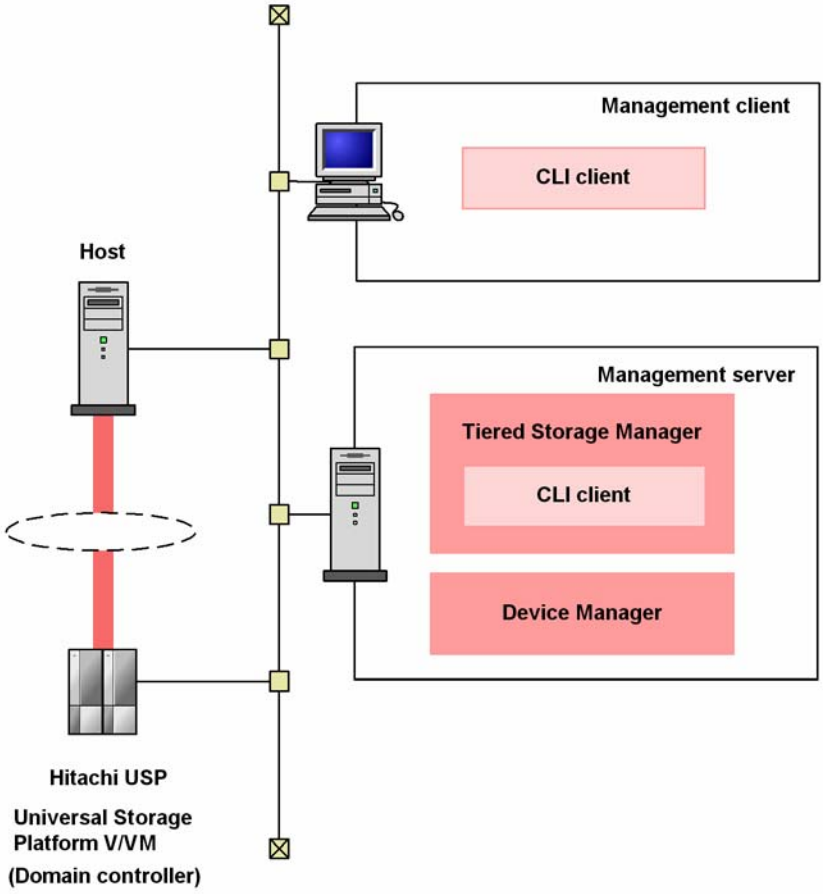

Figure 1-1 System Configuration of a CLI Client

Volume Operations Using the Tiered Storage Manager CLI

The following figure shows the flow of volume operations when the Tiered Storage Manager CLI is used. You can even execute tasks as you create them.

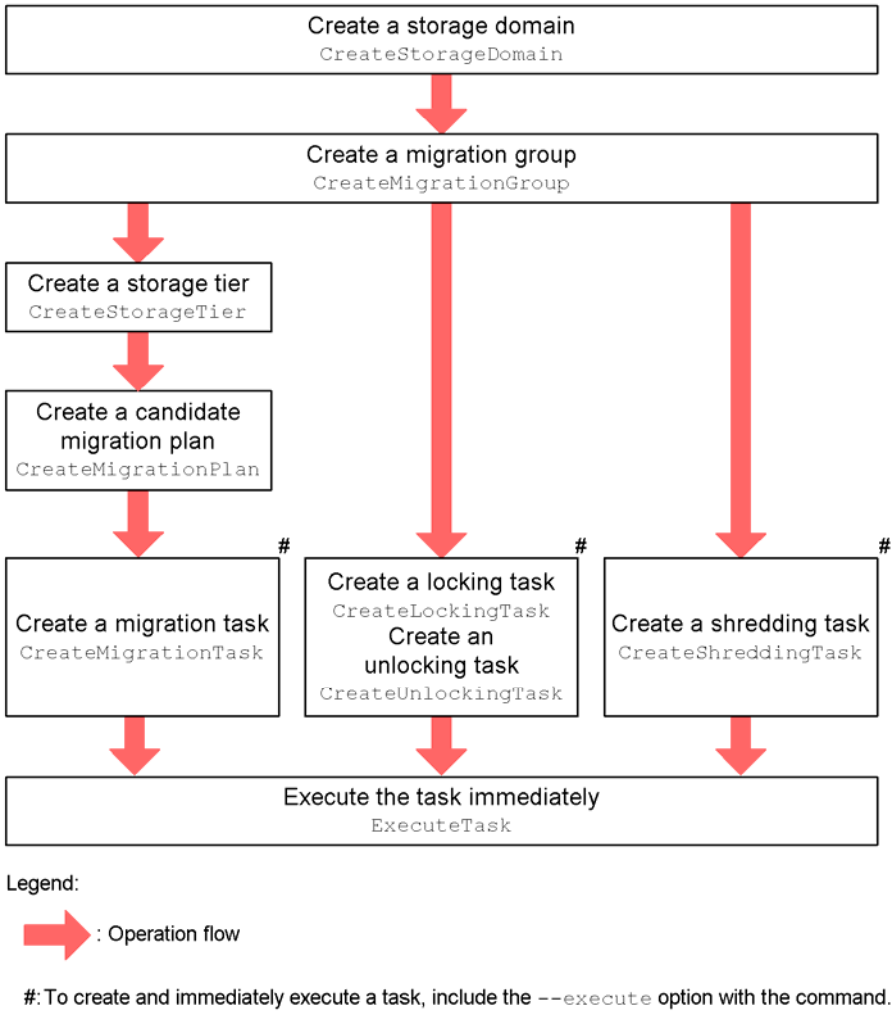

Figure 1-2 Flow of Migration Operations

Creating a Storage Domain

Use the `CreateStorageDomain` command to create a storage domain. Creating a storage domain involves registering the storage subsystem in Tiered Storage Manager.

Migration (the relocation of volume data) can be performed between a domain controller volume and an external storage subsystem that is connected to the domain controller.

Creating a Migration Group

Use the `CreateMigrationGroup` command to create a migration group in a storage domain.

Creating a Storage Tier

Use the `CreateStorageTier` command to create a storage tier in a storage domain that has already been created. A storage tier is a collection of volumes that are migration target candidates.

You can search for volumes and pools within the storage domain and specify the search results as a storage tier.

Creating a Candidate Migration Plan

It is too time-consuming to create pairs of migration source LDEVs and migration target LDEVs individually. You can use the `CreateMigrationPlan` command to make Tiered Storage Manager automatically select all the appropriate LDEVs for migration source LDEVs. Tiered Storage Manager will then output information regarding the various combinations of migration source and target LDEVs to the standard output or to a redirect file (as text data). The text file created by the `CreateMigrationPlan` command is called a *candidate migration plan*. You can also edit a candidate migration plan by using a text editor.

Creating and Executing Tasks

Tiered Storage Manager uses tasks to perform storage subsystem operations. You can use the CLI to create four types of tasks:

- Migration tasks
- Locking task
- Unlocking task
- Shredding tasks

You use the `CreateMigrationTask`, `CreateLockingTask`, `CreateUnlockingTask`, and `CreateShreddingTask` commands to create tasks. A task ID is assigned to all created tasks.

When creating a task, Tiered Storage Manager checks to make sure that the information on the selected volumes matches and there are no irregularities between the volumes. As a result, if there are a lot of volumes included in a migration group, it might take a while to create the task.

There are the following two methods for executing tasks:

- Executing a task as soon as it is created
- Using the `ExecuteTask` command to execute a task that is on standby

  If a task is not executed immediately after it is created, it is placed on standby.

  To execute tasks on standby, use the `ExecuteTask` command with the ID of the task on standby.

If a task has been executed and has not yet completed, a new task from the same migration group cannot be created.

Creating and Executing a Migration Task

To migrate a volume, first use the `CreateMigrationPlan` command to create a candidate migration plan. Next, select the created candidate migration plan, and then use the `CreateMigrationTask` command to create a migration task.

Notes on creating a migration task

Depending on filter conditions specified for the target storage tier, even if the migration has terminated normally, the migration source volumes might not be included in the target storage tier.

Before creating a migration task, make sure you check the following:

- Whether it is necessary to migrate the migration source volumes
- Whether the default attributes assigned to the migration target volumes are appropriate

Reserving a migration target volume

When you use the `CreateMigrationTask` command to create a migration task, the migration target volume is reserved and cannot be used by anything other than Tiered Storage Manager until the migration task has completed. However, a reserved volume is released if any of the following conditions are met:

- Migration terminates normally, and the migration task changes to the terminated status.
- The migration task is changed to the terminated (canceled) status by using the `CancelTask` command.
- The migration task ends with a failure.

Swapping controller LDEV numbers for migration source and target volumes

Once migration terminates normally, the controller LDEV numbers of the migration source and target volumes are swapped. Note that the labels assigned to the volumes remain the same.

Erasing Data from a Migration Source Volume

By default, the data on a migration source volume is not deleted after migration. However, to prevent any inadvertent disclosure of information, we recommend that you use the `erasedata` parameter from the `CreateMigrationTask` command to erase all the data on the migration source volume immediately after a migration.

Erasing data from a migration source pool volume and then deleting the volume

When the migration source is a DP volume, the migration target is a DP pool, and the setting to automatically erase the data after a migration is specified, all the data will be deleted from the migration source volume, and then both the volume and the volume group will also be deleted. The target to be deleted differs depending on whether Open Volume Management is installed.

The following table describes the differences in volume deletion when Open Volume Management is installed.

Table 1-1 Differences in Volume Deletion Depending on Whether Open Volume Management is Installed

Open Volume Management Installation	Number of Volumes in a Virtual Volume Group	Deletion Target
Not installed	1	▪ DP volume ▪ DP volume group
	Multiple	No valid deletion target The error message KATS50388-E is displayed.
Installed	1	▪ DP volume ▪ DP volume group
	Multiple	▪ DP volume ▪ DP volume group#

#

When the last DP volume is deleted, the DP volume group will also be deleted.

Creating and Executing a Locking Task

To lock a volume (for example, to write-protect (`Read only`) or read/write-protect (`Protect`) its data) you need to create and execute a locking task. Use the `CreateLockingTask` command to create a locking task.

Tiered Storage Manager locks volumes on a migration group basis. Once a volume is locked, you can then move it to another migration group.

Creating and Executing an Unlocking Task

To unlock a volume, you need to create and execute an unlocking task. Use the `CreateUnlockingTask` command to create an unlocking task.

Tiered Storage Manager unlocks volumes on a migration group basis. Once a volume is unlocked, you can then move it to another migration group. All the volumes that have been unlocked can be stored in one location, which is designated for useable volumes.

Creating and Executing a Shredding Task

To completely erase data from a migration group, you need to create and execute a shredding task. Use the `CreateShreddingTask` command to create a shredding task.

Tiered Storage Manager erases data in volumes on a migration group basis. After volumes have been completely shredded, the data is gone and you can move the shredded volumes to another migration group. This enables you to set aside volumes without any data to be used again later.

2

System Requirements and Software Installation

This chapter explains what must be done before starting up the CLI. The system requirements for using the CLI, how to set up the CLI, and how to subsequently set up the required environment are explained. Cautionary notes on executing certain commands are also included.

Programs Required for the CLI

The following table lists the programs that are required to set up the CLI on a management client.

Table 2-1 OS, JRE Version, and IPv6 Environment Support for CLI Client

OS	OS Product Name	JRE Version	IPv6 [#1] Environment Support
Windows® 7 (x86)	Microsoft® Windows 7 Enterprise Edition (No SP) Microsoft Windows 7 Professional Edition (No SP) Microsoft Windows 7 Ultimate Edition (No SP)	6.0	Yes
Windows 7 (x64)	Microsoft Windows 7 Enterprise Edition (No SP) Microsoft Windows 7 Professional Edition (No SP) Microsoft Windows 7 Ultimate Edition (No SP)	6.0	Yes
Windows Server® 2003 (x86) [#2]	Microsoft Windows Server 2003, Datacenter Edition (SP2) Microsoft Windows Server 2003, Enterprise Edition (SP2) Microsoft Windows Server 2003, Standard Edition (SP2)	1.4.2 (Build 06 or later)	No
		5.0 (Build 07 or later) or 6.0	Yes
	Microsoft Windows Server 2003 R2, Datacenter Edition (SP2) Microsoft Windows Server 2003 R2, Enterprise Edition (SP2) Microsoft Windows Server 2003 R2, Standard Edition (SP2)	5.0 (Build 07 or later) or 6.0	Yes
Windows Server 2003 (x64) [#2]	Microsoft Windows Server 2003, Datacenter x64 Edition (SP2) Microsoft Windows Server 2003, Enterprise x64 Edition (SP2) Microsoft Windows Server 2003, Standard x64 Edition (SP2) Microsoft Windows Server 2003 R2, Datacenter x64 Edition (SP2) Microsoft Windows Server 2003 R2, Enterprise x64 Edition (SP2) Microsoft Windows Server 2003 R2, Standard x64 Edition (SP2)	5.0 (Build 07 or later) or 6.0	Yes

OS	OS Product Name	JRE Version	IPv6 #1 Environment Support
Windows Server 2008 (x86) #2, #3, #4	Microsoft Windows Server 2008 Datacenter 32-bit (No SP, SP2) Microsoft Windows Server 2008 Enterprise 32-bit (No SP, SP2) Microsoft Windows Server 2008 Standard 32-bit (No SP, SP2) Microsoft Windows Server 2008 Datacenter without Hyper-V™ 32-bit (No SP, SP2) Microsoft Windows Server 2008 Enterprise without Hyper-V 32-bit (No SP, SP2) Microsoft Windows Server 2008 Standard without Hyper-V 32-bit (No SP, SP2)	6.0	Yes
Windows Server 2008 (x64) #2, #3, #4	Microsoft Windows Server 2008 Datacenter (No SP, SP2) Microsoft Windows Server 2008 Enterprise (No SP, SP2) Microsoft Windows Server 2008 Standard (No SP, SP2) Microsoft Windows Server 2008 Datacenter without Hyper-V (No SP, SP2) Microsoft Windows Server 2008 Enterprise without Hyper-V (No SP, SP2) Microsoft Windows Server 2008 Standard without Hyper-V (No SP, SP2)	6.0	Yes
Windows Server 2008 R2 (x64) #3, #4	Microsoft Windows Server 2008 R2, Datacenter (No SP) Microsoft Windows Server 2008 R2, Enterprise (No SP) Microsoft Windows Server 2008 R2, Standard (No SP)	6.0	Yes
Windows Vista® (x86) #2	Microsoft Windows Vista Business Edition (No SP, SP1, SP2) Microsoft Windows Vista Enterprise Edition (No SP, SP1, SP2) Microsoft Windows Vista Ultimate Edition (No SP, SP1, SP2)	6.0	Yes
Windows Vista (x64) #2	Microsoft Windows Vista Business Edition (No SP, SP1, SP2) Microsoft Windows Vista Enterprise Edition (No SP, SP1, SP2) Microsoft Windows Vista Ultimate Edition (No SP, SP1, SP2)	6.0	Yes
Windows XP #2	Microsoft Windows XP Professional Edition Operating System (SP2, SP3)	1.4.2 (Build 06 or later) or 5.0 (Build 07 or later) or 6.0	No

OS	OS Product Name	JRE Version	IPv6 [#1] Environment Support
Solaris	Solaris 8 (SPARC) Solaris 9 (SPARC)	1.4.2 (Build 06 or later) or 5.0 (Build 07 or later) or 6.0	No
	Solaris 10 (SPARC)	1.4.2 (Build 06 or later)	No
		5.0 (Build 07 or later) or 6.0	Yes
	Solaris 10 (x64)	5.0 (Build 07 or later)	Yes
HP-UX	HP-UX 11i v1 (PA-RISC)	1.4.2 (Build 08 or later) or 5.0(Build 03 or later)	No
	HP-UX 11i v2 (PA-RISC) HP-UX 11i v2 (IPF)	1.4.2 (Build 08 or later)	No
	HP-UX 11i v3 (PA-RISC) HP-UX 11i v3 (IPF)	5.0(Build 03 or later)	Yes
Linux®	Red Hat Enterprise Linux 5.2 (x86) Red Hat Enterprise Linux 5.2 Advanced Platform (x86) Red Hat Enterprise Linux 5.3 (x86) Red Hat Enterprise Linux 5.3 (x64) Red Hat Enterprise Linux 5.3 Advanced Platform (x86) Red Hat Enterprise Linux 5.3 Advanced Platform (x64) Red Hat Enterprise Linux 5.4 (x86) Red Hat Enterprise Linux 5.4 (x64) Red Hat Enterprise Linux 5.4 Advanced Platform (x86) Red Hat Enterprise Linux 5.4 Advanced Platform (x64)	6.0	Yes
	SUSE Linux Enterprise Server 10 (x86) (SP2, SP3) SUSE Linux Enterprise Server 10 (x64) (SP2, SP3)	5.0 (Build 10 or later)	Yes
	SUSE Linux Enterprise Server 11 (x86) (No SP) SUSE Linux Enterprise Server 11 (x64) (No SP)	6.0	Y

Legend:

Yes: An IPv6 environment is supported.

No: An IPv6 environment is not supported.

#1

Both an IPv4 environment and IPv6 environment are required to run Tiered Storage Manager. For details about settings for IPv6 environments, see the *Hitachi Tiered Storage Manager Server Configuration and Operation Guide*.

#2

The CLI also runs on guest OSs on VMware® ESX version 3.*x*.

#3

The CLI does not support operations on Windows Server 2008 (Hyper-V) guest OSs.

#4

Operation on Server Core is not supported.

Allocating Memory

In order to execute commands, you need to first specify an appropriate maximum value for the memory size. The amount of memory that can be allocated is set using the `HTSM_CLI_MEM_SIZE` environment variable.

The default for `HTSM_CLI_MEM_SIZE` is set to 256M, meaning that 256 MB is reserved. The value specified must be a multiple of 1,024 bytes and a minimum of 2 MB. Since the default unit for this value is bytes, add k or K to specify kilobytes, or m or M to specify megabytes. For the maximum memory size value, specify at least 150 MB. However, we recommend that you use the default of 256 MB.

If the amount of memory set for `HTSM_CLI_MEM_SIZE` is not enough for CLI execution, the CLI will display the following error message, and then terminate:

```
A java.lang.OutOfMemoryError exception occurred in the main thread.
<<No stack trace is available>>
```

If the above error occurs, increase the value of `HTSM_CLI_MEM_SIZE`, and run the CLI again.

CLI Setup Requirements

The requirements for setting up the CLI on a management client are as follows:

When the management client is running on Windows:

- You have logged on as a member of the Administrators group.
- At least 100 MB of free space must exist on the disk that the OS is installed on.

- The environment allows `.zip` files to be unzipped.
- You are logged on as a user with Administrator permissions for the system drive, and for whom the following accesses are allowed:
  - Creating files and writing data
  - Creating folders and adding data

When the management client is running on Solaris, HP-UX, or Linux:

- You have logged on as a user with administrator privileges (`root`).
- At least 100 MB of free space must exist on the disk containing the `/opt` directory.

Setting Up the CLI

This section describes how to set up the CLI on a management client. To set up the CLI on a management client, transfer the CLI setup file from the Tiered Storage Manager server to the management client. A JRE must be installed on the management client.

When you execute commands on the management server, you do not need to set up the CLI. The CLI will be set up and ready to go after Tiered Storage Manager is installed on the management server.

Setting Up the CLI on a Windows System

To set up the CLI when the management client OS is Windows:

1. Log on to the management client as a user who is a member of the Administrators group.
2. Use FTP or some sort of external storage media to transfer the setup file from the management server of Tiered Storage Manager to the management client.

   The CLI setup file is stored in the following folder or directory on the management server:

   If the management server OS is Windows:

   installation-folder-of-the-Tiered-Storage-Manager-server`\Dist\`

   If the management server OS is Solaris or Linux:

   installation-directory-of-the-Tiered-Storage-Manager-server`/Dist/`

   The following shows setup file name:

   `TSM06-40-`*mm*`_E`*nn*`_WIN_CLI.zip`

   mm indicates the revised version number. *nn* indicates the build number.

   You can copy the file above to any location.
3. Unzip the transferred setup file in the Windows system drive.

   After the setup file is unzipped, several files will be stored on the system drive, such as the batch file for setup, the batch file for uninstallation, the batch file for running the CLI, and the properties files.
4. Execute the batch file for setup (`setup.bat`) from the command prompt.

   system-drive`\TieredStorageManager\0640\Setup\setup.bat`

   The `setup.bat` file stores and sets up the common library for collecting trace information, and edits the batch file for running the CLI. The common library is stored in the following folder:

   system-drive`\Program Files\Hitachi\HNTRLib2`

Note:

- In Windows 7, Windows Server 2008, or Windows Vista, execute `setup.bat` as a user with Administrator permissions. Right-click the command prompt, choose **Run as administrator**, and then execute `setup.bat`. If the user who executes `setup.bat` does not have Administrator permissions, an error message will be displayed and setup will terminate.
- When `setup.bat` is executed, whether the location where the file will be extracted is correct will be checked. If the executed `setup.bat` is not the same as `setup.bat` included in the path shown above, an error message will be displayed and setup will terminate.

Setting Up the CLI on a Solaris, HP-UX, or Linux System

To set up the CLI when the management client OS is Solaris, HP-UX, or Linux system:

1. Log on to the management client machine as a user with administrator privileges (`root`).
2. Use FTP or some sort of external storage media to transfer the setup file from the management server of Tiered Storage Manager to the management client.

   The CLI setup file is stored in the following folder or directory on the management server:

   If the management server OS is Windows:

   installation-folder-of-the-Tiered-Storage-Manager-server`\Dist\`

   If the management server OS is Solaris or Linux:

   installation-directory-of-the-Tiered-Storage-Manager-server`/Dist/`

   The following shows the setup file name for each management client OS:

   – For Solaris (SPARC): `TSM06-40-`*mm*`_E`*nn*`_SOL_CLI.tar.gz`
   – For Solaris 10 (x64): `TSM06-40-`*mm*`_E`*nn*`_AMD64_CLI.tar.gz`
   – For HP-UX: `TSM06-40-`*mm*`_E`*nn*`_HP_CLI.tar.gz`
   – For Linux (RHEL): `TSM06-40-`*mm*`_E`*nn*`_LNX_CLI.tar.gz`
   – For Linux (SLES): `TSM06-40-`*mm*`_E`*nn*`_LNXS_CLI.tar.gz`

   mm indicates the revised version number. *nn* indicates the build number.

   You can copy this file to any location, such as `/tmp`.
3. Unzip the transferred setup file in the `/opt` directory.

   After the setup file is unzipped, several files are stored in the `/opt` directory, such as the shell script for setup, the shell script for uninstallation, the shell script for running the CLI, and the properties files.

4. Execute the shell script for setup (`setup.sh`).

   `/opt/TieredStorageManager/0640/Setup/setup.sh`

   The common library for collecting trace information is stored and set up. The common library is stored in the following directory:

   `/opt/Hitachi/HNTRLib2`

Note: When `setup.sh` is executed, the following conditions will be checked. If either of the following conditions is not satisfied, an error message will be displayed and the setup will terminate:

- Whether the executed `setup.sh` is the same as the `setup.sh` that is in the path shown above (whether the location where `setup.sh` will be extracted is correct)
- Whether the executed `setup.sh` matches the management client OS

About the umask of the script `htsmcli` for Solaris, HP-UX, or Linux:

umask 0 is used for the script `htsmcli`. As such, access permissions for the following files, created by htsmcli, will become -rw-rw-rw-:

Trace log files created in `/opt/TieredStorageManager/0640/CLI/logs`.

Uninstalling the CLI

To uninstall the CLI, you must execute the batch file or shell script for uninstallation. If you uninstall the CLI, the files for the CLI are deleted and the common library for collecting trace information is uninstalled.

The uninstallation batch file or shell script is located in the same directory as the batch file or shell script for setup.

Uninstalling the CLI from a Windows System

To uninstall the CLI from a Windows system:

1. Back up the `htsmcli.properties` file.

   You do not need to back up this file if you are no longer going to use the CLI on the computer it is installed on.

2. Make sure that the two conditions below are met for the following folder:

   system-drive`\TieredStorageManager`

   – The current directory used for executing the `bat` file is not in or under this folder.

   – Files under this folder are not being accessed.

   If the two conditions above are not met, folders might not be deleted, even if the uninstallation ends normally.

3. Execute the batch file for uninstallation (`unsetup.bat`) from the command prompt.

   Enter the following file name:

   system-drive`\TieredStorageManager\0640\Setup\unsetup.bat`

   The common library for collecting trace information is uninstalled, and the files and folders that were unzipped from the setup file during the setup are deleted.

Note: In Windows 7, Windows Server 2008, or Windows Vista, execute `unsetup.bat` as a user with Administrator permissions. Right-click the command prompt, choose **Run as administrator**, and then execute `unsetup.bat`.

If you execute `unsetup.bat` as a user who does not have Administrator permissions, an error message will be displayed and the uninstallation will terminate. Execute `unsetup.bat` again as a user who has Administrator permissions.

Uninstalling the CLI from a Solaris, HP-UX, or Linux System

To uninstall the CLI from a Solaris, HP-UX, or Linux system:

1. Back up the `htsmcli.properties` file.

   You do not need to back up this file if you are no longer going to use the CLI on the computer it is installed on.

2. Execute the shell script for uninstallation (`unsetup.sh`).

   ```
   /opt/TieredStorageManager/0640/Setup/unsetup.sh
   ```

   The common library for collecting trace information is uninstalled, and the files and directories unzipped from the setup file during the setup are deleted.

Preparations After Setup

This section explains the preparations that must be made to execute the CLI commands after you have set up the CLI.

Setting Up the htsmcli.properties Properties File

Each time you execute the CLI, you need to enter the server location, user name, password, and whether to use SSL communication. In order to skip this step, you can specify the server location and common options in the `htsmcli.properties` properties file in advance.

If you do not set up the `htsmcli.properties` properties file, you will need to enter the server location, user name, and password every time you execute a command.

By default, the `htsmcli.properties` properties file is stored in the following locations:

On a management client:

If the OS is Windows:

system-drive`\TieredStorageManager\0640\CLI\`

If the OS is Solaris, HP-UX, or Linux:

`/opt/TieredStorageManager/0640/CLI/`

On a management server:

If the OS is Windows:

installation-folder-of-the-Tiered-Storage-Manager-server`\CLI\`

If the OS is Solaris or Linux:

installation-directory-of-the-Tiered-Storage-Manager-server`/CLI/`

This example shows how to specify the server location, user name, and password in the `htsmcli.properties` properties file:

```
# Tiered Storage Manager Command Line Interface Properties File
# Can be used to provide options and default parameters for the
# Tiered Storage Manager CLI program.
# The server location
# htsmserver.location=
htsmserver.location=rmi://localhost:20352/HTSMServer

##### OPTIONS ####
# User name
option.username=user01
# Password
# Password can be provided directly, or from a password file
option.password=user01_pass
# Redirect file for Stdout
#option.output=D:\\TieredStorageManager\\redirect.txt
```

```
##### COMMAND PARAMETERS ####
# The Storage domain name, for commands that use this parameter
#parameter.storagedomainname=Domain01
```

The following table describes in detail the above example.

Table 2-2 Description of the Example htsmcli.properties Properties File

Setting Example	Description
Lines staring with a #	These are comment lines.
htsmserver.location= rmi://localhost:20352/HTSMServer	Specify the location of the Tiered Storage Manager server by using the following format: rmi://<*host-name* or *IP-address*[#1]>:<*port*[#2]>/HTSMServer
option.username=user01	Specify the user name used to log on to the Tiered Storage Manager server.
option.password=user01_pass	Specify the password corresponding to the user name.[#3] If the password file (a text file containing passwords) exists, specify the location in the following format: *@absolute-path-to-the-password-file*

#1

Specify the host name or IP address of the Tiered Storage Manager server. If you do not specify any value, it is assumed that the local host is specified. If you want to use an IPv6 address, enclose the IP address in brackets [ ] as shown below. Note that an error occurs if you did not specify any IPv6 address in brackets.

rmi://[*IPv6-address*]:*port*/HTSMServer

#2

Specify the same value for *the-port-number-that-receives-requests-from-the-client* that was specified during the Tiered Storage Manager installation. If you do not specify any value, either of the following values will be set by default:

24500: When SSL communication with the Tiered Storage Manager server has been set

20352: When SSL communication with the Tiered Storage Manager server has not been set

#3

You can specify a password by specifying plain text for the option.password property or by specifying an encoded character string for the option.password2 property. We recommend that you specify an encoded character string for better security. For details about how to encode a password, see Encoding the Password in the Properties File or Password File.

Specifying HTSM_CLI_HOME

HTSM_CLI_HOME is an environment variable used to inform the CLI of the location of the htsmcli.properties file. The htsmcli.properties properties file can be stored anywhere, but to use it, you need to set the path to it in the HTSM_CLI_HOME environment variable.

If you are using a Windows environment, note the following points:

- Do not enclose the path in single or double quotation marks (' or ").

  (Example of an invalid specification: "C:\TieredStorageManager\0640\CLI")

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

  (Example of an invalid specification: C:\TieredStorageManager\0640\CLI\)

- Do not specify a directory that is directly under the root of a drive.

  (Example of an invalid specification: C:\)

Encoding the Password in the Properties File or Password File

Specify a password in the htsmcli.properties file or password file to omit entering the password when using CLI. You can specify a plain text password for the htsmcli.properties file or password file. However, we recommend that you use the htsmaccount command to encode the password for better security.

Environment Settings for Encoding a Password

There are two levels for encoding passwords, NORMAL and HIGH. If you encode a password in the NORMAL level, environment settings are not required. For details about how to change the encoding level to HIGH for generating a safer and more secure character string, see the *Hitachi Device Manager Server Configuration and Operation Guide*.

How to Use the htsmaccount Command

This section describes the htsmaccount command, which encodes a password and outputs it to the htsmcli.properties file or password file. The htsmaccount command is stored in the following locations:

On a management client:

If the OS is Windows:

system-drive\TieredStorageManager\0640\CLI\

If the OS is Solaris, HP-UX, or Linux:

/opt/TieredStorageManager/0640/CLI/

On a management server:

If the OS is Windows:

installation-folder-of-the-Tiered-Storage-Manager-server\CLI\

If the OS is Solaris or Linux:

installation-directory-of-the-Tiered-Storage-Manager-server/CLI/

Execute the htsmaccount command using the user account used to log in to the OS on which the CLI (htsmcli) is executed. If you execute the CLI by using a user account different from the one that was used to execute the htsmaccount command, an error might occur.

The format of the htsmaccount command is as follows:

```
htsmaccount { -u user-name [ -f password-file-name ] | help }
```

-u

Specify the Tiered Storage Manager user name that executes the CLI. If a user name has been set for the option.username property in the htsmcli.properties file, specify the same user name for the -u option. To change the user name that executes the CLI, you first need to change the setting for the option.username property in the htsmcli.properties file. In addition, if an encoded password is already set for the option.password2 property, delete that value.

-f

Specify this option if you want to output the encoded password to a file. Use an absolute path to specify the file name. If you specify the -f option, the path to the file is set for the option.password2 property in the htsmcli.properties file. If you omit the -f option, the character string of the encoded password is set.

help

Displays help for the htsmaccount command.

When the htsmaccount command is executed, a message appears prompting you to enter the password. If you enter the password twice, that password is encoded and then automatically set for the option.password2 property in the htsmcli.properties file.

If a password has been set for the option.password or option.password2 property in the htsmcli.properties file, enter that password when you execute the htsmaccount command. If the character string that you enter matches the password that has been set, a message appears prompting you to enter the password to encode. After the password is encoded, the existing property is deleted and the option.password2 property is reset.

After the command completes, you do not need to specify the password when using CLI. After the `htsmaccount` command finishes and the CLI is set up, use the `GetStorageDomains` command to make sure that the password is correctly set.

Change the Access Permission for the CLI/logs Folder

Before using the CLI, change the access permission for the `CLI/logs` folder so that the Windows user account using the CLI can read and write data to and from this folder.

- `CLI/logs` folder set up on the management server:

  installation-folder-of-the-Tiered-Storage-Manager-server`\CLI\logs`

- `CLI/logs` folder set up on the management client:

  system-drive`\TieredStorageManager\0640\CLI\logs`

Setting Up the Java™ Execution Environment

Before you can execute commands, you need to specify a path for the `java` command in the `HTSM_CLI_JRE_PATH` environment variable. The value to be specified depends on the version, which is indicated in Table 2-1 *OS, JRE Version, and IPv6 Environment Support for CLI Client*. Even if you do not specify a value for this environment variable, you can execute the CLI by using the JRE specified in the `PATH` environment variable. In Windows, you can set environment variables by using the `set` command. In Solaris, HP-UX, or Linux, you need to use a different set of commands, such as the `setenv` and `export` commands, depending on the OS or shell you are using.

This example shows how to specify `HTSM_CLI_JRE_PATH` in Windows:

```
C:\>SET HTSM_CLI_JRE_PATH=C:\Program Files\Java\j2re1.4.2_06\bin
```

When setting the environment variable `HTSM_CLI_JRE_PATH` in Windows, note the following points:

- Do not enclose the path in single or double quotation marks (`'` or `"`).

  (Example of an invalid specification: `"C:\Documents and Settings"`)

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

  (Example of an invalid specification: `C:\Documents and Settings\`)

- Do not specify a path that is directly under the root of a drive.

  (Example of an invalid specification: `C:\`)

- Do not specify a folder for which there are no access permissions assigned to it.

Note: When connecting to the Tiered Storage Manager server, which exists outside the firewall, you need to adjust the firewall settings so that the Tiered Storage Manager CLI can use `java.exe`.

Setting Up SSL Communication

For SSL communication with a Tiered Storage Manager server, a client needs to have the same electronic certificate as the server. SSL communications at different security levels require different electronic certificate content.

To use SSL communication or change security levels for SSL communication:

1. Set up the Tiered Storage Manager server for SSL communication at the desired security level.

   For details about the SSL communication settings for the Tiered Storage Manger server, see the *Hitachi Tiered Storage Manager Server Configuration and Operation Guide*.

2. Download an electronic certificate from the following URL by using the Web browser on the CLI client:

   `http://host-name-or-IP-address:port-number/TieredStorageManager/TieredStorageMangaerCerts`

   Enter the `server.base.port` value in the `server.properties` file for *port-number*. For details about the `server.properties` file, see the *Hitachi Tiered Storage Manager Server Configuration and Operation Guide*.

3. Set the path and name of the downloaded electronic certificate for the environment variable `HTSM_CLI_CERTS_PATH`.

   The name of the electronic certificate is `TieredStorageManagerCerts`. If a path is not specified, the defaults are as follows:

   Storage directory of the electronic certificate file: The directory where the `htsmcli` command is executed

Note: For the electronic certificate, specify a file that you have access permissions for. If you do not have such permissions, SSL communication will fail because the electronic certificate will be unreadable.

After completing the above settings, for the arguments in the CLI command (*server-location* and *options*), specify the values for using SSL communication and execute the command. For details about the arguments relating to SSL communication in the CLI command, see Description of the CLI Command Elements and Options Common to All CLI Commands.

Executing Commands

After completing the necessary preparations, you can execute commands. Although the CLI is provided as a Java application, it can also be started in a batch file (script), for ease of use.

When Starting the CLI on the Management Server

To start the CLI on the management server, open a command prompt on the management server computer and then enter the following:

In Windows:

```
installation-folder-of-the-Tiered-Storage-Manager-server\CLI\htsmcli arguments
```

In Solaris or Linux:

```
installation-directory-of-the-Tiered-Storage-Manager-server/CLI/htsmcli arguments
```

When Starting the CLI on the Management Client

To start the CLI on the management client, open a command prompt on the management client computer and then enter the following:

In Windows:

```
system-drive\TieredStorageManager\0640\CLI\htsmcli arguments
```

In Solaris, HP-UX, or Linux:

```
# ./htsmcli arguments
```

If you start the CLI without specifying any arguments in the command line, the Tiered Storage Manager CLI version and Help format are displayed, as follows:

```
Tiered Storage Manager CLI 6.4.0-00
FOR HELP, TYPE: "htsmcli help [command]"
```

Notes on CLI Command Execution

Note the following points on CLI execution:

- CLI client's language type

  We recommend that you set the CLI client's language type to match the server's locale.

  When you operate the CLI on the management server, the language used for outputting information is the same, since the locale for the CLI and the locale for the Tiered Storage Manager server are the same.

When you operate the CLI on a management client, the language of the information received from the Tiered Storage Manager server depends on the locale of the Tiered Storage Manager server. The language of the information output by the CLI, such as messages and trace information, depends on the locale of the client on which the CLI is running.

- Canceling a CLI command

  If you have cancelled a CLI command by using the **Ctrl + C** keys or by closing the window, the command execution result cannot be checked. In such a case, execute a command such as `GetTasks` to check the command execution result. Also, if it is still necessary to check the command execution result, execute another command, such as `DeleteTasks`.

- Executing commands in Windows supporting the User Account Control function

  If the User Account Control function is enabled, use a command prompt with Administrator permissions to execute the CLI commands. If you do not do this, log files and execution results might not be output to the previously specified location.

  The following Windows OSs support the User Account Control function:

  – Windows 7

  – Windows Vista

  – Windows Server 2008

3

Using the Tiered Storage Manager CLI

This chapter provides a basic outline necessary for operating the CLI, such as user permissions, command and parameter formats, and filter condition expressions.

CLI Command Overview and User Permissions

To create and execute commands, you must have the user permissions to access Tiered Storage Manager. There are four different levels of user permissions:

- Admin permission

  Enables you to manage storage domains and view information managed by Tiered Storage Manager. This permission does not enable you to create or edit migration groups, storage tiers, or tasks.

- Modify permission

  Enables you to perform all operations other than storage domain creation and deletion.

- Execute permission

  Enables you to view information managed by Tiered Storage Manager and to execute tasks.

- View permission

  Enables you to view information managed by Tiered Storage Manager.

For details on how to set up user permissions, see the *Hitachi Tiered Storage Manager User's Guide*.

The following table lists all the different CLI commands, briefly describes each command, and shows which user permissions levels are necessary to execute the various commands.

Table 3-1 CLI Command Descriptions and the Necessary User Access Permissions

Category	Command Name	Description	Permission			
			Admin	Modify	Execute	View
Storage domain management	CreateStorage Domain	Creates a new storage domain (by registering a domain controller).	Yes	No	No	No
	DeleteStorage Domain	Deletes a registered storage domain.	Yes	No	No	No
	GetStorage Domains	Obtains information about storage domains.	Yes	Yes	Yes	Yes
	ModifyStorage Domain	Changes attributes for a storage domain. You can change the following attributes: ▪ Storage domain name ▪ Storage domain description	Yes	Yes	No	No
	Refresh	Updates the storage domain information. The refresh processing re-obtains subsystem information from Device Manager and registers it in the Tiered Storage Manager repository.	Yes	Yes	No	No
Storage tier management	CreateStorage Tier	Creates a storage tier.	No	Yes	No	No
	DeleteStorage Tier	Deletes a storage tier.	No	Yes	No	No
	GetStorageTiers	Obtains information about storage tiers.	Yes	Yes	Yes	Yes
	ModifyStorage Tier	Changes attributes for a storage tier. You can change the following attributes: ▪ Storage tier name ▪ Filter conditions for a storage tier ▪ Storage tier description	No	Yes	No	No

Category	Command Name	Description	Permission			
			Admin	Modify	Execute	View
Migration group management	CreateMigration Group	Creates a migration group.	No	Yes	No	No
	DeleteMigration Group	Deletes a migration group.	No	Yes	No	No
	GetMigration Groups	Obtains information about migration groups in a storage domain.	Yes	Yes	Yes	Yes
	ModifyMigration Group	Changes attributes for a migration group. The following attributes can be changed: ▪ Migration group name ▪ Attribute indicating whether the migration group is subject to migration operations. ▪ Migration group description ▪ Number of days before the specified elapsed period event occurs ▪ Event notification address ▪ Description for the specified elapsed period event ▪ LDEV selection rules (the array group selection rule, the array group avoidance rule)	No	Yes	No	No
	AddVolumeTo MigrationGroup	Adds a volume to a migration group.	No	Yes	No	No
	RemoveVolume FromMigration Group	Removes a volume from a migration group.	No	Yes	No	No
Task creation	CreateMigration Plan	Creates a migration plan.	Yes	Yes	Yes	Yes
	CreateMigration Task	Creates a migration task.	No	Yes	No	No
	CreateLocking Task	Creates a locking task to lock and write-protect (Read only) or read/write-protect (Protect) volumes.	No	Yes	No	No
	CreateUnlocking Task	Creates an unlocking task to unlock volumes.	No	Yes	No	No
	CreateShredding Task	Creates a shredding task to completely erase data from migration groups.	No	Yes	No	No

Category	Command Name	Description	Permission			
			Admin	Modify	Execute	View
Task management	GetTasks	Obtains information about tasks.	Yes	Yes	Yes	Yes
	ModifyTask	Changes attributes for a task. You can change the following attributes: ▪ Task description ▪ Event notification address	No	Yes	No	No
	ExecuteTask	Executes a task in standby status.	No	Yes	Yes	No
	CancelTask	Changes the status of a task currently in standby status to terminated (canceled) status.	No	Yes	No	No
	StopTask	Stops a task.	No	Yes	No	No
	DeleteTasks	Deletes a terminated task.	No	Yes	No	No
Acquisition of volume information	GetVolumes	Acquires information about the volumes in storage domains, storage tiers, and migration groups.	Yes	Yes	Yes	Yes
Acquisition of pool information	GetPools	Acquires information about DP pools in storage domains.	Yes	Yes	Yes	Yes
Acquisition of free space information	GetFreeSpaces	Acquires information about free space in storage subsystems.	Yes	Yes	Yes	Yes

Legend:

Yes: Command can be executed.

No: Command cannot be executed.

CLI Command Syntax

This section explains the format and syntax of the CLI commands.

The general format for the command line is as follows.

The general format for the command line

```
htsmcli [server-location] command [options]... [parameters]...
```

Description of the CLI Command Elements

Tiered Storage Manager CLI commands may include the following command elements:

- *server-location*
- *command-name*
- *options*
- *parameters*

Among the above arguments, the arguments shown below can be set in advance in the `htsmcli.properties` file. When these arguments are set in the `htsmcli.properties` file, you can omit specifying them in the command line.

- *server-location*
- *options-common-to-all-CLI-commands* (See Options Common to All CLI Commands.)
- *parameters*

If the value of an argument specified in the `htsmcli.properties` file and the value specified on the command line differ, the following rules will be obeyed:

- First: The value specified on the command line takes precedence over the value specified in the properties file.
- Second: The value specified in the `htsmcli.properties` file is of a lower priority than the command line value.

Table 3-2 describes the CLI command elements. The server location, command options, and command parameters can be specified in the command line or they can be omitted from the command line if they are included in the `htsmcli.properties` file. For more information about the CLI property files, see Tiered Storage Manager Properties Files.

Table 3-2 Description of Tiered Storage Manager CLI Command Elements

Command Element	Description
server-location	Specify the location of the Tiered Storage Manager server by using the following format: rmi://<*host-name-or-IP-address*>:<*port*>/HTSMServer (For example, specify a value such as rmi://myhost.mydomain:20352/HTSMServer.) *host-name-or-IP-address* Specify the host name or IP address of the Tiered Storage Manager server. If this is omitted, the local host is used as the default value. If you specify an IPv6 address, enclose it within square brackets ([ ]), as shown in the following example. Note that an error occurs if you do not specify an IPv6 address in brackets: rmi://[*IPv6-address*]:<*port*>/HTSMServer If you specify an IPv6 address when the OS is Solaris, HP-UX or Linux, you might need to use platform-dependent escape characters. *port* For the number of the port that receives requests from the client, specify the same value as the one that was specified during the Tiered Storage Manager installation. If you do not specify any value, either of the following values will be set by default: 24500: When SSL communication with the Tiered Storage Manager server has been set 20352: When SSL communication with the Tiered Storage Manager server has not been set
command-name	The name of a command, such as CreateStorageDomain or CreateMigrationTask. Command names are not case-sensitive. (For example, createstoragedomain and CREATESTORAGEDOMAIN are the same.)
options	Use the general UNIX format when entering options. There are two kinds of expressions: one-character expressions and one-word expressions. Insert a hyphen before one-character expressions, and two hyphens before one-word expressions. For example, specify -u for a one-character expression, and --username for a one-word expression. Options can be specified in any order. Options are case sensitive.
parameters	Parameters contain information passed to the server as part of a request. The parameters required depend on the command requested. Each parameter consists of a name and a value.

Options Common to All CLI Commands

There are two kinds of options: those used for all CLI commands, and those used for only some CLI commands. This subsection describes the options used for all CLI commands.

If an argument needs to be specified after an option, specify the argument as a single character string. Arguments that contain spaces should be enclosed in quotation marks, or whatever is appropriate for the command execution environment. For example:

```
--output "C:\My Documents\redirect.txt"
```

The following table lists options common to all commands.

Table 3-3 Options Common to All CLI Commands

Option	Option Argument	Description
-u or --username	*user-name*	Specify the user name used to log on to the Tiered Storage Manager server.
-p or --password	*password* or *@name-of-password-file*	Specify the password corresponding to the user name. ▪ You can either specify the password directly, or specify a file that contains the password. ▪ When specifying a file name for an argument, specify a name that begins with the at sign (@). The string in the first line of the specified text file is assumed to be the password. For the file name, specify either an absolute path, or a relative path from the directory from which the CLI command is executed. ▪ If incorrect passwords are entered and the number of login failures reaches the defined limit, the Tiered Storage Manager server will lock the user account. #1
-o or --output	*name-of-the-standard-output-redirect-file* #2	Specify the name of the redirect file to which the standard output is to be output. ▪ Specify this to redirect the execution results of a CLI command to the specified file, instead of the console. ▪ For the file name, specify either an absolute path, or a relative path from the directory from which the CLI command is executed.
-s or --secure	No arguments	Specify this option for SSL communication between the Tiered Storage Manager server and the CLI client. Various settings must be changed to use SSL communication. For details about how to set this option, see Setting Up SSL Communication.

#1

Users who have Admin (user management) permission can unlock accounts. For details on how to unlock accounts, see the *Hitachi Tiered Storage Manager User's Guide*.

#2

By using umask, if you want to create a file to which the standard output is to be redirected, use the shell redirect functionality instead of the `--output` option.

Specifying an illegal character in a file name, such as for a redirect file, can produce unexpected results. For example, if a file name containing a colon (:) is specified in a redirect destination or in the `--output` option in a Windows system, a file name up to, but not including, the colon will be generated, but nothing will be output to that file.

Command Parameters

Specify parameters in the format *name*=*value*. The following is an example:

```
controllerserialnumber=14011
```

Parameters can be specified in any order. *name* is not case sensitive, but *value* is case sensitive unless otherwise noted.

Specify parameters as single character strings. Enclose parameters that contain spaces in double quotation marks, as follows:

```
"filtercondition = capacity < '1024GB'"
```

Note:

- Special care should be taken when using a symbol (<, >, &, or !) to which a special meaning is attached by the OS. To override the OS's special meanings for any of these symbols, a character string containing such a symbol must be enclosed in single (') or double (") quotation marks. Also, the symbol can be preceded by an escape character.
- Problems may be encountered if you use Windows Vista 4-byte characters.

The following table lists the values and characters that can be specified for parameters. For details about the parameters, see Detailed Command Descriptions.

Commands that start with `Modify` might sometimes have parameters that start with `new`. For details about parameters that start with `new`, refer to the description about the parameter with the same name but with `new` omitted. For example, for details about the `newcost` parameter of the `ModifyStorageTier` command, refer to the description about the `cost` parameter.

Table 3-4 Values that can be Specified for Parameters

Parameter	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
arraygroupavoidanceofmigrationgroups	--	A to Z a to z 0 to 9 Hyphen (-) Underscore (_) Period (.) At sign (@) Space character ( ) Non-ASCII characters ▪ The specified value cannot start or end with a space character. ▪ An empty character string cannot be specified.	A maximum of 75 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
arraygroupselectionrule	BalanceCapacity MinimumCoverage MaximumCoverage	▪ The value is not case sensitive. ▪ The value cannot contain space characters.	--
canmigrate	Yes No	▪ The value is not case sensitive. ▪ The value cannot contain space characters.	--
chargefor	Allocated Utilized	▪ The value is not case sensitive. ▪ The value cannot contain space characters.	--

Parameter	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
controllerdevicenumber	--	The character string consists of two hexadecimal values less than 0x100, separated by a colon (:) (0:00 format), or three hexadecimal values less than 0x100, separated by colons (:) (00:00:00 format). ▪ Express the leading part as 1 or 2 digits and the trailing parts as 2 digits each. ▪ The value is not case sensitive. ▪ Space characters cannot be specified.	--
controllerdisplaymodel	The value displayed for the displayArrayType attribute of the StorageArray object, in GetStorageArray for the Device Manager CLI.	No restrictions on the types of characters exist, but note the following restriction: ▪ The specified value cannot start or end with a space character.	A maximum of 75 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
controllername	The value displayed for the name attribute of the StorageArray object, in GetStorageArray for the Device Manager CLI.	No restrictions on the types of characters exist, but note the following restriction: ▪ The specified value cannot start or end with a space character.	A maximum of 256 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.

Parameter	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
controllerserialnumber	The value displayed for the serialNumber attribute of the StorageArray object, in GetStorageArray for the Device Manager CLI.	A to Z a to z 0 to 9 Hyphen (-) Underscore (_) Period (.) At sign (@) Space character ( ) Non-ASCII characters ▪ The specified value cannot start or end with a space character. ▪ A value must be specified.	A maximum of 75 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
cost dpcost	Specify each element of the cost by using the following format: *currency-code amount / unit-of-capacity / unit-of-period* Note that a space at the beginning or end, or between each element, will be ignored: ▪ *currency-code* # Specify a currency code conforming to ISO4217 using 3 capital letters. ▪ *amount* Specify an integer from 0 to 9,223,372,036,854,775,807. Do not use commas or periods. ▪ *unit-of-capacity* MB GB TB The value is not case sensitive. ▪ *unit-of-period* Month Year The value is not case sensitive.		
datetype	Creation End	▪ The value is not case sensitive. ▪ The value cannot contain space characters	--
daystobase	Integer in the range 0 to 2,147,483,647	▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0.	--

Parameter	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
description	--	No restrictions.	A maximum of 500 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
direction	Before After Just	▪ The value is not case sensitive. ▪ The value cannot contain space characters	--
dpchargefor	Allocated Consumed Utilized	▪ The value is not case sensitive. ▪ The value cannot contain space characters.	--
eraseData	Yes No	▪ The value is not case sensitive. ▪ The value cannot contain space characters	--
filtercondition	See Table 3-5, Table 3-6, and Table 3-7		A maximum of 4,096 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
guardmode	ReadOnly Protect	▪ The value is not case sensitive. ▪ The value cannot contain any space characters.	--

Parameter	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
id	A unique ID given to the created task. This is the value displayed as an ID attribute when task information is output by a command, such as the GetTasks command.	A to Z a to z 0 to 9 Hyphen (-) Underscore (_) Period (.) At sign (@) Space character ( ) Non-ASCII characters ▪ The specified value cannot start or end with a space character. ▪ A value must be specified.	A maximum of 75 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
immediate	Yes No	▪ The value is not case sensitive. ▪ The value cannot contain space characters.	--
migrationplan	A value specifying the file name of the migration plan when executing the CreateMigrationPlan command.	--	--
movefrommigrationgroup	Yes No	▪ The value is not case sensitive. ▪ The value cannot contain space characters.	--

Parameter	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
name Specify one of the following names: ▪ *storage-domain-name* ▪ *storage-tier-name* ▪ *migration-group-name* storagedomainname storagetiername targetstoragetiername migrationgroupname movetomigrationgroupname	--	A to Z a to z 0 to 9 Hyphen (-) Underscore (_) Period (.) At sign (@) Space character ( ) Non-ASCII characters ▪ The specified value cannot start or end with a space character. ▪ A value must be specified.	A maximum of 75 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
notifytourl	Space characters, or the value obtained by combining mailto: and the email address	The following characters are supported for email addresses: A to Z a to z 0 to 9 Hyphen (-) Underscore (_) Period (.) At sign (@)	1 to 255 bytes for the email address (when converted to UTF-8) 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
reminddayslater	Integer ranging from 1 to 21,900	▪ You cannot add a plus sign (+) to the value.	--
reminderdescription	--	No restrictions.	A maximum of 500 bytes (when converted to UTF-8) 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
resource	Volume Pool	▪ The value is not case sensitive. ▪ The value cannot contain any space characters.	--
retentiondays	Integer ranging from -1 to 21,900	▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0.	--

Parameter	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
shreddingmethod	ZERO-ONCE DoD	▪ The value is not case sensitive. ▪ The value cannot contain any space characters.	--
status (GetTasks command)	Standby Active Active.Waiting Active.Executing Active.WaitingMigration Active.Migrating Active.WaitingDataErasure Active.DataErasing Active.WaitingVolumeCreation Active.VolumeCreation Active.WaitingPathCreation Active.PathCreation Active.WaitingExternalMapping Active.ExternalMapping Active.WaitingZeroDataDiscard Active.ZeroDataDiscarding Failure.MigrationFailure Failure.DataErasureFailure Failure.VolumeCreationFailure Failure.PathCreationFailure Failure.ExternalMappingFailure Failure.ZeroDataDiscardFailure Stopping Stop.MigrationStop Stop.DataErasureStop Stop.PathCreationStop Stop.ExternalMappingStop Stop.ZeroDataDiscardStop NotEnd Success Failure Cancel Stop End	▪ The value is not case sensitive. ▪ The value cannot contain space characters. ▪ Only a lower-level status can be specified by omitting Active., Failure., or Stop..	--

Parameter	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
status (DeleteTasks command)	Failure.MigrationFailure Failure.DataErasureFailure Failure.VolumeCreationFailure Failure.PathCreationFailure Failure.ExternalMappingFailure Failure.ZeroDataDiscardFailure Stop.MigrationStop Stop.DataErasureStop Stop.PathCreationStop Stop.ExternalMappingStop Stop.ZeroDataDiscardStop Success Failure Cancel Stop End	▪ The value is not case sensitive. ▪ The value cannot contain space characters. ▪ Only a lower-level status can be specified by omitting Failure., or Stop..	--
subsystemname	The value displayed for the name attribute of the StorageArray object (displayed in GetStorageArray for the Device Manager CLI). If the subsystem name is unknown, specify the product name and serial number.	N No restrictions on the types of characters exist, but note the following restriction: ▪ The specified value cannot start or end with a space character.	A maximum of 384 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
tasktype	Migration Locking Unlocking Shredding VolumeCreation ExternalMapping	▪ The value is not case sensitive. ▪ The value cannot contain any space characters.	--
zerodatadiscard	Yes No	▪ The value is not case sensitive. ▪ The value cannot contain space characters.	--

Legend:

-- : The applicable value is optional or the number of characters is fixed.

#

The Tiered Storage Manager CLI supports the following currency codes:

AED, AFN, ALL, AMD, ANG, AOA, ARS, AUD, AWG, AZN, BAM, BBD, BDT, BGN, BHD, BIF, BMD, BND, BOB, BOV, BRL, BSD, BTN, BWP, BYR, BZD, CAD, CDF, CHE, CHF, CHW, CLF, CLP, CNY, COP, COU, CRC, CUC, CUP, CVE, CZK, DJF, DKK, DOP, DZD, EEK, EGP, ERN, ETB, EUR, FJD, FKP, GBP, GEL, GHS, GIP, GMD, GNF, GTQ, GWP, GYD, HKD, HNL, HRK, HTG, HUF, IDR, ILS, INR, IQD, IRR, ISK, JMD, JOD, JPY, KES, KGS, KHR, KMF, KPW, KRW, KWD, KYD, KZT, LAK, LBP, LKR, LRD, LSL, LTL, LVL, LYD, MAD, MDL, MGA, MKD, MMK, MNT, MOP, MRO, MUR, MVR, MWK, MXN, MXV, MYR, MZN, NAD, NGN, NIO, NOK, NPR, NZD, OMR, PAB, PEN, PGK, PHP, PKR, PLN, PYG, QAR, RON, RSD, RUB, RWF, SAR, SBD, SCR, SDG, SEK, SGD, SHP, SLL, SOS, SRD, STD, SVC, SYP, SZL, THB, TJS, TMT, TND, TOP, TRY, TTD, TWD, TZS, UAH, UGX, USD, USN, USS, UYI, UYU, UZS, VEF, VND, VUV, WST, XAF, XAG, XAU, XBA, XBB, XBC, XBD, XCD, XDR, XFU, XOF, XPD, XPF, XPT, XTS, XXX, YER, ZAR, ZMK, ZWL

Filter Condition Expressions

You can specify filtering condition expressions for the `filtercondition` parameter (or the `newfiltercondition` parameter). Filter condition expressions are specified by combining properties. *Properties* in this subsection refer to `comparison_predicate` values in the filter condition expressions described in Syntax of Filter Condition Expressions.

You can specify the following kinds of filter condition expressions in the `filtercondition` parameter:

- Filter condition expressions for a storage tier (`storage_tier_filter_condition`)

  These filter condition expressions are specified for volumes and pools managed in the storage tier. They can be specified for the `CreateStorageTier` and `ModifyStorageTier` commands.

  The properties to specify will differ according to the target (volume or pool) managed by the storage tier.

  For volumes, the properties shown in Table 3-5 can be specified.

  For pools, the properties shown in Table 3-6 can be specified.

  Because both volumes and pools cannot be managed by a single storage tier, volume filter conditions and pool filter conditions cannot be specified at the same time.

- Filter condition expressions for volumes (`volume_filter_condition`)

  These filter condition expressions are used to filter storage domains and volumes in storage tiers. They can be specified for the `GetVolumes` and `CreateMigrationPlan` commands.

  The properties shown in Table 3-5 can be specified.

- Filter condition expressions for pools (`pool_filter_condition`)

  These filter condition expressions are used to filter pools in storage domains. They can be specified for the `GetPools` command.

  The properties shown in Table 3-6 can be specified.

- Filter condition expressions for free space (`free_space_filter_condition`)

  These filter condition expressions are used to filter free space in a subsystem registered in Device Manager. They can be specified for the `GetFreeSpaces` command.

  The properties shown in Table 3-7 can be specified.

Syntax of Filter Condition Expressions

The following shows the syntax of these filter condition expressions, in BNF format.

```
storage_tier_filter_condition ::= and_search_condition
| or_search_condition
and_search_condition ::= comparison_predicate
| and_search_condition "AND" and_search_condition
| "(" and_search_condition ")"
or_search_condition ::= comparison_predicate
| or_search_condition "OR" or_search_condition
| "(" or_search_condition ")"

volume_filter_condition ::= term | volume_filter_condition "OR" volume_filter_condition
term ::= factor | term "AND" term
factor ::= test | "NOT" factor
test ::= comparison_predicate | "(" volume_filter_condition ")"

pool_filter_condition ::= pool_term | pool_filter_condition "OR" pool_filter_condition
pool_term ::= pool_factor | pool_term "AND" pool_term
pool_factor ::= pool_test | "NOT" pool_factor
pool_test ::= comparison_predicate | "(" pool_filter_condition ")"

free_space_filter_condition ::= free_space_term | free_space_filter_condition "OR"
free_space_filter_condition
free_space_term ::= free_space_factor | free_space_term "AND" free_space_term
free_space_factor ::= free_space_test | "NOT" free_space_factor
free_space_test ::= comparison_predicate | "(" free_space_filter_condition ")"

comparison_predicate ::= symbol comp_op literal
symbol ::= name
comp_op ::= "=" | "<>" | "<" | ">" | "<=" | ">=" | "startsWith" | "contains"| "endsWith"
literal ::= string_literal | numeric_literal
numeric_literal ::= digit { digit }
digit ::= "0" | "1" | "2" | "3" | "4" | "5" | "6" | "7" | "8" | "9"
```

Note:

- Curly brackets ({}) indicate 0 or more repetitions.
- One filter condition expression can contain a maximum of 30 `comparison_predicate` values.
- `Unknown` cannot be specified for `literal`. Note that the displayed `Unknown` might mean that either the value is unknown or the character string is `Unknown`.

The following lists the `comp_op` types and their meanings:

- =: Equal
- <>: Not equal
- `startsWith`: Search for a value that begins with the specified character string
- `endsWith`: Search for a value that ends with the specified character string
- `contains`: Search for a value that contains the specified character string

Format of string_literal

Specify `string_literal` according to the following rules:

- If `string_literal` contains the following characters, enclose `string_literal` in single quotation marks:
  - Space character
  - Parenthesis (())
  - Less-than or greater-than signs (<>)
  - Equal sign (=)
  - Single quotation mark (')

  Example: `RAIDLevel='RAID5(3D+1P)'`

- If `string_literal` contains a single quotation mark ('), add another single quotation mark for each single quotation mark.

  Example: If `subsystemName` is `SUBSYSTEM'AAA`:

  ```
  subsystemName='SUBSYSTEM''AAA'
  ```

- If `string_literal` begins with a non-alphanumeric character, you must separate it from `comp_op` with a space character or enclose `string_literal` between single quotation marks.

  Example: `DiskType= -`, or `DiskType='-'`

Format of Properties for which Multiple Elements Can Be Specified

You can specify multiple elements for some properties by using commas to separate elements. If there are no restrictions on the specifiable characters for each element, follow the rules below.

Note that, even if you specify only one element for a property, you must follow these rules.

If a value consists of an element that contains one or more commas:

Enclose the element in single quotation marks, and then add another single quotation mark for each single quotation mark. After that, enclose the entire value in single quotation marks. The following example shows how to specify an element that contains a comma:

Example - When an element contains a comma (e.g., `A,B`):

1. Enclose the element `A,B` in single quotation marks (i.e., `'A,B'`).
2. Add another single quotation mark for each single quotation mark (i.e., `''A,B''`).
3. Enclose the element `''A,B''` in single quotation marks (i.e., `'''A,B'''`).

If a value consists of an element that contains one or more single quotation marks:

Add another single quotation mark for each single quotation mark. Next, enclose the element in single quotation marks, and then add another single quotation mark for each single quotation mark. After that, enclose the entire value in single quotation marks. The following example shows how to specify an element that contains a single quotation mark:

Example - When an element includes one single quotation mark (e.g., `C'D`):

1. Add another single quotation mark for each single quotation mark (i.e., `C''D`).
4. Enclose the element `C''D` in single quotation marks (i.e., `'C''D'`).
5. Add another single quotation mark for each single quotation mark (i.e., `''C''''D''`).
6. Enclose the element `''C''''D''` in single quotation marks (i.e., `'''C''''D'''`).

If a value consists of multiple elements that contain commas or single quotation marks:

Add another single quotation mark for each single quotation mark. Next, enclose each element in single quotation marks, and then add another single quotation mark for each single quotation mark. Then, use a comma and a space character to separate the elements. After that, enclose the entire value in single quotation marks. The following example shows how to specify a value:

Example - When a value consists of multiple elements (e.g., `A,B` and `C'D`):

1. As shown in the above examples, specify the element `A,B` as `''A,B''`, and the element `C'D` as `''C''''D''`.
7. Insert a comma and a space between the elements (i.e., `''A,B''`, `''C''''D''`).
8. Enclose the entire value in single quotation marks (i.e., `'''A,B''`, `''C''''D'''`).

Range of Valid Property Values

The tables below list the range of values that can be specified for the properties of filter condition expressions used for the `filtercondition` parameter.

Note that, for the `filtercondition` parameter, you cannot specify volume filter conditions and pool filter conditions at the same time. In addition, property names are not case sensitive.

For details about the properties, see Detailed Command Descriptions.

Table 3-5 Range of Valid Property Values for Volume Filter Conditions

Property Name	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
ArrayGroup	The value displayed for the displayName attribute of the ArrayGroup object, in GetStorageArray(subtarget=ArrayGroup) for the Device Manager CLI. Part of the value can also be specified by using startsWith or contains.	Any characters can be used. ▪ A value must be specified. ▪ If the operator is = or <>, commas (,) can be used to specify multiple ArrayGroup names. Space characters at the start or end of the ArrayGroup name are disregarded. ▪ If the operator is startsWith or contains, multiple ArrayGroup names cannot be separated with commas (,). ▪ If the operator is startsWith, the specified value cannot start with space characters. Space characters at the end are included in the search string. ▪ If the operator is contains, space characters at the start or end are included in the search string.	A maximum of 1,024 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes. The maximum number of elements separated by commas (,) is 100.
ArrayGroupBusyRate	Integer in the range 0 to 100	▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0. ▪ The value cannot contain space characters.	--

Property Name	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
ArrayGroupMaxBusyRate	Integer in the range 0 to 100	▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0. ▪ The value cannot contain space characters.	--
Capacity	If anything other than Block is specified for units, or if units are omitted, an integer from 0 to 9,223,372,036,854,775,807 when the value is converted to units of KB. If Block is specified for units, an integer from 0 to 9,223,372,036,854,775,807.	Specify a positive integer, or a combination of a positive integer and a character string indicating the units (such as 256, 500KB, or 10MB). The units you can specify are KB, MB, GB, TB, and Block. KB is the default unit.[#1] ▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0. ▪ The value cannot contain space characters. ▪ The value is not case sensitive.	--
CLPRNumber	An integer from 0 to 31	▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0. ▪ The value cannot contain space characters.	--

Property Name	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
ConsumedCapacity	An integer from 0 to 281,474,976,710,653KB	Specify a positive integer, or a combination of a positive integer and a character string indicating the units (such as 256, 500KB, or 10MB). The units you can specify are KB, MB, GB, and TB. KB is the default unit.[#1] ▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0. ▪ The value cannot contain space characters. ▪ The value is not case sensitive.	--
ConsumedCapacityPercentage	An integer from 0 to 100	▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0.	--

Property Name	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
ControllerArrayGroup	This value is displayed in the displayName attribute of the ArrayGroup object for the GetStorageArray(subtarget=ArrayGroup) in Device Manager CLI. Part of the value can also be specified by using startsWith or contains.	A to Z a to z 0 to 9 Hyphen (-) Underscore (_) Period (.) At sign (@) Space character ( ) Non-ASCII characters ▪ A value must be specified ▪ If the operator is = or <>, commas (,) can be used to specify multiple ArrayGroup names. Space characters at the start or end of the ArrayGroup name are disregarded. ▪ If the operator is startsWith or contains, multiple ArrayGroup names cannot be separated with commas (,). ▪ If the operator is startsWith, the specified value cannot start with space characters. Space characters at the end are included in the search string. ▪ If the operator is contains, space characters at the start or end are included in the search string.	A maximum of 75 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes. The maximum number of elements separated by commas (,) is 100.

Property Name	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
ControllerDeviceNumber	--	The character string is consists of two hexadecimal values less than 0x100, separated by a colon (:) (0:00 format), or three hexadecimal values less than 0x100, separated by colons (:) (00:00:00 format). You can specify a list of values separated by commas (,) or a range of values separated by a hyphen (-). ▪ Express the leading part as 1 or 2 digits and the trailing parts as 2 digits each. ▪ Space characters before and after the character string are ignored.	The maximum number of elements separated by commas (,) is 100. The range specified by a hyphen (-) can specify only 1 element.
CopyOnWriteSnapshot	Simplex P-VOL V-VOL POOL	▪ A space character cannot be used in the middle of a character string. ▪ Not case sensitive.	--
CVS	Yes No	▪ A space character cannot be used in the middle of a character string. ▪ Not case sensitive.	--
DiskCapacityInGB[#2]	An integer from 0 to 2,147,483,645	▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0.	--
DiskRPM	An integer from 0 to 2,147,483,645	▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0.	--

Property Name	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
DiskType	FC AT BD SAS[#3] SSD[#3] -	▪ The value cannot contain space characters. ▪ The value is not case sensitive.	--
DynamicProvisioning	The volume type. Enter one of the following: - DP-VOL DP-Pool-VOL	The value is not case sensitive.	--
EmulationType	The value displayed for the emulation attribute of the LogicalUnit object, in GetStorageArray(subtarget=LogicalUnit) for the Device Manager CLI.	No restrictions on the types of characters exist, but note the following restrictions: ▪ The specified value cannot start or end with a space character. ▪ Space characters included within the string are disregarded. ▪ The value is not case sensitive.	A maximum of 75 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
Encryption	Enabled Disabled -	▪ A space character cannot be used in the middle of a character string. ▪ Not case sensitive.	--

Property Name	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
Host	Part of the value can also be specified by using startsWith or contains.	No restrictions on the types of characters exist, but note the following restrictions: ▪ If the operator is = or <>, the specified value cannot start or end with space characters. ▪ If the operator is startsWith, the specified value cannot start with space characters. Space characters at the end are included in the search string. ▪ If the operator is contains, space characters at the start or end are included in the search string.	A maximum of 256 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
Label	Part of the value can also be specified by using startsWith or contains.	No restrictions on the types of characters exist, but note the following restrictions: ▪ The value is case sensitive. ▪ Spaces at the start or end are included in the search string.	A maximum of 64 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.

Property Name	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
LogicalGroup	Part of the value can also be specified by using startsWith, endsWith, or contains.	No restrictions on the types of characters exist, but note the following: ▪ If the operator is = or <>, the specified value cannot start or end with space characters. ▪ If the operator is startsWith, the specified value cannot start with space characters. Space characters at the end are included in the search string. ▪ If the operator is endsWith, the specified value cannot end with space characters. Space characters at the beginning are included in the search string. ▪ If the operator is contains, space characters at the start or end are included in the search string.	A maximum of 1,536 bytes[#4] (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
PoolId	-	▪ Specify characters other than commas. ▪ Use commas to delimit multiple items. ▪ The specified value cannot start or end with a space character. ▪ Space characters between elements are disregarded. ▪ The value is case sensitive.	A maximum of 20 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters are from 1 to 3 bytes. The maximum number of elements separated by commas (,) is 100.

Property Name	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
PortHostStorageDomain	Part of the value can also be specified by using startsWith, endsWith, or contains.	No restrictions on the types of characters exist, but note the following: ▪ If the operator is = or <>, the specified value cannot start or end with space characters. ▪ If the operator is startsWith, the specified value cannot start with space characters. Space characters at the end are included in the search string. ▪ If the operator is endsWith, the specified value cannot end with space characters. Space characters at the beginning are included in the search string. ▪ If the operator is contains, space characters at the start or end are included in the search string.	A maximum of 149 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
PVolMigrationGroup	--	A to Z a to z 0 to 9 Hyphen (-) Underscore (_) Period (.) At sign (@) Space character ( ) Non-ASCII characters ▪ A space character cannot be specified at the beginning or the end. ▪ A value must be specified.	A maximum of 75 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.

Property Name	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
PVolMUNumber	An integer from 0 to 2	▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0. ▪ The value cannot contain space characters.	--
RAIDLevel	The value displayed for the raidType attribute of the LogicalUnit object, in GetStorageArray(subtarget=LogicalUnit) for the Device Manager CLI.	No restrictions on the types of characters exist, but note the following restrictions. Specify this in the format of RAID*x*(*y*D+*z*P). RAID*x*: RAID level *y*D: Number of data disks *z*P: Number of parity disks ▪ Space characters are disregarded. ▪ The value is not case sensitive.	A maximum of 75 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
ShadowImage	Simplex P-VOL S-VOL SP-VOL	▪ A space character cannot be used in the middle of a character string. ▪ Not case sensitive.	--
SLPRNumber	An integer from 0 to 31	▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0. ▪ The value cannot contain space characters.	--

Property Name	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
SubsystemDisplayModel	The value displayed for the displayArrayType attribute of the StorageArray object, in GetStorageArray for the Device Manager CLI. If the displayed model name is unknown, specify the product name.	No restrictions on the types of characters exist, but note the following restrictions: ▪ The specified value cannot start or end with a space character. ▪ Space characters included within the string are disregarded. ▪ The value is not case sensitive.	A maximum of 384 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
SubsystemModel[#5]	The value displayed for the arrayType attribute of the StorageArray object, in GetStorageArray for the Device Manager CLI. If the model name is unknown, specify the product name.	No restrictions on the types of characters exist, but note the following restrictions: ▪ The specified value cannot start or end with a space character. ▪ Space characters included within the string are disregarded. ▪ The value is not case sensitive.	A maximum of 384 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
SubsystemName	The value displayed for the name attribute of the StorageArray object, in GetStorageArray for the Device Manager CLI.	No restrictions on the types of characters exist, but note the following restriction: ▪ The specified value cannot start or end with a space character.	A maximum of 384 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.

Property Name	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
SubsystemSerialNumber	The value displayed for the serialNumber attribute of the StorageArray object, in GetStorageArray for the Device Manager CLI. Part of the value can also be specified by using startsWith or contains.	Any characters can be used. ▪ A value must be specified. ▪ If the operator is = or <>, the specified value cannot start or end with space characters. ▪ If the operator is startsWith, the specified value cannot start with space characters. Space characters at the end are included in the search string. ▪ If the operator is contains, space characters at the start or end are included in the search string.	A maximum of 150 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
SubsystemVendor	The value displayed for the vendor attribute of the VolumeConnection object, in GetStorageArray for the Device Manager CLI.	No restrictions on the types of characters exist, but note the following restrictions: ▪ The specified value cannot start or end with a space character. ▪ Space characters included within the string are not discriminated. ▪ The value is not case sensitive.	A maximum of 150 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.

Property Name	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
SysplexidDevn	Part of the value can also be specified by using startsWith or contains.	No restrictions on the types of characters exist, but note the following: ▪ If the operator is startsWith, the specified value cannot start with space characters. Space characters at the end are included in the search string. ▪ If the operator is contains, space characters at the start or end are included in the search string.	A maximum of 25 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
TrueCopyAsynchronous	Simplex P-VOL S-VOL	Any characters can be used. ▪ A space character cannot be used in the middle of a character string. ▪ Not case sensitive.	--
TrueCopySynchronous	Simplex P-VOL S-VOL	Any characters can be used. ▪ A space character cannot be used in the middle of a character string. ▪ Not case sensitive.	--
UniversalReplicator	Simplex P-VOL S-VOL SP-VOL JNL-VOL	Any characters can be used. ▪ A space character cannot be used in the middle of a character string. ▪ Not case-sensitive.	--

Property Name	Permissible Value or Range	Valid Characters and Character Restrictions	Size or Number of Characters
VOLSER	Part of the value can also be specified by using `startsWith` or `contains`.	No restrictions on the types of characters exist, but note the following: ▪ If the operator is `startsWith`, the specified value cannot start with space characters. Space characters at the end are included in the search string. ▪ If the operator is `contains`, space characters at the start or end are included in the search string.	A maximum of 75 bytes (when converted to UTF-8) 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
VolumeLockStatus	Locked Unlocked	▪ The value cannot contain space characters. ▪ The value is not case sensitive.	--
VolumeStatus	Used Free	▪ The value cannot contain space characters. ▪ The value is not case sensitive.	--

Legend:

--: Indicates that there are no restrictions on the number of specifiable characters.

#1

If the information output by a CLI command includes a value that can be expressed as an integer and in a higher-order unit, the capacity unit that is used will differ from the unit specified by the user. For example, the value 10,240 KB is displayed as 10 MB.

#2

For the disk capacity, the value in KB is obtained from Device Manager. However, in Tiered Storage Manager, the values converted to gigabytes are used. This conversion involves division by 1,024 **x** 1,024 and then rounding to the nearest integer.

#3

When using Universal Volume Manager on Universal Storage Platform V/VM (microcode version 60-03-00-xx/xx or earlier) or Hitachi USP storage, the volumes to which SSD drives in Hitachi AMS2000 storage are externally connected will be displayed as SAS.

If you want to search for the volumes that meet the above condition, specify Hitachi AMS2000 for SubsystemName, and SAS for DiskType.

#4

The character string that can be specified in LogicalGroup is a maximum of 1,024 double-byte characters or 1,536 bytes (when converted to UTF-8). Any excess characters are deleted. If the first 1,024 characters or 1,536 bytes in UTF-8 are the same, LogicalGroup is treated as the same LogicalGroup in Tiered Storage Manager.

#5

This property is provided to maintain compatibility with previous versions. To specify a new filter condition, use SubsystemDisplayModel.

Table 3-6 Range of Valid Property Values for Pool Filter Conditions

Property Name	Specifiable Values	Specifiable Characters	Number of Specifiable Characters
PoolFreeCapacity	An integer from 0 to 281,474,976,710,653KB.	Specify a positive integer, or a combination of a positive integer and a character string indicating the units (Such as 256, 500KB or 10MB). The units you can specify are KB, MB, GB, and TB. KB is the default unit. # ▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0. ▪ Space characters cannot be used. ▪ The value is not case sensitive.	--

Property Name	Specifiable Values	Specifiable Characters	Number of Specifiable Characters
PoolId	--	▪ Specify characters other than commas. ▪ Use commas to delimit multiple items. ▪ The specified value cannot start or end with a space character. ▪ Space characters between elements are disregarded. ▪ The value is not case sensitive.	The number of characters that can be specified per element is 20 bytes (when converted to UTF-8). The maximum number of elements separated by commas (,) is 100.
OverProvisioningPercent	An integer from 0 to 2,147,483,645.	Specify a positive integer. ▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0.	--
OverProvisioningWarning	An integer from 0 to 2,147,483,645.	Specify a positive integer. ▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0.	--
OverProvisioningLimit	An integer from 0 to 2,147,483,645.	Specify a positive integer. ▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0.	--

Legend:

--: Indicates that there are no restrictions on the number of specifiable characters.

#

When expressing a value for the PoolFreeCapacity property in the output information of CLI commands, the highest-order unit, which might be different from the unit that the user specified, is used to express the value as an integer. For example, the value 10,240 KB is displayed as 10 MB.

Table 3-7 Range of Valid Property Values for Free Space Filter Conditions

Property Name	Specifiable Values	Specifiable Characters	Number of Specifiable Characters
ArrayGroup	The value displayed for the displayName attribute of the ArrayGroup object, in GetStorageArray (subtarget=ArrayGroup) for the Device Manager CLI. Part of the value can also be specified by using startsWith or contains.	Any characters can be used. ▪ A value must be specified. ▪ If the operator is = or <>, commas (,) can be used to specify multiple ArrayGroup names. Space characters at the start or end of the ArrayGroup name are disregarded. ▪ If the operator is startsWith or contains, multiple ArrayGroup names cannot be separated with commas (,). ▪ If the operator is startsWith, the specified value cannot start with space characters. Space characters at the end are included in the search string. ▪ If the operator is contains, space characters at the start or end are included in the search string.	A maximum of 1,024 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, and other characters are from 1 to 3 bytes. The maximum number of elements separated by commas (,) is 100.

Property Name	Specifiable Values	Specifiable Characters	Number of Specifiable Characters
Capacity	An integer from 0 to 9,223,372,036,854,775,807KB.	Specify a positive integer, or a combination of a positive integer and a character string indicating the units (such as 256, 500KB, or 10MB). The units you can specify are KB, MB, GB, and TB. KB is the default unit.[#1] ▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0. ▪ The value cannot contain space characters. ▪ The value is not case sensitive.	--
DiskCapacityInGB[#2]	An integer from 0 to 2,147,483,645	A positive integer	--
DiskRPM	An integer from 0 to 2,147,483,645	▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0.	--
DiskType	FC AT BD SAS SSD -	▪ The value cannot contain space characters. ▪ The value is not case sensitive.	--
EmulationType	The value displayed for the emulation attribute of the LogicalUnit object, in GetStorageArray (subtarget=LogicalUnit) for the Device Manager CLI.	No restrictions on the types of characters exist, but note the following restrictions: ▪ The specified value cannot start or end with a space character. ▪ Space characters included within the string are disregarded. ▪ The value is not case sensitive.	A maximum of 75 bytes (when converted to UTF-8) 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.

Property Name	Specifiable Values	Specifiable Characters	Number of Specifiable Characters
RAIDLevel	The value displayed for the raidType attribute of the LogicalUnit object, in GetStorageArray (subtarget=LogicalUnit) for the Device Manager CLI.	No restrictions on the types of characters exist, but note the following restrictions. Specify this in the format of RAID*x*, or RAID*x*(*y*D+*z*P). RAID*x*: RAID level *y*D: Number of data disks *z*P: Number of parity disks ▪ Space characters are disregarded. ▪ The value is not case sensitive.	A maximum of 75 bytes (when converted to UTF-8) 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
SubsystemName	The value displayed for the name attribute of the StorageArray object, in GetStorageArray for the Device Manager CLI.	No restrictions on the types of characters exist, but note the following restriction: ▪ The specified value cannot start or end with a space character.	A maximum of 384 bytes (when converted to UTF-8) 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.
SubsystemVendor	The value displayed for the vendor attribute of the VolumeConnection object, in GetStorageArray for the Device Manager CLI.	No restrictions on the types of characters exist, but note the following restrictions: ▪ The specified value cannot start or end with a space character. ▪ Space characters included within the string are disregarded. ▪ The value is not case sensitive.	A maximum of 150 bytes (when converted to UTF-8) 1 ASCII character is 1 byte, and other characters range from 1 to 3 bytes.

Property Name	Specifiable Values	Specifiable Characters	Number of Specifiable Characters
TotalFreeCapacity	An integer from 0 to 9,223,372,036,854,775,807KB.	Specify a positive integer, or a combination of a positive integer and a character string indicating the units (such as 256, 500KB, or 10MB). The units you can specify are KB, MB, GB, and TB. KB is the default unit.#1 ▪ You cannot add a plus sign (+) to the value. ▪ -0 is treated as 0. ▪ The value cannot contain space characters. ▪ The value is not case sensitive.	--

Legend:

--: Indicates that there are no restrictions on the number of specifiable characters.

#1

When expressing a value for the Capacity property in the output information of CLI commands, the highest-order unit, which might be different from the unit that the user has specified, is used to express the value as an integer. For example, the value 10,240 KB is displayed as 10 MB.

#2

For the disk capacity, a value in KB is obtained from Device Manager. However, in Tiered Storage Manager, the gigabyte-conversion of those values is used. This conversion involves dividing the disk capacity by 1,048,576 (1,024 x 1,024) and then rounding to the nearest integer.

CLI Return Responses and Output Information

The CLI returns a return value after it has finished executing a process.

The following two types of CLI return values exist:

- If the return value is 0 or a positive value, the CLI has terminated normally.
- If the return value is a negative value, an error (such as a parameter error) was detected in the CLI process.

When the CLI terminates normally, the processing results of the command are output to the standard output. For examples of processing results, see the usage examples for each command. Note that even when the CLI terminates normally, messages may be output to the standard error output. If any errors are detected, error messages are output to the standard error output. If any errors are detected, error messages are output to the standard error output. Follow the error message to help resolve the problem.

Checking the execution result of the task

Checking the execution results of tasks by simply examining the return values of the CLI commands is usually not enough. To acquire the information about the executed tasks and check the results, use the `GetTasks` command.

Displaying the CLI Help

To display basic help information, execute the CLI with `help` specified with no arguments.

- In Windows:

```
system-drive\TieredStorageManager\0640\CLI\htsmcli help
```

- In Solaris, HP-UX, and Linux:

```
# ./htsmcli help
```

The following is an example of basic CLI help information:

```
Tiered Storage Manager CLI 6.4.0-00
USAGE: htsmcli [server-location] command[ option]...[ parameter]...
SPECIFYING SERVER-LOCATION:
rmi://[host][:port]/HTSMServer
AVAILABLE COMMANDS:
CreateStorageDomain
DeleteStorageDomain
GetStorageDomains
ModifyStorageDomain
CreateStorageTier
DeleteStorageTier
            .
            .
            .
CancelTask
StopTask
DeleteTasks

FOR HELP, TYPE: "htsmcli help [command]"
AVAILABLE OPTIONS:
-u {username} or --username {username}   login name for HTSM Server
-p {password} or --password {password}   login password for HTSM Server
-s or --secure                           presence indicates secure connection
-o {filename} or --output {filename}     send output to the specified file, instead of the
console

SPECIFYING PARAMETERS:
Specify parameters for a command using name/value pairs,
like: controllerserialnumber=30051.  Use the command-specific help to see the parameters
for a given command.
```

To display the details on the format for each command, after `help`, specify the name of the command, such as `GetVolumes` or `CreateMigrationTask`.

- In Windows:

```
system-drive\TieredStorageManager\0640\CLI\htsmcli help command-name
```

- In Solaris, HP-UX, and Linux:

```
# ./htsmcli help command-name
```

A description of the specified command is displayed, including the correct format and parameters.

Suggested Maximum Values for Tiered Storage Manager Operations

For planning purposes, the following table contains suggested maximum values for Tiered Storage Manager operations.

Table 3-8 Suggested Maximum Values for Tiered Storage Manager Operations

Type of Operation	Description	Suggested Maximum Value for Normal Operations
Storage domain	Number of storage domains	5
	Number of external storage subsystems that can be connected to a single storage domain	5
Tuning Manager server	Number of Tuning Manager servers linked to Tiered Storage Manager	3#1
Storage tier	Number of storage tiers within the storage domain	100
Migration group	Number of migration groups within the storage domain	5,000
Volume	Number of volumes within the migration group	300
	Number of volumes within the storage tier	65,280#1
	Number of unused volumes within the storage tier	1,300#1
Task	Number of unfinished tasks that can be registered in Tiered Storage Manager	100
	Number of tasks that can be registered in Tiered Storage Manager	5,000
	Total number of volumes included in all tasks that have been registered in Tiered Storage Manager (the source volume and target volume are each counted separately)	30,000
Server execution multiplexing	Number of users who can access the Tiered Storage Manager server concurrently	5#2
Volume filter condition	Number of condition elements that can be combined by using AND or OR in one filter condition expression	30#2
	Number of elements that can be concurrently specified when an LDEV or array group is used for searching (the enumeration number of elements for ControllerDeviceNumber or ArrayGroup)	100#2

#1

This is the maximum value. The specified value cannot exceed this value.

#2

This is the maximum value. If this value is exceeded, an error occurs.

The following problems might occur if you use Tiered Storage Manager in an environment where the values required for normal operation are exceeded:

- The response time during Tiered Storage Manager operations will greatly increase.
- A memory shortage will occur because the amount of memory used by the Tiered Storage Manager server process, GUI process, CLI process, or Web browser will increase.
- An error (for example, `KATS41055-E` or `KATS61005-E`) occurs if another operation is attempted while Tiered Storage Manager is waiting for a response.

4

Detailed Command Descriptions

This chapter explains all the functions, specifiable options and parameters, and output items for every CLI command. The chapter also provides examples of how to use each CLI command and the corresponding execution results.

Each command is explained in the following order: syntax, options, parameters, output items, example, and execution results.

Commands for Managing Storage Domains

This section explains the functions, specifiable options and parameters, and output items of the CLI commands for managing storage domains. This section also provides examples of how to use the CLI commands and the corresponding execution results.

For details about these options, see Options Common to All CLI Commands.

The examples of how to use the commands shown in this chapter assume that the user name, password, location of the Tiered Storage Manager server, and whether to use SSL communication have been specified ahead of time in the properties file. As a result, these items are omitted in the examples.

CreateStorageDomain

The `CreateStorageDomain` command can be used to register a domain control storage subsystem as a storage domain. If Universal Storage Platform V/VM is used as a domain controller, the `CreateStorageDomain` command can be used to register, as a storage domain, the logical DKC whose logical DKC number is 0. Note that refresh processing (processing to obtain configuration information from Device Manager and register it in the Tiered Storage Manager repository) is performed asynchronously to the execution of this command.

You can use either of the following methods to specify a domain controller:

- A combination of the model name and serial number
- The name of the storage subsystem being used by Device Manager

Note: If the domain controller cannot be uniquely specified using the name of the storage subsystem, use the model name and serial number instead.

When the Tiered Storage Manager server does not receive a refresh request after a storage domain has been registered, the error message `KATS50210-E` appears. If this occurs, resolve the server failure, and then use the `Refresh` command to perform a refresh.

Syntax

```
htsmcli [server-location] CreateStorageDomain
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
{ controllerserialnumber=serial-number controllerdisplaymodel=display-model-name |
controllername=name-of-the-domain-control-storage-subsystem }
name=storage-domain-name
[ description=description-for-the-storage-domain ]
```

Options

Specify the `-d` or `--detail` option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, nothing will be displayed in the standard output.

Parameters

Table 4-1 Parameters of the CreateStorageDomain Command

Parameter Name	Optional or Required	Description
`controllerserialnumber`	Required	Specify the serial number of the domain controller. Use the value of `serialNumber` obtained by executing Device Manager's `GetStorageArray` command: ▪ `controllerserialnumber`: value of `serialNumber` Specify in combination with `controllerdisplaymodel`. You cannot specify this parameter together with `controllername`.
`controllerdisplaymodel`	Required	Specify the name used for displaying the domain controller model. Specify in combination with `controllerserialnumber`. This parameter cannot be specified together with `controllername`.
`controllername`	Required	Specify the name of the domain controller. Use the value of `controllername` obtained by executing Device Manager's `GetStorageArray` command: ▪ `controllername`: name value This parameter cannot be specified together with `controllerserialnumber` or `controllerdisplaymodel`.
`name`	Required	Specify the name of the storage domain to be registered. The name should be unique to Tiered Storage Manager.
`description`	Optional	Specify a description for the storage domain.

Output Items

Table 4-2 Items Output by the CreateStorageDomain Command

Type of Information	Item Name	Description	Displayed as Unknown
Information about the storage domain	name	The name of the registered storage domain	--
	controllerSerialNumber	The serial number of the domain controller	--
	controllerDisplayModel	The model name displayed on the domain controller	#
	controllerName	The name of the domain controller	#
	logicalDKCNumber	The logical DKC number of the domain controller. If the storage product is not Universal Storage Platform V/VM, nothing is displayed.	--
	description	A description of the storage domain	--

Legend:

--: Not applicable

#

Unknown is output for these items when the refresh status is NotInitialized, Processing, or Failure.

Example and Execution Results

- ***Example***: In this example, a domain controller of Hitachi USP and externally connected storage subsystem group are registered as a storage domain. The name of the storage domain is set as MegaTechUSP600-Primary.

```
htsmcli CreateStorageDomain --detail controllerserialnumber=14011
controllerdisplaymodel=USP name="MegaTechUSP600-Primary" description="USP600-Primary"
```

- ***Output***:

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
controllerSerialNumber=14011
controllerDisplayModel=USP
controllerName=USP@10.208.151.151
logicalDKCNumber=
description=USP600-Primary
```

DeleteStorageDomain

The DeleteStorageDomain command can be used to delete a registered storage domain.

Note that storage domains in the following states cannot be deleted:

- Storage domains that contain tasks that have not ended (End)
- Storage domains that are being refreshed

You can use the GetTasks command to check the status of the tasks on the storage domain.

Syntax

```
htsmcli [server-location] DeleteStorageDomain
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
name=storage-domain-name
```

Options

Specify the -d or --detail option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, nothing will be displayed in the standard output.

Parameters

Table 4-3 Parameters of the DeleteStorageDomain Command

Parameter Name	Optional or Required	Description
name	Required	Specify the name of the storage domain to be deleted.

Output Items

Table 4-4 Items Output by the DeleteStorageDomain Command

Type of Information	Item Name	Description	Displayed as Unknown
Information about the storage domain	name	The name of the deleted storage domain	--
	controllerSerialNumber	The serial number of the domain controller	--
	controllerDisplayModel	The model name displayed on the domain controller	#
	controllerName	The name of the domain controller	#

Type of Information	Item Name	Description	Displayed as Unknown
	logicalDKCNumber	The logical DKC number of the domain controller. If the storage product is not Universal Storage Platform V/VM, nothing is displayed.	--
	description	A description of the storage domain	--

Legend:

--: Not applicable

#

Unknown is output for these items when the refresh status is NotInitialized, Processing, or Failure.

Example and Execution Results

- ***Example:*** In this example, the registration for the MegaTechUSP600-Primary storage domain is deleted.

```
htsmcli DeleteStorageDomain --detail name="MegaTechUSP600-Primary"
```

- ***Output*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
controllerSerialNumber=14011
controllerDisplayModel=USP
controllerName=USP@10.208.151.151
logicalDKCNumber=
description=USP600-Primary
```

GetStorageDomains

The GetStorageDomains command can be used to obtain information about all the storage domains, or about the storage domain specified by the name parameter.

If this command is executed for a storage domain that requires a refresh, a warning message will be output to the standard error output.

Syntax

```
htsmcli [server-location] GetStorageDomains
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
[ name=storage-domain-name [ , storage-domain-name ] ... ]
```

Options

Specify the `-d` or `--detail` option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, only summary information will be displayed. Summary information consists of the information for which the *Output by -d* column contains -- in Table 4-6.

Parameters

Table 4-5 Parameters of the GetStorageDomains Command

Parameter Name	Optional or Required	Description
name	Optional	Specify the name of the storage domain about which you want to obtain information. If this is omitted, this command will be applied to all storage domains. When specifying multiple storage domain names, separate each one with a comma. Up to 255 storage domains can be specified, limited only by the maximum number of characters allowed by the command line.

Output Items

Table 4-6 Items Output by the GetStorageDomains Command

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
Information about the storage domain	name	The name of the storage domain	--	--
	totalCapacityInGB	The total capacity of the real volumes in the storage domain (units: GB). Values less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--	#
	usedCapacityInGB	The total capacity of the real volumes being used in the storage domain (units: GB). Values less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--	#
	usedCapacityPercentage	The ratio (percentage) of usedCapacityInGB to totalCapacityInGB. Values less than 1% are rounded up to display an integer.	--	#
	freeCapacityInGB	The total capacity of the real volumes that are not being used in the storage domain (units: GB). Values less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--	#

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
	freeCapacityPercentage	The ratio (percentage) of freeCapacityInGB to totalCapacityInGB. Values of less than 1% are rounded down to display an integer (for example, 45.3% is rounded down to 45%).	--	#
	numberOfSubsystems	The number of storage subsystems in the storage domain	-d	#
	numberOfStorageTiers	The number of storage tiers in the storage domain	--	--
	numberOfMigrationGroups	The number of migration groups in the storage domain	--	--
	refreshStatus	The refresh status. This can be any of the following: ▪ NotInitialized ▪ Processing ▪ Success ▪ Failure ▪ Incomplete (ended without completing refresh) ▪ RefreshRequired	--	--
	lastRefreshedTime	The date and time when the previous refresh finished. If the previous refresh has not finished, nothing is displayed.	-d	--
	controllerSerialNumber	The serial number of the domain controller	-d	--
	controllerDisplayModel	The model name displayed on the domain controller	-d	#
	controllerName	The name of the domain controller	-d	#
	logicalDKCNumber	The logical DKC number of the domain controller. If the storage product is not Universal Storage Platform V/VM, nothing is displayed.	-d	--
	description	A description of the storage domain	-d	--
Error information	message	An error message	--	--

Legend:

-d : Indicates output only when either the -d or the --detail option is specified.

-- : Not applicable

#

Unknown is output for these items when the refresh status is NotInitialized, Processing, or Failure.

Example and Execution Results

- ***Example (1):*** In this example, detailed information is obtained for the storage domains `MegaTechUSP600-Primary` and `MegaTechUSP600-Secondary`.

```
htsmcli GetStorageDomains --detail name="MegaTechUSP600-Primary,MegaTechUSP600-
Secondary"
```

- ***Output (1)***:

```
RESPONSE:
List of 2 StorageDomain elements:
An instance of StorageDomain(1 of 2)
name=MegaTechUSP600-Primary
totalCapacityInGB=8,552
usedCapacityInGB=6,576
usedCapacityPercentage=77
freeCapacityInGB=1,975
freeCapacityPercentage=23
numberOfSubsystems=2
numberOfStorageTiers=0
numberOfMigrationGroups=0
refreshStatus=Success
lastRefreshedTime=2008/11/19 21:43:13
controllerSerialNumber=14011
controllerDisplayModel=USP
controllerName=USP@10.208.151.151
logicalDKCNumber=
description=USP600-Primary
An instance of StorageDomain(2 of 2)
name=MegaTechUSP600-Secondary
totalCapacityInGB=Unknown
usedCapacityInGB=Unknown
usedCapacityPercentage=Unknown
freeCapacityInGB=Unknown
freeCapacityPercentage=Unknown
numberOfSubsystems=Unknown
numberOfStorageTiers=3
numberOfMigrationGroups=3
refreshStatus=Failure
lastRefreshedTime=
controllerSerialNumber=59432
controllerDisplayModel=USP
controllerName=Unknown
logicalDKCNumber=
description=USP600-Secondary
List of 1 ErrorInfo elements:
An instance of ErrorInfo(1 of 1)
message=KATS62010-E An error was detected in Device Manager. Code:7027, Contents:The
specified storage subsystem is not a Device Manager database.
```

- ***Example (2):*** In this example, summary information is obtained for the storage domains `MegaTechUSP600-Primary` and `MegaTechUSP600-Secondary`.

```
htsmcli GetStorageDomains name="MegaTechUSP600-Primary,MegaTechUSP600-Secondary"
```

- **Output *(2)*:**

```
RESPONSE:
List of 2 StorageDomain elements:
An instance of StorageDomain(1 of 2)
name=MegaTechUSP600-Primary
totalCapacityInGB=8,552
usedCapacityInGB=1,616
usedCapacityPercentage=45
freeCapacityInGB=1,976
freeCapacityPercentage=55
numberOfStorageTiers=25
```

```
numberOfMigrationGroups=13
refreshStatus=Success
An instance of StorageDomain(2 of 2)
name=MegaTechUSP600-Secondary
totalCapacityInGB=Unknown
usedCapacityInGB=Unknown
usedCapacityPercentage=Unknown
freeCapacityInGB=Unknown
freeCapacityPercentage=Unknown
numberOfStorageTiers=3
numberOfMigrationGroups=3
refreshStatus=Failure
List of 1 ErrorInfo elements:
An instance of ErrorInfo(1 of 1)
message=KATS62010-E An error has been detected in Device Manager. Code:7027
Description:The specified storage subsystem is not a Device Manager database.
```

- ***Example (3):*** In this example, summary information is obtained for the storage domain `MegaTechUSP600-Primary` that needs to be refreshed.

```
htsmcli GetStorageDomains name="MegaTechUSP600-Primary"
```

- ***Output (3)*:**

```
RESPONSE:List of 1 StorageDomain elements:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
totalCapacityInGB=8,552
usedCapacityInGB=6,576
usedCapacityPercentage=77
freeCapacityInGB=1,975
freeCapacityPercentage=23
numberOfStorageTiers=0
numberOfMigrationGroups=0
refreshStatus=RefreshRequired
KATS10622-W The storage domain information is not up-to-date. Refresh the storage
domain. (storage domain name : MegaTechUSP600-Primary)
```

ModifyStorageDomain

The `ModifyStorageDomain` command can be used to change information (the name or description) for a storage domain.

Note that information cannot be changed for storage domains in the following states:

- Storage domains that contain tasks that have not ended (`End`)
- Storage domains whose refresh status is `NotInitialized`, `Processing`, or `Failure`

You can use the `GetTasks` command to check the status of tasks.

If this command is executed for a storage domain that requires a refresh, a warning message will be output to the standard error output.

Syntax

```
htsmcli [server-location] ModifyStorageDomain
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
```

```
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
name=storage-domain-name
[ newname=storage-domain-name ]
[ newdescription=description-for-the-storage-domain ]
```

Options

Specify the `-d` or `--detail` option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, nothing will be displayed in the standard output.

Parameters

Table 4-7 Parameters of the ModifyStorageDomain Command

Parameter Name	Optional or Required	Description
name	Required	Specify the name of the storage domain about which you want to change information.
newname	Optional	Specify a new storage domain name. This name should be unique to Tiered Storage Manager. If this is omitted, the name of the storage domain will not change.
newdescription	Optional	Specify a new storage domain description. If this is omitted, the description of the storage domain will not change. If you specify only spaces, the previous storage domain description will be deleted.

Output Items

Table 4-8 Items Output by the ModifyStorageDomain Command

Type of Information	Item Name	Description	Displayed as Unknown
Information about the storage domain	name	The name of the storage domain	--
	controllerSerialNumber	The serial number of the domain controller	--
	controllerDisplayModel	The model name displayed on the domain controller	#
	controllerName	The name of the domain controller	#
	logicalDKCNumber	The logical DKC number of the domain controller. If the storage product is not Universal Storage Platform V/VM, nothing is displayed.	--
	description	A description of the storage domain	--

Legend:

--: Not applicable

#

Unknown is output for these items when the refresh status is NotInitialized, Processing, or Failure.

Example and Execution Results

- ***Example (1):*** In this example, the name of the storage domain MegaTechUSP600-Primary is changed to MyStorageDomain.

```
htsmcli ModifyStorageDomain --detail name="MegaTechUSP600-Primary"
newname="MyStorageDomain"
```

- ***Output (1)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MyStorageDomain
controllerSerialNumber=14011
controllerDisplayModel=USP
controllerName=USP@10.208.151.151
logicalDKCNumber=
description=USP600-Primary
```

- ***Example (2):*** In this example, the name of the storage domain MegaTechUSP600-Primary that needs to be refreshed is changed to MyStorageDomain.

```
htsmcli ModifyStorageDomain --detail name="MegaTechUSP600-Primary"
newname="MyStorageDomain"
```

- ***Output (2)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MyStorageDomain
controllerSerialNumber=14011
controllerDisplayModel=USP
controllerName=USP@10.208.151.151
logicalDKCNumber=
description=USP600-Primary
KATS10622-W The storage domain information is not up-to-date. Refresh the storage
domain. (storage domain name : MyStorageDomain)
```

Refresh

The Refresh command can be used to perform refresh processing (processing to re-obtain configuration information from Device Manager and register it in the Tiered Storage Manager repository) for all storage domains, or for any storage domains specified by the storagedomainname parameter.

Note that refresh processing is performed asynchronously to the execution of the Refresh command.

If an attempt to access to the storage domains fails during refresh processing, the refresh processing will be stopped. The refresh status will return to its previous state. To determine whether refresh processing has been completed successfully, check that the last refresh time of the storage domain (`lastRefreshedTime`) has been updated after performing the refresh processing.

To check the refresh status, use the `GetStorageDomains` command.

Syntax

```
htsmcli [server-location] Refresh
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ storagedomainname=storage-domain-name ]
```

Parameters

Table 4-9 Parameters of the Refresh Command

Parameter Name	Optional or Required	Description
storagedomainname	Optional	Specify the name of the storage domain. If this is omitted, all storage domains are refreshed.

Output Items

Nothing is output by this command.

Example and Execution Results

- ***Example:*** In this example, the `Refresh` command is issued for the `MegaTechUSP600-Primary` storage domain, and configuration information is re-obtained from Device Manager and registered in the Tiered Storage Manager repository.

```
htsmcli Refresh storagedomainname="MegaTechUSP600-Primary"
```

- ***Output*:** No information is output by this command. Use the `GetStorageDomains` command to check whether the refresh has finished.

Commands for Managing Storage Tiers

This section explains the functions, specifiable options and parameters, and output items of the CLI commands for managing storage tiers. This section also provides examples of how to use the CLI commands and the corresponding execution results.

For details about these options, see Options Common to All CLI Commands.

The examples of how to use the commands shown in this chapter assume that the user name, password, location of the Tiered Storage Manager server, and whether to use SSL communication have been specified ahead of time in the properties file. As a result, these items are omitted in the examples.

CreateStorageTier

The `CreateStorageTier` command can be used to create a storage tier within a storage domain.

Storage tiers cannot be created within a storage domain whose refresh status is either `Processing` or `Failure`.

If this command is executed for a storage domain that requires a refresh, a warning message will be output to the standard error output.

Even if you migrate volumes, the labels set to the volumes and resource groups will not be switched. If you want to change these labels or resource groups along with migration, do so after the migration completes.

Syntax

```
htsmcli [ server-location] CreateStorageTier
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
storagedomainname=storage-domain-name
name=storage-tier-name
[ resource={ Volume | Pool } ]
filtercondition=filter-condition
[ description=description-for-the-storage-tier ]
[ cost=cost-of-normal-volumes
  chargefor=charge-target-for-normal-volumes ]
[ dpcost=cost-of-DP-volumes
  dpchargefor=charge-target-for-DP-volumes ]
```

Options

Specify the `-d` or `--detail` option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, nothing will be displayed in the standard output.

Parameters

Table 4-10 Parameters of the CreateStorageTier Command

Parameter Name	Optional or Required	Description
`storagedomainname`	Required	Specify the name of the storage domain.
`name`	Required	Specify the name of the storage tier to be created. This name should be unique within the storage domain.
`resource`	Optional	Specify the type of the storage tier to be created. If you omit this, the condition specified in the `filtercondition` parameter will be used. ▪ `Volume`: Filter volumes. ▪ `Pool`: Filter pools.
`filtercondition`	Required	Specify a filter condition. You can specify either volume properties listed in Table 4-11 or the pool properties listed in Table 4-12 for this parameter.
`description`	Optional	Specify a description of the storage tier.
`cost`	Optional	Specify the cost of normal volumes by using the following format: *`currency-code amount / unit-of-capacity / unit-of-period`* ▪ *`currency-code`* Specify a currency code conforming to ISO4217 using upper-case characters. ▪ *`amount`* Specify the amount of money. Do not use commas or periods. ▪ *`unit-of-capacity`* Specify `MB`, `GB`, or `TB`. The value is not case-sensitive. ▪ *`unit-of-period`* Specify either `Month` or `Year`. The value is not case-sensitive. By specifying how much a set amount (capacity) of storage in a storage tier costs for a set time period, you can operate storage with an awareness of costs. Tiered Storage Manager enables you to specify such cost, time period, and charge-target information. You can freely specify the cost to match the provided services and their charge system. For details about the values that can be specified, see Command Parameters. This parameter can be specified only if the storage tier is specified using volume filter conditions. When specifying this parameter, also specify the `chargefor` parameter.

Parameter Name	Optional or Required	Description
chargefor	Optional	Specify the charge target for the cost of normal volumes. ▪ Allocated: The volume capacity allocated to the host ▪ Utilized: The volume capacity actually used by the host When specifying this parameter, also specify the cost parameter.
dpcost	Optional	Specify the cost of DP volumes. The method for specifying this parameter is the same as for the cost parameter. When specifying this parameter, also specify the dpchargefor parameter.
dpchargefor	Optional	Specify the charge target for the cost of DP volumes. ▪ Allocated: The DP volume capacity allocated to the host ▪ Consumed: The DP volume capacity that has already been consumed ▪ Utilized: The DP volume capacity actually used by the host When specifying this parameter, also specify the dpcost parameter.

Table 4-11 Properties Specifiable for the filtercondition Parameter (Volume) (CreateStorageTier)

Property Name	Operators	Description
SubsystemModel#	=, <>	The name of the storage subsystem model
SubsystemDisplayModel	=, <>	The name used for displaying the model of the storage subsystem. This name is displayArrayType of Device Manager (not arrayType). Example: Lightning_9980V
SubsystemSerialNumber	=, <>, startsWith, contains	The serial number of the storage subsystem
SubsystemName	=, <>	The name of the storage subsystem
SubsystemVendor	=, <>	The name of the storage subsystem vendor
ControllerDeviceNumber	=	The controller LDEV number. Only a representative LDEV can be specified for a LUSE volume.
Host	=, <>, startsWith, contains	The name of the host
ArrayGroup	=, <>, startsWith, contains	The name of the array group
DynamicProvisioning	=, <>	The volume type
Capacity	<, <=, =, <>, >, >=	The volume capacity

Property Name	Operators	Description
ConsumedCapacity	<, <=, =, <>, >, >=	The used capacity of the volume
ConsumedCapacityPercentage	<, <=, =, <>, >, >=	The percentage of the volume that is being used
RAIDLevel	=, <>	The RAID level
EmulationType	=, <>	The emulation type
DiskType	=, <>	The disk type
VolumeStatus	=	A character string indicating whether the volume is being used
VolumeLockStatus	=	A character string indicating the lock status of the volume
SLPRNumber	=, <>	The SLPR number
CLPRNumber	=, <>	The CLPR number
ControllerArrayGroup	=, <>, startsWith, contains	The name of the controller array group
ArrayGroupBusyRate	<, <=, =, <>, >, >=	The array group usage rate
ArrayGroupMaxBusyRate	<, <=, =, <>, >, >=	The maximum array group usage rate
SysplexidDevn	=, <>, startsWith, contains	SYSPLEXID and DEVN. This property is in the format *SYSPLEXID/DEVN*.
VOLSER	=, <>, startsWith, contains	Mainframe volume information (volume serial number) managed by the mainframe host
DiskRPM	<, <=, =, <>, >, >=	The disk speed (rpm)
DiskCapacityInGB	<, <=, =, <>, >, >=	The disk capacity
LogicalGroup	=, <>, startsWith, contains, endsWith	Name of the logical group. This property compares the logical group name entered as a forward slash-delimited character string (delimiter: /) with the logical group name registered in Tiered Storage Manager (which does not have a leading forward slash).
PortHostStorageDomain	=, <>, startsWith, contains, endsWith	A port name and host storage domain name. This property compares the port name and host storage domain name entered in the format *port-name/host-storage-domain-name* with the port/host storage domain name registered in Tiered Storage Manager.
PVolMigrationGroup	=, <>	If the volume is a ShadowImage S-VOL, this is the migration group name containing the corresponding P-VOL.
PVolMUNumber	=, <>	If the volume is a ShadowImage S-VOL, this is the MU number of the corresponding P-VOL.
ShadowImage	=, <>	ShadowImage volume type

Property Name	Operators	Description
TrueCopyAsynchronous	=, <>	TrueCopy Asynchronous volume type
TrueCopySynchronous	=, <>	TrueCopy Synchronous volume type
UniversalReplicator	=, <>	Universal Replicator volume type
CopyOnWriteSnapshot	=, <>	Copy-On-Write Snapshot volume type
PoolId	=, <>	The pool number
CVS	=	Indicates whether the volume has the CVS attribute. This can be either Yes or No: ▪ Yes: Has CVS attribute ▪ No: Does not have CVS attribute
Label	=, <>, startsWith, contains	Label specified for a representative LDEV
Encryption	=	The encryption setting

#

This property is for maintaining compatibility with older versions. When you specify new filter conditions, use SubsystemDisplayModel.

Table 4-12 Properties Specifiable for the filtercondition Parameter (Pool) (CreateStorageTier)

Property name	Operators	Description
PoolFreeCapacity	=, <>, >, >=, <, <=	The free capacity of the pool
PoolId	=, <>	The pool number
OverProvisioningPercent	=, <>, >, >=, <, <=	The over-provisioning percent The over-provisioning percent indicates the ratio between the DP pool capacity and the total DP volume capacity allocated to the DP pool.
OverProvisioningWarning	=, <>, >, >=, <, <=	The threshold for the DP pool over-provisioning percent at which a warning is issued
OverProvisioningLimit	=, <>, >, >=, <, <=	The upper limit for the DP pool over-provisioning percent

Output Items

Table 4-13 Items Output by the CreateStorageTier Command

Type of Information	Item Name	Description
Information about the storage domain	name	The name of the storage domain
Information about the storage tier	name	The name of the created storage tier
	filterCondition	Filter conditions for the storage tier
	description	A description of the storage tier
	cost	The cost of normal volumes is displayed in the following format: *currency-code amount / unit-of-capacity / unit-of-period* If this item is not set, nothing is displayed.
	chargefor	The charge target for normal volumes. ▪ Allocated: The volume capacity allocated to the host ▪ Utilized: The volume capacity actually used by the host If this item is not set, nothing is displayed.
	dpcost	The cost of DP volumes is displayed in the following format: *currency-code amount / unit-of-capacity / unit-of-period* If this item is not set, nothing is displayed.
	dpchargefor	The charge target for DP volumes. ▪ Allocated: The DP volume capacity allocated to the host ▪ Consumed: The DP volume capacity that has already been consumed ▪ Utilized: The DP volume capacity actually used by the host If this item is not set, nothing is displayed.

Example and Execution Results

- ***Example (1):*** In this example, a storage tier that consists of volumes of RAID level RAID5(3D+1P) is created in the storage domain MegaTechUSP600-Primary. The name of the storage tier is set as MegaTech-HighCost.

```
htsmcli CreateStorageTier --detail storagedomainname="MegaTechUSP600-Primary"
name="MegaTech-HighCost" filtercondition="RAIDLevel='RAID5(3D+1P)' AND ArrayGroup='1-
10-1'"
```

- ***Output (1)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 StorageTier elements:
An instance of StorageTier(1 of 1)
name=MegaTech-HighCost
filterCondition=RAIDLevel = 'RAID5(3D+1P)' AND ArrayGroup = '1-10-1'
description=
cost=
chargefor=
dpcost=
```

```
dpchargefor=
```

- ***Example (2):*** In this example, a storage tier that consists of volumes of RAID level RAID5(3D+1P) is created in the storage domain MegaTechUSP600-Primary that needs to be refreshed. The name of the storage tier is set as MegaTech-HighCost.

```
htsmcli CreateStorageTier --detail storagedomainname="MegaTechUSP600-Primary"
name="MegaTech-HighCost" filtercondition="RAIDLevel='RAID5(3D+1P)' AND ArrayGroup='1-
10-1'"
```

- ***Output (2)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 StorageTier elements:
An instance of StorageTier(1 of 1)
name=MegaTech-HighCost
filterCondition=RAIDLevel = 'RAID5(3D+1P)' AND ArrayGroup = '1-10-1'
description=
cost=
chargefor=
dpcost=
dpchargefor=
KATS10622-W The storage domain information is not up-to-date. Refresh the storage
domain. (storage domain name : MegaTechUSP600-Primary)
```

DeleteStorageTier

The DeleteStorageTier command can be used to delete a storage tier. Storage tiers are deleted regardless of whether they contain any volumes.

Note that storage tiers in the following statuses cannot be deleted:

- Storage tiers that are specified for tasks that have not ended (End)
- Storage tiers within the storage domains whose refresh status is either Processing or Failure

You can use the GetTasks command to check the status of tasks.

If this command is executed for a storage domain that requires a refresh, a warning message will be output to the standard error output.

Syntax

```
htsmcli [server-location] DeleteStorageTier
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
storagedomainname=storage-domain-name
name=storage-tier-name
```

Options

Specify the `-d` or `--detail` option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, nothing will be displayed in the standard output.

Parameters

Table 4-14 Parameters of the DeleteStorageTier Command

Parameter Name	Optional or Required	Description
`storagedomainname`	Required	Specify the name of the storage domain.
`name`	Required	Specify the name of the storage tier to be deleted.

Output Items

Table 4-15 Items Output by the DeleteStorageTier Command

Type of Information	Item Name	Description
Information about the storage domain	`name`	The name of the storage domain
Information about the storage tier	`name`	The name of the deleted storage tier
	`filterCondition`	Filter conditions for the storage tier
	`description`	A description of the storage tier
	`cost`	The cost of normal volumes is displayed in the following format: *currency-code amount / unit-of-capacity / unit-of-period* If this item is not set, nothing is displayed.
	`chargefor`	The charge target for normal volumes. ▪ `Allocated`: The volume capacity allocated to the host ▪ `Utilized`: The volume capacity actually used by the host If this item is not set, nothing is displayed.
	`dpcost`	The cost of DP volumes is displayed in the following format: *currency-code amount / unit-of-capacity / unit-of-period* If this item is not set, nothing is displayed.
	`dpchargefor`	The charge target for DP volumes. ▪ `Allocated`: The DP volume capacity allocated to the host ▪ `Consumed`: The DP volume capacity that has already been consumed ▪ `Utilized`: The DP volume capacity actually used by the host If this item is not set, nothing is displayed.

Example and Execution Results

- ***Example (1):*** In this example, the storage tier `MegaTech-HighCost` is deleted from the storage domain `MegaTechUSP600-Primary`.

```
htsmcli DeleteStorageTier --detail storagedomainname="MegaTechUSP600-Primary"
name="MegaTech-HighCost"
```

- ***Output (1)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 StorageTier elements:
An instance of StorageTier(1 of 1)
name=MegaTech-HighCost
filterCondition=RAIDLevel='RAID5(3D+1P)' AND Capacity < '1GB'
description=
cost=USD3000/TB/Year
chargefor=Allocated
dpcost=USD3/GB/Year
dpchargefor=Consumed
```

- ***Example (2):*** In this example, a storage tier named `MegaTech-HighCost` is deleted from the storage domain `MegaTechUSP600-Primary` that needs to be refreshed.

```
htsmcli DeleteStorageTier --detail storagedomainname="MegaTechUSP600-Primary"
name="MegaTech-HighCost"
```

- ***Output (2)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
An instance of StorageTier(1 of 1)
name=MegaTech-HighCost
filterCondition=RAIDLevel = 'RAID5(3D+1P)' AND ArrayGroup = '1-10-1'
description=
cost=USD3000/TB/Year
chargefor=Allocated
dpcost=USD3/GB/Year
dpchargefor=Consumed
KATS10622-W The storage domain information is not up-to-date. Refresh the storage
domain. (storage domain name : MegaTechUSP600-Primary)
```

GetStorageTiers

The `GetStorageTiers` command can be used to obtain information about all storage tiers in the storage domain, or about the storage tier specified by the `name` parameter.

Information cannot be obtained for storage tiers in storage domains whose refresh status is either `Processing` or `Failure`.

If this command is executed for a storage domain that requires a refresh, a warning message will be output to the standard error output.

Syntax

```
htsmcli [server-location] GetStorageTiers
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
storagedomainname=storage-domain-name
[ name=storage-tier-name[ ,storage-tier-name ]... ]
```

Options

Specify the `-d` or `--detail` option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, only summary information will be displayed. Summary information consists of the information for which the *Output by -d* column contains -- in Table 4-17.

Parameters

Table 4-16 Parameters of the GetStorageTiers Command

Parameter Name	Optional or Required	Description
storagedomainname	Required	Specify the name of the storage domain.
name	Optional	Specify the name of the storage tier about which you want to obtain information. If this is omitted, this command will be applied to all the storage tiers in the storage domain. When specifying multiple storage tier names, separate each one with a comma. Up to 255 storage tier names can be specified, limited only by the maximum number of characters allowed by the command line.

Output Items

Table 4-17 Items Output by the GetStorageTiers Command

Type of Information	Item Name	Description	Output by -d	Displayed in Pool Conditions
Information about the storage domain	name	The name of the storage domain	--	--
Information about the storage tier	name	The name of the storage tier	--	--
	filterCondition	The filter conditions for the storage tier	-d	--
	numberOfVolumes	The number of real volumes in the storage tier.	-d	#

Type of Information	Item Name	Description	Output by -d	Displayed in Pool Conditions
	totalCapacityInGB	The total capacity of the real volumes in the storage tier (units: GB). Values less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--	#
	totalCapacityPercentageToStorageDomain	Ratio (percentage) of totalCapacityInGB to the total amount of capacity in the real volumes within the storage domain. Values less than 1% are rounded up to display an integer.	--	#
	usedCapacityInGB	The total capacity of the real volumes being used in the storage tier (units: GB). Values less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--	#
	usedCapacityPercentage	The ratio (percentage) of usedCapacityInGB to totalCapacityInGB. Values less than 1% are rounded up to display an integer.	--	#
	freeCapacityInGB	The total capacity of the real volumes that are free in the storage tier (units: GB). Values less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--	#
	freeCapacityPercentage	The ratio (percentage) of freeCapacityInGB to totalCapacityInGB. Values of less than 1% are rounded down to display an integer. (For example, 45.3% is rounded down to 45%.)	--	#
	numberOfManagedVolumes	The number of logical volumes in the storage tier. This provides the number of normal volumes and virtual volumes in the storage tier.	-d	#
	totalManagedCapacityInGB	The total capacity of the normal volumes and virtual volumes in the storage tier (units: GB). Values less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--	#
	usedManagedCapacityInGB	The total capacity of normal volumes and virtual volumes that are being used in the storage tier (units: GB). Values less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--	#

Type of Information	Item Name	Description	Output by -d	Displayed in Pool Conditions
	usedManagedCapacityPercentage	The ratio (percentage) of usedManagedCapacityInGB to totalManagedCapacityInGB. Values of less than 1% are rounded down to display an integer. (For example, 45.3% is rounded down to 45%.)	--	#
	freeManagedCapacityInGB	The total capacity of the normal volumes and virtual volumes that are free in the storage tier (units: GB). Values less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--	#
	freeManagedCapacityPercentage	The ratio (percentage) of freeManagedCapacityInGB to totalManagedCapacityInGB Values of less than 1% are rounded down to display an integer. (For example, 45.3% is rounded down to 45%.) The value of freeManagedCapacityPercentage is 100 if the value of usedManagedCapacityPercentage is 0.	--	#
	consumedCapacityInGB	The total used capacity of the normal volumes and virtual volumes in the storage tier (units: GB). Values less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--	#
	description	A description of the storage tier	-d	--
	cost	The cost of normal volumes is displayed in the following format: *currency-code amount / unit-of-capacity / unit-of-period* If this item is not set, nothing is displayed.	--	--
	chargefor	The charge target for normal volumes. ▪ Allocated: The volume capacity allocated to the host ▪ Utilized: The volume capacity actually used by the host If this item is not set, nothing is displayed.	--	--
	dpcost	The cost of DP volumes is displayed in the following format: *currency-code amount / unit-of-capacity / unit-of-period* If this item is not set, nothing is displayed.	--	--

Type of Information	Item Name	Description	Output by -d	Displayed in Pool Conditions
	dpchargefor	The charge target for DP volumes. ▪ Allocated: The DP volume capacity allocated to the host ▪ Consumed: The DP volume capacity that has already been consumed ▪ Utilized: The DP volume capacity actually used by the host If this item is not set, nothing is displayed.	--	--

Legend:

-d : Indicates output only when either the -d or the --detail option is specified.

-- : Not applicable

#

For storage tiers created by using pool filter conditions, a hyphen (-) is displayed because no relevant information exists.

Example and Execution Results

- ***Example (1):*** In this example, detailed information is obtained for both the MegaTech-HighCost and MyStorageTier storage tiers, in the MegaTechUSP600-Primary storage domain.

```
htsmcli GetStorageTiers --detail storagedomainname="MegaTechUSP600-Primary"
name="MegaTech-HighCost,MyStorageTier"
```

- ***Output* (1):**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 2 StorageTier elements:
An instance of StorageTier(1 of 2)
name=MegaTech-HighCost
filterCondition=RAIDLevel = 'RAID5(3D+1P)' AND Capacity < '1GB'
numberOfVolumes=91
totalCapacityInGB=387
totalCapacityPercentageToStorageDomain=5
usedCapacityInGB=29
usedCapacityPercentage=8
freeCapacityInGB=358
freeCapacityPercentage=92
numberOfManagedVolumes=25
totalManagedCapacityInGB=1,000
usedManagedCapacityInGB=300
usedManagedCapacityPercentage=30
freeManagedCapacityInGB=700
freeManagedCapacityPercentage=70
consumedCapacityInGB=500
description=
cost=USD3000/TB/Year
chargefor=Allocated
dpcost=USD3/GB/Year
```

```
dpchargefor=Consumed
An instance of StorageTier(2 of 2)
name=MyStorageTier
filterCondition=RAIDLevel <> 'RAID5(3D+1P)'
numberOfVolumes=2
totalCapacityInGB=9
totalCapacityPercentageToStorageDomain=1
usedCapacityInGB=0
usedCapacityPercentage=0
freeCapacityInGB=9
freeCapacityPercentage=100
numberOfManagedVolumes=25
totalManagedCapacityInGB=1,000
usedManagedCapacityInGB=300
usedManagedCapacityPercentage=30
freeManagedCapacityInGB=700
freeManagedCapacityPercentage=70
consumedCapacityInGB=500
description=
cost=USD3000/TB/Year
chargefor=Allocated
dpcost=USD3/GB/Year
dpchargefor=Consumed
```

- ***Example (2):*** In this example, summary information is obtained for both the `MegaTech-HighCost` and `MyStorageTier` storage tiers, in the `MegaTechUSP600-Primary` storage domain.

```
htsmcli GetStorageTiers storagedomainname="MegaTechUSP600-Primary" name="MegaTech-
HighCost,MyStorageTier"
```

- ***Output (2)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 2 StorageTier elements:
An instance of StorageTier(1 of 2)
name=MegaTech-HighCost
totalCapacityInGB=387
totalCapacityPercentageToStorageDomain=5
usedCapacityInGB=29
usedCapacityPercentage=8
freeCapacityInGB=358
freeCapacityPercentage=92
totalManagedCapacityInGB=1,000
usedManagedCapacityInGB=300
usedManagedCapacityPercentage=30
freeManagedCapacityInGB=700
freeManagedCapacityPercentage=70
consumedCapacityInGB=500
cost=USD3000/TB/Year
chargefor=Allocated
dpcost=USD3/GB/Year
dpchargefor=Consumed
An instance of StorageTier(2 of 2)
name=MyStorageTier
totalCapacityInGB=9
totalCapacityPercentageToStorageDomain=1
usedCapacityInGB=0
usedCapacityPercentage=0
freeCapacityInGB=9
freeCapacityPercentage=100
totalManagedCapacityInGB=1,000
usedManagedCapacityInGB=300
usedManagedCapacityPercentage=30
```

```
freeManagedCapacityInGB=700
freeManagedCapacityPercentage=70
consumedCapacityInGB=500
cost=USD3000/TB/Year
chargefor=Allocated
dpcost=USD3/GB/Year
dpchargefor=Consumed
```

- ***Example (3):*** In this example, to obtain summary information for all storage tiers in the storage domain `MegaTechUSP600-Secondary`, the `GetStorageTiers` command is executed without specifying the storage tier name. However, no storage tier exists.

```
htsmcli GetStorageTiers storagedomainname="MegaTechUSP600-Secondary"
```

- ***Output (3)*:**

```
RESPONSE:
(Command completed; empty list returned)
```

- ***Example (4):*** In this example, summary information is obtained about the storage tier `MegaTech-HighCost` within the storage domain `MegaTechUSP600-Primary` that needs to be refreshed.

```
htsmcli GetStorageTiers storagedomainname="MegaTechUSP600-Primary" name="MegaTech-
HighCost"
```

- ***Output (4)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 StorageTier elements:
An instance of StorageTier(1 of 1)
name=MegaTech-HighCost
totalCapacityInGB=387
totalCapacityPercentageToStorageDomain=5
usedCapacityInGB=29
usedCapacityPercentage=8
freeCapacityInGB=358
freeCapacityPercentage=92
totalManagedCapacityInGB=1,000
usedManagedCapacityInGB=300
usedManagedCapacityPercentage=30
freeManagedCapacityInGB=700
freeManagedCapacityPercentage=70
consumedCapacityInGB=500
cost=USD3000/TB/Year
chargefor=Allocated
dpcost=USD3/GB/Year
dpchargefor=Consumed
KATS10622-W The storage domain information is not up-to-date. Refresh the storage
domain. (storage domain name : MegaTechUSP600-Primary)
```

ModifyStorageTier

The `ModifyStorageTier` command can be used to change information (the name, filter condition, or description) of a storage tier.

Note that the information about storage tiers in the following statuses cannot be changed:

- Storage tiers specified for tasks that have not ended (`End`)

- Storage tiers within storage domains whose refresh status is either `Processing` or `Failure`

You can use the `GetTasks` command to check the status of tasks.

If this command is executed for a storage domain that requires a refresh, a warning message will be output to the standard error output.

Even if you migrate volumes, the labels set to the volumes and resource groups will not be switched. If you want to change these labels or resource groups along with migration, do so after the migration completes.

Syntax

```
htsmcli [ server-location] ModifyStorageTier
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
storagedomainname=storage-domain-name
name=storage-tier-name
[ newname=storage-tier-name ]
[ { newresource={ Volume | Pool } newfiltercondition=filter-condition |
newfiltercondition=filter-condition } ]
[ newdescription=description-for-the-storage-tier ]
[ newcost=cost-of-normal-volumes ]
[ newchargefor=charge-target-for-normal-volumes ]
[ newdpcost=cost-of-DP-volumes ]
[ newdpchargefor=charge-target-for-DP-volumes ]
```

Options

Specify the `-d` or `--detail` option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, nothing will be displayed in the standard output.

Parameters

Table 4-18 Parameters of the ModifyStorageTier Command

Parameter Name	Optional or Required	Description
storagedomainname	Required	Specify the name of the storage domain.
name	Required	Specify the name of the storage tier.
newname	Optional	Specify a new storage tier name. This name should be unique within the storage domain. If this is omitted, the name of the storage tier will not change.

Parameter Name	Optional or Required	Description
newresource	Optional	Specify the type of the storage tier. If you omit this, the condition specified in the newfiltercondition parameter will be used. ▪ Volume: Filter volumes. ▪ Pool: Filter pools.
newfilterconditi on	Optional	Specify a filter condition. You can specify either volume properties listed in Table 4-19 or the pool properties listed in Table 4-20 for this parameter. If this is omitted, the filter condition will not be updated.
newdescription	Optional	Specify a new storage tier description. If this is omitted, the description of the storage tier will not change. If you specify only spaces, the previous storage tier description will be deleted.
newcost	Optional[#1]	Specify the cost of normal volumes by using the following format: *currency-code amount / unit-of-capacity / unit-of-period* ▪ *currency-code* Specify a currency code conforming to ISO4217 using upper-case characters. ▪ *amount* Specify the amount of money. Do not use commas or periods. ▪ *unit-of-capacity* Specify MB, GB, or TB. The value is not case-sensitive. ▪ *unit-of-period* Specify either Month or Year. The value is not case-sensitive. By specifying how much a set amount (capacity) of storage in a storage tier costs for a set time period, you can operate storage with an awareness of costs. Tiered Storage Manager enables you to specify such cost, time period, and charge-target information. You can freely specify the cost to match the provided services and their charge system. For details about the values that can be specified, see Command Parameters. This parameter can be specified only if the storage tier is specified using volume filter conditions. You can specify an empty string for this parameter. If you specify an empty string, the old settings will be deleted. If you specify an empty string for this parameter, also specify an empty string for the newchargefor parameter.
newchargefor	Optional[#1]	Specify the charge target for the cost of normal volume. ▪ Allocated: The volume capacity allocated to the host ▪ Utilized: The volume capacity actually used by the host You can specify an empty string for this parameter. If you specify an empty string, the old settings will be deleted. If you specify an empty string for this parameter, also specify an empty string for the newcost parameter.

Parameter Name	Optional or Required	Description
newdpcost	Optional#2	Specify the cost of DP volumes. The method to specify this parameter is the same as for the newcost parameter. You can specify an empty string for this parameter. If you specify an empty string, the old settings will be deleted. If you specify an empty string for this parameter, also specify an empty string for the newdpchargefor parameter.
newdpchargefor	Optional#2	Specify the charge target for the cost of the DP volume. ▪ Allocated: The DP volume capacity allocated to the host ▪ Consumed: The DP volume capacity that has already been consumed ▪ Utilized: The DP volume capacity actually used by the host You can specify an empty string for this parameter. If you specify an empty string, the old settings will be deleted. If you specify an empty string for the newdpcost parameter.

#1

Specify these parameters so that, after the ModifyStorageTier command is executed, either both the cost of normal volumes and the charge target for the cost of normal volumes are set or neither is set.

#2

Specify these parameters so that, after the ModifyStorageTier command is executed, either both the cost of DP volumes and the charge target for the cost of DP volumes are set or neither is set.

Table 4-19 Properties Specifiable for the newfiltercondition Parameter (Volume) (ModifyStorageTier)

Property Name	Operators	Description
SubsystemModel#	=, <>	The name of the storage subsystem model
SubsystemDisplayModel	=, <>	The name used for displaying the model of the storage subsystem. This is the name defined in displayArrayType in Device Manager (not arrayType). Example: Lightning_9980V
SubsystemSerialNumber	=, <>, startsWith , contains	The serial number of the storage subsystem
SubsystemName	=, <>	The name of the storage subsystem
SubsystemVendor	=, <>	The vendor name of the storage subsystem
ControllerDeviceNumber	=	The controller LDEV number. Only a representative LDEV can be specified for a LUSE volume.

Property Name	Operators	Description
Host	=, <>, startsWith, contains	The name of the host
ArrayGroup	=, <>, startsWith , contains	The name of the array group
DynamicProvisioning	=, <>	The volume type
Capacity	<, <=, =, <>, >, >=	The volume capacity
ConsumedCapacity	<, <=, =, <>, >, >=	The used capacity of the volume
ConsumedCapacityPercentage	<, <=, =, <>, >, >=	The percentage of the volume that is being used
RAIDLevel	=, <>	The RAID level
EmulationType	=, <>	The emulation type
DiskType	=, <>	The disk type
VolumeStatus	=	A character string indicating whether the volume is being used
VolumeLockStatus	=	A character string indicating the lock status of the volume
SLPRNumber	=, <>	The SLPR number
CLPRNumber	=, <>	The CLPR number
ControllerArrayGroup	=, <> , startsWith , contains	The name of the controller array group
ArrayGroupBusyRate	<, <=, =, <>, >, >=	The array group usage rate
ArrayGroupMaxBusyRate	<, <=, =, <>, >, >=	The maximum array group usage rate
SysplexidDevn	=, <>, startsWith, contains	SYSPLEXID and DEVN. This property is in the format *SYSPLEXID/DEVN*.
VOLSER	=, <>, startsWith, contains	Mainframe volume information (volume serial number) managed by the mainframe host
DiskRPM	<, <=, =, <>, >, >=	Disk speed (rpm)
DiskCapacityInGB	<, <=, =, <>, >, >=	Disk capacity

Property Name	Operators	Description
LogicalGroup	=, <>, startsWith, contains, endsWith	Name of the logical group. This property compares the logical group name entered as a forward slash-delimited character string (delimiter: /) with the logical group name registered in Tiered Storage Manager (which does not have a leading forward slash).
PortHostStorageDomain	=, <>, startsWith, contains, endsWith	A port name and host storage domain name. This property compares the port name and host storage domain name entered in the format *port-name/host-storage-domain-name* with the port/host storage domain name registered in Tiered Storage Manager.
PVolMigrationGroup	=, <>	If the volume is a ShadowImage S-VOL, this is the migration group name containing the corresponding P-VOL.
PVolMUNumber	=, <>	If the volume is a ShadowImage S-VOL, this is the MU number of the corresponding P-VOL.
ShadowImage	=, <>	ShadowImage volume type
TrueCopyAsynchronous	=, <>	TrueCopy Asynchronous volume type
TrueCopySynchronous	=, <>	TrueCopy Synchronous volume type
UniversalReplicator	=, <>	Universal Replicator volume type
CopyOnWriteSnapshot	=, <>	Copy-On-Write Snapshot volume type
PoolId	=, <>	The pool number
CVS	=	Indicates whether the volume has the CVS attribute. This can be either Yes or No: ▪ Yes: Has CVS attribute ▪ No: Does not have CVS attribute
Label	=, <>, startsWith, contains	Label specified for a representative LDEV
Encryption	=	The encryption setting

#

This property is for maintaining compatibility with older versions. When you specify new filter conditions, use SubsystemDisplayModel.

Table 4-20 Properties Specifiable for the newfiltercondition Parameter (Pool) (ModifyStorageTier)

Property Name	Operators	Description
PoolFreeCapacity	=, <>, >, >=, <, <=	The free capacity of the pool
PoolId	=, <>	The pool number
OverProvisioning Percent	=, <>, >, >=, <, <=	The over-provisioning percent The over-provisioning percent indicates the ratio between the DP pool capacity and the total DP volume capacity allocated to the DP pool.
OverProvisioning Warning	=, <>, >, >=, <, <=	The threshold for the DP pool over-provisioning percent at which a warning is issued
OverProvisioning Limit	=, <>, >, >=, <, <=	The upper limit for the DP pool over-provisioning percent

Output Items

Table 4-21 Items Output by the ModifyStorageTier Command

Type of Information	Item Name	Description
Information about the storage domain	name	The name of the storage domain
Information about the storage tier	name	The name of the storage tier
	filterCondition	The filter conditions of the storage tier
	description	A description of the storage tier
	cost	The cost of normal volumes is displayed in the following format: *currency-code amount / unit-of-capacity / unit-of-period* If this item is not set, nothing is displayed.
	chargefor	The charge target for normal volumes. ▪ Allocated: The volume capacity allocated to the host ▪ Utilized: The volume capacity actually used by the host If this item is not set, nothing is displayed.
	dpcost	The cost of DP volumes is displayed in the following format: *currency-code amount / unit-of-capacity / unit-of-period* If this item is not set, nothing is displayed.
	dpchargefor	The charge target for DP volumes. ▪ Allocated: The DP volume capacity allocated to the host ▪ Consumed: The DP volume capacity that has already been consumed ▪ Utilized: The DP volume capacity actually used by the host If this item is not set, nothing is displayed.

Example and Execution Results

- ***Example (1):*** In this example, the name of the storage tier `MyStorageTier` in the storage domain `MegaTechUSP600-Primary` is changed to `OurStorageTier`.

```
htsmcli ModifyStorageTier --detail storagedomainname="MegaTechUSP600-Primary"
name="MyStorageTier" newname="OurStorageTier"
```

- ***Output (1)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 StorageTier elements:
An instance of StorageTier(1 of 1)
name=OurStorageTier
filterCondition=RAIDLevel <> 'RAID5(3D+1P)'
description=
cost=USD3000/TB/Year
chargefor=Allocated
dpcost=USD3/GB/Year
dpchargefor=Consumed
```

- ***Example (2):*** In this example, the name of the storage tier `MyStorageTier` in the storage domain `MegaTechUSP600-Primary` that needs to be refreshed is changed to `OurStorageTier`.

```
htsmcli ModifyStorageTier --detail storagedomainname="MegaTechUSP600-Primary"
name="MyStorageTier" newname="OurStorageTier"
```

- ***Output (2)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 StorageTier elements:
An instance of StorageTier(1 of 1)
name=OurStorageTier
filterCondition=RAIDLevel <> 'RAID5(3D+1P)'
description=
cost=USD3000/TB/Year
chargefor=Allocated
dpcost=USD3/GB/Year
dpchargefor=Consumed
KATS10622-W The storage domain information is not up-to-date. Refresh the storage
domain. (storage domain name : MegaTechUSP600-Primary)
```

Commands for Managing Migration Groups

This section explains the functions, specifiable options and parameters, and output items of the CLI commands for managing migration groups. This section also provides examples of how to use the CLI commands and the corresponding execution results.

For details about these options, see Options Common to All CLI Commands.

The examples of how to use the commands shown in this chapter assume that the user name, password, location of the Tiered Storage Manager server, and whether to use SSL communication have been specified ahead of time in the properties file. As a result, these items are omitted in the examples.

CreateMigrationGroup

The `CreateMigrationGroup` command can be used to create a migration group within a storage domain.

For the migration group to be created, you can use the `canmigrate` parameter to specify an attribute indicating whether the migration group is subject to migration operations. If you disable migration, you can prevent the volume belonging to the migration group from being migrated by mistake.

Migration groups cannot be created within a storage domain whose refresh status is either `Processing` or `Failure`.

If this command is executed for a storage domain that requires a refresh, a warning message will be output to the standard error output.

Even if you migrate volumes, the labels set to the volumes and resource groups will not be switched. If you want to change these labels or resource groups along with migration, do so after the migration completes.

Note: Using the `CreateMigrationGroup` command, you can set the LDEV selection rules for migration groups. For details about the LDEV selection rules, see the *Hitachi Tiered Storage Manager User's Guide*.

Syntax

```
htsmcli [server-location] CreateMigrationGroup
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
storagedomainname=storage-domain-name
name=migration-group-name
[ canmigrate={ Yes | No } ]
[ notifytourl=event-notification-address ]
[ reminddayslater=number-of-days-before-the-specified-elapsed-period-event-occurs ]
[ reminderdescription=description-for-the-specified-elapsed-period-event ]
[ arraygroupselectionrule={ BalanceCapacity | MinimumCoverage | MaximumCoverage } ]
[ arraygroupavoidanceofmigrationgroups=migration-group-name
[ ,migration-group-name ]... ]
[ description=description-for-the-migration-group ]
```

Options

Specify the `-d` or `--detail` option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, nothing will be displayed in the standard output.

Parameters

Table 4-22 Parameters of the CreateMigrationGroup Command

Parameter Name	Optional or Required	Description
storagedomainname	Required	Specify the name of the storage domain.
Name	Required	Specify the name of the migration group to be created. This name should be unique within the storage domain.
canmigrate	Optional	Specify whether migration is possible. This can be any of the following: ▪ Yes: Migration is possible (default). ▪ No: Migration is not possible.
notifytourl	Optional	Specify the address to be notified when the event occurs.
reminddayslater	Optional	Specify the number of days before the specified elapsed-period event is to occur, expressed as an integer that is 1 or greater.
Reminderdescription	Optional	Specify the text that is to be displayed when the specified elapsed-period event occurs.
arraygroupselectionrule	Optional	Specify the parameter for the array group selection rule that is used to create a migration plan. This can be any of the following: ▪ BalanceCapacity: Balancing the capacity (default) ▪ MinimumCoverage: Minimizing the distribution ▪ MaximumCoverage: Maximizing the distribution

Parameter Name	Optional or Required	Description
Arraygroupavoidanceofmigrationgroups	Optional	Specify the parameter for the array group avoidance rule that is used to create a migration plan. You can specify the name of the migration group that you do not want to coexist with LDEVs in the same array group. If you specify only spaces, the previous migration group name will be deleted. If you omit this parameter, the array group avoidance rule will not be applied.
description	Optional	Specify a description of the migration group.

Output Items

Table 4-23 Items Output by the CreateMigrationGroup Command

Type of Information	Item Name	Description
Information about the storage domain	name	The name of the storage domain
Information about the migration group	name	The name of the created migration group
	canMigrate	Indicates whether migration is possible
	notifyToURL	Event notification address
	remindAt	Date and time the specified elapsed-period event occurs
	reminderDescription	Description to be displayed when the specified elapsed-period event occurs
	arrayGroupSelectionRule	Array group selection rule
	arrayGroupAvoidanceOfMigrationGroups	Array group avoidance rule. If no array group avoidance rule has been set, nothing is displayed.
	description	A description of the migration group

Example and Execution Results

- ***Example (1)***: In this example, the migration group MG01 is created in the MegaTechUSP600-Primary storage domain:

```
htsmcli CreateMigrationGroup --detail storagedomainname="MegaTechUSP600-Primary"
name="MG01" description="MigrationGroup01"
arraygroupavoidanceofmigrationgroups="MG012,MG013"
```

- ***Output (1)***:

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 MigrationGroup elements:
An instance of MigrationGroup(1 of 1)
name=MG01
canMigrate=Yes
notifyToURL=
remindAt=
reminderDescription=
```

```
arrayGroupSelectionRule=BalanceCapacity
arrayGroupAvoidanceOfMigrationGroups=MG012,MG013
description=MigrationGroup01
```

- ***Example (2)***: In this example, the migration group MG01 is created in the MegaTechUSP600-Primary storage domain and a specified elapsed-period event is generated 20 days later.

```
htsmcli CreateMigrationGroup --detail storagedomainname="MegaTechUSP600-Primary"
name="MG01" reminddayslater="20" notifytourl="mailto:test@example.com"
reminderdescription="It is scheduled to move." description="MigrationGroup01"
arraygroupselectionrule=MinimumCoverage
arraygroupavoidanceofmigrationgroups="MG012,MG013"
```

- ***Output (2)***:

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 MigrationGroup elements
An instance of MigrationGroup(1 of 1)
name=MG01
canMigrate=Yes
notifyToURL=mailto:test@example.com
remindAt=2010/06/24 19:40:05
reminderDescription=It is scheduled to move.
arrayGroupSelectionRule=MinimumCoverage
arrayGroupAvoidanceofMigrationGroups=MG012,MG013
description=MigrationGroup01
```

- ***Example (3)***: In this example, the migration group MG01 is created in the storage domain MegaTechUSP600-Primary that needs to be refreshed.

```
htsmcli CreateMigrationGroup --detail storagedomainname="MegaTechUSP600-Primary"
name="MG01" description="MigrationGroup01"
arraygroupavoidanceofmigrationgroups="MG012,MG013"
```

- ***Output (3)***:

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 MigrationGroup elements:
An instance of MigrationGroup(1 of 1)
name=MG01
canMigrate=Yes
notifyToURL=
remindAt=
reminderDescription=
arrayGroupSelectionRule=BalanceCapacity
arrayGroupAvoidanceOfMigrationGroups=MG012,MG013
description=MigrationGroup01
KATS10622-W The storage domain information is not up-to-date. Refresh the storage
domain. (storage domain name : MegaTechUSP600-Primary)
```

DeleteMigrationGroup

The DeleteMigrationGroup command can be used to delete a migration group. You can delete migration groups regardless of whether they contain any volumes.

Note that migration groups in the following states cannot be deleted:

- Migration groups specified for tasks that have not yet ended (End)
- Migration groups within storage domains whose refresh status is either Processing or Failure
- Migration groups specified as a migration target after the completion of a shredding task that has not yet ended (End)
- Migration groups specified as a migration target after the completion of a locking task that has not yet ended (End)
- Migration groups specified as a migration target after the completion of an unlocking task that has not yet ended (End)

You can use the GetTasks command to check the status of tasks.

If this command is executed for a storage domain that requires a refresh, a warning message will be output to the standard error output.

Syntax

```
htsmcli [server-location] DeleteMigrationGroup
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
storagedomainname=storage-domain-name
name=migration-group-name
```

Options

Specify the -d or --detail option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, nothing will be displayed in the standard output.

Parameters

Table 4-24 Parameters of the DeleteMigrationGroup Command

Parameter Name	Optional or Required	Description
storagedomainname	Required	Specify the storage domain name.
Name	Required	Specify the name of the migration group to be deleted.

Output Items

Table 4-25 Items Output by the DeleteMigrationGroup Command

Type of Information	Item Name	Description
Information about the storage domain	name	The name of the storage domain
Information about the migration group	name	The name of the deleted migration group
	canMigrate	Indicates whether migration is possible
	notifyToURL	Event notification address
	remindAt	Date and time the specified elapsed-period event occurs
	reminderDescription	Description to be displayed when the specified elapsed-period event occurs
	arrayGroupSelectionRule	Array group selection rule
	arrayGroupAvoidanceOfMigrationGroups	Array group avoidance rule. If no array group avoidance rule has been set, nothing is displayed.
	description	A description of the migration group

Example and Execution Results

- ***Example (1)***: In this example, the migration group MG01 is deleted from the storage domain MegaTechUSP600-Primary.

```
htsmcli DeleteMigrationGroup --detail storagedomainname="MegaTechUSP600-Primary"
name="MG01"
```

- ***Output (1)***:

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 MigrationGroup elements:
An instance of MigrationGroup(1 of 1)
name=MG01
canMigrate=Yes
notifyToURL=
remindAt=
reminderDescription=
arrayGroupSelectionRule=MinimumCoverage
arrayGroupAvoidanceOfMigrationGroups=MG012,MG013
description=MigrationGroup01
```

- ***Example (2)***: In this example, the migration group MG01 is deleted from the storage domain MegaTechUSP600-Primary that needs to be refreshed.

```
htsmcli DeleteMigrationGroup --detail storagedomainname="MegaTechUSP600-Primary"
name="MG01"
```

- ***Output (2)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 MigrationGroup elements:
An instance of MigrationGroup(1 of 1)
name=MG01
canMigrate=Yes
notifyToURL=
remindAt=
reminderDescription=
arrayGroupSelectionRule=MinimumCoverage
arrayGroupAvoidanceOfMigrationGroups=MG012,MG013
description=MigrationGroup01
KATS10622-W The storage domain information is not up-to-date. Refresh the storage
domain. (storage domain name : MegaTechUSP600-Primary)
```

GetMigrationGroups

The `GetMigrationGroups` command can be used to obtain information about all migration groups in the storage domain, or about the migration group specified by the `name` parameter.

Information cannot be obtained for migration groups in storage domains whose refresh status is either `Processing` or `Failure`.

If this command is executed for a storage domain that requires a refresh, a warning message will be output to the standard error output.

Syntax

```
htsmcli [server-location] GetMigrationGroups
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
storagedomainname=storage-domain-name
[ name=migration-group-name [ , migration-group-name ] ...]
```

Options

Specify the `-d` or `--detail` option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, only summary information will be displayed. Summary information consists of the information for which the *Output by -d* column contains -- in Table 4-27.

Parameters

Table 4-26 Parameters of the GetMigrationGroups Command

Parameter Name	Optional or Required	Description
storagedomainname	Required	Specify the name of the storage domain.
name	Optional	Specify the name of the migration group about which you want to obtain information. If this is omitted, this command will be applied to all the migration groups in the storage domain. When specifying multiple migration groups, separate each one with a comma. Up to 255 migration groups can be specified, limited only by the maximum number of characters allowed by the command line.

Output Items

Table 4-27 Items Output by the GetMigrationGroups Command

Type of Information	Item Name	Description	Output by -d
Information about the storage domain	name	The name of the storage domain	--
Information about the migration group	name	The name of the migration group	--
	targetStorageTierName	The name of the storage tier for which the migration destination was last specified. If no migration task has ever been created, nothing is displayed.	--
	canMigrate	Indicates whether migration is possible	--
	notifyToURL	Event notification address	-d
	remindAt	Date and time the specified elapsed-period event occurs	--
	reminderDescription	Description to be displayed when the specified elapsed-period event occurs	-d
	lastModifyUserGroup	The user group name of the user who created or last modified the migration group	-d
	creationTime	The date and time when the migration group was created	-d
	lastModifyTime	The date and time when the migration group information was last changed	-d
	lastMigrationTime	The date and time when migration was performed for the storage tier specified in targetStorageTierName. If the previous migration has not finished or a new migration task is created, nothing is displayed.	--

Type of Information	Item Name	Description	Output by -d
	migrationStatus	The status of the migration task. If migration has not previously been performed, nothing is displayed. If migration has previously been performed, this can be any of the following: ▪ Standby ▪ Active.WaitingMigration (waiting for migration) ▪ Active.Migrating (migration in progress) ▪ Active.WaitingDataErasure (waiting for data erasure) ▪ Active.DataErasing (data erasure in progress) ▪ Active.WaitingZeroDataDiscard (waiting to release unused space) ▪ Active.ZeroDataDiscarding (releasing unused space) ▪ Failure.MigrationFailure (migration ended in failure) ▪ Failure.DataErasureFailure (erasure ended in failure) ▪ Failure.ZeroDataDiscardFailure (release of unused space ended in failure) ▪ Stopping (being stopped) ▪ Stopping.Immediate (stopping mid-task) ▪ Stop.MigrationStop (migration has stopped) ▪ Stop.DataErasureStop (data erasure has stopped) ▪ Stop.ZeroDataDiscardStop (release of unused space has stopped) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Unknown (status other than the above)	--
	taskType	The type of task. If no task has been created, nothing is displayed. If the task has been created, this can be any of the following: ▪ Migration ▪ Locking ▪ Unlocking ▪ Shredding	--

Type of Information	Item Name	Description	Output by -d
	taskStatus	The status of the task displayed in taskType. If no task has been created, nothing is displayed. If the task has been created, this can be any of the following: ▪ Standby ▪ Active.Waiting (waiting for execution) ▪ Active.Executing (being executed) ▪ Active.WaitingMigration (waiting for migration) ▪ Active.Migrating (migration in progress) ▪ Active.WaitingDataErasure (waiting for data erasure) ▪ Active.DataErasing (data erasure in progress) ▪ Active.WaitingZeroDataDiscard (waiting to release unused space) ▪ Active.ZeroDataDiscarding (releasing unused space) ▪ Failure.MigrationFailure (migration ended in failure) ▪ Failure.DataErasureFailure (erasure ended in failure) ▪ Failure.ZeroDataDiscardFailure (release of unused space ended in failure) ▪ Stopping (being stopped) ▪ Stopping.Immediate (stopping mid-task) ▪ Stop.MigrationStop (migration has stopped) ▪ Stop.DataErasureStop (data erasure has stopped) ▪ Stop.ZeroDataDiscardStop (release of unused space has stopped) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped) ▪ Unknown (status other than the above)	--
	numberOfVolumes	The number of real volumes in the migration group	--
	totalCapacityInGB	The total capacity of the real volumes in the storage domain (units: GB). Values less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--
	numberOfManagedVolumes	The number of normal volumes and virtual volumes in the migration group	--
	totalManagedCapacityInGB	The total capacity of the normal volumes and virtual volumes in the migration group (units: GB). Values less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--

Type of Information	Item Name	Description	Output by -d
	consumedCapacityInGB	The total used capacity for the normal volumes and virtual volumes in the migration group (units: GB). Values less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--
	arrayGroupSelectionRule	Array group selection rule	-d
	arrayGroupAvoidanceOfMigrationGroups	Array group avoidance rule. If no array group avoidance rule has been set, nothing is displayed.	-d
	description	A description of the migration group	-d

Legend:

-d : Indicates output only when either the -d or the --detail option is specified.

-- : Not applicable

Example and Execution Results

- ***Example (1):*** In this example, detailed information is obtained for all migration groups in the MegaTechUSP600-Primary storage domain.

```
htsmcli GetMigrationGroups --detail storagedomainname="MegaTechUSP600-Primary"
```

- ***Output (1)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 2 MigrationGroup elements
An instance of MigrationGroup(1 of 2)
name=MG01
targetStorageTierName=
canMigrate=Yes
notifyToURL=
remindAt=
reminderDescription=
lastModifyUserGroup=Admin
creationTime=2008/01/31 11:57:23
lastModifyTime=2008/04/02 12:05:59
lastMigrationTime=
migrationStatus=
taskType=
taskStatus=
numberOfVolumes=0
totalCapacityInGB=0
numberOfManagedVolumes=25
totalManagedCapacityInGB=1,000
consumedCapacityInGB=300
arrayGroupSelectionRule=MinimumCoverage
arrayGroupAvoidanceOfMigrationGroups=MG012,MG013
description=MigrationGroup01
An instance of MigrationGroup(2 of 2)
name=MyGroup
targetStorageTierName=
canMigrate=Yes
notifyToURL=mailto:test@example.com
```

```
remindAt=2008/05/24 19:40:05
reminderDescription=It is scheduled to move.
lastModifyUserGroup=Admin
creationTime=2008/03/31 12:06:41
lastModifyTime=2008/04/02 12:06:41
lastMigrationTime=
migrationStatus=
taskType=
taskStatus=
numberOfVolumes=0
totalCapacityInGB=0
numberOfManagedVolumes=25
totalManagedCapacityInGB=1,000
consumedCapacityInGB=300
arrayGroupSelectionRule=BalanceCapacity
arrayGroupAvoidanceOfMigrationGroups=
description=MyMigrationGroup
```

- ***Example (2):*** In this example, summary information is obtained for all migration groups in the MegaTechUSP600-Primary storage domain.

```
htsmcli GetMigrationGroups storagedomainname="MegaTechUSP600-Primary"
```

- ***Output (2)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 2 MigrationGroup elements
An instance of MigrationGroup(1 of 2)
name=MG01
targetStorageTierName=
canMigrate=Yes
remindAt=
lastMigrationTime=
migrationStatus=
taskType=
taskStatus=
numberOfVolumes=0
totalCapacityInGB=0
numberOfManagedVolumes=25
totalManagedCapacityInGB=1,000
consumedCapacityInGB=300
An instance of MigrationGroup(2 of 2)
name=MyGroup
targetStorageTierName=
canMigrate=Yes
remindAt=2008/02/24 19:40:05
lastMigrationTime=
migrationStatus=
taskType=
taskStatus=
numberOfVolumes=0
totalCapacityInGB=0
numberOfManagedVolumes=25
totalManagedCapacityInGB=1,000
consumedCapacityInGB=300
```

- ***Example (3):*** In this example, to obtain summary information for all migration groups in the storage domain MegaTechUSP600-Secondary, the GetMigrationGroups command is executed without specifying the migration group name. However, no migration group exists.

```
htsmcli GetMigrationGroups storagedomainname="MegaTechUSP600-Secondary"
```

- ***Output (3)*:**

```
RESPONSE:
(Command completed; empty list returned)
```

- ***Example (4):*** In this example, summary information is obtained about all migration groups within `MegaTechUSP600-Primary`, which is a storage domain that requires a refresh:

```
htsmcli GetMigrationGroups storagedomainname="MegaTechUSP600-Primary"
```

- ***Output (4)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 MigrationGroup elements:
An instance of MigrationGroup(1 of 1)
name=MG01
targetStorageTierName=
canMigrate=Yes
remindAt=
lastMigrationTime=
migrationStatus=
taskType=
taskStatus=
numberOfVolumes=0
totalCapacityInGB=0
numberOfManagedVolumes=25
totalManagedCapacityInGB=1,000
consumedCapacityInGB=300
KATS10622-W The storage domain information is not up-to-date. Refresh the storage
domain. (storage domain name : MegaTechUSP600-Primary)
```

ModifyMigrationGroup

The `ModifyMigrationGroup` command can be used to change information about a migration group. The command can change the following information:

- Migration group name
- Attribute indicating whether the migration group is subject to migration
- Description of the migration group
- Number of days before the specified elapsed period event occurs
- Event notification address
- Array group selection rule
- Array group avoidance rule
- Description for the specified elapsed period event

Note that information cannot be changed for migration groups in the following statuses:

- Migration groups specified for tasks that have not ended (`End`)
- Migration groups within storage domains whose refresh status is either `Processing` or `Failure`

- Migration groups specified for a migration target after completing a locking, unlocking, or shredding task, which has not ended (End)

You can use the GetTasks command to check the status of tasks.

If this command is executed for a storage domain that requires a refresh, a warning message will be output to the standard error output.

Even if you migrate volumes, the labels set to the volumes and resource groups will not be switched. If you want to change these labels or resource groups along with migration, do so after the migration completes.

Syntax

```
htsmcli [server-location] ModifyMigrationGroup
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
storagedomainname=storage-domain-name
name=migration-group-name
[ newname=migration-group-name]
[ newcanmigrate={ Yes | No } ]
[ newnotifytourl=event-notification-address ]
[ newreminddayslater=number-of-days-before-the-specified-elapsed-period-event-occurs ]
[ newreminderdescription=description-for-the-specified-elapsed-period-event ]
[ newarraygroupselectionrule={ BalanceCapacity | MinimumCoverage |
MaximumCoverage } ]
[ newarraygroupavoidanceofmigrationgroups=migration-group-name
[ ,migration-group-name ]... ]
[ description=description-for-the-migration-group ]
```

Options

Specify the -d or --detail option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, nothing will be displayed in the standard output.

Parameters

Table 4-28 Parameters of the ModifyMigrationGroup Command

Parameter Name	Optional or Required	Description
storagedomainname	Required	Specify the name of the storage domain.
name	Required	Specify the name of the migration group.
newname	Optional	Specify a new migration group name. This name should be unique within the storage domain. If this is omitted, the name of the migration group will not change.

Parameter Name	Optional or Required	Description
newcanmigrate	Optional	Specify whether migration is possible. This can be either Yes or No: ▪ Yes: Migration is possible. ▪ No: Migration is not possible. If this is omitted, the migration will remain the same.
newreminddayslater	Optional	Specify the number of days before the specified elapsed-period event is to occur, expressed as an integer that is 1 or greater. When this item is omitted, the existing number of days before the elapsed-period event is to occur remains unchanged. If you specify only spaces, the previously specified value will be erased.
newnotifytourl	Optional	Specify the address to be notified when the specified elapsed-period event occurs. When this item is omitted, the event notification address remains unchanged. If you specify only spaces, the previously specified event notification address will be erased.
newreminderdescription	Optional	Specify the text that is to be displayed when the specified elapsed-period event occurs. When this item is omitted, the description to be displayed when the specified elapsed-period event occurs remains unchanged. If you specify only spaces, the previously specified description will be erased.
newarraygroupselectionrule	Optional	Specify this parameter to modify the array group selection rule parameter value that was set in CreateMigrationGroup. This can be any of the following: ▪ BalanceCapacity: Balancing the capacity ▪ MinimumCoverage: Minimizing the distribution ▪ MaximumCoverage: Maximizing the distribution If this parameter is omitted, the array group selection rule that is used to create migration plans remains unchanged.
newarraygroupavoidanceofmigrationgroups	Optional	Specify this parameter to modify the array group avoidance rule parameter that was set in CreateMigrationGroup. Specify the name of a migration group whose LDEV is not in the same array group. If you specify only spaces, the previous migration group name specified will be deleted. If this parameter is omitted, the array group avoidance rule will not be applied.
newdescription	Optional	Specify a new migration group description. If this is omitted, the description of the migration group will not change. If you specify only spaces, the previous migration group description will be deleted.

Output Items

Table 4-29 Items Output by the ModifyMigrationGroup Command

Type of Information	Item Name	Description
Information about the storage domain	name	The name of the storage domain
Information about the migration group	name	The name of the migration group
	canMigrate	Indicates whether migration is possible
	notifyToURL	Event notification address
	remindAt	Date and time the specified elapsed-period event occurs
	reminderDescription	Description to be displayed when the specified elapsed-period event occurs
	arrayGroupSelectionRule	Array group selection rule
	arrayGroupAvoidanceOfMigrationGroups	Array group avoidance rule. If no array group avoidance rule has been set, nothing is displayed.
	description	A description of the migration group

Example and Execution Results

- ***Example (1):*** In this example, the name, description, and number of days before the specified elapsed-period event is to occur are changed for the migration group `MG01` in the storage domain `MegaTechUSP600-Primary`.

```
htsmcli ModifyMigrationGroup --detail storagedomainname="MegaTechUSP600-Primary"
name="MG01" newname="MG011" newreminddayslater="25" newdescription="MigrationGroup011"
```

- ***Output (1)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 MigrationGroup elements:
An instance of MigrationGroup(1 of 1)
name=MG011
canMigrate=Yes
notifyToURL=mailto:test@example.com
remindAt=2010/06/10 19:40:05
reminderDescription=It is scheduled to move.
arrayGroupSelectionRule=BalanceCapacity
arrayGroupAvoidanceOfMigrationGroups=MG012,MG013
description=MigrationGroup011
```

- ***Example (2)***: In this example, the name, description, and number of days before the specified elapsed-period event is to occur are changed for the migration group `MG01` in the storage domain `MegaTechUSP600-Primary` that needs to be refreshed.

```
htsmcli ModifyMigrationGroup --detail storagedomainname="MegaTechUSP600-Primary"
name="MG01" newname="MG011" newreminddayslater="25" newdescription="MigrationGroup011"
newarraygroupselectionrule=BalanceCapacity
```

- ***Output (2)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 MigrationGroup elements:
An instance of MigrationGroup(1 of 1)
name=MG011
canMigrate=Yes
notifyToURL=mailto:test@example.com
remindAt=2010/06/28 19:40:05
reminderDescription=It is scheduled to move.
arrayGroupSelectionRule=BalanceCapacity
arrayGroupAvoidanceOfMigrationGroups=MG012,MG013
description=MigrationGroup011
KATS10622-W The storage domain information is not up-to-date. Refresh the storage
domain. (storage domain name : MegaTechUSP600-Primary)
```

AddVolumeToMigrationGroup

The AddVolumeToMigrationGroup command can be used to add a volume to the specified migration group. Use the LDEV number in the domain controller (controller LDEV number) to specify a volume.

Note that volumes cannot be added to migration groups in the following statuses:

- Migration groups specified for tasks that have not ended (End)
- Migration groups within storage domains whose refresh status is either Processing or Failure

You can use the GetTasks command to check the status of tasks.

If this command is executed for a storage domain that requires a refresh, a warning message will be output to the standard error output.

Note: If information about a volume in the storage domain cannot be obtained because the volume in the storage subsystem has been deleted using Device Manager, Unknown will be output as the value of the output items.

Syntax

```
htsmcli [server-location] AddVolumeToMigrationGroup
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
storagedomainname=storage-domain-name
name=migration-group-name
controllerdevicenumber=controller-LDEV-number
[ movefrommigrationgroup={ Yes | No } ]
```

Options

Specify the `-d` or `--detail` option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, nothing will be displayed in the standard output.

Parameters

Table 4-30 Parameters of the AddVolumeToMigrationGroup Command

Parameter Name	Optional or Required	Description
`storagedomainname`	Required	Specify the name of the storage domain.
`name`	Required	Specify the name of the migration group.
`controllerdevicenumber`	Required	Specify the controller LDEV number.
`movefrommigrationgroup`	Optional	Specify whether or not it is permissible to move the volume of another migration group: This can be either Yes or No: ▪ Yes: Moving the volume of another migration group is permitted ▪ No: Moving the volume of another migration group is not permitted (default)

Output Items

Table 4-31 Items Output by the AddVolumeToMigrationGroup Command

Type of Information	Item Name	Description	Displayed as Unknown
Information about the storage domain	`name`	The name of the storage domain	--
Information about the migration group	`name`	The name of the migration group	--
	`canMigrate`	Indicates whether migration is possible	--
	`notifyToURL`	Event notification address	--
	`remindAt`	Date and time the specified elapsed-period event occurs	--
	`reminderDescription`	Description to be displayed when the specified elapsed-period event occurs	--
	`arrayGroupSelectionRule`	Array group selection rule	--

Type of Information	Item Name	Description	Displayed as Unknown
Information about volumes (LUs) to be added	arrayGroupAvoidanceOfMigrationGroups	Array group avoidance rule. . If no array group avoidance rule has been set, nothing is displayed.	--
	description	A description of the migration group	--
	controllerDeviceNumber	The controller LDEV number The number is displayed in 0:00 or 00:00:00 format.	--
	emulationType	The emulation type	#1
	CVS	The CVS volume attribute of the volume. This can be either Yes or No.	#1
	capacityInKB	The capacity of the volume (units: KB)	#1
	RAIDLevel	The RAID level For an SMI-S Enabled subsystem, only RAID*x* of RAID*x*(*y*D+*z*P) is displayed.	#1, #2
	diskType	The disk type	#1, #2
	controllerArrayGroupName	The array group name of the LU in the domain controller	#1
	arrayGroupName	The array group name of the LU in the storage subsystem that stores the actual data.	#1, #2
	volumeStatus	Indicates whether the volume is being used. This can be either Used (you cannot specify the volume as the migration destination) or Free (you can specify the volume as the migration destination).	#1
	volumeLockStatus	Indicates whether the volume is locked. This can be either Locked (you cannot specify the volume as the migration destination) or Unlocked (you can specify the volume as the migration destination).	#1
	hostNames	The host name If multiple host names exist, they are separated by commas (,).	#1

Legend:

-- : Not applicable

#1

Unknown is output when volume information cannot be obtained for the domain controller.

#2

Unknown is output when information cannot be obtained for externally connected storage.

Example and Execution Results

- ***Example (1):*** In this example, a volume is added to the migration group MG011 in the storage domain MegaTechUSP600-Primary. The controller LDEV number for the added volume in the domain controller is set as 3:A6.

```
htsmcli AddVolumeToMigrationGroup --detail storagedomainname="MegaTechUSP600-Primary"
name="MG011" controllerdevicenumber="3:A6" movefrommigrationgroup=Yes
```

- ***Output (1)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 MigrationGroup elements
An instance of MigrationGroup(1 of 1)
name=MG011
canMigrate=Yes
notifyToURL=
remindAt=
reminderDescription=
arrayGroupSelectionRule=MinimumCoverage
arrayGroupAvoidanceOfMigrationGroups=MG012,MG013
description=MigrationGroup011
List of 1 Volume elements:
An instance of Volume(1 of 1)
controllerDeviceNumber=3:A6
emulationType=OPEN-V
CVS=Yes
capacityInKB=10,240,320
RAIDLevel=RAID5(3D+1P)
diskType=Unknown
controllerArrayGroupName=E9980-1
arrayGroupName=1-9-1
volumeStatus=Used
volumeLockStatus=Unlocked
hostNames=
```

- ***Example (2)***: In this example, a volume whose controller logical device number is 3:A6 is added to the migration group MG011 within the storage domain MegaTechUSP600-Primary that needs to be refreshed.

```
htsmcli AddVolumeToMigrationGroup --detail storagedomainname="MegaTechUSP600-Primary"
name="MG011" controllerdevicenumber="3:A6" movefrommigrationgroup=Yes
```

- ***Output (2)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 MigrationGroup elements:
An instance of MigrationGroup(1 of 1)
name=MG011
canMigrate=Yes
notifyToURL=
remindAt=
reminderDescription=
arrayGroupSelectionRule=MinimumCoverage
arrayGroupAvoidanceOfMigrationGroups=MG012,MG013
description=MigrationGroup011
List of 1 Volume elements:
An instance of Volume(1 of 1)
controllerDeviceNumber=3:A6
emulationType=OPEN-V
CVS=Yes
capacityInKB=10,240,320
RAIDLevel=RAID5(3D+1P)
```

```
diskType=Unknown
controllerArrayGroupName=E9980-1
arrayGroupName=1-9-1
volumeStatus=Used
volumeLockStatus=Unlocked
hostNames=
KATS10622-W The storage domain information is not up-to-date. Refresh the storage
domain. (storage domain name : MegaTechUSP600-Primary)
```

RemoveVolumeFromMigrationGroup

The RemoveVolumeFromMigrationGroup command can be used to remove a specified volume from its migration group. Use the LDEV number in the domain controller (controller LDEV number) to specify a volume.

Note that volumes cannot be removed from migration groups in the following statuses:

- Migration groups specified for tasks that have not ended (End)
- Migration groups within storage domains whose refresh status is either Processing or Failure

You can use the GetTasks command to check the status of tasks.

If this command is executed for a storage domain that requires a refresh, a warning message will be output to the standard error output.

Note: If information about a volume in the storage domain cannot be obtained because the volume in the storage subsystem has been deleted using Device Manager, Unknown will be output as the value of the output items.

Syntax

```
htsmcli [server-location] RemoveVolumeFromMigrationGroup
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
storagedomainname=storage-domain-name
name=migration-group-name
controllerdevicenumber=controller-LDEV-number
```

Options

Specify the -d or --detail option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, nothing will be displayed in the standard output.

Parameters

Table 4-32 Parameters of the RemoveVolumeFromMigrationGroup Command

Parameter Name	Optional or Required	Description
storagedomainname	Required	Specify the name of the storage domain.
name	Required	Specify the name of the migration group.
controllerdevicenumber	Required	Specify the controller LDEV number.

Output Items

Table 4-33 Items Output by the RemoveVolumeFromMigrationGroup Command

Type of Information	Item Name	Description	Displayed as Unknown
Information about the storage domain	name	The name of the storage domain	--
Information about the migration group	name	The name of the migration group	--
	canMigrate	Indicates whether migration is possible	--
	notifyToURL	Event notification address	--
	remindAt	Date and time the specified elapsed-period event occurs	--
	reminderDescription	Description to be displayed when the specified elapsed-period event occurs	--
	arrayGroupSelectionRule	Array group selection rule	--
	arrayGroupAvoidanceOfMigrationGroups	Array group avoidance rule If no array group avoidance rule has been set, nothing is displayed.	--
	description	A description of the migration group	--

Type of Information	Item Name	Description	Displayed as Unknown
Information about removed volumes (LUs)	controllerDeviceNumber	The controller LDEV number The number is displayed in 0:00 or 00:00:00 format.	--
	emulationType	The emulation type	#1
	CVS	The CVS volume attribute of the volume. This can be either Yes or No.	#1
	capacityInKB	The capacity of the volume (units: KB)	#1
	RAIDLevel	The RAID level For an SMI-S Enabled subsystem, only RAID*x* of RAID*x*(*y*D+*z*P) is displayed.	#1, #2
	diskType	The disk type	#1, #2
	controllerArrayGroupName	The array group name of the LU in the domain controller	#1
	arrayGroupName	The array group name of the LU in the storage subsystem that stores the actual data.	#1, #2
	volumeStatus	Indicates whether the volume is being used. This can be either Used (you cannot specify the volume as the migration destination) or Free (you can specify the volume as the migration destination).	#1
	volumeLockStatus	Indicates whether the volume is locked. This can be either Locked or Unlocked.	#1
	hostNames	The host name. If multiple host names exist, they are separated by commas (,).	#1

Legend:

-- : Not applicable

#1

Unknown is output when volume information cannot be obtained for the domain controller.

#2

Unknown is output when information cannot be obtained for externally connected storage.

Example and Execution Results

- ***Example (1):*** In this example, a volume is removed from the migration group MG011 in the storage domain MegaTechUSP600-Primary. The controller LDEV number for the removed volume in the domain controller is set as 3:A7.

```
htsmcli RemoveVolumeFromMigrationGroup --detail storagedomainname="MegaTechUSP600-
Primary" name="MG011" controllerdevicenumber="3:A7"
```

- ***Output (1)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 MigrationGroup elements
An instance of MigrationGroup(1 of 1)
name=MG011
canMigrate=Yes
notifyToURL=
remindAt=
reminderDescription=
arrayGroupSelectionRule=MinimumCoverage
arrayGroupAvoidanceOfMigrationGroups=MG012,MG013
description=MigrationGroup011
List of 1 Volume elements:
An instance of Volume(1 of 1)
controllerDeviceNumber=3:A7
emulationType=OPEN-V
CVS=Yes
capacityInKB=10,240,320
RAIDLevel=RAID5(3D+1P)
diskType=Unknown
controllerArrayGroupName=E9980-1
arrayGroupName=1-9-1
volumeStatus=Used
volumeLockStatus=Unlocked
hostNames=
```

- ***Example (2):*** In this example, a volume whose controller logical device number is `3:A7` is deleted from the migration group `MG011` within the storage domain `MegaTechUSP600-Primary` that needs to be refreshed.

```
htsmcli RemoveVolumeFromMigrationGroup --detail storagedomainname="MegaTechUSP600-
Primary" name="MG011" controllerdevicenumber="3:A7"
```

- ***Output (2)*:**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 MigrationGroup elements:
An instance of MigrationGroup(1 of 1)
name=MG011
canMigrate=Yes
notifyToURL=
remindAt=
reminderDescription=
arrayGroupSelectionRule=MinimumCoverage
arrayGroupAvoidanceOfMigrationGroups=MG012,MG013
description=MigrationGroup011
List of 1 Volume elements:
An instance of Volume(1 of 1)
controllerDeviceNumber=3:A7
emulationType=OPEN-V
CVS=Yes
capacityInKB=10,240,320
RAIDLevel=RAID5(3D+1P)
diskType=Unknown
controllerArrayGroupName=E9980-1
arrayGroupName=1-9-1
volumeStatus=Used
volumeLockStatus=Unlocked
hostNames=
KATS10622-W The storage domain information is not up-to-date. Refresh the storage
domain. (storage domain name : MegaTechUSP600-Primary)
```

Commands for Creating Tasks

This section explains the functions, specifiable options and parameters, and output items of the CLI commands for creating tasks. This section also provides examples of how to use the CLI commands and the corresponding execution results.

For details about these options, see Options Common to All CLI Commands.

The examples of how to use the commands shown in this chapter assume that the user name, password, location of the Tiered Storage Manager server, and whether to use SSL communication have been specified ahead of time in the properties file. As a result, these items are omitted in the examples.

CreateMigrationPlan

The `CreateMigrationPlan` command can be used to create a candidate migration plan for the specified migration group. Candidate migration plans are output to the standard output in text format, or put into the redirect file specified by the `--output` option.

The storage tier chosen as the migration target decides, among all the volumes in the migration group, which volumes can be a candidate for the migration target. When you use the `filtercondition` parameter to specify a volume filter condition, candidates for the migration target volume are chosen based on that condition.

Volumes that are candidates for the migration target are chosen from the SLPR to which the migration source volume belongs. Volumes that are candidates for the migration target are displayed in pairs in the candidate migration plan with the applicable migration source volume.

There are comment lines (lines that begin with #) in the candidate migration plan. If multiple migration target volume candidates exist, they are all shown within comment lines as well. Note that all volumes, other than the first candidate, are chosen not only from the SLPR to which the migration source volume belongs, but also from the other SLPRs.

Even if you cannot select candidates for the migration target volume for all the migration source volumes, the candidate migration plans with selected migration targets will be created. However, in such a case, an error will occur.

If the migration group contains non-migratable volumes, only the volumes that are migratable will be migrated. Note that, if there are no migratable volumes, an error will occur when you attempt to create the migration plan.

For non-migratable volumes, the source volume will select itself as the target volume in the candidate migration plan.

For details about comment lines, see Table 4-38.

Comment Lines for a Candidate Migration Target Volume

You can use a created candidate migration plan in its current state for migration, or you can change the contents by editing the text data. The format of a candidate migration plan is as follows:

- Each item consists of an item name, equal sign (=), and value, in that order. Note that only the item name is specified for `pair`.
- Any space characters before or after the item name, equal sign (=), and value are ignored.
- Specify only one item per line. The specification for an item cannot continue over multiple lines.
- Item names are not case-sensitive (for example, `storagedomainname` and `STORAGEDOMAINNAME` are the same).
- Item values are case-sensitive (for example, `groupName_1` and `GroupName_1` are different).
- Lines in which the first non-space character is a hash mark (#) are treated as comments.

Specify the items in the order listed in the table below:

Table 4-34 Migration Plan Items

Type of Information	Item Name	Description
Information about the overall plan[#1]	`plan-type`	The plan type
	`format-version`	The format version of the plan. Specify this item for compatibility between different format versions.
	`storageDomainName`	The name of the storage domain
	`migrationGroupName`	The name of the migration group
	`targetStorageTierName`	The name of the migration target storage tier
	`permitCrossSLPRMigration`	Specify whether to allow migration between SLPRs. This can be either Yes or No: ▪ Yes: Allow migration between SLPRs ▪ No: Do not allow migration between SLPRs
	`permitCrossCLPRMigration`	Specify whether to allow migration between CLPRs. This can be either Yes or No: ▪ Yes: Allow migration between CLPRs ▪ No: Do not allow migration between CLPRs

Type of Information	Item Name	Description
Information about each volume pair for migration[#2]	pair	The symbol indicating the start of the specification of a migration source volume and migration target volume
	sourceControllerDeviceNumber	The migration source volume.[#3] ▪ Specify the controller logical device number. ▪ Specify a volume that belongs to the specified migration group.
	targetControllerDeviceNumber[#4]	The migration target volume.[#3] ▪ Specify the controller logical device number. ▪ Specify a volume that belongs to the specified storage tier. ▪ Specify only spaces when specifying a storage tier created using a pool filter condition for the migration destination. ▪ Specify NotMigrate when you do not want to migrate the volume in sourceControllerDeviceNumber.
	targetPoolId[#4]	The target DP pool number. This item is optional. To create and migrate a DP volume, specify the number of the migration target pool in the following format: DP *x* or DP*x* (*x*: 0 to 127)

#1

Specify each item once at the beginning of a candidate migration plan.

#2

Specify the information for all migration source volumes that belong to the specified migration group.

#3

No migration source volume or migration target volume can be specified redundantly in different combinations.

#4

If you want to specify a storage tier created by using a pool filter condition and do not want to migrate the volume in sourceControllerDeviceNumber, specify NotMigrate for targetControllerDeviceNumber and delete the targetPoolId line.

This command does not reserve volume migration for migration source and target volumes.

Volumes specified for tasks that have not ended (whose status is not End) cannot be selected as migration target volumes, because volume migration has been reserved for such volumes.

Candidate migration plans cannot be created in storage domains whose refresh status is either Processing or Failure.

You can use the GetTasks command to check the status of tasks.

You cannot create a candidate migration plan for a storage domain that requires a refresh.

If you execute a command for a storage domain that requires a refresh, command execution will fail.

Even if you migrate volumes, the labels set to the volumes and resource groups will not be switched. If you want to change these labels or resource groups along with migration, do so after the migration completes.

Syntax

```
htsmcli [server-location] CreateMigrationPlan
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
storagedomainname=storage-domain-name
migrationgroupname=migration-group-name
targetstoragetiername=target-storage-tier-name
[ filtercondition=filter-condition ]
```

Parameters

Table 4-35 Parameters of the CreateMigrationPlan Command

Parameter Name	Optional or Required	Description
storagedomainname	Required	Specify the name of the storage domain.
migrationgroupname	Required	Specify the name of the migration group.
targetstoragetiername	Required	Specify the name of the storage tier (migration target storage tier name) to which migration is to be performed. For the conditions that must be satisfied for setting the migration target storage tier as a DP pool by specifying a storage tier created according to pool filter conditions, see the *Hitachi Tiered Storage Manager User's Guide*.
filtercondition	Optional	Specify a volume filter condition. For details about specifiable properties, see Table 4-36. If this parameter is omitted, output information will not be filtered by filter conditions. If a storage tier that was created by using a pool filter condition is specified for the parameter targetstoragetiername, this parameter cannot be specified.

Table 4-36 Properties Specifiable for the filtercondition Parameter (Volume) (CreateMigrationPlan)

Property Name	Operators	Description
SubsystemModel#	=, <>	The model name of the storage subsystem
SubsystemDisplayModel	=, <>	The name used for displaying the model of the storage subsystem. This name is displayArrayType of Device Manager (not arrayType). Example: Lightning_9980V
SubsystemSerialNumber	=, <>, startsWith, contains	The serial number of the storage subsystem
SubsystemName	=, <>	The name of the storage subsystem
SubsystemVendor	=, <>	The name of the storage subsystem vendor
ControllerDeviceNumber	=	The controller LDEV number
Host	=, <>, startsWith, contains	The name of the host
ArrayGroup	=, <>, startsWith, contains	The name of the array group
DynamicProvisioning	=, <>	The volume type
Capacity	<, <=, =, <>, >, >=	The volume capacity
ConsumedCapacity	<, <=, =, <>, >, >=	The used capacity of the volume
ConsumedCapacityPercentage	<, <=, =, <>, >, >=	The percentage of the volume that is being used
RAIDLevel	=, <>	The RAID level
EmulationType	=, <>	The emulation type
DiskType	=, <>	The disk type
VolumeStatus	=	A character string indicating whether the volume is being used
VolumeLockStatus	=	A character string indicating the lock status of the volume
SLPRNumber	=, <>	The SLPR number
CLPRNumber	=, <>	The CLPR number
ControllerArrayGroup	=, <>, startsWith, contains	The name of the controller array group
ArrayGroupBusyRate	<, <=, =, <>, >, >=	The array group usage rate
ArrayGroupMaxBusyRate	<, <=, =, <>, >, >=	The maximum array group usage rate

Property Name	Operators	Description
SysplexidDevn	=, <>, startsWith, contains	SYSPLEXID and DEVN. This property is in the format *SYSPLEXID/DEVN*.
VOLSER	=, <>, startsWith, contains	Mainframe volume information (volume serial number) managed by the mainframe host
DiskRPM	<, <=, =, <>, >, >=	Disk speed (rpm)
DiskCapacityInGB	<, <=, =, <>, >, >=	Disk capacity
LogicalGroup	=, <>, startsWith, contains, endsWith	Name of the logical group This property compares the logical group name entered as a forward slash-delimited character string (delimiter: /) with the logical group name registered in Tiered Storage Manager (which does not have a forward slash).
PortHostStorageDomain	=, <>, startsWith, contains, endsWith	A port name and host storage domain name. This property compares the port name and host storage domain name entered in the format *port-name/host-storage-domain-name* with the port/host storage domain name registered in Tiered Storage Manager.
PVolMigrationGroup	=, <>	If the volume is a ShadowImage's S-VOL, this is the migration group name containing the corresponding P-VOL.
PVolMUNumber	=, <>	If the volume is a ShadowImage's S-VOL, this is the MU number of the corresponding P-VOL.
ShadowImage	=, <>	ShadowImage volume type
TrueCopyAsynchronous	=, <>	TrueCopy Asynchronous volume type
TrueCopySynchronous	=, <>	TrueCopy Synchronous volume type
UniversalReplicator	=, <>	Universal Replicator volume type
CopyOnWriteSnapshot	=, <>	Copy-On-Write Snapshot volume type
PoolId	=, <>	The pool number
CVS	=	Indicates whether or not the volume has the CVS attribute. This can be either Yes or No: ▪ Yes: With CVS attribute ▪ No: Without CVS attribute
Label	=, <>, startsWith, contains	Label specified for a representative LDEV
Encryption	=	The encryption setting

#

This property is for maintaining compatibility with older versions. When you specify new filter conditions, use SubsystemDisplayModel.

Output Items

Table 4-37 Items Output by the CreateMigrationPlan Command

Type of Information	Item Name	Description
Information about the overall plan	plan-type	The plan type
	format-version	The plan format version. This item is displayed for compatibility between different format versions.
	storageDomainName	The name of the storage domain
	migrationGroupName	The name of the migration group
	targetStorageTierName	The name of the migration target storage tier
	permitCrossSLPRMigration	Indicates whether migration is permitted for transferring volume data between SLPRs. This can be either Yes or No[#1]: ▪ Yes: permitted ▪ No: not permitted
	permitCrossCLPRMigration	Indicates whether migration is permitted for transferring volume data between CLPRs. This can be either Yes or No[#2]: ▪ Yes: permitted ▪ No: not permitted
Information about each volume pair for migration	pair	The symbol indicating the start of specification for a migration source volume and migration target volume
	sourceControllerDeviceNumber	The controller LDEV number of the migration source volume. The number is displayed in 0:00 or 00:00:00 format.
	targetControllerDeviceNumber	The controller LDEV number of the migration target volume. The number is displayed in 0:00 or 00:00:00 format. Nothing is displayed when a migration target volume cannot be selected. If the command cannot find some of the target volumes, the character string NotMigrate is displayed.
	targetPoolId	The target DP pool number. This item is automatically displayed when the migration target is a DP pool. (That is when the storage tier created according to the pool filter conditions for the targetstoragetiername parameter is specified.) If you create a migration plan by specifying volume filter conditions, this line will not be displayed If the migration target for the migration source volume cannot be set to a pool volume, or if there is no pool volume that can be specified as a migration target, nothing is output.

#1

This is set to No when the CreateMigrationPlan command creates a candidate migration plan.

#2

This is set to Yes when the CreateMigrationPlan command creates a candidate migration plan. Even if No is set for this item, the migration plan will be executed in the same way as when Yes is set.

Table 4-38 Items Output by the CreateMigrationPlan Command (Comment Line)

Type of Information	Item Name	Description
Comment lines for the LDEV selection rules[#1]	arrayGroupSelectionRule	Information about the array group selection rule is displayed among the LDEV selection rules.
	arrayGroupAvoidanceOfMigrationGroups	Information about the array group avoidance rule is displayed among the LDEV selection rules.
Migration profile information[#2]	configuration	Groups the volumes based on the emulation type, capacity[#3], and CVS attribute[#4] (configuration). These items are separated by a comma and single-byte space.
	numberOfNeededVolumes	The number of volumes necessary for executing a migration task, from among the volumes grouped in configuration within the storage tier
	numberOfAvailableVolumes	The number of volumes that can be used to execute a migration task, from among the volumes grouped in configuration within the storage tier. The number enclosed in parentheses indicates the number of volumes with the same capacity as the migration source volume.
	numberOfDifference	The number obtained by subtracting numberOfNeededVolumes from numberOfAvailableVolumes. The number enclosed in parentheses indicates the number obtained by subtracting the number of volumes in numberOfNeededVolumes from the number in parentheses in numberOfAvailableVolumes.
Pairs consisting of a migration source volume and migration target volume[#5]	LUSE	The LUSE attribute
	LU	The LU device number
	emulationType	The emulation type
	CVS	The CVS volume attribute of the volume. This can be either Yes or No.
	capacityInKB	The capacity of the volume (units: KB)
	LBA	The volume capacity in blocks
	SLPRNumber	The SLPR number
	CLPRNumber	The CLPR number
	cacheMode	The cache mode
	IOSuppressionMode	The IO suppression mode

Type of Information	Item Name	Description
Information about volumes that are migration target candidates[#6]	Volumes specified as migration target volumes (candidate volumes) and the controller logical device numbers of the corresponding migration source volumes	Joined by hyphens when displayed in the #Target candidates for source LDEV line. Volumes that are available as the migration source volume for the migration target volume are displayed and separated by commas. **Reference:** There are two types of information for the #Target candidates for source LDEV line, depending on the Tiered Storage Manager server settings. One type is migration target volumes that have the same capacity as the migration source volume, and the other is migration target volumes that have larger capacities than the migration source volume. One or both of these types are displayed. If both types are displayed, they are output in the following order: 1. Migration target volumes that have the same capacity as the migration source volume 2. Migration target volumes that have larger capacities than the migration source volume For a mixed display example, refer to *Example (2)*.
	emulationType	The emulation type
	CVS	The CVS volume attribute of the volume. This can be either Yes or No.
	capacityInKB	The capacity of the migration target volume (units: KB)
	LBA	The volume capacity in blocks
	subsystem	The model name of the storage subsystem
	SLPRNumber	The SLPR number
	CLPRNumber	The CLPR number
	arrayGroupName	The array group name of the LDEV
	diskType	The disk type When using Universal Volume Manager on Universal Storage Platform V/VM (microcode version 60-03-00-xx/xx or earlier) or Hitachi USP storage, the volumes to which SSD drives in Hitachi AMS2000 storage are externally connected will be displayed as SAS.
	RAIDLevel	The RAID level For an SMI-S Enabled subsystem, only RAID*x* of RAID*x*(*y*D+*z*P) is displayed.
	cacheMode	The cache mode
	IOSuppressionMode	The I/O suppression mode
	dynamicProvisioning	The volume type. This can be any of the following: ▪ -: Normal volumes ▪ DP-VOL: DP volumes ▪ DP-Pool-VOL: DP pool volumes
	arrayGroupBusyRate	The array group usage (%). Up to 2 decimal places are displayed.

Type of Information	Item Name	Description
	arrayGroupMaxBusyRate	The maximum value of the array group usage (%). Up to 2 decimal places are displayed.
	targetControllerDeviceNumber	The controller logical device number of the migration target volume. Multiple lines are displayed for a volume when multiple volumes are available as the migration target volume candidate. Volumes that are available as the migration target volume include volumes that have larger capacities than the migration source volume (and need to be re-created).#7 The first candidate volume displays the controller logical device number followed by an asterisk (*) and the controller logical device number of the migration source volume in parentheses.

#1

Displayed before the `# Begin Profile Information` line

#2

Displayed between the `# Begin Profile Information` and `# End Profile Information` lines

#3

The value in KB is displayed in parentheses in addition to the value in TB, GB, MB, or KB. The value is displayed to two decimal places for TB or GB and as an integer for MB or KB.

#4

When the emulation type is `OPEN-V`, the CVS attribute is not displayed. When the emulation type is other than `OPEN-V` and the LDEV type is the CSV attribute, `CVS` is displayed. When the emulation type is not `OPEN-V` and the LDEV type is not the CSV attribute, `nonCVS` is displayed.

#5

Information such as the attributes, capacity, and location of the migration source volumes are displayed after the `pair` line (before the lines that display the pair consisting of the migration source volume and migration target volume).

#6

The items to be output and their order might differ depending on the version of the Tiered Storage Manager server.

#7

If you do not want to display the volumes that have larger capacities than the migration source volume as candidate volumes, specify `0` for the `server.migrationPlan.candidateCapacityGroupDisplayMaxCount` key in the `server.properties` file. For details about the `server.properties` properties file, see the *Hitachi Tiered Storage Manager Server Configuration and Operation Guide*.

Example and Execution Results

- ***Example (1)***: In this example, a candidate migration plan is created for when each volume in the `MG011` migration group is migrated to the `MegaTech-HighCost` storage tier, in the `MegaTechUSP600-Primary` storage domain.

```
htsmcli CreateMigrationPlan storagedomainname="MegaTechUSP600-Primary"
migrationgroupname="MG011" targetstoragetiername="MegaTech-HighCost"
```

- ***Output (1)***: If all of the migration target volumes (candidate volumes) have the same capacities as their migration source volumes:

```
#Example plan for migration
plan-type=Migration
format-version=1.0
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
targetStorageTierName=MegaTech-HighCost
permitCrossSLPRMigration=No
permitCrossCLPRMigration=Yes
# arrayGroupSelectionRule=MinimumCoverage
# arrayGroupAvoidanceOfMigrationGroups=MG012,MG013

# Begin Profile Information
#   List of 2 Profile elements:
#     An instance of Profile(1 of 2)
#       configuration=Open-V, 4.97GB(5,211,422KB)
#       numberOfNeededVolumes=2
#       numberOfAvailableVolumes=20(20)
#       numberOfDifference=18(18)
#     An instance of Profile(2 of 2)
#       configuration=Open-9, 9GB(9,437,184KB), CVS
#       numberOfNeededVolumes=5
#       numberOfAvailableVolumes=3(3)
#       numberOfDifference=-2(-2)
# End Profile Information

    pair
#     LUSE=No
#     LU=3:A6
#     emulationType=OPEN-V
#     CVS=Yes
#     capacityInKB=10,240,320
#     LBA=20,480,640
#     SLPRNumber=0
#     CLPRNumber=0
#     cacheMode=Disable
#     IOSuppressionMode=Disable
      sourceControllerDeviceNumber=3:A6
      targetControllerDeviceNumber=2:80

    pair
#     LUSE=No
#     LU=3:A7
#     emulationType=OPEN-V
```

```
#     CVS=Yes
#     capacityInKB=10,240,320
#     LBA=20,480,640
#     SLPRNumber=0
#     CLPRNumber=0
#     cacheMode=Disable
#     IOSuppressionMode=Disable
      sourceControllerDeviceNumber=3:A7
      targetControllerDeviceNumber=2:84

#   Target candidates for source LDEV - 3:A6, 3:A7
#     emulationType=OPEN-V
#     CVS=Yes
#     capacityInKB=10,240,320
#     LBA=20,480,640
#     subsystem=USP#14011
#     SLPRNumber=0
#     CLPRNumber=0
#     arrayGroupName=1-10-1
#     diskType=FC
#     RAIDLevel=RAID5(3D+1P)
#     cacheMode=Disable
#     IOSuppressionMode=Disable
#     dynamicProvisioning=-
#     arrayGroupBusyRate=50.00
#     arrayGroupMaxBusyRate=60.73
#     targetControllerDeviceNumber=2:80 * (3:A6)
#     targetControllerDeviceNumber=2:84 * (3:A7)
#     targetControllerDeviceNumber=2:85
#     targetControllerDeviceNumber=2:86
#     targetControllerDeviceNumber=2:87
#     targetControllerDeviceNumber=2:89
#     targetControllerDeviceNumber=2:8A
#     targetControllerDeviceNumber=2:8C
#     targetControllerDeviceNumber=2:8F
#     targetControllerDeviceNumber=2:91
#     targetControllerDeviceNumber=2:92
#     targetControllerDeviceNumber=2:95
#     targetControllerDeviceNumber=2:99
#     targetControllerDeviceNumber=2:9E
#     targetControllerDeviceNumber=2:9F
#     targetControllerDeviceNumber=2:A0
#     targetControllerDeviceNumber=2:A3
#     targetControllerDeviceNumber=2:A4
#     targetControllerDeviceNumber=2:A5
#     targetControllerDeviceNumber=2:A6
#     targetControllerDeviceNumber=2:A7
```

- ***Example (2)***: In this example, a candidate migration plan is created for when each volume in the `MG001` migration group is migrated to the `MegaTech-HighCost` storage tier, in the `MegaTechUSP600-Primary` storage domain.

```
htsmcli CreateMigrationPlan storagedomainname="MegaTechUSP600-Primary"
migrationgroupname="MG001" targetstoragetiername="MegaTech-HighCost"
```

- ***Output (2):*** If the migration target volumes (candidate volumes) include candidate volumes with the same capacities as their migration source volumes as well as candidate volumes with larger capacities than their migration source volumes:

```
#Example plan for migration
plan-type=Migration
format-version=1.0
storageDomainName=MegaTechUSP600-Primary
```

```
migrationGroupName=MG001
targetStorageTierName=MegaTech-HighCost
permitCrossSLPRMigration=No
permitCrossCLPRMigration=Yes
# arrayGroupSelectionRule=BalanceCapacity
# arrayGroupAvoidanceOfMigrationGroups=

# Begin Profile Information
#   List of 1 Profile elements:
#     An instance of Profile(1 of 1)
#       configuration=OPEN-V, 9.76 GB(10,240,320 KB, 20,480,640 Blocks)
#       numberOfNeededVolumes=2
#       numberOfAvailableVolumes=9(4)
#       numberOfDifference=7(2)
# End Profile Information

    pair
#     LUSE=No
#     LU=00:0A:00
#     emulationType=OPEN-V
#     CVS=Yes
#     capacityInKB=10,240,320
#     LBA=20,480,640
#     SLPRNumber=0
#     CLPRNumber=0
#     cacheMode=Unknown
#     IOSuppressionMode=Unknown
      sourceControllerDeviceNumber=00:0A:00
      targetControllerDeviceNumber=00:0A:09

    pair
#     LUSE=No
#     LU=00:0A:02
#     emulationType=OPEN-V
#     CVS=Yes
#     capacityInKB=10,240,320
#     LBA=20,480,640
#     SLPRNumber=0
#     CLPRNumber=0
#     cacheMode=Unknown
#     IOSuppressionMode=Unknown
      sourceControllerDeviceNumber=00:0A:02
      targetControllerDeviceNumber=00:0A:0C

#   Target candidates for source LDEV - 00:0A:00, 00:0A:02
#     emulationType=OPEN-V
#     CVS=Yes
#     capacityInKB=10,240,320
#     LBA=20,480,640
#     subsystem=USP_V@172.16.110.1
#     SLPRNumber=0
#     CLPRNumber=0
#     arrayGroupName=1-6-1
#     diskType=-
#     RAIDLevel=RAID5(3D+1P)
#     cacheMode=Unknown
#     IOSuppressionMode=Unknown
#     dynamicProvisioning=-
#     arrayGroupBusyRate=
#     arrayGroupMaxBusyRate=
#     targetControllerDeviceNumber=00:0A:09 * (00:0A:00)
#     targetControllerDeviceNumber=00:0A:0C * (00:0A:02)
#     targetControllerDeviceNumber=00:0A:12
#     targetControllerDeviceNumber=00:0A:1E

#   Target candidates for source LDEV - 00:0A:00, 00:0A:02
```

```
#     emulationType=OPEN-V
#     CVS=Yes
#     capacityInKB=10,486,080
#     LBA=20,972,160
#     subsystem=USP_V@172.16.110.1
#     SLPRNumber=0
#     CLPRNumber=0
#     arrayGroupName=1-4-1
#     diskType=-
#     RAIDLevel=RAID5(3D+1P)
#     cacheMode=Unknown
#     IOSuppressionMode=Unknown
#     dynamicProvisioning=-
#     arrayGroupBusyRate=
#     arrayGroupMaxBusyRate=
#     targetControllerDeviceNumber=00:07:F3
#     targetControllerDeviceNumber=00:07:F4
#     targetControllerDeviceNumber=00:07:F5
#     targetControllerDeviceNumber=00:07:F6
#     targetControllerDeviceNumber=00:07:F9
```

- ***Example (3)***: This example uses the same conditions as those used for Example (1) to create a candidate migration plan, except that the capacities of some migration target volumes are larger than those of their migration source volumes.

```
htsmcli CreateMigrationPlan storagedomainname="MegaTechUSP600-Primary"
migrationgroupname="MG011" targetstoragetiername="MegaTech-HighCost"
```

- ***Output (3)***:

```
#Example plan for migration
plan-type=Migration
format-version=1.0
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
targetStorageTierName=MegaTech-HighCost
permitCrossSLPRMigration=No
permitCrossCLPRMigration=Yes
# arrayGroupSelectionRule=BalanceCapacity
# arrayGroupAvoidanceOfMigrationGroups=

# Begin Profile Information
#   List of 2 Profile elements:
#     An instance of Profile(1 of 2)
#       configuration=OPEN-V, 1,000 MB(1,024,320 KB, 2,048,640 Blocks)
#       numberOfNeededVolumes=1
#       numberOfAvailableVolumes=4(0)
#       numberOfDifference=3(-1)
#     An instance of Profile(2 of 2)
#       configuration=OPEN-V, 9.76 GB(10,240,320 KB, 20,480,640 Blocks)
#       numberOfNeededVolumes=1
#       numberOfAvailableVolumes=4(4)
#       numberOfDifference=3(3)
# End Profile Information

    pair
#     LUSE=No
#     LU=00:00:0E
#     emulationType=OPEN-V
#     CVS=Yes
#     capacityInKB=1,024,320
#     LBA=2,048,640
#     SLPRNumber=0
#     CLPRNumber=0
```

```
#      cacheMode=Unknown
#      IOSuppressionMode=Unknown
       sourceControllerDeviceNumber=00:00:0E
       targetControllerDeviceNumber=00:0A:09

     pair
#      LUSE=No
#      LU=00:0A:00
#      emulationType=OPEN-V
#      CVS=Yes
#      capacityInKB=10,240,320
#      LBA=20,480,640
#      SLPRNumber=0
#      CLPRNumber=0
#      cacheMode=Unknown
#      IOSuppressionMode=Unknown
       sourceControllerDeviceNumber=00:0A:00
       targetControllerDeviceNumber=00:0A:02

#    Target candidates for source LDEV - 00:0A:00
#      emulationType=OPEN-V
#      CVS=Yes
#      capacityInKB=10,240,320
#      LBA=20,480,640
#      subsystem=USP_V@172.16.110.1
#      SLPRNumber=0
#      CLPRNumber=0
#      arrayGroupName=1-6-1
#      diskType=-
#      RAIDLevel=RAID5(3D+1P)
#      cacheMode=Unknown
#      IOSuppressionMode=Unknown
#      dynamicProvisioning=-
#      arrayGroupBusyRate=
#      arrayGroupMaxBusyRate=
#      targetControllerDeviceNumber=00:0A:02 * (00:0A:00)
#      targetControllerDeviceNumber=00:0A:09 * (00:00:0E)

#    Target candidates for source LDEV - 00:00:0E
#      emulationType=OPEN-V
#      CVS=Yes
#      capacityInKB=10,240,320
#      LBA=20,480,640
#      subsystem=USP_V@172.16.110.1
#      SLPRNumber=0
#      CLPRNumber=0
#      arrayGroupName=1-6-1
#      diskType=-
#      RAIDLevel=RAID5(3D+1P)
#      cacheMode=Unknown
#      IOSuppressionMode=Unknown
#      dynamicProvisioning=-
#      arrayGroupBusyRate=
#      arrayGroupMaxBusyRate=
#      targetControllerDeviceNumber=00:0A:02 * (00:0A:00)
#      targetControllerDeviceNumber=00:0A:09 * (00:00:0E)

KATS10624-W The candidate migration plan contains at least one target volume that has a
larger capacity than its corresponding source volume. This target volume(s) will be
resized to match its corresponding source volume(s), freeing the excess capacity.
```

Note: If both of the conditions that *some of the migration target volumes could not be found* and *some of the migration target volumes are larger than their migration source volumes* are satisfied, the message KATS10602-W and the message KATS10624-W, which are the warning messages for the respective conditions, are both output. In this case, the message KATS10624-W is output before the message KATS10602-W.

- ***Example (4)***: This example uses the same conditions as those used for Example (1) to create a candidate migration plan. In this example, some of the migration target volumes cannot be found.

```
htsmcli CreateMigrationPlan storagedomainname="MegaTechUSP600-Primary"
migrationgroupname="MG011" targetstoragetiername="MegaTech-HighCost"
```

- ***Output (4)***:

```
#Example plan for migration
plan-type=Migration
format-version=1.0
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
targetStorageTierName=MegaTech-HighCost
permitCrossSLPRMigration=No
permitCrossCLPRMigration=Yes
# arrayGroupSelectionRule=MinimumCoverage
# arrayGroupAvoidanceOfMigrationGroups=MG012,MG013

# Begin Profile Information
#   List of 2 Profile elements:
#     An instance of Profile(1 of 2)
#       configuration=Open-V,4.97GB
#       numberOfNeededVolumes=2
#       numberOfAvailableVolumes=20(20)
#       numberOfDifference=18(18)
#     An instance of Profile(2 of 2)
#       configuration=Open-9, 9GB, CVS
#       numberOfNeededVolumes=5
#       numberOfAvailableVolumes=3(3)
#       numberOfDifference=-2(-2)
# End Profile Information

    pair
#     LUSE=No
#     LU=0:E7
#     emulationType=OPEN-9
#     CVS=No
#     capacityInKB=7,211,520
#     LBA=14,423,040
#     SLPRNumber=0
#     CLPRNumber=0
#     cacheMode=Disable
#     IOSuppressionMode=Disable
      sourceControllerDeviceNumber=0:E7
      targetControllerDeviceNumber=NotMigrate

    pair
#     LUSE=No
#     LU=3:A6
#     emulationType=OPEN-V
#     CVS=Yes
#     capacityInKB=10,240,320
#     LBA=20,480,640
```

```
#     SLPRNumber=0
#     CLPRNumber=0
#     cacheMode=Disable
#     IOSuppressionMode=Disable
      sourceControllerDeviceNumber=3:A6
      targetControllerDeviceNumber=2:80

    pair
#     LUSE=No
#     LU=3:A7
#     emulationType=OPEN-V
#     CVS=Yes
#     capacityInKB=10,240,320
#     LBA=20,480,640
#     SLPRNumber=0
#     CLPRNumber=0
#     cacheMode=Disable
#     IOSuppressionMode=Disable
      sourceControllerDeviceNumber=3:A7
      targetControllerDeviceNumber=2:84

#   Target candidates for source LDEV - 3:A7, 3:A6
#     emulationType=OPEN-V
#     CVS=Yes
#     capacityInKB=10,240,320
#     LBA=20,480,640
#     subsystem=USP#14011
#     SLPRNumber=0
#     CLPRNumber=0
#     arrayGroupName=1-10-1
#     diskType=FC
#     RAIDLevel=RAID5(3D+1P)
#     cacheMode=Disable
#     IOSuppressionMode=Disable
#     dynamicProvisioning=-
#     arrayGroupBusyRate=50.00
#     arrayGroupMaxBusyRate=60.73
#     targetControllerDeviceNumber=2:80 * (3:A6)
#     targetControllerDeviceNumber=2:84 * (3:A7)
#     targetControllerDeviceNumber=2:85
#     targetControllerDeviceNumber=2:86
#     targetControllerDeviceNumber=2:87
#     targetControllerDeviceNumber=2:89
#     targetControllerDeviceNumber=2:8A
#     targetControllerDeviceNumber=2:8C
#     targetControllerDeviceNumber=2:8F
#     targetControllerDeviceNumber=2:91
#     targetControllerDeviceNumber=2:92
#     targetControllerDeviceNumber=2:95
#     targetControllerDeviceNumber=2:99
#     targetControllerDeviceNumber=2:9E
#     targetControllerDeviceNumber=2:9F
#     targetControllerDeviceNumber=2:A0
#     targetControllerDeviceNumber=2:A3
#     targetControllerDeviceNumber=2:A4
#     targetControllerDeviceNumber=2:A5
#     targetControllerDeviceNumber=2:A6
#     targetControllerDeviceNumber=2:A7

KATS10602-W The candidate migration plan includes a volume that should not be migrated.
Check the migration plan, and then create a migration task.
```

- ***Example (5):*** This example uses the same conditions as those used for Example (1) to create a candidate migration plan. In this example, a storage tier created by using pool filter conditions is specified as the target storage tier.

```
htsmcli CreateMigrationPlan storagedomainname="MegaTechUSP600-Primary"
migrationgroupname="MG011" targetstoragetiername="MegaTech-HighCost"
```

- ***Output (5):***

```
#Example plan for migration
plan-type=Migration
format-version=1.0
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
targetStorageTierName=MegaTech-HighCost
permitCrossSLPRMigration=No
permitCrossCLPRMigration=Yes
# arrayGroupSelectionRule=MinimumCoverage
# arrayGroupAvoidanceOfMigrationGroups=MG012,MG013

# Begin Profile Information
#   List of 1 Profile elements:
#     An instance of Profile(1 of 2)
#       configuration=Open-V,4.97GB
#       numberOfNeededVolumes=2
#       numberOfAvailableVolumes=20(20)
#       numberOfDifference=18(18)
#     An instance of Profile(2 of 2)
#       configuration=Open-9, 9GB, CVS
#       numberOfNeededVolumes=5
#       numberOfAvailableVolumes=3(3)
#       numberOfDifference=-2(-2)
# End Profile Information

    pair
#     LUSE=No
#     LU=0:E7
#     emulationType=OPEN-9
#     CVS=No
#     capacityInKB=7,211,520
#     LBA=14,423,040
#     SLPRNumber=0
#     CLPRNumber=0
#     cacheMode=Disable
#     IOSuppressionMode=Disable
      sourceControllerDeviceNumber=0:E7
      targetControllerDeviceNumber=
      targetPoolId=DP 1
```

- ***Example (6):*** In this example, the `CreateMigrationPlan` command is executed on `MegaTechUSP600-Primary`, which is a storage domain that requires a refresh:

```
htsmcli CreateMigrationPlan storagedomainname="MegaTechUSP600-Primary"
migrationgroupname="MG011" targetstoragetiername="MegaTech-HighCost"
```

- ***Output (6):***

```
KATS50209-E An attempt to create the migration plan has failed.
KATS50906-E The storage domain information is not up-to-date. Refresh the storage
domain, make sure the Device Manager information about volumes to be migrated matches
the Tiered Storage Manager information, and then retry the operation. storage domain
name : MegaTechUSP600-Primary
```

CreateMigrationTask

The `CreateMigrationTask` command can be used to create a migration task to perform migration using the specified migration plan.

If any of the following conditions exists, you cannot create a migration task:

- When the refresh status of the storage domain is `Processing` or `Failure`
- When a refresh is required for the storage domain
- When, among the migration source volumes or migration target volumes, there is a volume included in a task that has not ended (`End`), or only volumes that cannot be migrated have been included
- The migration group specified for the `migrationgroupname` parameter at the creation of a task is specified for the `migrationgroupname` or `movetomigrationgroupname` parameter in a task that has not ended (`End`)
- When you attempt to create a migration task by using a migration plan in which `NotMigrate` is specified for all the migration target volumes

When the `--execute` option is specified for the created migration task, the task is executed immediately. If this option is not specified, the task is put in `Standby` status, and can subsequently be executed by using the `ExecuteTask` command.

Migration tasks are executed by requests to the Tiered Storage Manager server. Actual volume migration is performed asynchronously to this command.

Once a migration task has been created, none of the following operations can be performed:

- Changing or deleting the storage domain
- Changing or deleting a migration group that will be migrated
- Changing or deleting the specified storage tier

When processing for the Tiered Storage Manager server to receive an execution request fails after a migration task has been created, the error message `KATS50213-E` appears. In such a case, resolve the server failure, and then use the `ExecuteTask` command to execute the task.

Even if you migrate volumes, the labels set to the volumes and resource groups will not be switched. If you want to change these labels or resource groups along with migration, do so after the migration task is executed.

You can specify whether the data on the migration source volume should be erased after migration terminates normally (the erasedata parameter) and whether the unused space on the migration target volume should be released (the zerodatadiscard parameter). When the zero data discard function is performed, the free capacity of the pool can be increased by releasing unused pages in virtual volumes.

If you specify that the data in the migration source volume is to be erased, before executing the CreateMigrationTask command, make sure that data erasure software (Volume Shredder) has been installed on your storage subsystem. If you specify that the data is to be erased on a storage subsystem in which Volume Shredder is not installed, and then execute the CreateMigrationTask command, the error message KATS50315-E will be displayed. If Volume Shredder has not been installed on the storage subsystem, perform either of the following operations so that the CreateMigrationTask command is not set to erase the data in the migration source volume, and then execute the command:

- Specify No for the erasedata parameter.
- Omit the erasedata parameter, and specify parameter.erasedata=No in the htsmcli.properties file. (Even if server.migration.dataErase.defaultValue=true is specified in the server.properties file, the setting in the htsmcli.properties file is given priority.)
- Omit the erasedata parameter, and specify server.migration.dataErase.defaultValue=false in the server.properties properties file while parameter.erasedata is not specified in the htsmcli.properties file.

  For details about the server.properties file, see the *Hitachi Tiered Storage Manager Server Configuration and Operation Guide*.

Note:

- The default value of the server.migration.dataErase.defaultValue key is false (do not delete). In order to prevent inappropriate information disclosure, it is recommended that you delete the data on the migration source volume after migration.
- During the execution of a migration in which a volume is re-created, if an error occurs during the processing or the processing stops in the middle, the migration target volume might remain deleted. Check the output message, and then manually create the volume.

Syntax

```
htsmcli [server-location] CreateMigrationTask
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
```

```
[ { -e | --execute } ]
migrationplan=migration-plan-file-name
[ erasedata={ Yes | No } ]
[ zerodatadiscard ={ Yes | No } ]
[ notifytourl=event-notification-address ]
[ description=task-description ]
```

Options

Table 4-39 Options of the CreateMigrationTask Command

Option Name	Option Arguments	Optional or Required	Description
-e or --execute	None	Optional	Specify this to immediately execute the created migration task. If this is omitted, the migration task is placed in Standby status.

Parameters

Table 4-40 Parameters of the CreateMigrationTask Command

Parameter Name	Optional or Required	Description
migrationplan	Required	Specify the name of the migration plan file. Specify it as an absolute path or relative path from the command execution directory.
erasedata	Optional	Specify whether the data for the migration source volume is to be deleted once after migration terminates normally. This can be either Yes or No: ▪ Yes: Delete the data ▪ No: Do not delete the data The default value differs depending on the value of the server.migration.dataErase.defaultValue key in the server.properties file, and the value of parameter.erasedata in the htsmcli.properties file. The settings in the htsmcli.properties file takes precedence over the settings in the server.properties file.
zerodatadiscard	Optional	Specify whether the unused space in the migration target volume is to be released after migration terminates normally. ▪ Yes: Release the unused space. (Default) ▪ No: Do not release the unused space. To enable this parameter specification, the following conditions must be satisfied: ▪ The migration target volume is either a DP volume or DP pool. ▪ The migration source volume is not a volume that is part of a ShadowImage or Copy-on-Write Snapshot pair. ▪ The microcode version of Universal Storage Platform V/VM is 60-07-00-*xx*/*xx* or later. If the above conditions are not satisfied, even if Yes is specified for this parameter, the unused space is not released, and no message will be output.

Parameter Name	Optional or Required	Description
notifytourl	Optional	Specify the address to be notified when the event occurs.
description	Optional	Specify a description of the migration task.

Output Items

Table 4-41 Items Output by the CreateMigrationTask Command

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (Migration)
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.WaitingMigration (waiting for migration) ▪ Success ▪ Unknown (status other than the above)
	timeEstimate	The estimated time for the task execution. If you specify the erasedata parameter during task creation, and then execute the task, this value will include the time to delete data. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.
	creationTime	The date and time when the task was created
	endTime	The date and time when task execution ended
	ownerID	The user ID of the user who created the task
	storageDomainName	The name of the storage domain
	migrationGroupName	The name of the migration group
	previousTargetStorageTierName	The name of the migration target storage tier for the previous migration. If migration has not been performed before, nothing is displayed.
	targetStorageTierName	The name of the migration target storage tier
	eraseData	Indicates whether the data for the migration source volume is to be deleted once after migration terminates normally.

Type of Information	Item Name	Description
	zeroDataDiscard	Indicates whether the unused space in the migration target volume is to be released after migration terminates normally. Even if Yes is specified for the zerodatadiscard parameter, No is displayed if the conditions for the zero data discard function are not satisfied. For details about the conditions for the zero data discard function, see the zerodatadiscard parameter in Table 4-40.
	notifyToURL	Event notification address
	description	The task description
Information about the migration volumes	sourceControllerDeviceNumber	The controller LDEV number of the migration source volume. The number is displayed in 0:00 or 00:00:00 format.
	targetControllerDeviceNumber	The controller LDEV number of the migration target volume. The number is displayed in 0:00 or 00:00:00 format.
	timeEstimate	The estimated time for task execution for each volume. If you specify the erasedata parameter during task creation, and then execute the task, this value will include the time to delete data. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.

Example and Execution Results

- ***Example (1):*** In this example, a text file named D:\tmp\plan.txt that contains a migration plan is read to create a migration task.

```
htsmcli CreateMigrationTask migrationplan="D:\\tmp\\plan.txt" erasedata="No"
```

- ***Output (1)*:**

```
RESPONSE:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Migration
status=Standby
timeEstimate=0:02:02
creationTime=2008/03/25 16:53:11
endTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
previousTargetStorageTierName=
targetStorageTierName=MegaTech-HighCost
eraseData=No
zeroDataDiscard=Yes
notifyToURL=
description=
List of 2 MigrationInfo elements:
An instance of MigrationInfo(1 of 2)
sourceControllerDeviceNumber=3:A6
targetControllerDeviceNumber=2:80
timeEstimate=0:01:01
An instance of MigrationInfo(2 of 2)
sourceControllerDeviceNumber=3:A7
targetControllerDeviceNumber=2:84
timeEstimate=0:01:01
```

- ***Example (2):*** In this example, the storage domain `MegaTechUSP600-Primary` that needs to be refreshed is specified and the `CreateMigrationTask` command is executed.

```
htsmcli CreateMigrationTask migrationplan="D:\\tmp\\plan.txt" erasedata="No"
```

- ***Output (2)*:**

```
KATS50204-E An attempt to register the migration task has failed.
KATS50906-E The storage domain information is not up-to-date. Refresh the storage
domain, make sure the Device Manager information about volumes to be migrated matches
the Tiered Storage Manager information, and then retry the operation. storage domain
name : (MegaTechUSP600-Primary)
```

CreateLockingTask

The `CreateLockingTask` command creates a locking task that locks volumes in order to write-protect (Read only) or read/write-protect (Protect) their data. Locking is performed for a migration group.

If the migration group contains volumes that cannot be locked (such as locked volumes), the task locks only those volumes that can be locked.

If any of the following conditions exists, you cannot create a locking task:

- When the refresh status of the storage domain is `Processing` or `Failure`
- When a refresh is required for the storage domain
- When there is no volume that can be locked in a migration group specified for the `migrationgroupname` parameter
- The migration group specified for the `migrationgroupname` parameter at the creation of a task is specified for the `migrationgroupname` or `movetomigrationgroupname` parameter in a task that has not ended (`End`)
- The migration group specified for the `movetomigrationgroupname` parameter at the creation of a task is specified for the `migrationgroupname` parameter in a task that has not ended (`End`)

When the `--execute` option is specified for a locking task, the created task is executed immediately. If this option is not specified, the task is put in `Standby` status and can be executed subsequently by the `ExecuteTask` command.

Locking tasks are executed by request to the Tiered Storage Manager server. Actual volume locking is performed asynchronously to this command.

Once a locking task has been created, none of the following operations can be performed:

- Changing or deleting the storage domain
- Changing or deleting a migration group that is to be locked
- Changing or deleting the target migration group

A locked period can be reset if Tiered Storage Manager is used to relock a volume for which no locked period has been set because the volume was locked by a program other than Tiered Storage Manager, such as Storage Navigator.

If processing at the Tiered Storage Manager server that receives the execution request fails after the locking task has been created, the KATS50213-E error message is generated. In such a case, resolve the server failure, and then use the ExecuteTask command to execute the task.

Syntax

```
htsmcli [server-location] CreateLockingTask
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-standard-output-redirect-file ]
[ { -f | --force } ]
[ { -e | --execute } ]
storagedomainname=storage-domain-name
migrationgroupname=migration-group-name
[ guardmode={ ReadOnly | Protect } ]
[ retentiondays=locked-period ]
[ movetomigrationgroupname=target-migration-group-name-after-locking ]
[ notifytourl=event-notification-address ]
[ description=task-description ]
```

Options

Table 4-42 Options of the CreateLockingTask Command

Option Name	Option Arguments	Optional or Required	Description
-f or --force	None	Optional	Specify this option to create a locking task without confirmation. If this option is omitted, it will be necessary to confirm task creation.
-e or --execute	None	Optional	Specify this option to execute the created locking task immediately. If this option is omitted, the locking task will be placed in Standby status.

Parameters

Table 4-43 Parameters of the CreateLockingTask Command

Parameter Name	Optional or Required	Description
storagedomainname	Required	Specify the name of the storage domain.
migrationgroupname	Required	Specify the name of the migration group.

Parameter Name	Optional or Required	Description
guardmode	Optional	Specify the locking method to be applied when the locking task is executed. You can specify either of the following Data Retention Utility's guard attributes: ▪ ReadOnly: Protected from write operations (default) ▪ Protect: Protected from read and write operations
retentiondays	Optional	Specify the number of days until the task can unlock the volume (the locked period). The default is 0. When -1 is specified, the locked period is set to be indefinite.
movetomigrationgroupname	Optional	Specify the name of the target migration group for a volume whose locking has been completed.
notifytourl	Optional	Specify the address to be notified when the event occurs.
description	Optional	Specify a description of the task.

Output Items

Table 4-44 Items Output by the CreateLockingTask Command

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (Locking)
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.Waiting (waiting for execution) ▪ Unknown (status other than the above)
	creationTime	The date and time when the task was created
	endTime	The date and time when task execution ended
	ownerID	The user ID of the user who created the task
	storageDomainName	The name of the storage domain
	migrationGroupName	The name of the migration group
	retentionDays	The locked period (in days). If there is no locking period, -1 (Unlimited) will be displayed.
	retainedThrough	The date the locked period expires. If there is no expiration date, Unlimited will be displayed.
	guardMode	The locking method to be applied when the locking task is executed. ▪ Read only: Protected from write operations ▪ Protect: Protected from read and write operations

Type of Information	Item Name	Description
	moveToMigrationGroupName	The target migration group name of a volume whose locking has been completed
	notifyToURL	Event notification address
	description	The description of the task
Information about the volume to be locked	controllerDeviceNumber	Controller logical device number of the volume. The number is displayed in 0:00 or 00:00:00 format.

Example and Execution Results

- ***Example (1)***: In this example, a locking task that locks volumes in read-only status for 365 days is created. Because this example does not specify the force option, a message asking whether or not the locking task is to be created is displayed. The message output destination is the standard error output.

```
htsmcli CreateLockingTask storagedomainname=MegaTechUSP600-Primary
migrationgroupname=MG011 guardmode=ReadOnly retentiondays=365
Are you sure you want to lock the migration group "MG011"? (Y/N) :
```

- ***Output (1):***

```
RESPONSE:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Locking
status=Standby
creationTime=2008/03/25 16:53:11
endTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
retentionDays=365
retainedThrough=
guardMode=Read only
moveToMigrationGroupName=
notifyToURL=mailto:test@example.com
description=
List of 2 LockingInfo elements
An instance of LockingInfo(1 of 2)
controllerDeviceNumber=3:A6
An instance of LockingInfo(2 of 2)
controllerDeviceNumber=3:A7
```

- ***Example (2)***: This example uses the same conditions as those used for Example (1) to create a locking task, except that the --force option is specified.

```
htsmcli CreateLockingTask --force storagedomainname=MegaTechUSP600-Primary
migrationgroupname=MG011 guardmode=ReadOnly retentiondays=365
```

- ***Output (2)***:

```
RESPONSE:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Locking
status=Standby
creationTime=2008/03/25 16:53:11
```

```
endTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
retentionDays=365
retainedThrough=
guardMode=Read only
moveToMigrationGroupName=
notifyToURL=mailto:test@example.com
description=
List of 2 LockingInfo elements
An instance of LockingInfo(1 of 2)
controllerDeviceNumber=3:A6
An instance of LockingInfo(2 of 2)
controllerDeviceNumber=3:A7
```

- ***Example (3)***: In this example, a locking task that locks volumes in read-only status indefinitely is created by specifying the `--force` option.

```
htsmcli CreateLockingTask --force storagedomainname=MegaTechUSP600-Primary
migrationgroupname=MG011 guardmode=ReadOnly retentiondays=-1
```

- ***Output (3)***:

```
RESPONSE:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Locking
status=Standby
creationTime=2008/03/25 16:53:11
endTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
retentionDays=-1(Unlimited)
retainedThrough=
guardMode=Read only
moveToMigrationGroupName=
notifyToURL=mailto:test@example.com
description=
List of 2 LockingInfo elements
An instance of LockingInfo(1 of 2)
controllerDeviceNumber=3:A6
An instance of LockingInfo(2 of 2)
controllerDeviceNumber=3:A7
```

- ***Example (4)***: In this example, the storage domain `MegaTechUSP600-Primary`, which requires a refresh, is specified as a parameter to execute the `CreateLockingTask` command:

```
htsmcli CreateLockingTask storagedomainname=MegaTechUSP600-Primary
migrationgroupname=MG011
```

- ***Output (4)***:

```
KATS50225-E An attempt to register the locking task has failed.
KATS50907-E The storage domain information is not up-to-date. Refresh the storage
domain. storage domain name : MegaTechUSP600-Primary
```

CreateUnlockingTask

The `CreateUnlockingTask` command can be used to create an unlocking task that unlocks volumes whose locked period has expired. Unlocking is performed for a migration group.

If the migration group contains volumes that cannot be unlocked, the task unlocks only those volumes that can be unlocked.

If any of the following conditions exists, you cannot create an unlocking task:

- When the refresh status of the storage domain is `Processing` or `Failure`
- When a refresh is required for the storage domain
- When there is no volume that can be unlocked in a migration group specified for the `migrationgroupname` parameter
- The migration group specified for the `migrationgroupname` parameter at the creation of a task is specified for the `migrationgroupname` or `movetomigrationgroupname` parameter in a task that has not ended (`End`)
- The migration group specified for the `movetomigrationgroupname` parameter at the creation of a task is specified for the `migrationgroupname` parameter in a task that has not ended (`End`)

When the `--execute` option is specified for an unlocking task, the created task is executed immediately. If this option is not specified, the task is put in `Standby` status and can be executed subsequently by the `ExecuteTask` command.

Unlocking tasks are executed by request to the Tiered Storage Manager server. Actual volume unlocking is performed asynchronously to this command.

Once an unlocking task has been created, none of the following operations can be performed:

- Changing or deleting the storage domain
- Changing or deleting a migration group that is to be unlocked
- Changing or deleting the target migration group

If processing at the Tiered Storage Manager server that receives an execution request fails after the unlocking task has been created, the `KATS50213-E` error message is generated. In such a case, resolve the server failure, and then use the `ExecuteTask` command to execute the task.

Syntax

```
htsmcli [server-location] CreateUnlockingTask
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-standard-output-redirect-file ]
[ { -e | --execute } ]
storagedomainname=storage-domain-name
migrationgroupname=migration-group-name
[ movetomigrationgroupname=target-migration-group-name-after-unlocking ]
[ notifytourl=event-notification-address ]
[ description=task-description ]
```

Options

Table 4-45 Options of the CreateUnlockingTask Command

Option Name	Option Arguments	Optional or Required	Description
-e or --execute	None	Optional	Specify this option to execute the created unlocking task immediately. If this option is omitted, the unlocking task will be placed in Standby status.

Parameters

Table 4-46 Parameters of the CreateUnlockingTask Command

Parameter Name	Optional or Required	Description
storagedomainname	Required	Specify the name of the storage domain.
migrationgroupname	Required	Specify the name of the migration group.
movetomigrationgroupname	Optional	Specify the name of the target migration group for a volume whose unlocking has been completed.
notifytourl	Optional	Specify the address to be notified when the event occurs.
description	Optional	Specify a description of the task.

Output Items

Table 4-47 Items Output by the CreateUnlockingTask Command

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (Unlocking)
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.Waiting (waiting for execution) ▪ Unknown (status other than the above)
	creationTime	The date and time when the task was created
	endTime	The date and time when task execution ended
	ownerID	The user ID of the user who created the task
	storageDomainName	The name of the storage domain
	migrationGroupName	The name of the migration group
	moveToMigrationGroupName	The target migration group name of a volume whose unlocking has been completed
	notifyToURL	Event notification address
	description	The description of the task
Information about the volume to be unlocked	controllerDeviceNumber	Controller logical device number of the volume. The number is displayed in 0:00 or 00:00:00 format.

Example and Execution Results

- ***Example (1)***: In this example, an unlocking task that unlocks volumes is created.

```
htsmcli CreateUnlockingTask storagedomainname=MegaTechUSP600-Primary
migrationgroupname=MG011
```

- ***Output (1)***:

```
RESPONSE:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Unlocking
status=Standby
creationTime=2008/03/25 16:53:11
endTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
moveToMigrationGroupName=
notifyToURL=mailto:test@example.com
```

```
description=
List of 2 UnlockingInfo elements
An instance of UnlockingInfo(1 of 2)
controllerDeviceNumber=3:A6
An instance of UnlockingInfo(2 of 2)
controllerDeviceNumber=3:A7
```

- ***Example (2)***: In this example, the storage domain `MegaTechUSP600-Primary`, which requires a refresh, is specified as a parameter to execute the `CreateUnlockingTask` command:

```
htsmcli CreateUnlockingTask storagedomainname=MegaTechUSP600-Primary
migrationgroupname=MG011
```

- ***Output (2)***:

```
KATS50226-E An attempt to register the unlocking task has failed.
KATS50907-E The storage domain information is not up-to-date. Refresh the storage
domain. storage domain name : MegaTechUSP600-Primary
```

CreateShreddingTask

The `CreateShreddingTask` command can be used to create a shredding task that erases all data from a migration group after migration is completed. Shredding is performed for a migration group.

If the migration group contains volumes that cannot be shredded (such as locked volumes), the task only erases data from shreddable volumes. You can move the shredded volumes to another migration group.

If any of the following conditions exists, you cannot create a shredding task:

- When the refresh status of the storage domain is `Processing` or `Failure`
- When a refresh is required for the storage domain
- When there is no volume that can be shredded in a migration group specified for the `migrationgroupname` parameter
- The migration group specified for the `migrationgroupname` parameter at the creation of a task is specified for the `migrationgroupname` or `movetomigrationgroupname` parameter in a task that has not ended (`End`)
- The migration group specified for the `movetomigrationgroupname` parameter at the creation of a task is specified for the `migrationgroupname` parameter in a task that has not ended (`End`)

When the `--execute` option is specified for a shredding task, the created task is executed immediately. If the option is not specified, the task is put in `Standby` status and can be executed subsequently by the `ExecuteTask` command.

Shredding tasks are executed by making a request to the Tiered Storage Manager server. Actual volume shredding is performed asynchronously to this command.

Once a shredding task has been created, none of the following operations can be performed:

- Changing or deleting the storage domain
- Changing or deleting a migration group subject to shredding
- Changing or deleting the target migration group

If the Tiered Storage Manager server fails to process the request after the shredding task has been created, the KATS50213-E error message is generated. In such a case, resolve the server failure, and then use the ExecuteTask command to execute the task.

Syntax

```
htsmcli [server-location] CreateShreddingTask
{ -u | --username } user-name
{ -p | --password } {password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-standard-output-redirect-file ]
[ { -f | --force } ]
[ { -e | --execute } ]
storagedomainname=storage-domain-name
migrationgroupname=migration-group-name
[ shreddingmethod={ ZERO-ONCE | DoD } ]
[ movetomigrationgroupname=name-of-target-migration-group-after-shredding ]
[ notifytourl=event-notification-address ]
[ description=task-description ]
```

Options

Table 4-48 Options of the CreateShreddingTask Command

Option Name	Option Arguments	Optional or Required	Description
-f or --force	None	Optional	Specify this option to create a shredding task without confirmation. If this option is omitted, it will be necessary to confirm task creation.
-e or --execute	None	Optional	Specify this option to execute the created shredding task immediately. If this option is omitted, the shredding task will be placed in Standby status.

Parameters

Table 4-49 Parameters of the CreateShreddingTask Command

Parameter Name	Optional or Required	Description
storagedomainname	Required	Specify the name of the storage domain.
migrationgroupname	Required	Specify the name of the migration group.

Parameter Name	Optional or Required	Description
shreddingmethod	Optional	Specify the shredding pattern. This can be any of the following: ▪ ZERO-ONCE: The data 0 is written only once ▪ DoD: The DoD standard method is used
movetomigrationgroupname	Optional	Specify the name of the target migration group for a volume whose shredding has been completed.
notifytourl	Optional	Specify the address to be notified when the event occurs.
description	Optional	Specify a description of the task.

Output Items

Table 4-50 Items Output by the CreateShreddingTask Command

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (Shredding)
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.Waiting (waiting for execution) ▪ Unknown (status other than the above)
	timeEstimate	The estimated time for the task execution. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.
	creationTime	The date and time when the task was created
	endTime	The date and time when task execution ended
	ownerID	The user ID of the user who created the task
	storageDomainName	The name of the storage domain
	migrationGroupName	The name of the migration group
	shreddingMethod	The shredding pattern ▪ ZERO-ONCE: The data 0 is written only once ▪ DoD: The DoD standard method is used
	moveToMigrationGroupName	The target migration group name of a volume whose shredding has been completed
	notifyToURL	Event notification address
	description	The description of the task

Type of Information	Item Name	Description
Information about the volume to be shredded	controllerDeviceNumber	Controller logical device number of the volume. The number is displayed in 0:00 or 00:00:00 format.
	timeEstimate	The estimated time for task execution for each volume. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.

Example and Execution Results

- ***Example (1)***: In this example, a shredding task is created that shreds the volumes in the MG011 migration group using the DoD standard method and moves the shredded volumes to the MG044 migration group. Because this example does not specify the --force option, a message asking whether or not the shredding task is to be created is displayed. The message output destination is the standard error output.

```
htsmcli CreateShreddingTask storagedomainname=MegaTechUSP600-Primary
migrationgroupname=MG011 shreddingmethod=DoD movetomigrationgroupname=MG044
Are you sure you want to shred the data in the migration group "MG011"? (Y/N) :
```

- ***Output (1)***:

```
RESPONSE:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Shredding
status=Standby
timeEstimate=0:02:02
creationTime=2008/03/25 16:53:11
endTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
shreddingMethod=DoD
moveToMigrationGroupName=MG044
notifyToURL=
description=
List of 2 ShreddingInfo elements:
An instance of ShreddingInfo(1 of 2)
controllerDeviceNumber=3:A6
timeEstimate=0:01:01
An instance of ShreddingInfo(2 of 2)
controllerDeviceNumber=3:A7
timeEstimate=0:01:01
```

- ***Example (2)***: This example uses the same conditions as those used for Example (1) to create a shredding task, except that the --force option is specified.

```
htsmcli CreateShreddingTask --force storagedomainname=MegaTechUSP600-Primary
migrationgroupname=MG011 shreddingmethod=DoD movetomigrationgroupname=MG044
```

- ***Output (2)*:**

```
RESPONSE:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Shredding
status=Standby
timeEstimate=0:02:02
```

```
creationTime=2008/03/25 16:53:11
endTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
shreddingMethod=DoD
moveToMigrationGroupName=MG044
notifyToURL=mailto:test@example.com
description=
List of 2 ShreddingInfo elements
An instance of ShreddingInfo(1 of 2)
controllerDeviceNumber=3:A6
timeEstimate=0:01:01
An instance of ShreddingInfo(2 of 2)
controllerDeviceNumber=3:A7
timeEstimate=0:01:01
```

- ***Example (3)***: In this example, the storage domain `MegaTechUSP600-Primary`, which requires a refresh, is specified as a parameter to execute the `CreateShreddingTask` command:

```
htsmcli CreateShreddingTask storagedomainname=MegaTechUSP600-Primary
migrationgroupname=MG011
```

- ***Output (3)*:**

```
KATS50224-E An attempt to register the shredding task has failed.
KATS50907-E The storage domain information is not up-to-date. Refresh the storage
domain. storage domain name : MegaTechUSP600-Primary
```

Commands for Managing Tasks

This section explains the functions, specifiable options and parameters, and output items of the CLI commands for managing tasks. This section also provides examples of how to use the CLI commands and the corresponding execution results.

For details about these options, see Options Common to All CLI Commands.

The usage examples shown in this chapter assume that the user name, password, location of the Tiered Storage Manager server, and whether to use SSL communication are specified in the properties file. Therefore, these items are omitted in the examples.

GetTasks

The `GetTasks` command can be used to obtain information about the task specified by the `id` parameter, or about tasks that match other specified parameters.

You can use the `tasktype` parameter to specify the type of target task. You can also specify a range of tasks by using the `status` parameter, which indicates the task status.

Furthermore, you can use any dates linked to the task, such as the creation date or end date, to specify a range of tasks, such as the following:

- Tasks created (or ended) on or before the specified base date
- Tasks created (or ended) on or after the specified base date
- Tasks created (or ended) on the specified base date

Syntax

```
htsmcli [ server-location] GetTasks
{ -u | --username } user-name
{ -p | --password } { password | @password-file-name }
[ { -s | --secure } ]
[ { -o | --output } standard-output-redirect-file-name ]
[ { -d | --detail } ]
[ { id=task-ID |
[ { storagedomainname=storage-domain-name
[ migrationgroupname=migration-group-name ]
[ targetstoragetiername=target-storage-tier-name ]
| subsystemname=subsystem-name } ]
[ status=status [ ,status ]... ]
[ [ datetype = { Creation | End } ]
daystobase=days-to-base-date
[ direction={ Before | After | Just } ] ]
[ tasktype={ Migration | Shredding | Locking | Unlocking
| VolumeCreation | ExternalMapping } ] } ]
```

Options

Specify the `-d` or `--detail` option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, only summary information will be displayed. Summary information consists of the information for which the *Output by -d* column contains -- in Table 4-52 to Table 4-55.

Parameters

Table 4-51 Parameters of the GetTasks Command

Parameter Name	Optional or Required	Description
`id`	Optional	Specify the task ID. This parameter cannot be specified with other parameters.
`storagedomainname`	Optional	Specify the name of the storage domain. This must be specified when `migrationgroupname` or `targetstoragetiername` is specified.
`migrationgroupname`	Optional	Specify the name of the migration group, along with `storagedomainname`.
`targetstoragetiername`	Optional	Specify the name of the migration target storage tier, along with `storagedomainname`. This parameter is used only for narrowing down the migration tasks.
`subsystemname`	Optional	Specify the name of the subsystem. If you omit this parameter, the storage subsystems are not narrowed down.
`status`	Optional	Specify the status of the task. This can be any of the following: ▪ Standby ▪ Active (running, same as specifying all of the Active statuses at the same time) ▪ `Active.Waiting` (waiting for execution) ▪ `Active.Executing` (being executed) ▪ `Active.WaitingMigration` (waiting for migration) ▪ `Active.Migrating` (migration in progress) ▪ `Active.WaitingDataErasure` (waiting for data erasure) ▪ `Active.DataErasing` (data erasure in progress) ▪ `Active.WaitingVolumeCreation` (waiting for a volume to be created) ▪ `Active.VolumeCreation` (volume creation in progress) ▪ `Active.WaitingPathCreation` (waiting for path creation) ▪ `Active.PathCreation` (path creation in progress) ▪ `Active.WaitingExternalMapping` (waiting for external mapping) ▪ `Active.ExternalMapping` (external mapping in progress) ▪ `Active.WaitingZeroDataDiscard` (waiting to release unused space) ▪ `Active.ZeroDataDiscarding` (releasing unused space) ▪ `Failure.MigrationFailure` (migration ended in failure)

Parameter Name	Optional or Required	Description
		▪ Failure.DataErasureFailure (erasure ended in failure) ▪ Failure.VolumeCreationFailure (volume creation ended in failure) ▪ Failure.PathCreationFailure (path creation ended in failure) ▪ Failure.ExternalMappingFailure (external mapping ended in failure) ▪ Failure.ZeroDataDiscardFailure (release of unused space ended in failure) ▪ Stopping (being stopped) ▪ Stop.MigrationStop (migration has stopped) ▪ Stop.DataErasureStop (data erasure has stopped) ▪ Stop.PathCreationStop (path creation has stopped) ▪ Stop.ExternalMappingStop (external mapping has stopped) ▪ Stop.ZeroDataDiscardStop (release of unused space has stopped) ▪ NotEnd (not ended, same as multiple specification of Standby and Active) ▪ Success ▪ Failure (same as specifying all of the Failure statuses at the same time) ▪ Cancel (returned to original state) ▪ Stop (has been stopped, same as specifying all of the Stop statuses at the same time) ▪ End (ended, same as multiple specification of Success, Failure, Cancel, and Stop) When specifying multiple task statuses, separate each one with a comma. Only a lower-level status can be specified by omitting Active., Failure., or Stop..
datetype	Optional	Specify the type of date (creation date or end date) linked to the task, for specifying a date range. This can be any of the following: ▪ Creation (default) ▪ End
daystobase	Optional	Specify the number of days to the base date that is 0 or a positive integer. Specify how many days from the base date tasks should be obtained.
direction	Optional	Specify the direction for daystobase. This can be any of the following: ▪ Before (days on or before the base date) ▪ After (days on or after the base date) ▪ Just (the base date itself, which is the default)

Parameter Name	Optional or Required	Description
tasktype	Optional	Specify the type of task. This can be any of the following: ▪ Migration ▪ Locking ▪ Unlocking ▪ Shredding ▪ VolumeCreation ▪ ExternalMapping If this parameter is omitted, the command acquires information about all types of tasks.

Output Items

The GetTasks command can acquire and display information about multiple types of tasks. Therefore, the output items depend on the task type. The following tables show the GetTasks command's output items for each task type.

Table 4-52 Items Output by the GetTasks Command (Migration Task)

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.	--	--
	taskType	The type of task (Migration)	--	--
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.WaitingMigration (waiting for migration) ▪ Active.Migrating (migration in progress) ▪ Active.WaitingDataErasure (waiting for data erasure) ▪ Active.DataErasing (data erasure in progress) ▪ Active.WaitingZeroDataDiscard (waiting to release unused space) ▪ Active.ZeroDataDiscarding (releasing unused space) ▪ Failure.MigrationFailure (migration ended in failure) ▪ Failure.DataErasureFailure (erasure ended in failure)	--	--

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
		▪ Failure.ZeroDataDiscardFailure (release of unused space ended in failure) ▪ Stopping (being stopped) ▪ Stopping.Immediate (stopping mid-task) ▪ Stop.MigrationStop (migration has stopped) ▪ Stop.DataErasureStop (data erasure has stopped) ▪ Stop.ZeroDataDiscardStop (release of unused space has stopped) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Unknown (status other than the above)		
	timeEstimate	The estimated time for the task execution. If you specify the erasedata parameter during task creation, and then execute the task, this value will include the time to delete data. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.	--	--
	creationTime	The date and time when the task was created	--	--
	executionRequestTime	The execution request time and date for the task	--	--
	timeElapsed	The elapsed time from the starting point of the task execution. This value is displayed in hhhh:mm:ss format. If the elapsed time is 10,000 hours or more, 9999:59:59 is displayed. If the elapsed time cannot be acquired, n/a is displayed. If the task is not executed, nothing is displayed.	--	--
	endTime	The date and time when task execution ended	--	--
	migrationStartedTime	The date and time when migration execution started	--	--
	migrationCompletionTime	The date and time when migration execution completed	-d	--

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
	migrationProgress	Indicates the migration progress, as a percentage. . Values of less than 1% are rounded down to display an integer. (For example, 45.3% is rounded down to 45%.)	--	--
	estimatedMigrationCompletionTime	The date and time when migration is expected to finish	-d	--
	dataErasureStartedTime	The date and time when erasure execution started	--	--
	dataErasureCompletionTime	The date and time when erasure execution completed	-d	--
	dataErasureProgress	Indicates the erasure progress, as a percentage. Values of less than 1% are rounded down to display an integer. (For example, 45.3% is rounded down to 45%.)	--	--
	estimatedDataErasureCompletionTime	The date and time when erasure is expected to finish	-d	--
	zeroDataDiscardStartedTime	The date and time when execution of a zero data discard task started	--	--
	zeroDataDiscardCompletionTime	The date and time when execution of a zero data discard task completed	-d	--
	zeroDataDiscardProgress	Indicates the progress of a zero data discard task, as a percentage. Values of less than 1% are rounded down to display an integer. (For example, 45.3% is rounded down to 45%.)	--	--
	estimatedZeroDataDiscardCompletionTime	The date and time when a zero data discard task is expected to finish	-d	--
	ownerID	The user ID of the user who created the task	--	--
	ownerGroupID	The user group ID of the user who created the task	-d	--
	storageDomainName	The name of the storage domain	--	--
	migrationGroupName	The name of the migration group	--	--
	previousTargetStorageTierName	The name of the migration target storage tier for the previous migration. If migration has never been performed, nothing is displayed.	-d	--
	targetStorageTierName	The name of the migration target storage tier	--	--
	eraseData	Indicates whether the data for the migration source volume is to be deleted once after migration terminates normally.	--	--

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
	zeroDataDiscard	Indicates whether the unused space in the migration target volume is to be released after migration terminates normally. Even if the zero data discard function is specified during migration task creation, No is displayed if the conditions for the zero data discard functions are not satisfied. For details about the conditions for the zero data discard function, see the zerodatadiscard parameter in Table 4-40.	--	--
	totalCapacityInGB	The total capacity of the volumes subject to migration in the migration group (units: GB). Values less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--	--
	notifyToURL	Event notification address	--	--
	description	A description of the task	--	--
Information about task errors	message	An error message	-d	--
Information about the migration volumes	sourceControllerDeviceNumber	The controller LDEV number of the migration source volume. The number is displayed in 0:00 or 00:00:00 format.	-d	--
	sourceSubsystemSerialNumber	The serial number of the storage subsystem that stores the actual data for the migration source volume.	-d	--
	sourceSubsystemDisplayModel	The display name for the model of the storage subsystem that stores the actual data for the migration source volume. If the displayed model name is unknown, the product name is displayed.	-d	--
	sourceSubsystemName	The name of the storage subsystem that stores the actual data for the migration source volume. If the subsystem name is unknown, the product name and serial number are displayed.	-d	--
	sourceSubsystemVendor	The vendor name of the storage subsystem that stores the actual data for the migration source volume.	-d	--

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
	sourceSubsystemDeviceNumber	The LDEV number of the LU in the storage subsystem that stores the actual data of the migration source volume. The number is displayed as a decimal number or a hexadecimal number in the 0:00 or 00:00:00 format. For an SMI-S Enabled subsystem, an element name is displayed.	-d	--
	sourceSubsystemDeviceID	The device ID of the LU in the storage subsystem that stores the actual data of the migration source volume. For a Hitachi storage subsystem, - is displayed.	-d	--
	sourceSLPRNumber	The number for the SLPR to which the migration source volume belongs.	-d	--
	sourceCLPRNumber	The number for the CLPR to which the migration source volume belongs.	-d	--
	sourceRAIDLevel	The RAID level of the migration source volume. For an SMI-S Enabled subsystem, only RAID*x* of RAID*x*(*y*D+*z*P) is displayed.	-d	--
	sourceDiskType	The type of disks in which the migration source volume exists. When using Universal Volume Manager on Universal Storage Platform V/VM (microcode version 60-03-00-xx/xx or earlier) or Hitachi USP storage, the volumes to which SSD drives in Hitachi AMS2000 storage are externally connected will be displayed as SAS.	-d	--
	sourceControllerArrayGroupName	The name of the controller array group in which the migration source volume exists.	-d	--
	sourceArrayGroupName	The array group name of the migration source volume.	-d	--
	sourceArrayGroupBusyRate	The array group usage rate (%) of the source volume. Up to 2 decimal places are displayed.	-d	#1
	sourceArrayGroupMaxBusyRate	The maximum array group usage rate (%) of the source volume. Up to 2 decimal places are displayed.	-d	#1
	targetControllerDeviceNumber	The controller LDEV number of the migration target volume. The device number is displayed in one of the following formats: 0:00 or 00:00:00.	-d	#2
	targetSubsystemSerialNumber	The serial number of the storage subsystem that stores the actual data for the migration target volume	-d	#2

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
	targetSubsystemDisplayModel	The display name for the model of the storage subsystem that stores the actual data for the migration target volume. If the display model name is unknown, the product name is displayed.	-d	#2
	targetSubsystemName	The name of the storage subsystem that stores the actual data for the migration target volume. If the subsystem name is unknown, the product name and serial number are displayed.	-d	#2
	targetSubsystemVendor	The vendor name of the storage subsystem that stores the actual data for the migration target volume	-d	#2
	targetSubsystemDeviceNumber	The LDEV number of the LU in the storage subsystem that stores the actual data of the migration target volume. The number is displayed as a decimal number or a hexadecimal number in the 0:00 or 00:00:00 format. For an SMI-S Enabled subsystem, an element name is displayed.	-d	#2
	targetSubsystemDeviceID	The device ID of the LU in the storage subsystem that stores the actual data of the migration target volume. For a Hitachi storage subsystem, - is displayed.	-d	#2
	targetSLPRNumber	The number for the SLPR to which the migration target volume belongs.	-d	#2
	targetCLPRNumber	The number for the CLPR to which the migration target volume belongs.	-d	#2
	targetRAIDLevel	The RAID level of the migration target volume. For an SMI-S Enabled subsystem, only RAID*x* of RAID*x* (*y*D+*z*P) is displayed.	-d	#2
	targetDiskType	The type of disks in which the migration target volume exists. When using Universal Volume Manager on Universal Storage Platform V/VM (microcode version 60-03-00-xx/xx or earlier) or Hitachi USP storage, the volumes to which SSD drives in Hitachi AMS2000 storage are externally connected will be displayed as SAS.	-d	#2
	targetControllerArrayGroupName	The name of the controller array group in which the migration target volume exists.	-d	#2

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
	targetArrayGroupName	The array group name of the migration target volume.	-d	#2
	targetArrayGroupBusyRate	The array group usage rate (%) of the target volume. Up to 2 decimal places are displayed.	-d	#1, #2
	targetArrayGroupMaxBusyRate	The maximum array group usage rate (%) of the target volume. Up to 2 decimal places are displayed.	-d	#1, #2
	emulationType	The emulation type	-d	--
	capacityInKB	The capacity of the volume (units: KB)	-d	--
	status	The migration status for each volume. This can be any of the following: ▪ Standby ▪ Active.WaitingMigration (waiting for migration) ▪ Active.Migrating (migration in progress) ▪ Active.WaitingDataErasure (waiting for data erasure) ▪ Active.DataErasing (data erasure in progress) ▪ Active.WaitingCreateVolume (waiting for volume creation) ▪ Active.CreatingVolume (volume creation in progress) ▪ Active.WaitingDeleteVolume (waiting for volume deletion) ▪ Active.DeletingVolume (volume deletion in progress) ▪ Active.WaitingDeleteVolumePre-create (waiting for volume deletion before re-creation) ▪ Active.DeletingVolumePre-create (deleting a volume before re-creation) ▪ Active.WaitingRe-createVolume (waiting for volume re-creation) ▪ Active.Re-creatingVolume (volume re-creation in progress) ▪ Active.WaitingZeroDataDiscard (waiting to release unused space) ▪ Active.ZeroDataDiscarding (releasing unused space) ▪ Failure.CreateVolumeFailure (volume creation ended in failure) ▪ Failure.DeleteVolumeFailure (volume deletion ended in failure) ▪ Failure.MigrationFailure (migration ended in failure)	-d	--

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
		▪ Failure.DataErasureFailure (erasure ended in failure) ▪ Failure.ZeroDataDiscardFailure (release of unused space ended in failure) ▪ Stopping (being stopped) ▪ Stopping.Immediate (stopping mid-task) ▪ Stop.MigrationStop (migration has stopped) ▪ Stop.DataErasureStop (data erasure has stopped) ▪ Stop.ZeroDataDiscardStop (release of unused space has stopped) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ OutOfExecution (not subject to task execution) ▪ Unknown (status other than the above)		
	migrationProgress	Indicates the migration progress for each volume, as a percentage. Values of less than 1% are rounded down to display an integer. (For example, 45.3% is rounded down to 45%.)	-d	--
	timeElapsed	The elapsed time from the start of the task execution for each volume. This value is displayed in hhhh:mm:ss format. If the elapsed time is 10,000 hours or more, 9999:59:59 is displayed. If the elapsed time cannot be acquired, n/a is displayed. If the task is not executed, nothing is displayed.	-d	--
	timeEstimate	The estimated time for the task execution for each volume. If you specify the erasedata parameter during task creation, and then execute the task, this value will include the time to delete data. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.	-d	--

Legend:

-d : Indicates output only when either the -d or the --detail option is specified.

-- : Not applicable

#1

Only spaces will be displayed if the information cannot be acquired from Tuning Manager.

#2

Unknown is displayed for these items until volume creation is finished if a storage tier that is assigned a pool as a filter condition is specified as the migration target.

Table 4-53 Items Output by the GetTasks Command (Locking Task)

Type of Information	Item Name	Description	Output by -d
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.	--
	taskType	The type of task (Locking)	--
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.Waiting (waiting for execution) ▪ Active.Executing (being executed) ▪ Stopping (being stopped) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped) ▪ Unknown (status other than the above)	--
	creationTime	The date and time when the task was created	--
	executionRequestTime	The execution request time and date for the task	--
	startTime	The date and time when task execution started	--
	timeElapsed	The elapsed time from the starting point of the task execution. This value is displayed in hhhh:mm:ss format. If the elapsed time is 10,000 hours or more, 9999:59:59 is displayed. If the elapsed time cannot be acquired, n/a is displayed. If the task is not executed, nothing is displayed.	--
	endTime	The date and time when task execution ended	--

Type of Information	Item Name	Description	Output by -d
	lockingProgress	Indicates the progress of the locking operation (%). Values of less than 1% are rounded down to display an integer (for example, 45.3% is rounded down to 45%).	--
	estimatedLockingCompletionTime	The date and time when the locking operation is expected to finish	-d
	ownerID	The user ID of the user who created the task	--
	storageDomainName	The name of the storage domain	--
	migrationGroupName	The name of the migration group	--
	retentionDays	The locked period (in days). If there is no locking period, -1 (Unlimited) will be displayed.	--
	retainedThrough	The date the locked period expires. If there is no expiration date, Unlimited will be displayed.	--
	guardMode	The locking method to be applied when the locking task is executed. ▪ Read only: Protected from write operations ▪ Protect: Protected from read and write operations	--
	moveToMigrationGroupName	The target migration group name of a volume whose locking has been completed.	--
	notifyToURL	Event notification Web address	--
	description	The description of the task	--
Information about task errors	message	Error message	-d
Information about the volume to be locked	controllerDeviceNumber	Controller logical device number of the volume. The number is displayed in 0:00 or 00:00:00 format.	-d
	subsystemSerialNumber	The serial number of the storage subsystem that stores the actual volume data.	-d
	subsystemDisplayModel	The display name for the model of the storage subsystem that stores the actual data. If the displayed model name is unknown, the product name will be displayed.	-d
	subsystemName	The name of the storage subsystem that stores the actual volume data. If the subsystem name is unknown, the product name and serial number will be displayed.	-d
	subsystemDeviceNumber	The LDEV number of the LU in the storage subsystem that stores the actual volume data. The number is displayed as a decimal number or a hexadecimal number in the 0:00 or 00:00:00 format. For an SMI-S Enabled subsystem, an element name is displayed.	-d

Type of Information	Item Name	Description	Output by -d
	subsystemDeviceID	The logical device ID of the LU in the storage subsystem that stores the actual volume data. For a Hitachi storage subsystem, - is displayed.	-d
	status	The lock status for a volume. This can be any of the following: ▪ Standby ▪ Active.Waiting (waiting for execution) ▪ Active.Executing (being executed) ▪ Stopping (being stopped) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped) ▪ OutOfExecution (not subject to task execution) ▪ Unknown (status other than the above)	-d
	timeElapsed	The elapsed time from the start of the task execution for each volume. This value is displayed in hhhh:mm:ss format. If the elapsed time is 10,000 hours or more, 9999:59:59 is displayed. If the elapsed time cannot be acquired, n/a is displayed. If the task is not executed, nothing is displayed.	-d

Legend:

-d : Indicates output only when either the -d or the --detail option is specified.

-- : Not applicable

Table 4-54 Items Output by the GetTasks Command (Unlocking Task)

Type of Information	Item Name	Description	Output by -d
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.	--
	taskType	The type of task (Unlocking)	--
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.Waiting (waiting for execution) ▪ Active.Executing (being executed) ▪ Stopping (being stopped) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped) ▪ Unknown (status other than the above)	--
	creationTime	The date and time when the task was created	--
	executionRequestTime	The execution request time and date for the task	--
	startTime	The date and time when task execution started	--
	timeElapsed	The elapsed time from the starting point of the task execution. This value is displayed in hhhh:mm:ss format. If the elapsed time is 10,000 hours or more, 9999:59:59 is displayed. If the elapsed time cannot be acquired, n/a is displayed. If the task is not executed, nothing is displayed.	--
	endTime	The date and time when task execution ended	--
	unlockingProgress	Indicates the progress of the unlocking operation (%). Values of less than 1% are rounded down to display an integer (for example, 45.3% is rounded down to 45%).	--
	estimatedUnlockingCompletionTime	The date and time when the unlocking operation is expected to finish	-d
	ownerID	The user ID of the user who created the task	--
	storageDomainName	The name of the storage domain	--
	migrationGroupName	The name of the migration group	--
	moveToMigrationGroupName	The target migration group name of a volume whose unlocking has been completed.	--
	notifyToURL	Event notification address	--
	description	The description of the task	--

Type of Information	Item Name	Description	Output by -d
Information about task errors	message	Error message	-d
Information about the volume to be unlocked	controllerDeviceNumber	Controller logical device number of the volume. The number is displayed in 0:00 or 00:00:00 format.	-d
	subsystemSerialNumber	The serial number of the storage subsystem that stores the actual volume data	-d
	subsystemDisplayModel	The display name for the model of the storage subsystem that stores the actual volume data. If the displayed model name is unknown, the product name will be displayed.	-d
	subsystemName	The name of the storage subsystem that stores the actual volume data. If the subsystem name is unknown, the product name and serial number will be displayed.	-d
	subsystemDeviceNumber	The LDEV number of the LU in the storage subsystem that stores the actual volume data. The number is displayed as a decimal number or a hexadecimal number in the 0:00 or 00:00:00 format. For an SMI-S Enabled subsystem, an element name is displayed.	-d
	subsystemDeviceID	The logical device ID of the LU in the storage subsystem that stores the actual volume data. For a Hitachi storage subsystem, - is displayed.	-d
	status	The unlock status for each volume. This can be any of the following: ▪ Standby ▪ Active.Waiting (waiting for execution) ▪ Active.Executing (being executed) ▪ Stopping (being stopped) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped) ▪ OutOfExecution (not subject to task execution) ▪ Unknown (status other than the above)	-d
	timeElapsed	The elapsed time from the start of the task execution for each volume. This value is displayed in hhhh:mm:ss format. If the elapsed time is 10,000 hours or more, 9999:59:59 is displayed. If the elapsed time cannot be acquired, n/a is displayed. If the task is not executed, nothing is displayed.	-d

Legend:

-d : Indicates output only when either the -d or the --detail option is specified.

-- : Not applicable

Table 4-55 Items Output by the GetTasks Command (Shredding Task)

Type of Information	Item Name	Description	Output by -d
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.	--
	taskType	The type of task (Shredding)	--
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.Waiting (waiting for execution) ▪ Active.Executing (being executed) ▪ Stopping (being stopped) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped) ▪ Unknown (status other than the above)	--
	timeEstimate	The estimated time for the task execution. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.	--
	creationTime	The date and time when the task was created	--
	executionRequestTime	The execution request time and date for the task	--
	startTime	The date and time when task execution started	--
	timeElapsed	The elapsed time from the starting point of the task execution. This value is displayed in hhhh:mm:ss format. If the elapsed time is 10,000 hours or more, 9999:59:59 is displayed. If the elapsed time cannot be acquired, n/a is displayed. If the task is not executed, nothing is displayed.	--
	endTime	The date and time when task execution ended	--
	shreddingProgress	Indicates the progress of the shredding operation (%). Values of less than 1% are rounded down to display an integer (for example, 45.3% is rounded down to 45%).	--
	estimatedShreddingCompletionTime	The date and time when the shredding operation is expected to finish	-d

Type of Information	Item Name	Description	Output by -d
	ownerID	The user ID of the user who created the task	--
	storageDomainName	The name of the storage domain	--
	migrationGroupName	The name of the migration group	--
	shreddingMethod	Shredding pattern. This can be any of the following: ▪ ZERO-ONCE: The data 0 is written only once ▪ DoD: The DoD standard method is used	--
	moveToMigrationGroupName	The target migration group name of a volume whose shredding has been completed.	--
	totalShreddingCapacityInGB	The total capacity of the volumes subject to shredding in the migration group (units: GB). Values of less than 1 GB are rounded down to an integer. (For example, 4.5 GB is rounded down to 4 GB.)	--
	notifyToURL	Event notification address	--
	description	The description of the task	--
Information about task errors	message	Error message	-d
Information about the volume to be shredded	controllerDeviceNumber	Controller logical device number of the volume. The number is displayed in 0:00 or 00:00:00 format.	-d
	subsystemSerialNumber	The serial number of the storage subsystem that stores the actual volume data.	-d
	subsystemDisplayModel	The display name for the model of the storage subsystem that stores the actual volume data. If the displayed model name is unknown, the product name will be displayed.	-d
	subsystemName	The name of the storage subsystem that stores the actual volume data. If the subsystem name is unknown, the product name and serial number will be displayed.	-d
	subsystemDeviceNumber	The LDEV number of the LU in the storage subsystem that stores the actual volume data. The number is displayed as a decimal number or a hexadecimal number in the 0:00 or 00:00:00 format. For an SMI-S Enabled subsystem, an element name is displayed.	-d
	subsystemDeviceID	The logical device ID of the LU in the storage subsystem that stores the actual volume data. For a Hitachi storage subsystem, - is displayed.	-d
	capacityInKB	The capacity of the volume (units: KB)	-d

Type of Information	Item Name	Description	Output by -d
	status	The shredding status of a volume. This can be any of the following: ▪ Standby ▪ Active.Waiting (waiting for execution) ▪ Active.Executing (being executed) ▪ Stopping (being stopped) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped) ▪ OutOfExecution (not subject to task execution) ▪ Unknown (status other than the above)	-d
	timeElapsed	The elapsed time from the start of the task execution for each volume. This value is displayed in hhhh:mm:ss format. If the elapsed time is 10,000 hours or more, 9999:59:59 is displayed. If the elapsed time cannot be acquired, n/a is displayed. If the task is not executed, nothing is displayed.	-d
	timeEstimate	The estimated time for task execution for each volume. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.	-d

Legend:

-d : Indicates output only when either the -d or the --detail option is specified.

-- : Not applicable

Table 4-56 Items Output by the GetTasks Command (Volume Creation Task)

Type of Information	Item Name	Description	Output by -d
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.	--
	taskType	The type of task (VolumeCreation)	--
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.WaitingVolumeCreation (waiting for a volume to be created) ▪ Active.VolumeCreation (volume creation in progress) ▪ Failure.VolumeCreationFailure (volume creation ended in failure) ▪ Stopping (being stopped) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped) ▪ Unknown (status other than the above)	--
	creationTime	The date and time when the task was created	--
	executionRequestTime	The execution request date and time for the task	--
	startTime	The date and time when task execution started	--
	timeElapsed	The elapsed time from the starting point of the task execution. This value is displayed in hhhh:mm:ss format. If the elapsed time is 10,000 hours or more, 9999:59:59 is displayed. If the elapsed time cannot be acquired, n/a is displayed. If the task is not executed, nothing is displayed.	--
	endTime	The date and time when task execution ended	--
	ownerID	The user ID of the user who created the task	--
	subsystemSerialNumber	The serial number of the storage subsystem containing the volume	-d
	subsystemDisplayModel	The display model name of the storage subsystem containing the volume	-d
	subsystemName	The subsystem name of the storage subsystem containing the volume	-d
	subsystemVendor	The vendor name of the storage subsystem containing the volume	-d

Type of Information	Item Name	Description	Output by -d
	totalCapacityInGB	The total capacity of the volume to be created (in GB). Values of less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--
	notifyToURL	The event notification address	--
	description	The description of the task	--
Information about task errors	message	The error message	-d
Information about the volume to be created	deviceNumber	The logical device number. The number is displayed as a decimal number or in 0:00 or 00:00:00 format. If multiple numbers exist, they are delimited by commas. For an SMI-S Enabled subsystem, an element name is displayed.	-d
	arrayGroupName	The array group name of the volume	-d
	freeSpaceIndex	The number of the free space in the volume array group	-d
	externalSubsystemSerialNumber	The serial number on the external storage subsystem side	-d
	externalSubsystemDisplayModel	The display model name on the external storage subsystem side	-d
	externalSubsystemName	The subsystem name on the external storage subsystem side	-d
	externalSubsystemVendor	The vendor name on the external storage subsystem side	-d
	numberOfVolumes	The number of volumes specified when the task was created	-d
	emulationType	The emulation type specified when the task was created	-d
	capacityInKB	The volume capacity in KB. Only the value is displayed	-d
	status	The status of the volume creation task for each volume. This can be any of the following: ▪ Standby ▪ Active.WaitingVolumeCreation (waiting for a volume to be created) ▪ Active.VolumeCreation (volume creation in progress) ▪ Failure.VolumeCreationFailure (volume creation ended in failure) ▪ Stopping (being stopped) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped)	-d

Type of Information	Item Name	Description	Output by -d
		▪ Unknown (status other than the above)	
	timeElapsed	The elapsed time from the start of the task execution for each volume. This value is displayed in hhhh:mm:ss format. If the elapsed time is 10,000 hours or more, 9999:59:59 is displayed. If the elapsed time cannot be acquired, n/a is displayed. If the task is not executed, nothing is displayed.	-d

Legend:

-d : Indicates output only when either the -d or the --detail option is specified.

-- : Not applicable

Table 4-57 Items Output by the GetTasks Command (External Mapping Task)

Type of Information	Item Name	Description	Output by -d
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.	--
	taskType	The type of task (ExternalMapping)	--
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.WaitingPathCreation (waiting for path creation) ▪ Active.PathCreation (path creation in progress) ▪ Active.WaitingExternalMapping (waiting for external mapping) ▪ Active.ExternalMapping (external mapping in progress) ▪ Failure.PathCreationFailure (path creation ended in failure) ▪ Failure.ExternalMappingFailure (external mapping ended in failure) ▪ Stopping (being stopped) ▪ Stopping.StoppingPathCreation (path creation is being stopped) ▪ Stopping.StoppingExternalMapping (external mapping is being stopped) ▪ Stop.PathCreationStop (path creation has stopped) ▪ Stop.ExternalMappingStop (external mapping has stopped)	--

Type of Information	Item Name	Description	Output by -d
		▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped) ▪ Unknown (status other than the above)	
	creationTime	The date and time when the task was created	--
	executionRequestTime	The execution request date and time for the task	--
	startTime	The date and time when task execution started	--
	timeElapsed	The elapsed time from the starting point of the task execution. This value is displayed in hhhh:mm:ss format. If the elapsed time is 10,000 hours or more, 9999:59:59 is displayed. If the elapsed time cannot be acquired, n/a is displayed. If the task is not executed, nothing is displayed.	--
	endTime	The date and time when task execution ended	--
	ownerID	The user ID of the user who created the task	--
	storageDomainName	The storage domain name	--
	subsystemSerialNumber	The serial number of the storage subsystem containing the volume	-d
	subsystemDisplayModel	The display model name of the storage subsystem containing the volume	-d
	subsystemName	The subsystem name of the storage subsystem containing the volume	-d
	subsystemVendor	The vendor name of the storage subsystem containing the volume	-d
	totalCapacityInGB	The total capacity of the volume to be externally connected in GB. Values of less than 1 GB are rounded down to display an integer (for example, 4.5 GB is rounded down to 4 GB).	--
	notifyToURL	The event notification address	--
	description	The description of the task	--
Information about task errors	message	The error message	-d
Information about the volume to be externally mapped	deviceNumber	The logical device number of the storage subsystem. The number is displayed as a decimal number or in 0:00 or 00:00:00 format. For an SMI-S Enabled subsystem, an element name is displayed.	-d
	arrayGroupName	The array group name of the volume.	-d

Type of Information	Item Name	Description	Output by -d
	externalSubsystemSerialNumber	The serial number on the external storage subsystem side	-d
	externalSubsystemDisplayModel	The display model name on the external storage subsystem side	-d
	externalSubsystemName	The subsystem name on the external storage subsystem side	-d
	externalSubsystemVendor	The vendor name on the external storage subsystem side	-d
	externalDeviceNumber	The logical device number of the LU on the external storage subsystem side. The number is displayed as a decimal number or in 0:00 or 00:00:00 format. For an SMI-S Enabled subsystem, an element name is displayed.	-d
	externalDeviceID	The logical device ID of the LU on the external storage subsystem side. For a Hitachi storage subsystem, - is displayed.	-d
	externalArrayGroupName	The array group name on the external storage subsystem side	-d
	pathGroupID	The path group ID when a volume is externally connected	-d
	capacityInKB	The volume capacity in KB. Only the value is displayed	-d
	status	The status of the external mapping task for each volume. This can be any of the following: ▪ Standby ▪ Active.WaitingPathCreation (waiting for path creation) ▪ Active.PathCreation (path creation in progress) ▪ Active.WaitingExternalMapping (waiting for external mapping) ▪ Active.ExternalMapping (external mapping in progress) ▪ Failure.PathCreationFailure (path creation ended in failure) ▪ Failure.ExternalMappingFailure (external mapping ended in failure) ▪ Stopping (being stopped) ▪ Stop.PathCreationStop (path creation has stopped) ▪ Stop.ExternalMappingStop (external mapping has stopped) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped) ▪ Unknown (status other than the above)	-d

Type of Information	Item Name	Description	Output by -d
	timeElapsed	The elapsed time from the start of the task execution for each volume. This value is displayed in hhhh:mm:ss format. If the elapsed time is 10,000 hours or more, 9999:59:59 is displayed. If the elapsed time cannot be acquired, n/a is displayed. If the task is not executed, nothing is displayed.	-d
Information about the mapping path used for external mapping	port	The external port of the storage subsystem on the domain controller side	-d
	WWN	The WWN of the storage subsystem on the domain controller side	-d
	externalTargetPort	The target port of the external storage subsystem	-d
	externalWWN	The WWN of the external storage subsystem	-d
	externalHSD	The host storage domain name of the external storage subsystem	-d
	externalLUN	The LUN of the external storage subsystem. The number is displayed as a decimal number.	-d

Legend:

-d : Indicates output only when either the -d or the --detail option is specified.

-- : Not applicable

Example and Execution Results

- ***Example (1)***: In this example, detailed information is acquired about the migration tasks in the MegaTechUSP600-Primary storage domain that were created at least 5 days ago and whose current status is Standby.

```
htsmcli GetTasks --detail storagedomainname="MegaTechUSP600-Primary" status="Standby"
datetype="Creation" daystobase="5" direction="After"
```

- ***Output (1)***:

```
RESPONSE:
List of 1 Task elements:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Migration
status=Standby
timeEstimate=0:02:04
creationTime=2008/03/25 16:53:11
executionRequestTime=
timeElapsed=
endTime=
migrationStartedTime=
migrationCompletionTime=
migrationProgress=0
estimatedMigrationCompletionTime=
dataErasureStartedTime=
dataErasureCompletionTime=
dataErasureProgress=0
estimatedDataErasureCompletionTime=
```

```
zeroDataDiscardStartedTime=
zeroDataDiscardCompletionTime=
zeroDataDiscardProgress=0
estimatedZeroDataDiscardCompletionTime=
ownerID=user
ownerGroupID=Admin
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
previousTargetStorageTierName=
targetStorageTierName=MegaTech-HighCost
eraseData=No
zeroDataDiscard=No
totalCapacityInGB=19
notifyToURL=mailto:test@example.com
description=
List of 2 MigrationInfo elements:
An instance of MigrationInfo(1 of 2)
sourceControllerDeviceNumber=3:A6
sourceSubsystemSerialNumber=14011
sourceSubsystemDisplayModel=USP
sourceSubsystemName=USP@10.208.151.151
sourceSubsystemVendor=HITACHI
sourceSubsystemDeviceNumber=3:A6
sourceSubsystemDeviceID=-
sourceSLPRNumber=0
sourceCLPRNumber=0
sourceRAIDLevel=RAID5(3D+1P)
sourceDiskType=Unknown
sourceControllerArrayGroupName=E9960-1
sourceArrayGroupName=1-9-1
sourceArrayGroupBusyRate=34.56
sourceArrayGroupMaxBusyRate=56.75
targetControllerDeviceNumber=2:80
targetSubsystemSerialNumber=14011
targetSubsystemDisplayModel=USP
targetSubsystemName=USP@10.208.151.151
targetSubsystemVendor=HITACHI
targetSubsystemDeviceNumber=2:80
targetSubsystemDeviceID=-
targetSLPRNumber=0
targetCLPRNumber=0
targetRAIDLevel=RAID5(3D+1P)
targetDiskType=Unknown
targetControllerArrayGroupName=E9960-11
targetArrayGroupName=1-10-1
targetArrayGroupBusyRate=34.56
targetArrayGroupMaxBusyRate=56.75
emulationType=OPEN-V
capacityInKB=10,240,320
status=Standby
migrationProgress=0
timeElapsed=
timeEstimate=0:01:02
An instance of MigrationInfo(2 of 2)
sourceControllerDeviceNumber=3:A7
sourceSubsystemSerialNumber=14011
sourceSubsystemDisplayModel=USP
sourceSubsystemName=USP@10.208.151.151
sourceSubsystemVendor=HITACHI
sourceSubsystemDeviceNumber=3:A7
sourceSubsystemDeviceID=-
sourceSLPRNumber=0
sourceCLPRNumber=0
sourceRAIDLevel=RAID5(3D+1P)
sourceDiskType=Unknown
sourceControllerArrayGroupName=E9980-1
```

```
sourceArrayGroupName=1-9-1
sourceArrayGroupBusyRate=34.56
sourceArrayGroupMaxBusyRate=56.75
targetControllerDeviceNumber=2:84
targetSubsystemSerialNumber=14011
targetSubsystemDisplayModel=USP
targetSubsystemName=USP@10.208.151.151
targetSubsystemVendor=HITACHI
targetSubsystemDeviceNumber=2:84
targetSubsystemDeviceID=-
targetSLPRNumber=0
targetCLPRNumber=0
targetRAIDLevel=RAID5(3D+1P)
targetDiskType=Unknown
targetControllerArrayGroupName=E9980-11
targetArrayGroupName=1-10-1
targetArrayGroupBusyRate=34.56
targetArrayGroupMaxBusyRate=56.75
emulationType=OPEN-V
capacityInKB=10,240,320
status=Standby
migrationProgress=0
timeElapsed=
timeEstimate=0:01:02
```

- ***Example (2)***: In this example, summary information is acquired about the migration tasks in the `MegaTechUSP600-Primary` storage domain that were created at least 5 days ago and whose current status is `Standby`.

```
htsmcli GetTasks storagedomainname="MegaTechUSP600-Primary" status="Standby"
datetype="Creation" daystobase="5" direction="After"
```

- ***Output (2)***:

```
RESPONSE:
List of 1 Task elements:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Migration
status=Standby
timeEstimate=0:02:04
creationTime=2008/03/25 16:53:11
executionRequestTime=
timeElapsed=
endTime=
migrationStartedTime=
migrationProgress=0
dataErasureStartedTime=
dataErasureProgress=0
zeroDataDiscardStartedTime=
zeroDataDiscardProgress=0
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
targetStorageTierName=MegaTech-HighCost
eraseData=No
zeroDataDiscard=No
totalCapacityInGB=19
notifyToURL=mailto:test@example.com
description=
```

- ***Example (3)***: In this example, detailed information is acquired about the locking tasks in the MegaTechUSP600-Primary storage domain that were created at least 5 days ago and whose current status is Standby.

```
htsmcli GetTasks --detail storagedomainname="MegaTechUSP600-Primary" status="Standby"
datetype="Creation" daystobase="5" direction="After"
```

- ***Output (3)***:

```
RESPONSE:
List of 1 Task elements:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Locking
status=Standby
creationTime=2008/03/25 16:53:11
executionRequestTime=
startTime=
timeElapsed=
endTime=
lockingProgress=0
estimatedLockingCompletionTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
retentionDays=365
retainedThrough=
guardMode=Read only
moveToMigrationGroupName=
notifyToURL=mailto:test@example.com
description=
List of 2 LockingInfo elements:
An instance of LockingInfo(1 of 2)
controllerDeviceNumber=3:A6
subsystemSerialNumber=14011
subsystemDisplayModel=USP
subsystemName=USP@10.208.151.151
subsystemDeviceNumber=3:A6
subsystemDeviceID=-
status=Standby
timeElapsed=
An instance of LockingInfo(2 of 2)
controllerDeviceNumber=3:A7
subsystemSerialNumber=14011
subsystemDisplayModel=USP
subsystemName=USP@10.208.151.151
subsystemDeviceNumber=3:A7
subsystemDeviceID=-
status=Standby
timeElapsed=
```

- ***Example (4)***: In this example, summary information is acquired about the locking tasks in the MegaTechUSP600-Primary storage domain that were created at least 5 days ago and whose current status is Standby.

```
htsmcli GetTasks storagedomainname="MegaTechUSP600-Primary" status="Standby"
datetype="Creation" daystobase="5" direction="After"
```

- ***Output (4)***:

```
RESPONSE:
List of 1 Task elements:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Locking
status=Standby
creationTime=2008/03/25 16:53:11
```

```
executionRequestTime=
startTime=
timeElapsed=
endTime=
lockingProgress=0
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
retentionDays=365
retainedThrough=
guardMode=Read only
moveToMigrationGroupName=
notifyToURL=mailto:test@example.com
description=
```

- ***Example (5)***: In this example, detailed information is acquired about the unlocking tasks in the `MegaTechUSP600-Primary` storage domain that were created at least 5 days ago and whose current status is `Standby`.

```
htsmcli GetTasks --detail storagedomainname="MegaTechUSP600-Primary" status="Standby"
datetype="Creation" daystobase="5" direction="After"
```

- ***Output (5)***:

```
RESPONSE:
List of 1 Task elements:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Unlocking
status=Standby
creationTime=2008/03/25 16:53:11
executionRequestTime=
startTime=
timeElapsed=
endTime=
unlockingProgress=0
estimatedUnlockingCompletionTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
moveToMigrationGroupName=
notifyToURL=mailto:test@example.com
description=
List of 2 UnlockingInfo elements:
An instance of UnlockingInfo(1 of 2)
controllerDeviceNumber=3:A6
subsystemSerialNumber=14011
subsystemDisplayModel=USP
subsystemName=USP@10.208.151.151
subsystemDeviceNumber=3:A6
subsystemDeviceID=-
status=Standby
timeElapsed=
An instance of UnlockingInfo(2 of 2)
controllerDeviceNumber=3:A7
subsystemSerialNumber=14011
subsystemDisplayModel=USP
subsystemName=USP@10.208.151.151
subsystemDeviceNumber=3:A7
subsystemDeviceID=-
status=Standby
timeElapsed=
```

- ***Example (6)***: In this example, summary information is acquired about the unlocking tasks in the MegaTechUSP600-Primary storage domain that were created at least 5 days ago and whose current status is Standby.

```
htsmcli GetTasks storagedomainname="MegaTechUSP600-Primary" status="Standby"
datetype="Creation" daystobase="5" direction="After"
```

- ***Output (6)***:

```
RESPONSE:
List of 1 Task elements:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Unlocking
status=Standby
creationTime=2008/03/25 16:53:11
executionRequestTime=
startTime=
timeElapsed=
endTime=
unlockingProgress=0
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
moveToMigrationGroupName=
notifyToURL=mailto:test@example.com
description=
```

- ***Example (7)***: In this example, detailed information is acquired about the shredding tasks in the MegaTechUSP600-Primary storage domain that were created at least 5 days ago and whose current status is Standby.

```
htsmcli GetTasks --detail storagedomainname="MegaTechUSP600-Primary" status="Standby"
datetype="Creation" daystobase="5" direction="After"
```

- ***Output (7)***:

```
RESPONSE:
List of 1 Task elements:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Shredding
status=Standby
timeEstimate=0:02:02
creationTime=2008/03/25 16:53:11
executionRequestTime=
startTime=
timeElapsed=
endTime=
shreddingProgress=0
estimatedShreddingCompletionTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
shreddingMethod=ZERO-ONCE
moveToMigrationGroupName=MG044
totalShreddingCapacityInGB=19
notifyToURL=mailto:test@example.com
description=
List of 2 ShreddingInfo elements:
An instance of ShreddingInfo(1 of 2)
controllerDeviceNumber=3:A6
subsystemSerialNumber=14011
subsystemDisplayModel=USP
subsystemName=USP@10.208.151.151
subsystemDeviceNumber=3:A6
subsystemDeviceID=-
```

```
capacityInKB=10,240,320
status=Standby
timeElapsed=
timeEstimate=0:01:01
An instance of ShreddingInfo(2 of 2)
controllerDeviceNumber=3:A7
subsystemSerialNumber=14011
subsystemDisplayModel=USP
subsystemName=USP@10.208.151.151
subsystemDeviceNumber=3:A7
subsystemDeviceID=-
capacityInKB=10,240,320
status=Standby
timeElapsed=
timeEstimate=0:01:01
```

- ***Example (8)***: In this example, summary information is acquired about the shredding tasks in the `MegaTechUSP600-Primary` storage domain that were created at least 5 days ago and whose current status is `Standby`.

```
htsmcli GetTasks storagedomainname="MegaTechUSP600-Primary" status="Standby"
datetype="Creation" daystobase="5" direction="After"
```

- ***Output (8)***:

```
RESPONSE:
List of 1 Task elements:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Shredding
status=Standby
timeEstimate=0:01:01
creationTime=2008/03/25 16:53:11
executionRequestTime=
startTime=
timeElapsed=
endTime=
shreddingProgress=0
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
shreddingMethod=ZERO-ONCE
moveToMigrationGroupName=MG044
totalShreddingCapacityInGB=19
notifyToURL=mailto:test@example.com
description=
```

- ***Example (9)***: In this example, the `GetTasks` command is executed to acquire detailed information about tasks that were created within a 5-day period before the command is executed and whose current status is `Standby`.

```
htsmcli GetTasks --detail status="Standby" datetype="Creation" daystobase="5"
direction="After"
```

- ***Output (9)***:

```
RESPONSE:
List of 1 Task elements:
An instance of Task(1 of 1)
ID=TK1k7lqmqu
taskType=VolumeCreation
status=Standby
creationTime=2008/10/10 08:44:45
executionRequestTime=
startTime=
timeElapsed=
```

```
endTime=
ownerID=user
subsystemSerialNumber=10037
subsystemDisplayModel=USP_V
subsystemName=USP_V@10.208.115.221
subsystemVendor=HITACHI
totalCapacityInGB=19
notifyToURL=mailto:test@example.com
description=
List of 1 VolumeCreationInfo elements:
An instance of VolumeCreationInfo(1 of 1)
deviceNumber=00:03:A6,00:03:A7
arrayGroupName=E27-20
freeSpaceIndex=5
externalSubsystemSerialNumber=14011
externalSubsystemDisplayModel=USP
externalSubsystemName=USP@10.208.151.151
externalSubsystemVendor=HITACHI
numberOfVolumes=2
emulationType=OPEN-V
capacityInKB=19,922,944
status=Standby
timeElapsed=
```

- ***Example (10)***: In this example, the `GetTasks` command is executed to acquire summary information about tasks that were created within a 5-day period before the command is executed and whose current status is `Standby`.

```
htsmcli GetTasks status="Standby" datetype="Creation" daystobase="5" direction="After"
```

- ***Output (10)***:

```
RESPONSE:
List of 1 Task elements:
An instance of Task(1 of 1)
ID=TK1k7lqmqu
taskType=VolumeCreation
status=Standby
creationTime=2008/10/10 08:44:45
executionRequestTime=
startTime=
timeElapsed=
endTime=
ownerID=user
totalCapacityInGB=19
notifyToURL=mailto:test@example.com
description=
```

- ***Example (11)***: In this example, the `GetTasks` command is executed to acquire detailed information about all tasks in the `MegaTechUSP600-Primary` storage domain that were created within a 5-day period before the command is executed and whose current status is `Standby`.

```
htsmcli GetTasks --detail storagedomainname="MegaTechUSP600-Primary" status="Standby"
datetype="Creation" daystobase="5" direction="After"
```

- ***Output (11)***:

```
RESPONSE:
List of 1 Task elements:
An instance of Task(1 of 1)
ID=TK1k7m37qq
taskType=ExternalMapping
status=Standby
creationTime=2008/10/10 10:22:36
```

```
executionRequestTime=
startTime=
timeElapsed=
endTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
subsystemSerialNumber=10037
subsystemDisplayModel=USP_V
subsystemName=USP_V@10.208.115.221
subsystemVendor=HITACHI
totalCapacityInGB=19
notifyToURL=mailto:test@example.com
description=
List of 1 ExternalMappingInfo elements:
An instance of ExternalMappingInfo(1 of 1)
deviceNumber=00:03:A7
arrayGroupName=E27-20
externalSubsystemSerialNumber=14011
externalSubsystemDisplayModel=USP
externalSubsystemName=USP@10.208.151.151
externalSubsystemVendor=HITACHI
externalDeviceNumber=0:28
externalDeviceID=-
externalArrayGroupName=1-9-1
pathGroupID=1
capacityInKB=19,922,944
status=Standby
timeElapsed=
List of 2 ExternalPathInfo elements:
An instance of ExternalPathInfo(1 of 2)
port=CL1-H
WWN=50.06.0E.80.05.27.35.07
externalTargetPort=CL3-A
externalWWN=50.06.0E.80.05.27.35.71
externalHSD=EXSP_RAID600_10037_CL1-H
externalLUN=10
An instance of ExternalPathInfo(2 of 2)
port=CL5-H
WWN=50.06.0E.80.05.27.35.08
externalTargetPort=CL3-B
externalWWN=50.06.0E.80.05.27.35.72
externalHSD=EXSP_RAID600_10037_CL5-H
externalLUN=12
```

- ***Example (12)***: In this example, the `GetTasks` command is executed to acquire summary information about all tasks in the `MegaTechUSP600-Primary` storage domain that were created within a 5-day period before the command is executed and whose current status is `Standby`.

```
htsmcli GetTasks storagedomainname="MegaTechUSP600-Primary" status="Standby"
datetype="Creation" daystobase="5" direction="After"
```

- ***Output (12)***:

```
RESPONSE:
List of 1 Task elements:
An instance of Task(1 of 1)
ID=TK1k7m37qq
taskType=ExternalMapping
status=Standby
creationTime=2008/10/10 10:22:36
executionRequestTime=
startTime=
timeElapsed=
endTime=
ownerID=user
```

```
storageDomainName=MegaTechUSP600-Primary
totalCapacityInGB=19
notifyToURL=mailto:test@example.com
description=
```

- ***Example (13)***: In this example, detailed information is acquired about multiple types of tasks in the MegaTechUSP600-Primary storage domain that were created at least 5 days ago and whose current status is Standby.

```
htsmcli GetTasks --detail storagedomainname="MegaTechUSP600-Primary" status="Standby"
datetype="Creation" daystobase="5" direction="After"
```

- ***Output (13)***:

```
RESPONSE:
List of 3 Task elements:
An instance of Task(1 of 3)
ID=TK1f2lymqv
taskType=Migration
status=Standby
timeEstimate=0:02:04
creationTime=2008/03/25 16:53:11
executionRequestTime=
timeElapsed=
endTime=
migrationStartedTime=
migrationCompletionTime=
migrationProgress=0
estimatedMigrationCompletionTime=
dataErasureStartedTime=
dataErasureCompletionTime=
dataErasureProgress=0
estimatedDataErasureCompletionTime=
zeroDataDiscardStartedTime=
zeroDataDiscardCompletionTime=
zeroDataDiscardProgress=0
estimatedZeroDataDiscardCompletionTime=
ownerID=user
ownerGroupID=Admin
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
previousTargetStorageTierName=
targetStorageTierName=MegaTech-HighCost
eraseData=No
zeroDataDiscard=No
totalCapacityInGB=19
notifyToURL=mailto:test@example.com
description=
List of 2 MigrationInfo elements:
An instance of MigrationInfo(1 of 2)
sourceControllerDeviceNumber=3:A6
sourceSubsystemSerialNumber=14011
sourceSubsystemDisplayModel=USP
sourceSubsystemName=USP@10.208.151.151
sourceSubsystemVendor=HITACHI
sourceSubsystemDeviceNumber=3:A6
sourceSubsystemDeviceID=-
sourceSLPRNumber=0
sourceCLPRNumber=0
sourceRAIDLevel=RAID5(3D+1P)
sourceDiskType=Unknown
sourceControllerArrayGroupName=E9960-1
sourceArrayGroupName=1-9-1
sourceArrayGroupBusyRate=34.56
sourceArrayGroupMaxBusyRate=56.75
targetControllerDeviceNumber=2:80
```

```
targetSubsystemSerialNumber=14011
targetSubsystemDisplayModel=USP
targetSubsystemName=USP@10.208.151.151
targetSubsystemVendor=HITACHI
targetSubsystemDeviceNumber=2:80
targetSubsystemDeviceID=-
targetSLPRNumber=0
targetCLPRNumber=0
targetRAIDLevel=RAID5(3D+1P)
targetDiskType=Unknown
targetControllerArrayGroupName=E9960-11
targetArrayGroupName=1-10-1
targetArrayGroupBusyRate=34.56
targetArrayGroupMaxBusyRate=56.75
emulationType=OPEN-V
capacityInKB=10,240,320
status=Standby
migrationProgress=0
timeElapsed=
timeEstimate=0:01:02
An instance of MigrationInfo(2 of 2)
sourceControllerDeviceNumber=3:A7
sourceSubsystemSerialNumber=14011
sourceSubsystemDisplayModel=USP
sourceSubsystemName=USP@10.208.151.151
sourceSubsystemVendor=HITACHI
sourceSubsystemDeviceNumber=3:A7
sourceSubsystemDeviceID=-
sourceSLPRNumber=0
sourceCLPRNumber=0
sourceRAIDLevel=RAID5(3D+1P)
sourceDiskType=Unknown
sourceControllerArrayGroupName=E9980-1
sourceArrayGroupName=1-9-1
sourceArrayGroupBusyRate=34.56
sourceArrayGroupMaxBusyRate=56.75
targetControllerDeviceNumber=2:84
targetSubsystemSerialNumber=14011
targetSubsystemDisplayModel=USP
targetSubsystemName=USP@10.208.151.151
targetSubsystemVendor=HITACHI
targetSubsystemDeviceNumber=2:84
targetSubsystemDeviceID=-
targetSLPRNumber=0
targetCLPRNumber=0
targetRAIDLevel=RAID5(3D+1P)
targetDiskType=Unknown
targetControllerArrayGroupName=E9980-11
targetArrayGroupName=1-10-1
targetArrayGroupBusyRate=34.56
targetArrayGroupMaxBusyRate=56.75
emulationType=OPEN-V
capacityInKB=10,240,320
status=Standby
migrationProgress=0
timeElapsed=
timeEstimate=0:01:02
An instance of Task(2 of 3)
ID=TK1f2lymqv
taskType=Shredding
status=Standby
timeEstimate=0:02:02
creationTime=2008/03/25 16:53:11
executionRequestTime=
startTime=
timeElapsed=
```

```
endTime=
shreddingProgress=0
estimatedShreddingCompletionTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
shreddingMethod=ZERO-ONCE
moveToMigrationGroupName=MG044
totalShreddingCapacityInGB=19
notifyToURL=mailto:test@example.com
description=
List of 2 ShreddingInfo elements:
An instance of ShreddingInfo(1 of 2)
controllerDeviceNumber=3:A6
subsystemSerialNumber=14011
subsystemDisplayModel=USP
subsystemName=USP@10.208.151.151
subsystemDeviceNumber=3:A6
subsystemDeviceID=-
capacityInKB=10,240,320
status=Standby
timeElapsed=
timeEstimate=0:01:01
An instance of ShreddingInfo(2 of 2)
controllerDeviceNumber=3:A7
subsystemSerialNumber=14011
subsystemDisplayModel=USP
subsystemName=USP@10.208.151.151
subsystemDeviceNumber=3:A7
subsystemDeviceID=-
capacityInKB=10,240,320
status=Standby
timeElapsed=
timeEstimate=0:01:01
An instance of Task(3 of 3)
ID=TK1f2lymqv
taskType=Unlocking
status=Standby
creationTime=2008/03/25 16:53:11
executionRequestTime=
startTime=
timeElapsed=
endTime=
unlockingProgress=0
estimatedUnlockingCompletionTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
moveToMigrationGroupName=
notifyToURL=mailto:test@example.com
description=
List of 2 UnlockingInfo elements:
An instance of UnlockingInfo(1 of 2)
controllerDeviceNumber=3:A6
subsystemSerialNumber=14011
subsystemDisplayModel=USP
subsystemName=USP@10.208.151.151
subsystemDeviceNumber=3:A6
subsystemDeviceID=-
status=Standby
timeElapsed=
An instance of UnlockingInfo(2 of 2)
controllerDeviceNumber=3:A7
subsystemSerialNumber=14011
subsystemDisplayModel=USP
subsystemName=USP@10.208.151.151
```

```
subsystemDeviceNumber=3:A7
subsystemDeviceID=-
status=Standby
timeElapsed=
```

- ***Example (14)***: In this example, summary information is acquired about multiple types of tasks in the `MegaTechUSP600-Primary` storage domain that were created at least 5 days ago and whose current status is `Standby`.

```
htsmcli GetTasks storagedomainname="MegaTechUSP600-Primary" status="Standby"
datetype="Creation" daystobase="5" direction="After"
```

- ***Output (14)***:

```
RESPONSE:
List of 1 Task elements:
An instance of Task(1 of 3)
ID=TK1f2lymqv
taskType=Migration
status=Standby
timeEstimate=0:02:04
creationTime=2008/03/25 16:53:11
executionRequestTime=
timeElapsed=
endTime=
migrationStartedTime=
migrationProgress=0
dataErasureStartedTime=
dataErasureProgress=0
zeroDataDiscardStartedTime=
zeroDataDiscardProgress=0
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
targetStorageTierName=MegaTech-HighCost
eraseData=No
zeroDataDiscard=No
totalCapacityInGB=19
notifyToURL=mailto:test@example.com
description=
An instance of Task(2 of 3)
ID=TK1f2lymqv
taskType=Shredding
status=Standby
timeEstimate=0:01:01
creationTime=2008/03/25 16:53:11
executionRequestTime=
startTime=
timeElapsed=
endTime=
shreddingProgress=0
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
shreddingMethod=ZERO-ONCE
moveToMigrationGroupName=MG044
totalShreddingCapacityInGB=19
notifyToURL=mailto:test@example.com
description=
An instance of Task(3 of 3)
ID=TK1f2lymqv
taskType=Unlocking
status=Standby
creationTime=2008/03/25 16:53:11
executionRequestTime=
startTime=
```

```
timeElapsed=
endTime=
unlockingProgress=0
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
moveToMigrationGroupName=
notifyToURL=mailto:test@example.com
description=
```

- ***Example (15)***: In this example, the `GetTasks` command is executed to acquire summary information about all tasks in the `MegaTechUSP600-Primary` storage domain that ended at least 5 days ago; however, there are no tasks that satisfy the specified condition.

```
htsmcli GetTasks storagedomainname="MegaTechUSP600-Primary" status="End"
datetype="Creation" daystobase="5" direction="Before"
```

- ***Output (15)***:

```
RESPONSE:
(Command completed; empty list returned)
```

ModifyTask

The `ModifyTask` command can be used to change task information (such as the task description and event notification address).

Task information cannot be changed in the following statuses:

- Task has ended (`End`).
- Task is in a storage domain whose refresh status is either `Processing` or `Failure`.

Syntax

```
htsmcli [server-location] ModifyTask
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
id =task-ID
[ newnotifytourl=event-notification-address ]
[newdescription=description-of-the-task ]
```

Options

Specify the `-d` or `--detail` option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, nothing will be displayed in the standard output.

Parameters

Table 4-58 Parameters of the ModifyTask Command

Parameter Name	Optional or Required	Description
id	Required	Specify the task ID.
newnotifytourl	Optional	Specify the address to be notified when the event occurs. When this item is omitted, the existing event notification address remains unchanged. If you specify only spaces, the previous event notification Web address will be erased.
newdescription	Optional	Specify a new task description. If this is omitted, the task description will not change. If you specify only spaces, the previous task description will be deleted.

Output Items

The ModifyTask command can change the properties of multiple types of tasks. Therefore, the output items depend on the task type. The following tables show the ModifyTask command's output items for each task type.

Table 4-59 Items Output by the ModifyTask Command (Migration Task)

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (Migration)
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.WaitingMigration (waiting for migration) ▪ Active.Migrating (migration in progress) ▪ Active.WaitingDataErasure (waiting for data erasure) ▪ Active.DataErasing (data erasure in progress) ▪ Active.WaitingZeroDataDiscard (waiting to release unused space) ▪ Active.ZeroDataDiscarding (releasing unused space) ▪ Stopping (being stopped) ▪ Stopping.Immediate (stopping mid-task) ▪ Unknown (status other than the above)

Type of Information	Item Name	Description
	timeEstimate	The estimated time for the task execution. If you specify the erasedata parameter during task creation, and then execute the task, this value will include the time to delete data. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.
	creationTime	The date and time when the task was created
	endTime	The date and time when task execution ended
	ownerID	The user ID of the user who created the task
	storageDomainName	The name of the storage domain
	migrationGroupName	The name of the migration group
	previousTargetStorageTierName	The name of the migration target storage tier for the previous migration. If migration has never been performed, nothing is displayed.
	targetStorageTierName	The name of the migration target storage tier
	eraseData	Indicates whether the data for the migration source volume is to be deleted once after migration terminates normally.
	zeroDataDiscard	Indicates whether the unused space in the migration target volume is to be released after migration terminates normally. Even if the zero data discard function is specified during migration task creation, No is displayed if the conditions for the zero data discard functions are not satisfied. For details about the conditions for the zero data discard function, see the zerodatadiscard parameter in Table 4-40.
	notifyToURL	Event notification address
	description	A description of the task
Information about the volume to be migrated	sourceControllerDeviceNumber	The controller LDEV number of the migration source volume. The number is displayed in 0:00 or 00:00:00 format.
	targetControllerDeviceNumber	The controller LDEV number of the migration target volume. The number is displayed in 0:00 or 00:00:00 format.
	timeEstimate	The estimated time for task execution for each volume. If you specify the erasedata parameter during task creation, and then execute the task, this value will include the time to delete data. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.

Table 4-60 Items Output by the ModifyTask Command (Locking Task)

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (Locking)
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.Waiting (waiting for execution) ▪ Active.Executing (being executed) ▪ Stopping (being stopped) ▪ Unknown (status other than the above)
	creationTime	The date and time when the task was created
	endTime	The date and time when task execution ended
	ownerID	The user ID of the user who created the task
	storageDomainName	The name of the storage domain
	migrationGroupName	The name of the migration group
	retentionDays	The locked period (in days). If there is no locking period, -1 (Unlimited) will be displayed.
	retainedThrough	The date the locked period expires. If there is no expiration date, Unlimited will be displayed.
	guardMode	The locking method to be applied when the locking task is executed. ▪ Read only: Protected from write operations ▪ Protect: Protected from read and write operations
	moveToMigrationGroupName	The target migration group name of the volume whose locking has been completed
	notifyToURL	Event notification address
	description	The description of the task
Information about the volume to be locked	controllerDeviceNumber	Controller logical device number of the volume. The number is displayed in 0:00 or 00:00:00 format.

Table 4-61 Items Output by the ModifyTask Command (Unlocking Task)

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (Unlocking)
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.Waiting (waiting for execution) ▪ Active.Executing (being executed) ▪ Stopping (being stopped) ▪ Unknown (status other than the above)
	creationTime	The date and time when the task was created
	endTime	The date and time when task execution ended
	ownerID	The user ID of the user who created the task
	storageDomainName	The name of the storage domain
	migrationGroupName	The name of the migration group
	moveToMigrationGroupName	The target migration group name of a volume whose unlocking has been completed
	notifyToURL	Event notification address
	description	The description of the task
Information about the volume to be unlocked	controllerDeviceNumber	Controller logical device number of the volume. The number is displayed in 0:00 or 00:00:00 format.

Table 4-62 Items Output by the ModifyTask Command (Shredding Task)

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (Shredding)
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.Waiting (waiting for execution) ▪ Active.Executing (being executed) ▪ Stopping (being stopped) ▪ Unknown (status other than the above)
	timeEstimate	The estimated time for the task execution. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.
	creationTime	The date and time when the task was created
	endTime	The date and time when task execution ended
	ownerID	The user ID of the user who created the task
	storageDomainName	The name of the storage domain
	migrationGroupName	The name of the migration group
	shreddingmethod	The shredding pattern. This can be any of the following: ▪ ZERO-ONCE: The data 0 is written only once ▪ DoD: The DoD standard method is used
	moveToMigrationGroupName	The target migration group name of a volume whose shredding has been completed
	notifyToURL	Event notification address
	description	The description of the task
Information about the volume to be shredded	controllerDeviceNumber	Controller logical device number of the volume. The number is displayed in 0:00 or 00:00:00 format.
	timeEstimate	The estimated time for task execution for each volume. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.

Table 4-63 Items Output by the ModifyTask Command (Volume Creation Task)

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (VolumeCreation)
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.WaitingVolumeCreation (waiting for a volume to be created) ▪ Active.VolumeCreation (volume creation in progress) ▪ Stopping (being stopped) ▪ Unknown (status other than the above)
	creationTime	The date and time when the task was created.
	endTime	The date and time when task execution ended.
	ownerID	The user ID of the user who created the task.
	subsystemName	The subsystem name of the storage subsystem containing the volume.
	notifyToURL	The event notification address.
	description	The description of the task.
Information about the volume to be created	arrayGroupName	The array group name of the volume.
	freeSpaceIndex	The number of the free space in the volume array group.

Table 4-64 Items Output by the ModifyTask Command (External Mapping Task)

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (ExternalMapping)
	status	The task status. This can be any of the following: ▪ Standby ▪ Active.WaitingPathCreation (waiting for path creation) ▪ Active.PathCreation (path creation in progress) ▪ Active.WaitingExternalMapping (waiting for external mapping) ▪ Active.ExternalMapping (external mapping in progress) ▪ Stopping (being stopped) ▪ Stopping.StoppingPathCreation (path creation is being stopped) ▪ Stopping.StoppingExternalMapping (external mapping is being stopped) ▪ Unknown (status other than the above)
	creationTime	The date and time when the task was created.
	endTime	The date and time when task execution ended.
	ownerID	The user ID of the user who created the task.
	storageDomainName	The storage domain name.
	subsystemName	The subsystem name of the storage subsystem containing the volume.
	notifyToURL	The event notification address.
	description	The description of the task.
Information about the volume to be externally mapped	externalDeviceNumber	The logical device number on the external storage subsystem side. The number is displayed as a decimal number or in 0:00 or 00:00:00 format. For an SMI-S Enabled subsystem, an element name is displayed.
	externalDeviceID	The logical device ID on the external storage subsystem side. For a Hitachi storage subsystem, - is displayed.

Example and Execution Results

- ***Example (1)***: In this example, the description of the migration task whose task ID is TK1f2lymqv is changed.

```
htsmcli ModifyTask --detail id="TK1f2lymqv" newdescription="This property was changed."
```

- ***Output (1)***:

```
RESPONSE:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Migration
status=Standby
timeEstimate=0:02:02
creationTime=2008/03/25 16:53:11
endTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
previousTargetStorageTierName=
targetStorageTierName=MegaTech-HighCost
eraseData=No
zeroDataDiscard=No
notifyToURL=mailto:test@example.com
description=This property was changed.
List of 2 MigrationInfo elements:
An instance of MigrationInfo(1 of 2)
sourceControllerDeviceNumber=3:A6
targetControllerDeviceNumber=2:80
timeEstimate=0:01:01
An instance of MigrationInfo(2 of 2)
sourceControllerDeviceNumber=3:A7
targetControllerDeviceNumber=2:84
timeEstimate=0:01:01
```

- ***Example (2)***: In this example, the description of the locking task whose task ID is TK1f2lymqv is changed.

```
htsmcli ModifyTask --detail id="TK1f2lymqv" newdescription="This property was changed."
```

- ***Output (2)***:

```
RESPONSE:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Locking
status=Standby
creationTime=2008/03/25 16:53:11
endTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
retentionDays=365
retainedThrough=
guardMode=Read only
moveToMigrationGroupName=
notifyToURL=mailto:test@example.com
description=This property was changed.
List of 2 LockingInfo elements
An instance of LockingInfo(1 of 2)
controllerDeviceNumber=3:A6
An instance of LockingInfo(2 of 2)
controllerDeviceNumber=3:A7
```

- ***Example (3)***: In this example, the description of the unlocking task whose task ID is TK1f2lymqv is changed.

```
htsmcli ModifyTask --detail id="TK1f2lymqv" newdescription="This property was changed."
```

- ***Output (3)***:

```
RESPONSE:
An instance of Task(1 of 1)
ID=TK1f2lymqv
```

```
taskType=Unlocking
status=Standby
creationTime=2008/03/25 16:53:11
endTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
moveToMigrationGroupName=
notifyToURL=mailto:test@example.com
description=This property was changed.
List of 2 UnlockingInfo elements
An instance of UnlockingInfo(1 of 2)
controllerDeviceNumber=3:A6
An instance of UnlockingInfo(2 of 2)
controllerDeviceNumber=3:A7
```

- ***Example (4)***: In this example, the description of the shredding task whose task ID is TK1f2lymqv is changed.

```
htsmcli ModifyTask --detail id="TK1f2lymqv" newdescription="This property was changed."
```

- ***Output (4)***:

```
RESPONSE:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Shredding
status=Standby
timeEstimate=0:02:02
creationTime=2008/03/25 16:53:11
endTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
shreddingMethod=DoD
moveToMigrationGroupName=Already-Shredded-MG
notifyToURL=mailto:test@example.com
description=This property was changed.
List of 2 ShreddingInfo elements:
An instance of ShreddingInfo(1 of 2)
controllerDeviceNumber=3:A6
timeEstimate=0:01:01
An instance of ShreddingInfo(2 of 2)
controllerDeviceNumber=3:A7
timeEstimate=0:01:01
```

- ***Example (5)***: In this example, the command changes the description of the volume creation task whose task ID is TK1k7lqmqu.

```
htsmcli ModifyTask --detail id="TK1k7lqmqu" newdescription="This property was changed."
```

- ***Output (5)***:

```
RESPONSE:
List of 1 Task elements:
An instance of Task(1 of 1)
ID=TK1k7lqmqu
taskType=VolumeCreation
status=Standby
creationTime=2008/10/10 08:44:45
endTime=
ownerID=user
subsystemName=USP_V@10.208.115.221
notifyToURL=mailto:test@example.com
description=This property was changed.
List of 1 VolumeCreationInfo elements:
An instance of VolumeCreationInfo(1 of 1)
arrayGroupName=E27-20
```

```
freeSpaceIndex=5
```

- ***Example (6)***: In this example, the command changes the description of the external mapping task whose task ID is TK1k7m37qq.

```
htsmcli ModifyTask --detail id="TK1k7m37qq" newdescription="This property was changed."
```

- ***Output (6)***:

```
RESPONSE:
List of 1 Task elements:
An instance of Task(1 of 1)
ID=TK1k7m37qq
taskType=ExternalMapping
status=Standby
creationTime=2008/10/10 10:22:36
endTime=
ownerID=user
storageDomainName=MegaTechUSP600-Primary
subsystemName=USP_V@10.208.115.221
notifyToURL=mailto:test@example.com
description=This property was changed.
List of 1 ExternalMappingInfo elements:
An instance of ExternalMappingInfo(1 of 1)
externalDeviceNumber=0:28
externalDeviceID=-
```

ExecuteTask

The ExecuteTask command can be used to request the execution of a specified task in the Standby status on the Tiered Storage Manager server. Tasks are usually not executed right after execution of this command because the Tiered Storage Manager server is busy with other tasks.

An execution request cannot be made to the Tiered Storage Manager server for a task in a storage domain whose refresh status is either Processing or Failure.

You can use the GetTasks command to check the status of tasks.

If a volume is being re-created on the migration target and an error occurs during the migration, all the data on the migration target volume might be deleted. Check the output message, and then manually create the volume.

Do not specify a label for the migration target volume until execution of the migration task ends.

Syntax

```
htsmcli [server-location] ExecuteTask
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
id=task-ID
```

Parameters

Table 4-65 Parameters of the ExecuteTask Command

Parameter Name	Optional or Required	Description
id	Required	Specify the task ID.

Output Items

Nothing is output by this command.

Example and Execution Results

- ***Example***: In this example, the task whose ID is TK1ev677gu is executed.

```
htsmcli ExecuteTask id=TK1ev677gu
```

- ***Output***: No information is output by this command.

CancelTask

The CancelTask command can be used to cancel a specified task in the Standby status. If cancellation is successful, the status of the task changes from Standby to Cancel. When this command is executed, volume migration reserve is released for the volume.

Tasks cannot be cancelled in the following statuses:

- Tasks are in the running status (Active).
- Tasks are in the ended status (End).
- Tasks are in a storage domain whose refresh status is either Processing or Failure.

Syntax

```
htsmcli [server-location] CancelTask
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ --emergency ]
id=task-ID
```

Options

Table 4-66 Options of the CancelTask Command

Option Name	Option Arguments	Optional or Required	Explanation
--emergency	No arguments	Optional	When specified, this option forcibly terminates the tasks and volume tasks that have been waiting (tasks on Standby) in the storage domain for which refreshing failed. **Note**: Specifying this option when Device Manager or the storage subsystem is running normally causes the task volume to remain reserved, creating an inconsistency between Tiered Storage Manager management information and Device Manager or storage subsystem information. After executing this option, take one of the following actions: ▪ When there is a target storage subsystem Refresh the storage subsystem using Device Manager and then refresh the storage domain using Tiered Storage Manager. ▪ When there is no target storage subsystem Delete the storage domain using Tiered Storage Manager and then delete the storage subsystem from Device Manager.

Parameters

Table 4-67 Parameters of the CancelTask Command

Parameter Name	Optional or Required	Description
id	Required	Specify the task ID.

Output Items

Nothing is output by this command.

Example and Execution Results

- ***Example***: In this example, the task whose ID is TK1ev677gu is cancelled.

```
htsmcli CancelTask id=TK1ev677gu
```

- ***Output***: No information is output by this command.

StopTask

The StopTask command can be used to issue to the Tiered Storage Manager server a request to stop a specified task that is in Standby status. This command also cancels migration volume reserve placed by the migration task. The command can stop tasks in the following statuses:

- `Active`

  However, tasks in one of the following statuses cannot be stopped:

  – When a shredding task is in the `Active.Executing` status

  – When a task for which the zero data discard function is being executed is in the `Active.ZeroDataDiscarding` status

  – When a migration task for which the zero data discard function has not been specified is in the `Active.DataErasing` status

- `Stopping`

  The tasks in this status can be stopped only if `Yes` is specified for the `immediate` parameter in a migration task.

Note that processing for stopping a task is not performed the same time as the execution of this command.

According to the `immediate` parameter specified by the user, a task will be stopped by one of the following methods:

- If there are volumes for which processing is being performed when a task stop request is issued, the task will be stopped after the processing ends. This method is applied if `No` is specified for the `immediate` parameter or when the `immediate` parameter is omitted.
- A task is stopped immediately. If there are volumes for which processing is being performed when a task stop request is issued, the processing will be interrupted. This method is applied if `Yes` is specified for the `immediate` parameter.

In both methods, processing will not be performed for volumes for which the processing has not yet been performed in the storage subsystem when the task stop request is issued. The state of the volumes for which the processing has not yet been performed is the same as the state before the stopping the task.

During a migration in which a volume is re-created, if the processing stops in the middle, the migration target volume might remain deleted. Check the output message, and then manually create the volume.

You can use the `GetTasks` command to check the status of task.

A task in a storage domain whose refresh status is either `Processing` or `Failure` cannot be stopped.

Syntax

```
htsmcli [server-location] StopTask
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-standard-output-redirect-file ]
[ --emergency ]
id=task-ID
[ immediate={ Yes | No } ]
```

Options

Table 4-68 Options of the StopTask Command

Option Name	Option Arguments	Optional or Required	Explanation
--emergency	No arguments	Optional	When specified, this option forcibly terminates the tasks and volume tasks that have not been completed (tasks on standby) in the storage domain for which refreshing failed. Note: Specifying this option when Device Manager or the storage subsystem is running normally causes the task volume to remain reserved, creating an inconsistency between Tiered Storage Manager management information and Device Manager or storage subsystem information. After executing this option, take one of the following actions: ▪ When there is a target storage subsystem Refresh the storage subsystem using Device Manager and then refresh the storage domain using Tiered Storage Manager. ▪ When there is no target storage subsystem Delete the storage domain using Tiered Storage Manager and then delete the storage subsystem from Device Manager.

Parameters

Table 4-69 Parameters of the StopTask Command

Parameter Name	Optional or Required	Description
id	Required	Specify the task ID.
immediate	Optional	Specify whether to immediately stop a migration task running in the storage subsystem. This can be either Yes or No. ▪ Yes: The migration task will be stopped immediately.# ▪ No: If there are volumes for which migration processing is being performed, the task will be stopped after the processing ends (default). If Yes is specified for a task that is being stopped, the task stop request will be accepted. However, if Yes is specified for a task that is being immediately stopped, the task stop request will not be accepted.

#

When a migration task being executed in a storage subsystem is stopped, a stop request is issued for each volume. Responding to a stop request for each volume might take time. Therefore, depending on the number of volumes, the processing for stopping a task might require different amounts of time to finish.

For example, if there are five volumes issuing a stop request, the time required to finish processing for all the volumes takes five times as long to respond than a stop request for just one volume.

Output Items

Nothing is output by this command.

Example and Execution Results

- ***Example***: In this example, the task whose task ID is `TK1ev677gu` is stopped.

```
htsmcli StopTask id=TK1ev677gu
```

- ***Output***: No information is output by this command.

DeleteTasks

The `DeleteTasks` command can be used to delete a task, specified by the `id` parameter, that has the ended status (`End`).

You can specify a range of tasks using the `status` parameter, which indicates the task status. You can also specify a type of task.

Furthermore, you can use any dates linked to the task, such as the creation date or end date, to specify a range of tasks, such as the following:

- Tasks created (or ended) on or before the specified base date
- Tasks created (or ended) on or after the specified base date
- Tasks created (or ended) on the specified base date

Specify the `--force` option to delete the task without seeing the confirmation message. If the `--force` option is omitted, a message for confirming each task will be output to the standard error output.

Syntax

```
htsmcli [ server-location] DeleteTasks
{ -u | --username } user-name
{ -p | --password } { password | @password-file-name }
[ { -s | --secure } ]
[ { -o | --output } standard-output-redirect-file-name ]
[ { -f | --force } ]
[ { id=task-ID |
[ { storagedomainname=storage-domain-name
[ migrationgroupname=migration-group-name ]
[ targetstoragetiername=target-storage-tier-name ]
| subsystemname=subsystem-name } ]
[ status=status [ ,status ]... ]
[ [ datetype = { Creation | End } ]
daystobase=days-to-base-date
[ direction={ Before | After | Just } ] ]
[ tasktype={ Migration | Shredding | Locking
| Unlocking | VolumeCreation | ExternalMapping } ] } ]
```

Options

Table 4-70 Options of the DeleteTasks Command

Option Name	Option Arguments	Optional or Required	Description
-f or --force	None	Optional	Specify this to delete without confirmation. If this is omitted, deletion will need to be confirmed for each task.

Parameters

Table 4-71 Parameters of the DeleteTasks Command

Parameter Name	Optional or Required	Description
id	Optional	Specify the task ID. This parameter cannot be specified with other parameters.
storagedomainname	Optional	Specify the name of the storage domain. This must be specified when migrationgroupname or targetstoragetiername is specified.
migrationgroupname	Optional	Specify the name of the migration group, along with storagedomainname.
targetstoragetiername	Optional	Specify the name of the migration target storage tier, along with storagedomainname. This parameter is used only for narrowing down the migration tasks.
subsystemname	Optional	Specify the name of the subsystem. If you omit this parameter, the storage subsystems are not narrowed down.
status	Optional	Specify the status of the task. This can be any of the following: ▪ Failure.MigrationFailure (migration ended in failure) ▪ Failure.DataErasureFailure (erasure ended in failure) ▪ Failure.VolumeCreationFailure (volume creation ended in failure) ▪ Failure.PathCreationFailure (path creation ended in failure)

Parameter Name	Optional or Required	Description
		▪ Failure.ExternalMappingFailure (external mapping ended in failure) ▪ Failure.ZeroDataDiscardFailure (release of unused space ended in failure) ▪ Stop.MigrationStop (migration has stopped) ▪ Stop.DataErasureStop (data erasure has stopped) ▪ Stop.PathCreationStop (path creation has stopped) ▪ Stop.ExternalMappingStop (external mapping has stopped) ▪ Stop.ZeroDataDiscardStop (release of unused space has stopped) ▪ Success ▪ Cancel (returned to original state) ▪ Failure (Same as specifying all of the Failure statuses at the same time) ▪ Stop (has been stopped, same as specifying all of the Stop statuses at the same time) ▪ End (ended, same as multiple specification of Success, Failure, Cancel, and Stop) When specifying multiple task statuses, separate each one with a comma. Only a lower-level status can be specified by omitting Failure. or Stop..
datetype	Optional	Specify the type of date (creation date or end date) linked to the task, for specifying a date range. This can be any of the following: ▪ Creation (default) ▪ End
daystobase	Optional	Specify the number of days to the base date that is 0 or a positive integer. Specify how many days from the base date tasks should be obtained.
direction	Optional	Specify the direction for daystobase. This can be any of the following: ▪ Before (days on or before the base date) ▪ After (days on or after the base date) ▪ Just (the base date itself, which is the default)
tasktype	Optional	Specify the type of task. This can be any of the following: ▪ Migration ▪ Shredding ▪ Locking ▪ Unlocking ▪ VolumeCreation ▪ ExternalMapping If the parameter is omitted, the command does not narrow down the task types.

Output Items

The DeleteTasks command can delete multiple types of tasks. Therefore, the output items depend on the type of task. The following tables show the DeleteTasks command's output items for each type of task.

If the applied task does not exist within the specified task range, nothing is output.

Table 4-72 Items Output by the DeleteTasks Command (Migration Task)

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (Migration)
	status	The task status. This can be any of the following: ▪ Failure.MigrationFailure (migration ended in failure) ▪ Failure.DataErasureFailure (erasure ended in failure) ▪ Failure.ZeroDataDiscardFailure (release of unused space ended in failure) ▪ Stop.MigrationStop (migration has stopped) ▪ Stop.DataErasureStop (data erasure has stopped) ▪ Stop.ZeroDataDiscardStop (release of unused space has stopped) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Unknown (status other than the above)

Type of Information	Item Name	Description
	timeEstimate	The estimated time for the task execution. If you specify the erasedata parameter during task creation, and then execute the task, this value will include the time to delete data. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.
	creationTime	The date and time when the task was created
	endTime	The date and time when task execution ended
	ownerID	The user ID of the user who created the task
	storageDomainName	The name of the storage domain
	migrationGroupName	The name of the migration group
	previousTargetStorageTierName	The name of the migration target storage tier for the previous migration. If migration has never been performed, nothing is displayed.
	targetStorageTierName	The name of the migration target storage tier
	eraseData	Indicates whether the data for the migration source volume is to be deleted once after migration terminates normally.
	zeroDataDiscard	Indicates whether the unused space in the migration target volume is to be released after migration terminates normally. Even if the zero data discard function is specified during migration task creation, No is displayed if the conditions for the zero data discard functions are not satisfied. For details about the conditions for the zero data discard function, see the zerodatadiscard parameter in Table 4-40.
	notifyToURL	Event notification address
	description	A description of the task
Information about migration volumes	sourceControllerDeviceNumber	Controller logical device number of the source volume. The number is displayed in 0:00 or 00:00:00 format.
	targetControllerDeviceNumber	Controller logical device number of the target volume. The number is displayed in 0:00 or 00:00:00 format.
	timeEstimate	The estimated time for task execution for each volume. If you specify the erasedata parameter during task creation, and then execute the task, this value will include the time to delete data. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.

Table 4-73 Items Output by the DeleteTasks Command (Locking Task)

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (Locking)
	status	The task status. This can be any of the following: ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped) ▪ Unknown (status other than the above)
	creationTime	The date and time when the task was created
	endTime	The date and time when task execution ended
	ownerID	The user ID of the user who created the task
	storageDomainName	The name of the storage domain
	migrationGroupName	The name of the migration group
	retentionDays	The locked period (in days). If there is no locking period, -1 (Unlimited) will be displayed.
	retainedThrough	The date the locked period expires. If there is no expiration date, Unlimited will be displayed.
	guardMode	The locking method to be applied when the locking task is executed. ▪ Read only (protected from write operations) ▪ Protect (protected from read and write operations)
	moveToMigrationGroupName	The target migration group name of a volume whose locking has been completed
	notifyToURL	The event notification address
	description	The description of the task
Information about the volume to be locked	controllerDeviceNumber	Controller logical device number of the volume. The number is displayed in 0:00 or 00:00:00 format.

Table 4-74 Items Output by the DeleteTasks Command (Unlocking Task)

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (Unlocking)
	status	The task status. This can be any of the following: ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped) ▪ Unknown (status other than the above)
	creationTime	The date and time when the task was created
	endTime	The date and time when task execution ended
	ownerID	The user ID of the user who created the task
	storageDomainName	The name of the storage domain
	migrationGroupName	The name of the migration group
	moveToMigrationGroupName	The target migration group name of a volume whose unlocking has been completed
	notifyToURL	The event notification address
	description	The description of the task
Information about the volume to be unlocked	controllerDeviceNumber	Controller logical device number of the volume. The number is displayed in 0:00 or 00:00:00 format.

Table 4-75 Items Output by the DeleteTasks Command (Shredding Task)

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (Shredding)
	status	The task status. This can be any of the following: ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped) ▪ Unknown (status other than the above)
	timeEstimate	The estimated time for the task execution. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.
	creationTime	The date and time when the task was created
	endTime	The date and time when task execution ended
	ownerID	The user ID of the user who created the task
	storageDomainName	The name of the storage domain
	migrationGroupName	The name of the migration group
	shreddingMethod	The shredding pattern. This can be any of the following: ▪ ZERO-ONCE: The data 0 is written only once ▪ DoD: The DoD standard method is used
	moveToMigrationGroupName	The target migration group name of a volume whose shredding has been completed
	notifyToURL	The event notification address
	description	The description of the task
Information about the volume to be shredded	controllerDeviceNumber	Controller logical device number of the volume. The number is displayed in 0:00 or 00:00:00 format.
	timeEstimate	The estimated time for task execution for each volume. This value is displayed in hhhh:mm:ss format. If the estimated value is 10,000 hours or more, 9999:59:59 is displayed.

Table 4-76 Items Output by the DeleteTasks Command (Volume Creation Task)

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (VolumeCreation)
	status	The task status. This can be any of the following: ▪ Failure.VolumeCreationFailure (volume creation ended in failure) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped) ▪ Unknown (status other than the above)
	creationTime	The date and time when the task was created.
	endTime	The date and time when task execution ended.
	ownerID	The user ID of the user who created the task.
	subsystemName	The subsystem name of the storage subsystem containing the volume.
	notifyToURL	The event notification address.
	description	The description of the task.
Information about the volume to be created	arrayGroupName	The array group name of the volume.
	freeSpaceIndex	The number of the free space in the volume array group.

Table 4-77 Items Output by the DeleteTasks Command (External Mapping Task)

Type of Information	Item Name	Description
Information about the task	ID	The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format ########.
	taskType	The type of task (ExternalMapping)
	status	The task status. This can be any of the following: ▪ Failure.PathCreationFailure (path creation ended in failure) ▪ Failure.ExternalMappingFailure (external mapping ended in failure) ▪ Stop.PathCreationStop (path creation has stopped) ▪ Stop.ExternalMappingStop (external mapping has stopped) ▪ Success ▪ Failure ▪ Cancel (returned to original state) ▪ Stop (has been stopped) ▪ Unknown (status other than the above)
	creationTime	The date and time when the task was created.
	endTime	The date and time when task execution ended.
	ownerID	The user ID of the user who created the task.
	storageDomainName	The storage domain name.
	subsystemName	The subsystem name of the storage subsystem containing the volume.
	notifyToURL	The event notification address.
	description	The description of the task.
Information about the volume to be externally mapped	externalDeviceNumber	The logical device number on the external storage subsystem side. The number is displayed as a decimal number or in 0:00 or 00:00:00 format. For an SMI-S Enabled subsystem, an element name is displayed.
	externalDeviceID	The logical device ID on the external storage subsystem side. For a Hitachi storage subsystem, - is displayed.

Example and Execution Results

- ***Example (1)***: In this example, the cancelled migration tasks from the MegaTechUSP600-Primary storage domain are deleted. Because the --force option is not specified in this example, a message is output confirming deletion for each task.

```
htsmcli DeleteTasks storagedomainname="MegaTechUSP600-Primary" status="Cancel"
taskType="Migration"
```

- ***Output (1)***:

```
CONFIRMATION:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Migration
status=Cancel
timeEstimate=0:02:02
creationTime=2008/03/25 16:53:11
endTime=2008/04/02 16:53:45
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
previousTargetStorageTierName=
targetStorageTierName=MegaTech-HighCost
eraseData=No
zeroDataDiscard=No
notifyToURL=mailto:test@example.com
description=
List of 2 MigrationInfo elements:
An instance of MigrationInfo(1 of 2)
sourceControllerDeviceNumber=3:A6
targetControllerDeviceNumber=2:80
timeEstimate=0:01:01
An instance of MigrationInfo(2 of 2)
sourceControllerDeviceNumber=3:A7
targetControllerDeviceNumber=2:84
timeEstimate=0:01:01
Are you sure you want to delete this task? (Y/N) :
```

- ***Example (2)***: In this example, the cancelled locking tasks from the MegaTechUSP600-Primary storage domain are deleted.

```
htsmcli DeleteTasks storagedomainname="MegaTechUSP600-Primary" status="Cancel"
taskType="Locking"
```

- ***Output (2)***:

```
CONFIRMATION:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Locking
status=Cancel
creationTime=2008/03/25 16:53:11
endTime=2008/04/02 16:53:45
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
retentionDays=365
retainedThrough=
guardMode=Read only
moveToMigrationGroupName=
notifyToURL=mailto:test@example.com
description=This property was changed.
List of 2 LockingInfo elements:
An instance of LockingInfo(1 of 2)
controllerDeviceNumber=3:A6
```

```
An instance of LockingInfo(2 of 2)
controllerDeviceNumber=3:A7
Are you sure you want to delete this task? (Y/N) :
```

- ***Example (3)***: In this example, the cancelled unlocking tasks from the MegaTechUSP600-Primary storage domain are deleted.

```
htsmcli DeleteTasks storagedomainname="MegaTechUSP600-Primary" status="Cancel"
taskType="Unlocking"
```

- ***Output (3)***:

```
CONFIRMATION:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Unlocking
status=Cancel
creationTime=2008/03/25 16:53:11
endTime=2008/04/02 16:53:45
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
moveToMigrationGroupName=
notifyToURL=mailto:test@example.com
description=This property was changed.
List of 2 UnlockingInfo elements:
An instance of UnlockingInfo(1 of 2)
controllerDeviceNumber=3:A6
An instance of UnlockingInfo(2 of 2)
controllerDeviceNumber=3:A7
Are you sure you want to delete this task? (Y/N) :
```

- ***Example (4)***: In this example, the cancelled shredding tasks from the MegaTechUSP600-Primary storage domain are deleted.

```
htsmcli DeleteTasks storagedomainname="MegaTechUSP600-Primary" status="Cancel"
taskType="Shredding"
```

- ***Output (4)***:

```
CONFIRMATION:
An instance of Task(1 of 1)
ID=TK1f2lymqv
taskType=Shredding
status=Cancel
timeEstimate=0:02:02
creationTime=2008/03/25 16:53:11
endTime=2008/04/02 16:53:45
ownerID=user
storageDomainName=MegaTechUSP600-Primary
migrationGroupName=MG011
shreddingMethod=DoD
moveToMigrationGroupName=Already-Shredded-MG
notifyToURL=mailto:test@example.com
description=This property was changed.
List of 2 ShreddingInfo elements:
An instance of ShreddingInfo(1 of 2)
controllerDeviceNumber=3:A6
timeEstimate=0:01:01
An instance of ShreddingInfo(2 of 2)
controllerDeviceNumber=3:A7
timeEstimate=0:01:01
Are you sure you want to delete this task? (Y/N) :
```

- ***Example (5)***: In this example, the command deletes the canceled volume creation task from the tasks.

```
htsmcli DeleteTasks status="Cancel" taskType="VolumeCreation"
```

- ***Output (5)***:

```
CONFIRMATION:
An instance of Task(1 of 1)
ID=TK1k7lqlct
taskType=VolumeCreation
status=Cancel
creationTime=2008/10/10 08:44:27
endTime=2008/10/10 08:44:57
ownerID=user
subsystemName=USP_V@10.208.115.221
notifyToURL=mailto:test@example.com
description=This property was changed.
List of 1 VolumeCreationInfo elements:
An instance of VolumeCreationInfo(1 of 1)
arrayGroupName=E27-20
freeSpaceIndex=5
Are you sure you want to delete this task? (Y/N) :
```

- ***Example (6)***: In this example, the command deletes the canceled external mapping task from the tasks for the `MegaTechUSP600-Primary` storage domain.

```
htsmcli DeleteTasks storagedomainname="MegaTechUSP600-Primary" status="Cancel"
taskType="ExternalMapping"
```

- ***Output (6)***:

```
CONFIRMATION:
An instance of Task(1 of 1)
ID=TK1k81tuxu
taskType=ExternalMapping
status=Cancel
creationTime=2008/10/13 11:48:49
endTime=2008/10/13 19:30:45
ownerID=user
storageDomainName=MegaTechUSP600-Primary
subsystemName=USP_V@10.208.115.221
notifyToURL=mailto:test@example.com
description=This property was changed.
List of 1 ExternalMappingInfo elements:
An instance of ExternalMappingInfo(1 of 1)
externalDeviceNumber=0:28
externalDeviceID=-
Are you sure you want to delete this task? (Y/N) :
```

Commands for Obtaining Information from the Domain Controller

This section explains the functions, specifiable options and parameters, and output items of the CLI commands for obtaining information from a domain controller. This section also provides examples of how to use the CLI commands and the corresponding execution results.

For details about these options, see Options Common to All CLI Commands.

The examples of how to use the commands shown in this chapter assume that the user name, password, location of the Tiered Storage Manager server, and whether to use SSL communication have been specified ahead of time in the properties file. As a result, these items are omitted in the examples.

GetVolumes

The `GetVolumes` command can be used to obtain a list of volumes (LUs) in the domain controller within the storage domain.

You can specify a storage tier name or migration group name to limit the number of items in the list of volumes. You can further limit the items obtained by specifying the combination of a storage tier or migration group with a volume filter condition.

Information cannot be obtained for volumes in storage domains whose refresh status is either `Processing` or `Failure`.

If this command is executed for a storage domain that requires a refresh, a warning message will be output to the standard error output.

Note:

- If information about a volume in the storage domain cannot be obtained because the volume in the storage subsystem has been deleted using Device Manager, `Unknown` will be output as the value of the output items.
- The `GetVolumes` command acquires volume information in pieces, and then displays the acquired information. This means that if another user performs an operation on a volume, changing the volumes state, during the execution of the `GetVolumes` command, the information that is displayed might contain both data acquired before and after the change was made.

Syntax

```
htsmcli [server-location] GetVolumes
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
storagedomainname=storage-domain-name
[ { storagetiername=storage-tier-name | migrationgroupname=migration-group-name } ]
[ filtercondition=filter-condition ]
```

Options

Specify the `-d` or `--detail` option to display detailed information in the standard output after CLI command execution. Specifying this option is optional. If you omit this option, only summary information will be displayed. Summary information consists of the information for which the *Output by -d* column contains -- in Table 4-80.

Parameters

Table 4-78 Parameters of the GetVolumes Command

Parameter Name	Optional or Required	Description
storagedomainname	Required	Specify the name of the storage domain.
storagetiername	Optional	Specify the name of a storage tier. Note that this cannot be specified when migrationgroupname is specified.
migrationgroupname	Optional	Specify the name of a migration group. Note that this cannot be specified when storagetiername is specified.
filtercondition	Optional	Specify a filter condition. For details about specifiable properties, see Table 4-79. If this is omitted, no filter condition is used to narrow down the search.

Table 4-79 Properties Specifiable for the filtercondition Parameter (Volume) (GetVolumes)

Property Name	Operators	Description
SubsystemModel#	=, <>	The name of the storage subsystem model
SubsystemDisplayModel	=, <>	The name used for displaying the model of the storage subsystem. This is the name defined in displayArrayType in Device Manager (not arrayType). Example: Lightning_9980V
SubsystemSerialNumber	=, <>, startsWith, contains	The serial number of the storage subsystem

Property Name	Operators	Description
SubsystemName	=, <>	The name of the storage subsystem
SubsystemVendor	=, <>	The name of the storage subsystem vendor
ControllerDeviceNumber	=	The controller LDEV number. Only a representative LDEV can be specified for a LUSE volume.
Host	=, <>, startsWith, contains	The name of the host
ArrayGroup	=, <>, startsWith, contains	The name of the array group
DynamicProvisioning	=, <>	The volume type
Capacity	<, <=, =, <>, >, >=	The volume capacity
ConsumedCapacity	<, <=, =, <>, >, >=	The used capacity of the volume
ConsumedCapacityPercentage	<, <=, =, <>, >, >=	The percentage of the volume that is being used
RAIDLevel	=, <>	The RAID level
EmulationType	=, <>	The emulation type
DiskType	=, <>	The disk type
VolumeStatus	=	A character string indicating whether the volume is being used
VolumeLockStatus	=	A character string indicating the lock status of the volume
SLPRNumber	=, <>	The SLPR number
CLPRNumber	=, <>	The CLPR number
ControllerArrayGroup	=, <>, startsWith, contains	The name of the controller array group
ArrayGroupBusyRate	<, <=, =, <>, >, >=	The array group usage rate
ArrayGroupMaxBusyRate	<, <=, =, <>, >, >=	The maximum array group usage rate
SysplexidDevn	=, <>, startsWith, contains	SYSPLEXID and DEVN. This property is in the format *SYSPLEXID/DEVN*.
VOLSER	=, <>, startsWith, contains	Mainframe volume information (volume serial number) managed by the mainframe host
DiskRPM	<, <=, =, <>, >, >=	Disk speed (rpm)
DiskCapacityInGB	<, <=, =, <>, >, >=	Disk capacity

Property Name	Operators	Description
LogicalGroup	=, <>, startsWith, contains, endsWith	Name of the logical group. This property compares the logical group name entered as a forward slash-delimited character string (delimiter: /) with the logical group name registered in Tiered Storage Manager (which does not have a leading forward slash).
PortHostStorageDomain	=, <>, startsWith, contains, endsWith	A port name and host storage domain name. This property compares the port name and host storage domain name entered in the format *port-name/host-storage-domain-name* with the port/host storage domain name registered in Tiered Storage Manager.
PVolMigrationGroup	=, <>	If the volume is a ShadowImage's S-VOL, this is the migration group name containing the corresponding P-VOL.
PVolMUNumber	=, <>	If the volume is a ShadowImage's S-VOL, this is the MU number of the corresponding P-VOL.
ShadowImage	=, <>	ShadowImage volume type
TrueCopyAsynchronous	=, <>	TrueCopy Asynchronous volume type
TrueCopySynchronous	=, <>	TrueCopy Synchronous volume type
UniversalReplicator	=, <>	Universal Replicator volume type
CopyOnWriteSnapshot	=, <>	Copy-On-Write Snapshot volume type
PoolId	=, <>	The pool number
CVS	=	Indicates whether or not the volume has the CVS attribute. This can be either Yes or No: ▪ Yes: Has CVS attribute ▪ No: Does not have CVS attribute
Label	=, <>, startsWith, contains	Label specified for a representative LDEV
Encryption	=	The encryption setting

#: This property is for maintaining compatibility with older versions. When you specify new filter conditions, use SubsystemDisplayModel.

Output Items

Table 4-80 Items Output by the GetVolumes Command

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
Information about the storage domain	name	The name of the storage domain	--	--
Information about the LU	controllerDeviceNumber	The controller LDEV number. For a LUSE volume, this is an LDEV number of a representative LDEV. The number is displayed in 0:00 or 00:00:00 format.	--	--
	label	Label specified for a representative LDEV. If no label is specified for the LDEV, nothing is displayed.	--	#1
	subsystemSerialNumber	The serial number of the storage subsystem that stores the actual data.	-d	#1
	subsystemDisplayModel	The display name for the model of the storage subsystem that stores the actual data. If the display model name is unknown, the product name is displayed.	-d	#1
	subsystemName	The name of the storage subsystem that stores the actual data. If the subsystem name is unknown, the product name and serial number are displayed.	-d	#1
	subsystemVendor	The vendor name of the storage subsystem that stores the actual data.	--	#1
	migrationGroupName	The name of the migration group to which the volume belongs	--	
	emulationType	The emulation type	--	#1
	CVS	The CVS volume attribute of the volume. This can be either Yes or No.	-d	#1
	capacityInKB	The capacity of the volume (units: KB). If the volume type is normal or pool, the physical capacity is displayed. If the volume type is virtual, the virtual capacity is displayed.	--	#1
	consumedCapacityInKB	The used capacity of the volume (units: KB). If the volume type is normal, the capacity of the normal volume is displayed. If the volume type is virtual, the used capacity of the virtual volume is displayed. If the volume type is pool, nothing is displayed.	--	#1

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
	consumedCapacityPercentage	The ratio (percentage) of consumedCapacityInKB to capacityInKB. If the volume type is pool, nothing is displayed.	--	#1
	RAIDLevel	The RAID level For an SMI-S Enabled subsystem, only RAID*x* of RAID*x*(*y*D+*z*P) is displayed.	--	#1, #2
	diskType	The disk type	--	#1, #2
	diskRPM	Disk speed (rpm). - is displayed if SSD is specified for DiskType.	-d	#1, #2
	encryption	Indicates whether the array group is encrypted. This can be any of the following: ▪ Enabled: The array group is encrypted. ▪ Disabled: The array group is not encrypted. ▪ -: Indicates a DP volume, V-VOL, or LUSE volume. Alternatively, the encryption feature is not supported.	-d	#1, #2
	diskCapacityInGB	The disk capacity (units: GB)	-d	#1, #2
	arrayGroupNumber	The array group number of the LU in the storage subsystem that stores the actual data. For a volume of an externally-connected SMI-S Enabled subsystem or a Hitachi AMS2000 DP volume, - is displayed.	-d	#1, #2
	controllerArrayGroupName	The array group name of the LU in the domain controller	--	#1
	arrayGroupName	The array group name of the LU in the storage subsystem that stores the actual data. For a DP volume of an externally-connected Hitachi AMS2000, nothing is displayed.	--	#1, #2
	arrayGroupBusyRate	The array group usage rate (%). Up to 2 decimal places are displayed.	--	#3
	arrayGroupMaxBusyRate	The maximum array group usage rate (%). Up to 2 decimal places are displayed.	--	#3

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
	program-product-name (such as trueCopySynchronous, trueCopyAsynchronous, universalReplicator, copyOnWriteSnapshot)	The program product volume type. Only the names of the program products that must be displayed as LU attributes are displayed.	-d	#1
	dynamicProvisioning	The volume type. This can be any of the following: ▪ -: Normal volumes ▪ DP-VOL: DP volumes ▪ DP-Pool-VOL: DP pool volumes	--	#1
	PoolId	The DP pool number. This can be any of the following: ▪ DP *x*: The targets are DP volumes that are related to a pool or pool volumes. (*x*: An integer from 0 to 127) ▪ Unassigned: The targets are DP volumes that are not related to a pool. In other cases, nothing is displayed.	-d	#1
	PVolMigrationGroupName	If the volume is a ShadowImage's S-VOL, this is the migration group name containing the corresponding P-VOL.	-d	#1
	PVolDeviceNumber	If the volume is a ShadowImage's S-VOL, this is the controller LDEV number of the corresponding P-VOL displayed in the format 0:00 or 00:00:00.	-d	#1
	PVolMUNumber	If the volume is a ShadowImage's S-VOL, this is the MU number of the corresponding P-VOL.	-d	#1
	volumeStatus	Indicates whether the volume is being used. This can be either Used (you cannot specify the volume as the migration destination) or Free (you can specify the volume as the migration destination).	--	#1
	volumeLockStatus	Indicates whether the volume is locked. This can be either Locked or Unlocked.	--	#1
	path	Indicates whether the path has been set. This can be either Yes or No.	-d	#1
	hostNames	The host name. If multiple host names exist, they are separated by commas (,).	--	#1

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
	logicalGroup	Logical group name. Multiple occurrences are separated by commas.	-d	#1
	port/HostStorageDomain	Host storage domain name. Multiple occurrences are separated by commas.	-d	#1
	SYSPLEXID/DEVN	SYSPLEXID and DEVN. This item is displayed in *SYSPLEXID/DEVN* format. Multiple occurrences are separated by commas.	-d	#1
	VOLSER	Mainframe volume information (volume serial number) managed by the mainframe host	-d	#1
	canMigrate	Indicates whether migration is possible. This can be either Yes or No: ▪ Yes: Can migrate. ▪ No: Cannot migrate.	--	--
	reason	The reason for migration being impossible is displayed. For details about the displayed character strings and their descriptions, see Table 4-81. The sequence in which the information is output might differ depending on the version of the Tiered Storage Manager server and CLI.	-d	--
Information about LDEVs in the domain controller The information for items from controllerDeviceNumber to arrayGroupMaxBusyRate is treated as one information unit. This information is displayed once for each such	controllerDeviceNumber	The controller LDEV number. The number is displayed in 0:00 or 00:00:00 format.	-d	--
	controllerSerialNumber	The serial number of the domain controller	-d	--
	controllerDisplayModel	The model name displayed on the domain controller	-d	#1
	controllerName	The name of the domain controller	-d	#1
	emulationType	The emulation type	-d	#1
	CVS	The CVS volume attribute of the volume. This can be either Yes or No.	-d	#1
	capacityInKB	The capacity of the LDEV (units: KB). If the volume type is normal or pool, the physical capacity is displayed. If the volume type is virtual, the virtual capacity is displayed.	-d	#1

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
unit.	consumedCapacityInKB	The used capacity of the volume (units: KB). If the volume type is normal, the capacity of the normal volume is displayed. If the volume type is virtual, the used capacity of the virtual volume is displayed. If the volume type is pool, nothing is displayed.	-d	#1
	consumedCapacityPercentage	The ratio (percentage) of consumedCapacityInKB to capacityInKB. If the volume type is pool, nothing is displayed.	-d	#1
	cylinders	Number of cylinders	-d	#1
	LBA	The volume capacity in blocks	-d	#1
	SLPRNumber	The SLPR number	-d	#1
	CLPRNumber	The CLPR number	-d	#1
	RAIDLevel	The RAID level For an SMI-S Enabled subsystem, only RAID*x* of RAID*x*(*y*D+*z*P) is displayed.	-d	#1, #2
	diskType	The disk type	-d	#1, #2
	diskModelName	Disk model name	-d	#1, #2
	diskRPM	Disk speed (rpm) - is displayed if SSD is specified for DiskType.	-d	#1, #2
	encryption	Indicates whether the array group is encrypted. This can be any of the following: ▪ Enabled: The array group is encrypted. ▪ Disabled: The array group is not encrypted. ▪ -: Indicates a DP volume, V-VOL, or LUSE volume. Alternatively, the encryption feature is not supported.	-d	#1, #2
	diskCapacityInGB	The disk capacity (units: GB)	-d	#1, #2

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
	guardMode	The guard attribute that is applied to the LDEV. There are six guard attributes, as listed below. If more than one attribute is applicable, they are separated with a semicolon (;). For the Read/Write attribute, nothing is displayed. ▪ Read/Write ▪ Read only ▪ Protect ▪ Invisible ▪ Zero Read Capacity ▪ S-VOL disable For details about these attributes, see the *Data Retention Utility User's Guide*.	-d	#1
	retainedThrough	The date the locked period expires. If there is no expiration date, Unlimited is displayed.	-d	#1
	guardDate	The date the lock was set. This information is displayed only when Tiered Storage Manager was used. If the lock was set by another program, this information is not displayed.	-d	--
	controllerArrayGroupNumber	The array group number of the LDEV	-d	#1
	controllerArrayGroupName	The array group name of the LDEV	-d	#1
	cacheMode	The cache mode. This can be either Enable or Disable: ▪ Enable: The cache mode is ON ▪ Disable: The cache mode is OFF	-d	#1
	IOSuppressionMode	The I/O suppression mode. This can be either Enable or Disable: ▪ Enable: The I/O suppression mode is ON ▪ Disable: The I/O suppression mode is OFF	-d	#1
	subsystemDeviceNumber	The LDEV number of the LU in the storage subsystem that stores the actual data. The number is displayed as a decimal number or a hexadecimal number in 0:00 or 00:00:00 format. For an SMI-S Enabled subsystem, an element name is displayed.	-d	#1

Type of Information	Item Name	Description	Output by -d	Displayed as Unknown
	subsystemDeviceID	The device ID of the LU in the storage subsystem that stores the actual data. For a Hitachi storage subsystem, - is displayed.	-d	#1
	subsystemSerialNumber	The serial number of the storage subsystem that stores the actual data.	-d	#1
	subsystemDisplayModel	The display name for the model of the storage subsystem that stores the actual data. If the display model name is unknown, the product name is displayed.	-d	#1
	subsystemName	The name of the storage subsystem that stores the actual data. If the subsystem name is unknown, the product name and serial number are displayed.	-d	#1
	subsystemVendor	The vendor name of the storage subsystem that stores the actual data.	-d	#1
	arrayGroupNumber	The array group number of the LU in the storage subsystem that stores the actual data. For a volume of an externally-connected SMI-S Enabled subsystem or a Hitachi AMS2000 DP volume, - is displayed.	-d	#1, #2
	arrayGroupName	The array group name of the LU in the storage subsystem that stores the actual data. For a DP volume of an externally-connected Hitachi AMS2000, nothing is displayed.	-d	#1, #2
	arrayGroupBusyRate	The array group usage rate (%). Up to 2 decimal places are displayed.	-d	#3
	arrayGroupMaxBusyRate	The maximum array group usage rate (%). Up to 2 decimal places are displayed.	-d	#3

Legend:

-d : Indicates output only when either the -d or the --detail option is specified.

-- : Not applicable

#1

Unknown is output when volume information cannot be obtained for the domain controller.

#2

Unknown is output when information cannot be obtained for externally connected storage.

#3

A null character string is displayed if the information cannot be acquired from Tuning Manager.

The following table describes the character stings that are displayed to the right of reason (why the migration was not possible).

Table 4-81 Displayed Character Strings and Descriptions for reason (Why the Migration Was Not Possible)

No.	Displayed Character String	Description	Migration Source Volume	Migration Target Volume
1	Cache Residency Manager	Cache Residency Manager [Cache Residency for Mainframe] is set for the specified volume.	Yes	Yes
2	Command Device	The specified volume is used as a command device.	Yes	Yes
3	Copy-On-Write Snapshot (target)	The specified volume satisfies all of the following conditions: ▪ The volume is the P-VOL of a Copy-On-Write-Snapshot pair. ▪ The status is Pair. ▪ The number of generations is 63 or less	No	Yes
4	Copy-On-Write Snapshot Status	The specified volume is one of the following: ▪ The volume is the P-VOL of a Copy-On-Write Snapshot pair, its status is Pair, and the number of generations is 64. ▪ The volume is the P-VOL of a Copy-On-Write Snapshot pair and its status is not Pair. ▪ The volume is the V-VOL of a Copy-On-Write Snapshot pair. ▪ The volume is the POOL of a Copy-On-Write Snapshot pair.	Yes	Yes
5	Dynamic Provisioning [Pool]	The specified volume is a Dynamic Provisioning pool volume.	Yes	Yes
6	Dynamic Provisioning [Unassigned]	The specified volume is a Dynamic Provisioning virtual volume and is not associated with a pool.	Yes	Yes
7	Externally Locked	The specified volume is using the external storage subsystem function, which is locked by Data Retention Utility#1 (not Read/Write).	Yes	Yes

No.	Displayed Character String	Description	Migration Source Volume	Migration Target Volume
8	Locked (target)	The specified volume is locked by Data Retention Utility[#1] (not Read/Write).	No	Yes
9	LUSE (target)	The specified volume is part of a LUSE.	No	Yes
10	Migration Group (target)	The specified volume is included in another migration group.	No	Yes
11	Migration Reserved	The specified volume has already been reserved as a migration target.	Yes	Yes
12	NAS (target)	The specified volume is a NAS system volume.	No	Yes
13	Not Acquired Volume Information	Information for the specified volume cannot be acquired.	Yes	Yes
14	Path (target)	A path is set for the specified volume.	No	Yes
15	ShadowImage (target)	The specified volume is part of a ShadowImage [ShadowImage for Mainframe] pair and does not satisfy any of the conditions in numbers 16 to 18.	No	Yes
16	ShadowImage Configuration [Leaf]	The specified volume is part of a ShadowImage [ShadowImage for Mainframe] S-VOL, and paired with an SP-VOL.	Yes	Yes
17	ShadowImage Configuration [Node]	The specified volume is part of a ShadowImage [ShadowImage for Mainframe] SP-VOL, and paired with two S-VOLs.		
18	ShadowImage Configuration [Root]	The specified volume is part of a ShadowImage [ShadowImage for Mainframe] P-VOL, and paired with three S-VOLs.		
19	System Disk	The specified volume is a system disk.	Yes	Yes
20	TrueCopy Asynchronous (target)	The specified volume is part of a TrueCopy [TrueCopy for Mainframe] pair, and the status is either PSUS or PSUE [suspended].	No	Yes
		The specified volume is part of a TrueCopy [TrueCopy for Mainframe] pair, and the status is PAIR [Duplex] [#2].	No	Yes
21	TrueCopy Synchronous (target)	The specified volume is part of a TrueCopy [TrueCopy for Mainframe] pair, and the status is either PSUS or PSUE [suspended].	No	Yes
		The specified volume is part of a TrueCopy [TrueCopy for Mainframe] pair, and the status is PAIR [Duplex] [#2].	No	Yes

No.	Displayed Character String	Description	Migration Source Volume	Migration Target Volume
22	TrueCopy Asynchronous Status	The specified volume is part of a True Copy [TrueCopy for Mainframe] pair, and the status is other than PSUS, PSUE [suspended], and PAIR [Duplex].	Yes	Yes
23	TrueCopy Synchronous Status	The specified volume is part of a True Copy [TrueCopy for Mainframe] pair, and the status is other than PSUS, PSUE [suspended], and PAIR [Duplex].	Yes	Yes
24	Universal Replicator (target)	The specified volume is part of a Universal Replicator [Universal Replicator for Mainframe] pair and the status is other than COPY [Pending duplex] or PAIR [Duplex].	No	Yes
25	Universal Replicator Status	▪ The specified volume is part of a Universal Replicator [Universal Replicator for Mainframe] pair, and the status is either COPY [Pending duplex] or PAIR [Duplex]. ▪ The specified volume is part of a Universal Replicator journal volume.	Yes	Yes
26	VOLSER (target)	VOLSER is set for the specified volume.	No	Yes

Legend:

Yes: Corresponds to the reason that the volume cannot be migrated (cannot be used as a volume for migration)

No: Does not correspond to the reason that the volume cannot be migrated (can be used as a volume for migration)

[ ]: The name of an optional program for a mainframe system

Tiered Storage Manager does not display the reason why a volume that has been configured by an optional program for mainframe systems cannot be migrated.

#1

Data Retention Utility is a product name. For details on this product, see the *Data Retention Utility User's Guide*.

#2

This applies only to Universal Storage Platform V/VM.

Example and Execution Results

- ***Example (1)***: In this example, detailed information is obtained for the volumes belonging to the `MyStorageTier` storage tier of the `MegaTechUSP600-Primary` storage domain.

```
htsmcli GetVolumes --detail storagedomainname="MegaTechUSP600-Primary"
storagetiername="MyStorageTier"
```

- ***Output (1)***:

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 2 LogicalUnit elements:
An instance of LogicalUnit(1 of 2)
controllerDeviceNumber=1:E0
label=CIPHER
subsystemSerialNumber=14011
subsystemDisplayModel=USP
subsystemName=USP#14011
subsystemVendor=HITACHI
migrationGroupName=
emulationType=OPEN-V
CVS=Yes
capacityInKB=5,120,640
consumedCapacityInKB=2,560,320
consumedCapacityPercentage=50
RAIDLevel=Unknown
diskType=Unknown
diskRPM=10,000
encryption=Disabled
diskCapacityInGB=4,448
arrayGroupNumber=Unknown
controllerArrayGroupName=E9960-1
arrayGroupName=Unknown
arrayGroupBusyRate=
arrayGroupMaxBusyRate=
shadowImage=Simplex
trueCopySynchronous=Simplex
trueCopyAsynchronous=Simplex
universalReplicator=S-VOL
copyOnWriteSnapshot=Simplex
dynamicProvisioning=-
PoolId=
PVolMigrationGroupName=
PVolDeviceNumber=2:E0
PVolMUNumber=0
volumeStatus=Free
volumeLockStatus=Unlocked
path=No
hostNames=
logicalGroup=Japan/Tokyo/Asakusa,Japan/Tokyo
port/HostStorageDomain=CL1-B/HCMDS0100
SYSPLEXID/DEVN=SYS0001/1234,SYS0002/4567
VOLSER=vvvvvv
canMigrate=No
List of 2 reason(s) for volume migration exclusion:
reason(1 of 2)=LUSE (target)
reason(2 of 2)=Universal Replicator status
List of 1 LDEV elements:
An instance of LDEV(1 of 1)
controllerDeviceNumber=1:E0
controllerSerialNumber=14011
controllerDisplayModel=USP
controllerName=USP@10.208.151.151
emulationType=OPEN-V
```

```
CVS=Yes
capacityInKB=5,120,640
consumedCapacityInKB=2,560,320
consumedCapacityPercentage=50
cylinders=1,770
LBA=10,241,280
SLPRNumber=0
CLPRNumber=1
RAIDLevel=Unknown
diskType=Unknown
diskModelName=DKS2C-K72FC
diskRPM=10,000
encryption=Disabled
diskCapacityInGB=4,448
guardMode=
retainedThrough=
guardDate=
controllerArrayGroupNumber=0
controllerArrayGroupName=E1-1
cacheMode=Enable
IOSuppressionMode=Enable
subsystemDeviceNumber=1:E0
subsystemDeviceID=-
subsystemSerialNumber=14011
subsystemDisplayModel=9500V
subsystemName=9500V#14011
subsystemVendor=HITACHI
arrayGroupNumber=Unknown
arrayGroupName=Unknown
arrayGroupBusyRate=
arrayGroupMaxBusyRate=
An instance of LogicalUnit(2 of 2)
controllerDeviceNumber=3:FF
label=CIPHER
subsystemSerialNumber=14011
subsystemDisplayModel=USP
subsystemName=USP#14011
subsystemVendor=HITACHI
migrationGroupName=
emulationType=OPEN-V
CVS=Yes
capacityInKB=5,120,640
consumedCapacityInKB=2,560,320
consumedCapacityPercentage=50
RAIDLevel=Unknown
diskType=Unknown
diskRPM=10,000
encryption=Disabled
diskCapacityInGB=4,448
arrayGroupNumber=Unknown
controllerArrayGroupName=E9980-1
arrayGroupName=Unknown
arrayGroupBusyRate=
arrayGroupMaxBusyRate=
shadowImage=Simplex
trueCopySynchronous=Simplex
trueCopyAsynchronous=Simplex
universalReplicator=Simplex
copyOnWriteSnapshot=Simplex
dynamicProvisioning=-
PoolId=
PVolMigrationGroupName=
PVolDeviceNumber=2:E0
PVolMUNumber=0
volumeStatus=Free
volumeLockStatus=Unlocked
```

```
path=No
hostNames=
logicalGroup=Japan/Tokyo/Asakusa
port/HostStorageDomain=CL1-B/HCMDS0100
SYSPLEXID/DEVN=SYS0001/1234
VOLSER=vvvvvv
canMigrate=No
List of 0 reason(s) for volume migration exclusion:
List of 1 LDEV elements:
An instance of LDEV(1 of 1)
controllerDeviceNumber=3:FF
controllerSerialNumber=14011
controllerDisplayModel=USP
controllerName=USP@10.208.151.151
emulationType=OPEN-V
CVS=Yes
capacityInKB=5,120,640
consumedCapacityInKB=2,560,320
consumedCapacityPercentage=50
cylinders=1,770
LBA=10,241,280
SLPRNumber=0
CLPRNumber=0
RAIDLevel=Unknown
diskType=Unknown
diskModelName=DKS2C-K72FC
diskRPM=10,000
encryption=Disabled
diskCapacityInGB=4,448
guardMode=
retainedThrough=
guardDate=
controllerArrayGroupNumber=1
controllerArrayGroupName=E1-2
cacheMode=Enable
IOSuppressionMode=Enable
subsystemDeviceNumber=3:FF
subsystemDeviceID=-
subsystemSerialNumber=14011
subsystemDisplayModel=9500V
subsystemName=9500V#14011
subsystemVendor=HITACHI
arrayGroupNumber=Unknown
arrayGroupName=Unknown
arrayGroupBusyRate=
arrayGroupMaxBusyRate=
```

- ***Example (2)***: In this example, summary information is obtained for the volumes belonging to the `MyStorageTier` storage tier of the `MegaTechUSP600-Primary` storage domain.

```
htsmcli GetVolumes storagedomainname="MegaTechUSP600-Primary"
storagetiername="MyStorageTier"
```

- ***Output (2)***:

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 2 LogicalUnit elements:
An instance of LogicalUnit(1 of 2)
controllerDeviceNumber=1:E0
label=CIPHER
subsystemVendor=HITACHI
migrationGroupName=
emulationType=OPEN-V
```

```
capacityInKB=5,120,640
consumedCapacityInKB=2,560,320
consumedCapacityPercentage=50
RAIDLevel=Unknown
diskType=Unknown
controllerArrayGroupName=E9960-1
arrayGroupName=Unknown
arrayGroupBusyRate=32.34
arrayGroupMaxBusyRate=45.67
dynamicProvisioning=-
volumeStatus=Free
volumeLockStatus=Unlocked
hostNames=
canMigrate=Yes
An instance of LogicalUnit(2 of 2)
controllerDeviceNumber=3:FF
label=CIPHER
subsystemVendor=HITACHI
migrationGroupName=
emulationType=OPEN-V
capacityInKB=5,120,640
consumedCapacityInKB=2,560,320
consumedCapacityPercentage=50
RAIDLevel=Unknown
diskType=Unknown
controllerArrayGroupName=E9980-1
arrayGroupName=Unknown
arrayGroupBusyRate=32.34
arrayGroupMaxBusyRate=45.67
dynamicProvisioning=-
volumeStatus=Free
volumeLockStatus=Unlocked
hostNames=
canMigrate=Yes
```

- ***Example (3)***: In this example, detailed information is obtained for the volumes belonging to the `MyStorageTier` storage tier of the `StorageDomain-600` storage domain.

```
htsmcli GetVolumes --detail storagedomainname="StorageDomain-600"
storagetiername="MyStorageTier"
```

- ***Output (3)***:

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=StorageDomain-600
List of 1 LogicalUnit elements:
An instance of LogicalUnit(1 of 1)
controllerDeviceNumber=00:A1:E0
label=CIPHER
subsystemSerialNumber=14011
subsystemDisplayModel=USP
subsystemName=USP#14011
subsystemVendor=HITACHI
migrationGroupName=
emulationType=OPEN-V
CVS=Yes
capacityInKB=5,120,640
consumedCapacityInKB=2,560,320
consumedCapacityPercentage=50
RAIDLevel=Unknown
diskType=Unknown
diskRPM=10,000
encryption=Disabled
diskCapacityInGB=4,448
```

```
arrayGroupNumber=Unknown
controllerArrayGroupName=E9960-1
arrayGroupName=Unknown
arrayGroupBusyRate=
arrayGroupMaxBusyRate=
shadowImage=Simplex
trueCopySynchronous=Simplex
trueCopyAsynchronous=Simplex
universalReplicator=S-VOL
copyOnWriteSnapshot=Simplex
dynamicProvisioning=-
PoolId=
PVolMigrationGroupName=
PVolDeviceNumber=00:A2:E0
PVolMUNumber=0
volumeStatus=Free
volumeLockStatus=Unlocked
path=No
hostNames=
logicalGroup=Japan/Tokyo/Asakusa,Japan/Tokyo
port/HostStorageDomain=CL1-B/HCMDS0100
SYSPLEXID/DEVN=SYS0001/1234,SYS0002/4567
VOLSER=vvvvvv
canMigrate=No
List of 2 reason(s) for volume migration exclusion:
reason(1 of 2)=LUSE (target)
reason(2 of 2)=Universal Replicator status
List of 1 LDEV elements:
An instance of LDEV(1 of 1)
controllerDeviceNumber=00:A1:E0
controllerSerialNumber=14011
controllerDisplayModel=USP
controllerName=USP@10.208.151.151
emulationType=OPEN-V
CVS=Yes
capacityInKB=5,120,640
consumedCapacityInKB=2,560,320
consumedCapacityPercentage=50
cylinders=1,770
LBA=10,241,280
SLPRNumber=0
CLPRNumber=1
RAIDLevel=Unknown
diskType=Unknown
diskModelName=DKS2C-K72FC
diskRPM=10,000
encryption=Disabled
diskCapacityInGB=4,448
guardMode=
retainedThrough=
guardDate=
controllerArrayGroupNumber=0
controllerArrayGroupName=E1-1
cacheMode=Enable
IOSuppressionMode=Enable
subsystemDeviceNumber=00:A1:E0
subsystemDeviceID=-
subsystemSerialNumber=14011
subsystemDisplayModel=9500V
subsystemName=9500V#14011
subsystemVendor=HITACHI
arrayGroupNumber=Unknown
arrayGroupName=Unknown
arrayGroupBusyRate=
arrayGroupMaxBusyRate=
```

- ***Example (4)***: In this example, summary information is obtained for the volumes belonging to the MyStorageTier storage tier of the StorageDomain-600 storage domain.

```
htsmcli GetVolumes storagedomainname="StorageDomain-600"
storagetiername="MyStorageTier"
```

- ***Output (4)***:

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=StorageDomain-600
List of 1 LogicalUnit elements:
An instance of LogicalUnit(1 of 1)
controllerDeviceNumber=00:A1:E0
label=CIPHER
subsystemVendor=HITACHI
migrationGroupName=
emulationType=OPEN-V
capacityInKB=5,120,640
consumedCapacityInKB=2,560,320
consumedCapacityPercentage=50
RAIDLevel=Unknown
diskType=Unknown
controllerArrayGroupName=E9960-1
arrayGroupName=Unknown
arrayGroupBusyRate=32.34
arrayGroupMaxBusyRate=45.67
dynamicProvisioning=-
volumeStatus=Free
volumeLockStatus=Unlocked
hostNames=
canMigrate=Yes
```

- ***Example (5)***: In this example, a volume search is performed for the storage tier MyStorageTier in the storage domain MegaTechUSP600-Primary. However, no volume that matches the specified conditions exists.

```
htsmcli GetVolumes storagedomainname="MegaTechUSP600-Primary"
storagetiername="MyStorageTier" filtercondition="EmulationType='OPEN-9'"
```

- ***Output (5)***:

```
RESPONSE:
(Command completed; empty list returned)
```

- ***Example (6):*** In this example, summary information is obtained about the volumes that belong to the storage tier MyStorageTier within the storage domain MegaTechUSP600-Primary that needs to be refreshed.

```
htsmcli GetVolumes storagedomainname="MegaTechUSP600-Primary"
storagetiername="MyStorageTier"
```

- ***Output (6)***:

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 1 LogicalUnit elements:
An instance of LogicalUnit(1 of 1)
controllerDeviceNumber=1:E0
label=CIPHER
subsystemVendor=HITACHI
migrationGroupName=
emulationType=OPEN-V
capacityInKB=5,120,640
consumedCapacityInKB=2,560,320
consumedCapacityPercentage=50
```

```
RAIDLevel=Unknown
diskType=Unknown
controllerArrayGroupName=E9960-1
arrayGroupName=Unknown
arrayGroupBusyRate=32.34
arrayGroupMaxBusyRate=45.67
dynamicProvisioning=-
volumeStatus=Free
volumeLockStatus=Unlocked
hostNames=
canMigrate=Yes
KATS10622-W The storage domain information is not up-to-date. Refresh the storage
domain. (storage domain name : MegaTechUSP600-Primary)
```

GetPools

The GetPools command can be used to list information about DP pools within a storage domain.

If this command is executed for a storage domain that requires a refresh, a warning message will be output to the standard error output.

Syntax

```
htsmcli[ server-location] GetPools
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
storagedomainname=storage-domain-name
[ storagetiername=storage-tier-name ]
[ filtercondition=filter-condition ]
```

Parameters

Table 4-82 Parameters of the GetPools Command

Parameter Name	Optional or Required	Description
storagedomainname	Required	Specify the name of a storage domain.
storagetiername	Optional	Specify the name of a storage tier. If this parameter is omitted, the output information will not be filtered by a storage tier.
filtercondition	Optional	Specify a filter condition. For details about specifiable properties, see Table 4-83. If this parameter is omitted, the output information will not be filtered by a filter condition.

Table 4-83 Properties Specifiable for the filtercondition Parameter (Pool) (GetPools)

Property Name	Operators	Description
PoolFreeCapacity	=, <>, >, >=, <, <=	The free capacity of the pool
PoolId	=, <>	The pool number
OverProvisioning Percent	=, <>, >, >=, <, <=	The over-provisioning percent The over-provisioning percent indicates the ratio between the DP pool capacity and the total DP volume capacity allocated to the DP pool.
OverProvisioning Warning	=, <>, >, >=, <, <=	The threshold for the DP pool over-provisioning percent at which a warning is issued
OverProvisioning Limit	=, <>, >, >=, <, <=	The upper limit for the DP pool over-provisioning percent

Output Items

Table 4-84 Items Output by the GetPools Command

Type of Information	Item Name	Description
Information about the storage domain	name	The name of the storage domain
Pool information (output for each pool)	poolId	The pool number
	status	The status of the pool. This can be any of the following: ▪ Normal: The pool threshold has not been reached. ▪ OverThreshold: (Warning) The variable or fixed pool threshold has been exceeded. ▪ Blocked: The pool is full or an error has occurred.
	numberOfDpVolumes	The total number of DP volumes. The output item name varies depending on the storage vendor and series.
	capacityInKB	The total capacity of the pool (units: KB)
	freeCapacityInKB	The free capacity of the pool (units: KB)
	usageRate	The usage rate (%)
	threshold1	The variable threshold of the pool (%)
	threshold2	The fixed threshold of the pool (%)
	overProvisioning Percent	The over-provisioning percent (%) The over-provisioning percent indicates the ratio to the total DP volume capacity allocated to the DP pool and the DP pool capacity. If the over-provisioning percent is unknown, Unknown will be displayed.

Type of Information	Item Name	Description
	overProvisioningWarning	The threshold for the DP pool over-provisioning percent at which a warning is issued (%) If the threshold has not been set, nothing will be displayed.
	overProvisioningLimit	The upper limit for the DP pool over-provisioning percent (%) If the threshold has not been set, nothing will be displayed.
	CLPRNumber	The CLPR number

Example and Execution Results

- ***Example (1):*** In this example, information is obtained about pools within the storage domain MegaTechUSP600-Primary.

```
htsmcli GetPools storagedomainname="MegaTechUSP600-Primary"
```

- ***Output (1):***

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 2 Pool elements:
An instance of Pool(1 of 2)
poolId=DP 1
status=Normal
numberOfDpVolumes=5
capacityInKB=20,640
freeCapacityInKB=10,530
usageRate=59
threshold1=75
threshold2=80
overProvisioningPercent=90
overProvisioningWarning=
overProvisioningLimit=110
CLPRNumber=1
An instance of Pool(2 of 2)
poolId=DP 2
status=Normal
numberOfDpVolumes=10
capacityInKB=20,640
freeCapacityInKB=10,530
usageRate=59
threshold1=75
threshold2=80
overProvisioningPercent=99
overProvisioningWarning=
overProvisioningLimit=110
CLPRNumber=1
```

- ***Example (2):*** In this example, the GetPools command is executed for MegaTechUSP600-Primary, which is a storage domain that has no pool.

```
htsmcli GetPools storagedomainname="MegaTechUSP600-Primary"
```

- ***Output (2):***

```
RESPONSE:
(Command completed; empty list returned)
```

- ***Example (3):*** In this example, information is obtained about pools within the storage domain MegaTechUSP600-Primary that needs to be refreshed.

```
htsmcli GetPools storagedomainname="MegaTechUSP600-Primary"
```

- ***Output (3):***

```
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechUSP600-Primary
List of 2 Pool elements:
An instance of Pool(1 of 1)
poolId=DP 1
status=Normal
numberOfDpVolumes=1
capacityInKB=20,640
freeCapacityInKB=10,530
usageRate=59
threshold1=75
threshold2=80
overProvisioningPercent=90
overProvisioningWarning=
overProvisioningLimit=110
CLPRNumber=1
KATS10622-W The storage domain information is not up-to-date. Refresh the storage
domain. (storage domain name : MegaTechUSP600-Primary)
```

GetFreeSpaces

The GetFreeSpaces command can be used to obtain information about free space in the storage subsystems registered in Device Manager.

Syntax

```
htsmcli [ server-location] GetFreeSpaces
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -s | --secure } ]
[ { -o | --output } name-of-the-standard-output-redirect-file ]
subsystemname=subsystem-name
[ filtercondition=filter-condition ]
```

Parameters

Table 4-85 Parameters of the GetFreeSpaces Command

Parameter Name	Optional or Required	Description
subsystemname	Required	Specify the name of the subsystem.
filtercondition	Optional	Specify a filter condition. For details about specifiable properties, see Table 4-86. If this parameter is omitted, the output information will not be filtered by a filter condition.

Table 4-86 Properties Specifiable for the filtercondition Parameter (Free Space) (GetFreeSpaces)

Property Name	Operators	Description
ArrayGroup	=, <>, startsWith, contains	The name of the array group
Capacity	=, <>, >, >=, <, <=	The amount of the consecutive free space in the array group
TotalFreeCapacity	=, <>, >, >=, <, <=	The total amount of free space in the array group
RAIDLevel	=, <>	The RAID level of the array group
EmulationType	=, <>	The emulation type of the array group
SubsystemVendor	=, <>	The name of the storage subsystem vendor
SubsystemName	=, <>	The name of the storage subsystem
DiskType	=, <>	The disk type
DiskRPM	=, <>, >, >=, <, <=	Disk speed (rpm)
DiskCapacityInGB	=, <>, >, >=, <, <=	The disk capacity (in GB)

Output Items

Table 4-87 Items Output by the GetFreeSpaces Command

Type of Information	Item Name	Description	Displayed as Unknown
Subsystem information	name	The subsystem name	--
	serialNumber	The serial number of the storage subsystem	--
Free space information (multiple types)	arrayGroupName	The name of the array group to which the free space belongs	#1
	freeSpaceNumber	The free space number	--
	capacityInKB	The amount of free space in the array group (units: KB)	--
	totalFreeCapacityInKB	The total amount of free space in the array group (units: KB)	--
	emulationType	The emulation type of the array group to which the free space belongs	#2
	RAIDLevel	The RAID level of the array group to which the free space belongs	--
	subsystemVendor	The vender name of the storage subsystem to which the free space belongs	--
	diskType	The disk type of the array group to which the free space belongs	--

Type of Information	Item Name	Description	Displayed as Unknown
	diskRPM	Disk speed of the array group to which the free space belongs. If this value cannot be obtained, nothing is displayed.	#1, #2
	diskCapacityInGB	The disk capacity of the array group to which the free space belongs (units: GB)	#1, #2

Legend:

-- : Not applicable

#1

If array group information cannot be obtained, Unknown is displayed.

#2

If the command is executed for an SMI-S Enabled subsystem, Unknown is displayed.

Example and Execution Results

- ***Example (1):*** In this example, the GetFreeSpaces command obtains the information about free space in the storage subsystem USP@10.208.151.151.

```
htsmcli GetFreeSpaces subsystemname="USP@10.208.151.151"
```

- ***Output (1):***

```
RESPONSE:
List of 1 Subsystem elements:
An instance of Subsystem(1 of 1)
name=USP@10.208.151.151
serialNumber=12345
List of 2 FreeSpace elements:
An instance of FreeSpace(1 of 2)
arrayGroupName=1-1-1
freeSpaceNumber=1
capacityInKB=22,528
totalFreeCapacityInKB=741,416,632
emulationType=OPEN-V
RAIDLevel=RAID5(3D+1P)
subsystemVendor=HITACHI
diskType=-
diskRPM=10,000
diskCapacityInGB=268
An instance of FreeSpace(2 of 2)
arrayGroupName=1-1-1
freeSpaceNumber=507
capacityInKB=22,528
totalFreeCapacityInKB=741,416,632
emulationType=OPEN-V
RAIDLevel=RAID5(3D+1P)
subsystemVendor=HITACHI
diskType=-
diskRPM=10,000
diskCapacityInGB=268
```

- ***Example (2):*** In this example, the GetFreeSpaces command obtains the information about the free space in two storage subsystems named USP#14000.

```
htsmcli GetFreeSpaces subsystemname="USP#14000"
```

- ***Output (2):***

```
RESPONSE:
List of 2 Subsystem elements:
An instance of Subsystem(1 of 2)
name=USP#14000
serialNumber=12345
List of 2 FreeSpace elements:
An instance of FreeSpace(1 of 2)
arrayGroupName=1-1-1
freeSpaceNumber=1
capacityInKB=22,528
totalFreeCapacityInKB=741,416,632
emulationType=OPEN-V
RAIDLevel=RAID5(3D+1P)
subsystemVendor=HITACHI
diskType=-
diskRPM=10,000
diskCapacityInGB=268
An instance of FreeSpace(2 of 2)
arrayGroupName=1-1-1
freeSpaceNumber=507
capacityInKB=22,528
totalFreeCapacityInKB=741,416,632
emulationType=OPEN-V
RAIDLevel=RAID5(3D+1P)
subsystemVendor=HITACHI
diskType=-
diskRPM=10,000
diskCapacityInGB=268
An instance of Subsystem(2 of 2)
name=USP#14000
serialNumber=23456
List of 2 FreeSpace elements:
An instance of FreeSpace(1 of 2)
arrayGroupName=1-1-1
freeSpaceNumber=1
capacityInKB=22,528
totalFreeCapacityInKB=741,416,632
emulationType=OPEN-V
RAIDLevel=RAID5(3D+1P)
subsystemVendor=HITACHI
diskType=-
diskRPM=10,000
diskCapacityInGB=268
An instance of FreeSpace(2 of 2)
arrayGroupName=1-1-1
freeSpaceNumber=507
capacityInKB=22,528
totalFreeCapacityInKB=741,416,632
emulationType=OPEN-V
RAIDLevel=RAID5(3D+1P)
subsystemVendor=HITACHI
diskType=-
diskRPM=10,000
diskCapacityInGB=268
```

- ***Example (3):*** In this example, the GetFreeSpaces command obtains the information about the free space in two storage subsystems named USP#14001 when one of them has no free space.

```
htsmcli GetFreeSpaces subsystemname="USP#14001"
```

- ***Output (3):***

```
RESPONSE:
List of 2 Subsystem elements:
An instance of Subsystem(1 of 2)
name=USP#14001
serialNumber=12345
List of 2 FreeSpace elements:
An instance of FreeSpace(1 of 2)
arrayGroupName=1-1-1
freeSpaceNumber=1
capacityInKB=22,528
totalFreeCapacityInKB=741,416,632
emulationType=OPEN-V
RAIDLevel=RAID5(3D+1P)
subsystemVendor=HITACHI
diskType=-
diskRPM=10,000
diskCapacityInGB=268
An instance of FreeSpace(2 of 2)
arrayGroupName=1-1-1
freeSpaceNumber=507
capacityInKB=22,528
totalFreeCapacityInKB=741,416,632
emulationType=OPEN-V
RAIDLevel=RAID5(3D+1P)
subsystemVendor=HITACHI
diskType=-
diskRPM=10,000
diskCapacityInGB=268
An instance of Subsystem(2 of 2)
name=USP#14001
serialNumber=23456
List of 0 FreeSpace elements:
```

- ***Example (4):*** In this example, the GetFreeSpaces command is executed for the subsystem USP@10.208.151.151, which has no free space.

```
htsmcli GetFreeSpaces subsystemname="USP@10.208.151.151"
```

- ***Output (4):***

```
RESPONSE:
(Command completed; empty list returned)
```

5

Tiered Storage Manager Properties Files

This chapter describes how to specify options and parameters using Tiered Storage Manager properties files. It also explains the properties pertaining to the CLI trace log of Tiered Storage Manager.

Overview of Properties Files for Tiered Storage Manager CLI

There are two kinds of properties files for the Tiered Storage Manager CLI.

- Properties pertaining to options and parameters for the Tiered Storage Manager CLI are in the `htsmcli.properties` file
- Properties pertaining to the trace log for the Tiered Storage Manager CLI are in the `htsmclienv.properties` file.

By default, the files `htsmcli.properties` and `htsmclienv.properties` are stored in the following locations:

On a management client:

If the OS is Windows:

system-drive`\TieredStorageManager\0640\CLI\`

If the OS is Solaris, HP-UX, or Linux:

`/opt/TieredStorageManager/0640/CLI/`

On a management server:

If the OS is Windows:

installation-folder-of-the-Tiered-Storage-Manager-server`\CLI\`

If the OS is Solaris or Linux:

installation-directory-of-the-Tiered-Storage-Manager-server`/CLI/`

The `htsmcli.properties` file is a sample properties file and examples of property settings are coded in the file as comment lines. By using these examples, you can specify a property to be used. You can store the edited `htsmcli.properties` file in any directory. The directory in which the `htsmcli.properties` file is saved should be specified in the `HTSM_CLI_HOME` environment variable.

Note: The `HTSM_CLI_HOME` environment variable is used to notify the Tiered Storage Manager CLI of the location of the `htsmcli.properties` file to be used. If the directory where the `htsmcli.properties` file is stored is not specified for `HTSM_CLI_HOME`, Tiered Storage Manager cannot use the `htsmcli.properties` file.

The default values for each property have been set in the `htsmclienv.properties` file. You cannot change the storage location of the `htsmclienv.properties` file.

These files are in the same format as Java properties files. Properties can be updated using a text editor. Each property has a name and a value, separated by an equal sign (for example, `foo.bar=12345`). Each property is separated by a line-break, which is different for each OS.

In the properties files for the Tiered Storage Manager CLI, any lines that start with hash marks (#) are treated as comments. Literal strings or numbers do not need to be enclosed in quotation marks.

In Java properties files, the backslash character (\) is a reserved escape character, and any character following it is treated as a tab, line-feed, or other control character. Since absolute path names on Windows platforms generally contain backslashes, the path name must be preceded by another backslash. For example, the file path name `c:\TieredStorageManager\docroot\foo.bar` must be entered as `c:\\TieredStorageManager\\docroot\\foo.bar`. For property specifications, other characters do not generally need to be preceded by an escape character.

The following table lists the properties for the Tiered Storage Manager CLI.

Table 5-1 Properties for the Tiered Storage Manager CLI

Type	File Name	Property	For Details:
Properties pertaining to CLI options and parameters	htsmcli.properties	htsmserver.location	See htsmserver.location Property
		option.username	See option.username Property
		option.password	See option.password Property
		option.password2	See option.password2 Property
		option.output	See option.output Property
		option.secure	See option.secure Property
		parameter.*parameter-name*	See parameter.parameter-name Property
Properties pertaining to the trace log of the CLI	htsmclienv.properties	logger.filePath	See logger.filePath Property
		logger.maxFileSize	See logger.maxFileSize Property
		logger.fileCount	See logger.fileCount Property
		logger.tracelogLevel	See logger.tracelogLevel Property

Specifying Options and Parameters in the htsmcli.properties File

In the `htsmcli.properties` file, you can set properties for the location of the Tiered Storage Manager server, as well as the options and parameters used during the execution of CLI commands.

Note: Usable and printable characters are restricted to ASCII characters, including \u0020 - \u007E (which are recognized as ASCII characters), when they are used for values of properties in the `htsmcli.properties` file.

The following table shows some example values for the location of the Tiered Storage Manager server, as well as other options, in the `htsmcli.properties` file.

Table 5-2 Example Settings of Property Values in the htsmcli.properties File

Property	Value
`htsmserver.location`	`rmi://myhost.mydomain:24500/HTSMServer`
`option.username`	`user01`
`option.password`	`@C:\\TieredStorageManager\\0640\\CLI\\pass.txt`
`option.secure`	`true`

The following shows an example of the above properties and values.

```
#Tiered Storage Manager CLI - Configuration
#Wed June 23 18:53:54 JST 2010
htsmserver.location=rmi://myhost.mydomain:24500/HTSMServer

option.username=user01
#option.password=user01_pass
#option.password=@/home/user01/htsmclipassword

option.password=@C:\\TieredStorageManager\\0640\\CLI\\pass.txt
option.secure=true
```

htsmserver.location Property

This property specifies the location of the Tiered Storage Manager server.

For details about how to specify the location of the Tiered Storage Manager server, see CLI Command Syntax.

option.username Property

This property specifies the name used to log on to the Tiered Storage Manager server.

For details about how to specify the value of this property, see the explanation of the `--username` option in Options Common to All CLI Commands.

option.password Property

This property specifies the password that corresponds to the user ID set for the `option.username` property.

For details about how to specify the value of this property, see the explanation of the `--password` option in Options Common to All CLI Commands.

You can specify a password by specifying plain text for the `option.password` property or by specifying an encoded character string for the `option.password2` property. We recommdend that you specify the encoded character string. For details about how to encode a password, see Encoding the Password in the Properties File or Password File.

option.password2 Property

Using the `htsmaccount` command, this property can set the encoded password that corresponds to the user name set for the `option.username` property.

For details about how to encode a password, see Encoding the Password in the Properties File or Password File.

The path to a text file that contains the encoded password can be specified using an absolute path, or a relative path from the CLI installation directory.

If both the `option.password` and `option.password2` properties are specified in the properties file, the `option.password2` property takes priority.

option.output Property

This property specifies the file name to which the standard output is to be redirected.

For details about how to specify the value of this property, see the explanation of the `--output` option in Options Common to All CLI Commands.

option.secure Property

This property specifies whether to use SSL communication for communication between the Tiered Storage Manager server and the CLI client.

This property is not included in the default properties file after the CLI is installed.

Specify `true` to use SSL communication. If you do not want to use SSL communication, specify something other than `true` or nothing at all.

For details about the settings for using SSL communication, see Setting Up SSL Communication.

parameter.*parameter-name* Property

This property specifies the value of a command parameter. Values specified here are applied to all commands.

For details about how to specify the value of each command parameter, see Command Parameters, and the details about each command.

Specifying Properties for the Trace Log in the htsmclienv.properties File

In the `htsmclienv.properties` file, each type of value for the Tiered Storage Manager CLI log output function can be set to a property.

Note:

- Usable and printable characters are restricted to ASCII characters, including \u0020 - \u007E (which are recognized as ASCII characters), when they are used as property values in the `htsmcli.properties` file.
- Property names are case sensitive.

The following table shows an example of the Tiered Storage Manager CLI log information output settings in the `htsmclienv.properties` file.

Table 5-3 Example Settings of Property Values in the htsmclienv.properties File

Property	Value
logger.tracelogLevel	20
logger.fileCount	5
logger.maxFileSize	3MB
logger.filePath	(absolute path) C:\\TieredStorageManager\\0640\\CLI\\logs\\HTSMCLITrace (relative path) logs\\HTSMCLITrace

The following shows an example of the above properties and values.

```
####################################
#
#       Command Line Interface (CLI) Properties File
#
#   Can be used to provide options and default parameters for the
#   CLI program.

logger.tracelogLevel=20

logger.fileCount=5

logger.maxFileSize=3MB

logger.filePath=C:\\TieredStorageManager\\0640\\CLI\\logs\\HTSMCLITrace
```

logger.filePath Property

This property specifies the name of the file to which the trace log is output, using an absolute path or a relative path from the CLI installation directory. *n*.log is automatically appended to the specified file name (where *n* is a positive integer indicating the log number for the file).

Note: Do not use the following characters and names for the file name and directory names to be specified:

- Characters not permitted by the OS for file or directory names
- Names reserved by the OS

Default:

In Windows:

folder-that-contains-the-htsmCLI.jar-file\logs\HTSMCLITrace

In Solaris, HP-UX, or Linux:

directory-that-contains-the-htsmCLI.jar-file/logs/HTSMCLITrace

logger.maxFileSize Property

This property specifies the maximum size of a trace log file. When setting this value, specify KB for kilobytes, MB for megabytes, or neither of these for bytes. Note that for this property, KB indicates 1,024 bytes, and MB indicates 1,024 KB.

Specifiable values: From 32,768 bytes to 2,147,483,647 bytes (less than 2 GB).

Default: 1MB

logger.fileCount Property

This property specifies the maximum number of trace log files output by the log output function of the Tiered Storage Manager CLI.

The size of a trace log file is based on the size specified in the logger.maxFileSize Property, with a log number appended to the end of the file name (for example, HTSMCLITrace1.log and HTSMCLITrace2.log). Trace information is written to log files in the order of the log numbers. When the last file is completely full, the first file will be overwritten.

Acceptable values: 2 to 16.

Default: 10

logger.tracelogLevel Property

This property specifies the threshold for the output level of the trace log.

With the Tiered Storage Manager CLI, an output level of `0`, `10`, `20`, or `30` is set based on the content of the log output message, regardless of whether the type of error message is error, warning, or information. Only messages whose output level is less than or equal to the value set for this property are output to the trace log.

This property can be set to a value from `0` to `30`, but we recommend the default output level of `20`.

For details about the output level, see the *Hitachi Tiered Storage Manager Server Configuration and Operation Guide*.

Default: `20`

6

Troubleshooting

This chapter explains what to do when problems occur with the Tiered Storage Manager CLI.

Troubleshooting the Tiered Storage Manager CLI

When a problem occurs with the Tiered Storage Manager CLI, do the following:

- Make sure that the cause of the problem is not the software, the computer, or the LAN hardware, and then restart the computer.
- Make sure that no problems exist with the Tiered Storage Manager server. For details about troubleshooting the Tiered Storage Manager server, see the *Hitachi Tiered Storage Manager Server Configuration and Operation Guide*.

For details about troubleshooting the Tiered Storage Manager server, see the *Hitachi Tiered Storage Manager Server Configuration and Operation Guide*.

For troubleshooting information common to both the Tiered Storage Manager CLI client and Web client, see the *Hitachi Tiered Storage Manager User's Guide*.

For details about troubleshooting specific to the Tiered Storage Manager CLI, see the following table.

Table 6-1 Troubleshooting the Tiered Storage Manager CLI

Problem	Cause	Recommended Action
Cannot log in to Tiered Storage Manager.	The Tiered Storage Manager server was not found.	Check and, if necessary, revise the server location that was specified on the command line or as a property; make sure that the specified port number or host address is correct.
	The user name or password is incorrect.	Change the user name or password that was specified at the command line or property to the correct one.
	The user account is locked.	Unlock the user account manually.
	The user does not have Tiered Storage Manager permission.	Log in as a user who has user management permission and grant Tiered Storage Manager permissions to the applicable user.
The contents set in the `htsmclienv.properties` properties file have not been executed properly.	Operation is not possible because there is an incorrect setting in the properties file.	Follow the instructions in the output error message to correct the settings in the properties file.

Problem	Cause	Recommended Action
The contents set in the htsmcli.properties properties file have not been executed properly.	The parameter has been specified directly from the command line.	The values specified directly from the command line take preference over the values set in the properties file. If you omit the command line specification, the values in the properties file are used.
	Operation is not possible because there is an incorrect setting in the properties file.	Follow the instructions in the output error message to correct the settings in the properties file.
	The environment variable HTSM_CLI_HOME has not been set up.	Set the directory containing the htsmcli.properties properties file in the environment variable HTSM_CLI_HOME.
An error occurred that indicated the specified command was not found.	A path to java.exe (or java) has been specified incorrectly or has not been specified.	Specify the path of the java command in the environment variable HTSM_CLI_JRE_PATH. If HTSM_CLI_JRE_PATH is not specified, do the following: ▪ In Windows, add the folder containing java.exe to the environment variable PATH. ▪ In Solaris, HP-UX, or Linux, add the directory containing java to the environment variable PATH.
Times, such as the task creation time, that are displayed by CLI commands on the management client do not match those displayed by the Web client or by CLI commands on the management server.	The time settings on the management client differ from those on the management server.	In Windows, make the date and time properties and the environment variable TZ the same as those on the management server.
		In Solaris, HP-UX, or Linux, make the environment variable TZ the same as that on the management server.
Shredding is not available after performing a migration.	Storage Navigator was used in the external storage subsystem to lock volumes.	Unlock the volumes in the external storage subsystem, and then shred them.
Executing a migration task does not achieve migration.	Storage Navigator was used in the external storage subsystem to lock volumes.	Unlock the volumes in the external storage subsystem, and then perform migration.
No email is sent when a specified elapsed-period event occurs.	The following are possible causes: ▪ The Tiered Storage Manager CLI has not been connected to the SMTP server. ▪ SMTP authentication failed. ▪ The specified email address is invalid.	Check and, if necessary, correct the specified email address. If the specified email address is correct, make sure that the Tiered Storage Manager CLI has been connected to the SMTP server. Or, set the correct SMTP authentication user information.

Problem	Cause	Recommended Action
During daylight savings time, the operation start and end times displayed in the command execution result are not in daylight savings time.	The start and end times used by the migration task management are based on the management server's time. The client PC's time does not match the management server's time.	Set the client PC's time zone so that it matches the server's time zone.
Although `-s` or `--secure` is specified, SSL communication is unavailable.	The path of the electronic certificate has been specified incorrectly or has not been specified.	Set the directory that stores the electronic certificate file and its file name to the environment variable `HTSM_CLI_CERTS_PATH`.
	The specified electronic certificate file cannot be read.	Make sure that you have permission to access the electronic certificate file.
	The content of the specified electronic certificate file is invalid.	Use the electronic certificate file downloaded from the Tiered Storage Manager server. For directions on how to download this file, see Setting Up SSL Communication.
	The SSL communication port setting is invalid.	Make sure that the port number specified for the CLI command matches the `server.rmi.security.port` value specified in the `server.properties` file on the Tiered Storage Manager server.
	The security level of the Tiered Storage Manager server does not match the security level of the CLI.	When the security level of the Tiered Storage Manager server changes, the security level must be set again for SSL communication by the CLI. For details about how to set the security level, see Setting Up SSL Communication.

Notes on Connecting with Earlier Versions of the CLI Client

This appendix explains the incompatible items when earlier versions of CLI clients are connected to the Tiered Storage Manager server.

You can connect to the Tiered Storage Manager server version 6.4 or later from a CLI client version 5.0 or later. In this appendix, *earlier versions of CLI clients* refers to versions 5.0.0-00 to 6.3.*x*-*xx* unless otherwise explicitly stated.

You can enter the following command on the command line to determine the CLI version being used with your Tiered Storage Manager:

```
htsmcli help
```

Cautionary Notes on Connecting Earlier Versions of the CLI Client

This appendix explains the precautions to take when you execute commands from an earlier version of the CLI to a Tiered Storage Manager server whose version is newer than the version of the CLI.

Storage Domains Created by Specifying Universal Storage Platform V/VM

We do not guarantee that the storage domain created by specifying Universal Storage Platform V/VM will work properly if CLI version 5.5 or earlier is used.

Status Confirmation After the Refresh Processing Has Ended

If a storage access error occurs when refreshing a storage domain, refresh processing will stop and the refresh status will return to its previous state. If the refresh status was `Success` before refresh processing was performed, the status will return to `Success` even if refresh processing was stopped due to an error, and error messages will be displayed.

If storage domain information is obtained in version 5.5 or earlier of the CLI, `Success` will be displayed as the status without any error messages. However, in this case, refresh processing may not have been performed. To check whether refresh processing was correctly performed when an earlier CLI version was used, execute the `GetStorageDomains` command after refreshing, and then check whether the last refresh time of the storage domain (`lastRefreshedTime`) has been updated.

Limiting the Number of Candidate Volumes

You can limit the number of candidate volumes by specifying the `server.migrationPlan.candidateVolumeCountLimit` key in the `server.properties` file as an option. The default setting is `true` (the option is specified). If this option is specified, Tiered Storage Manager automatically selects candidate volumes by sorting LDEV numbers in ascending order. In this case, Tiered Storage Manager restricts the number of candidate volumes by selecting the maximum number of volumes according to predefined rules. In this case, the majority of candidate volumes with the same attributes will not be displayed, and the total number of volumes will decrease. This will allow you to reduce the memory size.

For details about the rules for limiting the number of candidate volumes, see the *Hitachi Tiered Storage Manager User's Guide*.

Depending on the operation status, you might not be able to correctly select a candidate volume.

For example, when volumes are managed on an LDEV number basis as shown in the figure below, if you specify the option to limit the number of candidate volumes, you might not be able to correctly select the candidate volumes.

All of the volumes in the following figure are defined as follows: 10 GB, OPEN-V, and CVS.

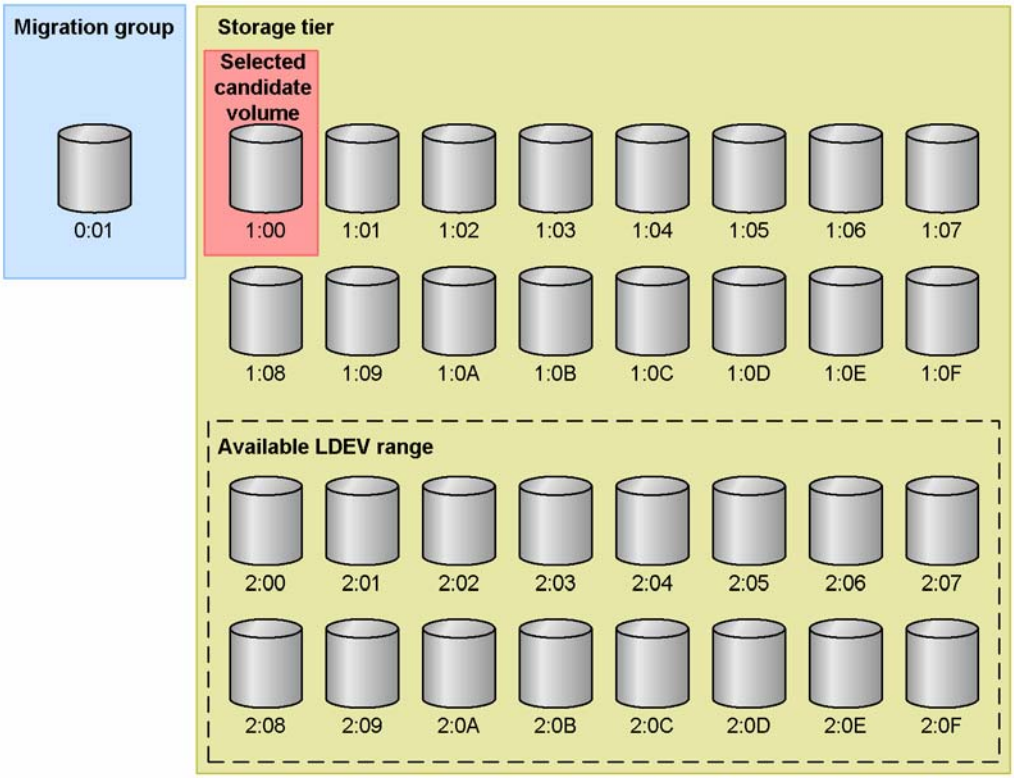

Figure A-1 Example of When a Candidate Volume Cannot be Selected Correctly

In the above example, if you choose to limit the number of candidate volumes, LDEV numbers will be sorted in ascending order and LDEV 1:00 will be selected as the candidate volume However, LDEV 1:00 is outside the range of available volumes and cannot be used as the candidate volume, so Tiered Storage Manager will not be able to select a candidate volume. To select a candidate volume in this situation, do not limit the number of candidate volumes.

To avoid limiting the number of candidate volumes, use the `server.migrationPlan.candidateVolumeCountLimit` property in the `server.properties` file.

For details about this file, see the *Hitachi Tiered Storage Manager Server Configuration and Operation Guide*.

Identifying the DP Volume and a Standard Volume

When you refer to a DP volume by using version 5.5 or earlier of the CLI, you will not be able to identify the DP volume because it will also be displayed as a standard volume.

Notes on SSL Communication

To use SSL communication, the CLI version must be 6.0 or later. In addition, to use SSL communication in the advanced security mode, the version of the Tiered Storage Manager server must be 6.4 or later.

Version 5.9 or earlier of the CLI cannot communicate with the Tiered Storage Manager server even if the `-s` or `--secure` option is specified. For version 5.9 or earlier of the CLI, do not specify the `-s` or `--secure` option, and use non-SSL communication.

Even if the version of the CLI is 6.0 or later, if the version of the Tiered Storage Manager server is 6.3 or earlier, SSL communication in the advanced security mode cannot be used.

Storage Tier Filter Conditions (Cost)

In Tiered Storage Manager version 6.3, the cost (the cost of normal volumes and the cost of DP volumes) can be set for a storage tier.

The cost of normal volumes cannot be set when pool filter conditions are specified for the storage tier. Therefore, if you use the CLI `ModifyStorageTier` command to modify a storage tier in which Tiered Storage Manager version 6.3 or later had been used to specify the cost of normal volumes, an error occurs when pool filter conditions are specified for the storage tier.

Using the Zero Data Discard Function for Migration Tasks

When the `CreateMigrationTask` command is executed from an earlier version of the CLI to a Tiered Storage Manager server whose version is 6.4 or later, the unused space in the migration target volume is released by default.

However, depending on the conditions, the specification changes so that the unused space is not released. For details about the conditions for enabling the zero data discard function, see the `zerodatadiscard` parameter in Table 4-40.

To view the zero data discard specification in an existing migration task, use the `GetTasks` command or the Web client from a Tiered Storage Manager client whose version is 6.4 or later.

In addition, if a migration task is created by using Tiered Storage Manager whose version is 6.3 or earlier, Tiered Storage Manager is upgraded to version 6.4 or later, and then the task is executed by using the `ExecuteTask` command, the unused space in the migration target volume is not released.

Displaying Information About an SMI-S Enabled Subsystem

In CLI version 6.1 or earlier, you might be unable to acquire information about an SMI-S Enabled subsystem. This section describes the information that cannot be acquired for an SMI-S Enabled subsystem.

If you want to externally connect an SMI-S Enabled subsystem, use CLI version 6.1.1 or later.

Volume Information

For an externally connected SMI-S Enabled subsystem, the `GetVolumes` command of CLI version 6.1.1 or later can display the volume information about that SMI-S Enabled subsystem. By contrast, CLI version 6.1 or earlier displays `Unknown` when you execute a command.

Output items for which `Unknown` is displayed are the same items that are marked with "#2" in the "Displayed as Unknown" column in Table 4-80.

Logical Device Number

For an externally connected SMI-S Enabled subsystem, CLI version 6.1.1 or later displays the logical device number of that SMI-S Enabled subsystem. By contrast, CLI version 6.1 or earlier displays Unknown when you execute a command.

The following shows the commands and the output items for which `Unknown` is displayed:

- `subsystemDeviceNumber` of the `GetVolumes` command and the `GetTasks` command (for a locking task, unlocking task, and shredding task)
- `sourceSubsystemDeviceNumber` and `targetSubsystemDeviceNumber` of the `GetTasks` command (for a migration task)

The following table shows the character strings that are displayed when you execute a command in CLI version 6.1 or earlier and in version 6.1.1 or later.

Table A-1 Logical Device Numbers of Externally Connected SMI-S Enabled Subsystems

CLI Version	Tiered Storage Manager Server Version	
	6.1 or Earlier	6.1.1 or Later
6.1 or earlier	Unknown	Unknown
6.1.1 or later	Not connectable[#1]	*device-number*[#2]

#1

When the version of the CLI client is newer than the version of the Tiered Storage Manager server, connection is not possible.

#2

Displays the logical device number of a volume on the external storage subsystem side. For details about the character string displayed, see Detailed Command Descriptions.

RAID Level

For an externally connected SMI-S Enabled subsystem, CLI version 6.1.1 or later displays only `RAIDx` for an SMI-S Enabled subsystem whose RAID level is `RAIDx(yD+zP)`. By contrast, CLI version 6.1 or earlier displays `RAIDx(Unknown)` when you execute a command.

The following shows the commands and the output items for which `RAIDx(Unknown)` is displayed:

- RAIDLevel of the `AddVolumeToMigrationGroup` command
- RAIDLevel of the `RemoveVolumeFromMigrationGroup` command
- RAIDLevel of the `GetVolumes` command
- RAIDLevel, joined by a hyphen, which is displayed in the line `# Target candidates for source LDEV` of the `CreateMigrationPlan` command
- `sourceRAIDLevel` and `targetRAIDLevel` of the `GetTasks` command (for a migration task)

The following table shows format of the RAID level when you execute a command in CLI version 6.1 or earlier and in version 6.1.1 or later.

Table A-2 RAID Level of Externally Connected SMI-S Enabled Subsystems

CLI Version	Tiered Storage Manager Server Version	
	6.1 or Earlier	6.1.1 or Later
6.1 or earlier	`RAIDx(Unknown)`	`RAIDx(Unknown)`
6.1.1 or later	Not connectable[#]	`RAIDx`

#

When the version of the CLI client is newer than the version of the Tiered Storage Manager server, connection is not possible.

Display of OPEN-V (0V) Volumes

When you execute a command in version 5.9 or earlier of the CLI, `OPEN-V` is displayed in the output information if `emulationType` is `OPEN-V (0V)`.

The target commands are as follows:

- `AddVolumeToMigrationGroup`
- `CreateMigrationPlan`
- `GetTasks`
- `GetVolumes`
- `RemoveVolumeFromMigrationGroup`

The Number of Volumes to be Migration Target Candidates

If you connect to the Tiered Storage Manager server with version 5.9 or earlier of the CLI, only the number of migration target (candidate) volumes with the same capacities as their migration source volumes is output.

The following table describes the number of volumes displayed for migration plans by each version of the CLI:

Table A-3 Number of Volumes to be Displayed for Migration Plans

CLI Version	Migration Profile Item Name		
	numberOfNeededVolumes	**numberOfAvailableVolumes**	**numberOfDifference**
5.9 or earlier	Number of unused volumes required for the migration target	Number of candidate volumes with the same capacities as their migration source volumes	Difference between the number of candidate volumes with the same capacities as their migration source volumes and the number of unused volumes required for the migration target
6.0 or later	Number of unused volumes required for the migration target	Number of migration target volumes with the capacities equal to or larger than their migration source volumes (number of candidate volumes with the same capacities as their migration source volumes)#	Difference between the number of migration target volumes with the capacities equal to or larger than their migration source volumes and the number of unused volumes required as migration targets (difference between the number of candidate volumes with the same capacities as their migration source volumes and the number of unused volumes required as the migration target)#

#

The second value is output enclosed by parentheses as follows:

Output example: `numberOfAvailableVolumes=9(4)`

Migration for Which a Volume with a Larger Capacity Than its Migration Source is Specified as a Migration Target

If you connect to the Tiered Storage Manager server with version 5.9 or earlier of the CLI, the following types of migration plans might be output when the migration plan is created:

- A migration plan for which a migration target volume with a larger capacity than its migration source is selected
- A migration plan in which a group of migration target candidate volumes (Target Candidates) with larger capacities than their migration sources is output
- A migration plan in which multiple groups of migration target candidate volumes (Target Candidates) whose migration source volumes differ but whose other attributes are the same are output

When you specify any of the above types of migration plans, migration tasks can be created even in version 5.9 or earlier of the CLI. However, when the migration plan is created, if a migration target volume (with a larger capacity than its migration source volume), that must be re-created, is selected as the default value, no warning message is displayed in the CLI version 5.9 or earlier.

The target commands are as follows:

- `CreateMigrationPlan`
- `CreateMigrationTask`

Output of the GetTasks Command

When Stopping is Specified for the Status Parameter

When you execute a command in version 5.8 or earlier of the CLI, task statuses displayed when `Stopping` is specified for the `status` parameter differ from those displayed when you execute a command in version 5.9 or later of the CLI.

The following table lists task statuses displayed in each version of the CLI when `Stopping` is specified for the `status` parameter.

Table A-4 Task Statuses Displayed When Stopping is Specified for the Status Parameter

CLI Version	Task Status	
	Stopping	Immediately Stopping
5.8 or earlier	`Stopping`	`Stopping`
5.9 or later	`Stopping`	`Stopping.Immediate`

Display Statuses for Volume Creation and Deletion

When you migrate volumes to a storage tier that was created by specifying pool attributes, the Tiered Storage Manager server automatically creates new volumes.

When you perform a migration that involves creating a new volume, blank characters are displayed for the migration target LDEVs and `Unknown` is displayed for other information. When you perform a migration that involves creating a new volume in version 5.8 or earlier of the CLI, for the migration target LDEVs, blank characters are displayed for the SLPR and CLPR numbers and for the values of `ArrayGroupBusyRate` and `ArrayGroupMaxBusyRate`. `Unknown` is displayed for all other information.

In version 5.9 or later of the CLI, the following statuses, which are for volume creation, have been added to the volume statuses displayed when you execute the `GetTasks` command:

- Waiting for volume creation
- Creating a volume
- Failure to create a volume

When you perform a migration by specifying a pool volume as the migration source and a pool as the migration target, the pool volume is deleted after the data in the volume is shredded.

In version 5.9 or later of the CLI, the following statuses, which are for volume deletion, have been added to the volume statuses displayed when you execute the `GetTasks` command:

- Waiting for volume deletion
- Deleting a volume

The volume statuses added to version 5.9 or later of the CLI are displayed as shown below.

Table A-5 Volume Statuses Output by the GetTasks Command (version 5.9 or later)

CLI Version	Volume Status				
	Waiting for Volume Creation	**Creating a Volume**	**Failure to Create a Volume**	**Waiting for Volume Deletion**	**Deleting a Volume**
5.8 or earlier	`Active.WaitingMigration`	`Active.WaitingMigration`	`Failure.MigrationFailure`	`Active.WaitingDataErasure`	`Active.DataErasing`
5.9 or later	`Active.WaitingCreateVolume`	`Active.CreatingVolume`	`Failure.CreateVolumeFailure`	`Active.WaitingDeleteVolume`	`Active.DeletingVolume`

Displaying Statuses for Volume Re-creation

Even if the capacity of a migration target volume is larger than that of its migration source volume, you can create a migration task. If you do not want to display volumes with larger capacities than their migration source volumes as candidate volumes, specify `0` for the `server.migrationPlan.candidateCapacityGroupDisplayMaxCount` key in the `server.properties` file. For details about this file, see the *Hitachi Tiered Storage Manager Server Configuration and Operation Guide*.

In version 6.0 or later of the CLI, the following statuses related to volume re-creation are included as volume statuses displayed when the `GetTasks` command is executed:

- Waiting for volume deletion before re-creation
- Deleting a volume before re-creation
- Waiting for volume re-creation
- Re-creating a volume
- Volume deletion failed

The following table describes the additional volume statuses in a CLI version 6.0 or later:

Table A-6 Volume Statuses Output by the GetTasks Command (version 6.0 or later)

CLI Version	Volume Status				
	Waiting for Volume Deletion Before Re-creation	**Deleting a Volume Before Re-creation**	**Waiting for Volume Re-creation**	**Re-creating a Volume**	**Volume Deletion Failed**
5.9 or earlier	`Active.WaitingMigration`	`Active.WaitingMigration`	`Active.WaitingMigration`	`Active.WaitingMigration`	`Failure.MigrationFailure`
6.0 or later	`Active.WaitingDeleteVolumePre-create`	`Active.DeletingVolumePre-create`	`Active.WaitingRe-createVolume`	`Active.Re-creatingVolume`	`Failure.DeleteVolumeFailure`

Notes on What is Displayed When a Volume Creation Task and an External Mapping Task are Specified for Command Parameters

If you execute a command for a volume creation task or external mapping task from a CLI client of version 6.0 or earlier, the displayed task statuses differ from the ones displayed when the command is executed from a CLI client of version 6.1 or later.

Even if you execute the `GetTasks` command with the volume creation task and the external mapping task specified as the tasks to be executed, only the information about the tasks other than the volume creation task and the external mapping task (such as the migration task, locking task, unlocking task, and shredding task) is displayed.

If you execute the `GetTasks` command by only specifying the volume creation task and the external mapping task as the tasks to be executed or by not specifying any parameters, no task information can be obtained, as shown in the following resulting display:

```
RESPONSE:
(Command completed; empty list returned)
```

If you execute the `ModifyTask` command with the volume creation task and the external mapping task specified as the tasks to be executed, the task information cannot be edited.

If you execute the `DeleteTasks` command with the volume creation task and the external mapping task specified as the tasks to be executed, you can delete the tasks by also specifying the task IDs and the `--force` option in the command.

Items Output by the GetStorageDomains Command

If the repository information managed in Device Manager differs from that in Tiered Storage Manager, `RefreshRequired` is displayed for `refreshStatus` when you execute the `GetStorageDomains` command.

In v5.8 or earlier of the CLI, if the repository information managed in Device Manager differs from that in Tiered Storage Manager, only information about whether the last refresh succeeded or failed is displayed for `refreshStatus`.

The following table shows the relationship between the statuses of a storage domain and values displayed for the `refreshStatus` output item of the `GetStorageDomains` command.

Table A-7 Values Displayed in refreshStatus of the GetStorageDomains Command

CLI Version	Last Refresh Is Complete		Last Refresh Is Not Complete	
	Refresh Is Required	Refresh Is Not Required	Refresh Is Required	Refresh Is Not Required
5.8 or earlier	Success	Success	Incomplete	Incomplete
5.9 or later	Refresh Required	Success	Refresh Required	Incomplete

Items Output by the GetStorageTiers Command

This section describes the GetStorageTiers command output displayed when you specify a storage tier that was created by specifying pool conditions as the migration target storage tier.

When you use version 5.8 or earlier of the CLI to execute the GetStorageTiers command with a storage tier that was created by specifying pool conditions, 0 is displayed for output items other than freeCapacityPercentage and freeManagedCapacityPercentage. For version 5.9 or later of the CLI, hyphens (-) are displayed instead. The value 100 is displayed for the output items freeCapacityPercentage and freeManagedCapacityPercentage.

The following table shows the relationship between the CLI versions and the values displayed by the GetStorageTiers command.

Table A-8 Display of a Storage Tier Created by Specifying Pool Conditions

CLI Version	Items Output by the GetStorageTiers Command	
	For Items Other Than freeCapacityPercentage and freeManagedCapacityPercentage	For freeCapacityPercentage and freeManagedCapacityPercentage
5.8 or earlier	0	100
5.9 or later	-	100

B

Changes in the Format of Output Items

In version 5.0 or later of the CLI, the format of some output items has been changed. The sections below explain specific format changes in version 5.0 and 5.5 of the CLI, respectively.

Changes in version 5.0:

- Header changes
- Output results from the `CreateMigrationPlan` command
- Capitalization of abbreviations

Changes in version 5.5:

- Display of TrueCopy
- Output results from the `GetVolumes` command

Item Format Changes in Version 5.0

Specific changes in CLI version 5.0 are explained below.

Header Changes

In versions of the CLI earlier than 5.0, some commands did not output a colon (:) at the end of the `List of ... elements:` header line. In version 5.0 or later, the colon is now output in all cases. This change affects the following commands:

- `AddVolumeToMigrationGroup`
- `CreateMigrationGroup`
- `CreateMigrationTask`
- `DeleteMigrationGroup`
- `DeleteTasks` (if a migration task is displayed when the deletion is confirmed)
- `GetMigrationGroups`
- `GetTasks` (if a migration task is displayed)
- `ModifyMigrationGroup`
- `ModifyTask` (if a migration task is modified)
- `RemoveVolumeFromMigrationGroup`

CreateMigrationPlan Command Output Results

The device numbers output to the right of the `# Target candidates for source LDEV` line are now sorted in ascending order.

Also, migration source and target volume pairs are now sorted in ascending order. The order is based on the logical device numbers of the representative LDEVs for the migration source volumes.

Capitalization of Abbreviations

All abbreviations in the output of an executed command are now capitalized. The following table lists capitalized abbreviations and examples of item names that include the abbreviations before and after this change.

Table B-1 Examples of Change in Capitalization

Abbreviation	Before Change	After Change
RAID	raidLevel	RAIDLevel
LDEV	Ldev	LDEV
SLPR	permitCrossSlprNumber	permitCrossSLPRNumber
CLPR	permitCrossClprNumber	permitCrossCLPRNumber
ID	id	ID

These abbreviations are output by the following commands:

- AddVolumeToMigrationGroup
- CreateMigrationPlan
- CreateMigrationTask
- DeleteTasks
- GetTasks
- GetVolumes
- ModifyTask
- RemoveVolumeFromMigrationGroup

Item Format Changes in Version 5.5

Specific changes in version 5.5 of the CLI are explained below.

Display of TrueCopy

The display of TrueCopy has changed in version 5.5 of the CLI. The display before and after this change is as follows:

Earlier than version 5.0:

- `trueCopy`

From version 5.5:

- `trueCopyAsynchronous`
- `trueCopySynchronous`

Display Order of GetVolumes Command Output

The order in which the output from the `GetVolumes` command is displayed has been changed. For the output displays, see the output examples in GetVolumes.

Acronyms and Abbreviations

BNF	Bachus Naur Form
CLI	Command Line Interface
CLPR	Cache Logical Partition
CVS	Custom volume size
DEVN	Device Number
DP	Dynamic Provisioning
FC	Fibre Channel
GUI	Graphical User Interface
HTTP	Hypertext Transfer Protocol
ID	Identifier
IP	Internet Protocol
IPF	Itanium processor family
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ISO	International Organization for Standardization
JRE	Java Runtime Environment
LBA	Logical block addressing
LDEV	Logical Device
LU	Logical Unit
LUN	Logical Unit Number
LUSE	Logical Unit Size Expansion
OS	Operating System
P-VOL	Primary volume
PA-RISC	Precision Architecture - Reduced Instruction Set Computer
RAID	Redundant Array of Independent Disks
RMI	Remote Method Invocation
S-VOL	Secondary volume
SAN	Storage Area Network
SLPR	Storage Logical Partition

SMI-S	Storage Management Initiative - Specification
SSD	Solid State Drive
SSL	Secure Sockets Layer
URL	Uniform Resource Locator
V-VOL	Virtual volume
VOLSER	Volume serial number
WWN	World Wide Name

Glossary

This glossary defines the special terms used in this document. Click the desired letter below to display the glossary entries that start with that letter.

#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

D

DP pool

A storage area for the data that will be written to a DP volume from the hosts. The Dynamic Provisioning function of Universal Storage Platform V/VM sets up this area by using either real volumes or volumes that are not real.

DP pool volume

A real volume used for a DP volume.

DP volume

A virtual volume that can be used by the Dynamic Provisioning function of Universal Storage Platform V/VM.

DP volume group

A group of virtual volumes created by Open Volume Management.

Dynamic Provisioning

A function of Universal Storage Platform V/VM. This function displays, to a host, the virtual capacity, and, in accordance with a write request from the host, provides a volume (DP volume) to which necessary physical disks are allocated.

L

LDEV (Logical Device)

The logical partitioning of storage areas in an array group of a storage subsystem. An LDEV is represented by a combination of the storage subsystem's product name, the storage subsystem's serial number, and the internal LU.

logical DKC

A name for managing a volume when volumes are managed by 64k-LDEV unit in Universal Storage Platform V/VM. In Universal Storage Platform V/VM, only migration source and target volumes in the same logical DKC can be migrated. For this reason, storage domains are made in logical DKC units.

logical DKC number

The number assigned to identify a logical DKC.

logical DKC serial number

The device identification number logically assigned to a logical DKC. This number is displayed as *logical-DKC-number* + *serial-number*.

logical group

A Device Manager function that allows users to manage the paths to the volumes assigned to a host, by dividing them into groups and placing them in hierarchies.

LU (logical unit)

A logical disk disclosed to a host as a SCSI LDEV on a storage subsystem port.

LUSE (LU size expansion)

A function that combines multiple LUs into a large LU. LUSE volumes can be created by using Device Manager.

N

normal volume

In Tiered Storage Manager, a normal volume is a volume that is not a virtual or pool volume.

P

pool

A storage area for virtual volumes.

pool volume

Real volumes that makes up a pool.

properties file

A file in which the settings, such as the settings for server operations or the default option settings for CLI execution, are specified. The Tiered Storage Manager server properties files are the following six files:

`server.properties` file

`client.properties` file

`database.properties` file

`devicemanager.properties` file

`logger.properties` file

`tuningmanager.properties` file

The Tiered Storage Manager CLI properties files are the following two files:

`htsmcli.properties` file

`htsmclienv.properties` file

R

real volume

A volume whose entire capacity is already allocated when the volume is created in Universal Storage Platform V/VM. In this manual, a real volume is a volume other than a virtual volume.

S

serial number

The device identification number assigned to a storage subsystem.

V

virtual volume

A generic term for virtual volumes used in storage functions. There are two types of virtual volumes:

Copy-On-Write Snapshot V-VOL

DP volume

virtual volume group

A group of virtual volumes created by Open Volume Management

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Hitachi Data Systems

Corporate Headquarters
750 Central Expressway
Santa Clara, California 95050-2627
U.S.A.
Phone: 1 408 970 1000
www.hds.com
info@hds.com

Asia Pacific and Americas
750 Central Expressway
Santa Clara, California 95050-2627
U.S.A.
Phone: 1 408 970 1000
info@hds.com

Europe Headquarters
Sefton Park
Stoke Poges
Buckinghamshire SL2 4HD
United Kingdom
Phone: + 44 (0)1753 618000
info.eu@hds.com

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