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Acronyms and Abbreviations

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About this guide

This guide provides information about:

• Installing HP StorageWorks Command View XP Advanced Edition Device Manager Server software.
• Installing Java™2 Java™ Runtime Environment (JRE).

Intended audience

This guide is intended for customers and HP authorized service providers who are experienced with the following:

• Data processing and direct-access storage device subsystems.
• HP StorageWorks XP Series disk array(s).

Prerequisites

Prerequisites for installing this product include:

• Reading through the user's guide.
• Meeting all the minimum installation requirements.
• Reviewing the readme.txt file on the CD for any last-minute announcements.

Document conventions and symbols

Table 1 Document Conventions

<table>
<thead>
<tr>
<th>Convention Element</th>
<th>Convention Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium blue text: Figure 1</td>
<td>Cross-reference links and e-mail addresses</td>
</tr>
<tr>
<td>Medium blue, underlined text (<a href="http://www.hp.com">http://www.hp.com</a>)</td>
<td>Web site addresses</td>
</tr>
</tbody>
</table>
| **Bold font** | • Key names  
• Text typed into a GUI element, such as into a box  
• GUI elements that are clicked or selected, such as menu and list |
| **Italics font** | Text emphasis |
| **Monospace font** | • File and directory names  
• System output  
• Code  
• Text typed at the command-line |
| **Monospace, italic font** | • Code variables  
• Command-line variables |
| **Monospace, bold font** | Emphasis of file and directory names, system output, code, and text typed at the command-line |

⚠️ **CAUTION:** Indicates that failure to follow directions could result in damage to equipment or data.

⚠️ **IMPORTANT:** Provides clarifying information or specific instructions.

⚠️ **NOTE:** Provides additional information.

⚠️ **TIP:** Provides helpful hints and shortcuts.
HP technical support
Telephone numbers for worldwide technical support are listed on the HP web site:
http://www.hp.com/support/
Collect the following information before calling:
- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions
For continuous quality improvement, calls may be recorded or monitored.
HP strongly recommends that customers sign up online using the Subscriber’s choice web site at
http://www.hp.com/go/e-updates
- Subscribing to this service provides you with email updates on the latest product enhancements, newest
  versions of drivers, and firmware documentation updates as well as instant access to numerous other
  product resources.
- After signing-up, you can quickly locate your products by selecting Business support and then Storage
  under Product Category.

HP-authorized reseller
For the name of your nearest HP-authorized reseller:
- In the United States, call 1-800-345-1518.
- Elsewhere, visit http://www.hp.com and click Contact HP to find locations and telephone numbers.

Helpful web sites
For additional product information, see the following web sites:
- http://www.hp.com
- http://www.hp.com/go/storage
- http://www.hp.com/support/
Revision history (start here)

Revision tables

Table 2 Revisions

<table>
<thead>
<tr>
<th>Date</th>
<th>Edition</th>
<th>Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>November, 2005</td>
<td>First</td>
<td>Initial release</td>
</tr>
</tbody>
</table>

Overview of HP StorageWorks XP Tiered Storage Manager
1 Overview of HP StorageWorks XP Tiered Storage Manager

This chapter explains the software components of Tiered Storage Manager as well as volume migration using the Tiered Storage Manager CLI. The explanations on migration cover the overall procedures and commands that can be used at each step, volume filtering and filter conditions, creation of candidate migration plans, and creation and execution of migration tasks.

- 1-1 Tiered Storage Manager Software Components
- 1-2 Volume Migration Using the Tiered Storage Manager CLI

1-1 Tiered Storage Manager Software Components

The following software components are needed to use the Tiered Storage Manager CLI to perform volume migration.

- Device Manager server
  The Device Manager server is a prerequisite program for the Tiered Storage Manager server.
  Tiered Storage Manager obtains configuration information about storage subsystems as well as information about volumes (LDEVs) from the Device Manager server. Also, the user management functionality provided by Device Manager is used to perform system registration for the user groups and users that use Tiered Storage Manager.

- Tiered Storage Manager server (Management server)
  The Tiered Storage Manager server (Management server) performs migration (relocation of volume data) within the domain control storage subsystem and the external storage subsystems that are connected to it, based on information received from the Management client.
  To use the Tiered Storage Manager server, the Device Manager server must be installed on the same server.

- Tiered Storage Manager client (Management client)
  The Tiered Storage Manager client (Management client) is used by system administrators, and storage administrators on the host side.
  The Management client provides users with information needed to perform migration, as obtained from Tiered Storage Manager server, and relays migration requests from the user to the Management server.
  The Management client consists of a CLI client and a Web client. The CLI client requires a Java execution environment.
  For details on how to operate the Web client, please refer to the HP StorageWorks XP Tiered Storage Manager User's Guide.

1-2 Volume Migration Using the Tiered Storage Manager CLI

This section explains the overall flow of operations when using the Tiered Storage Manager CLI to perform volume migration. Figure 1-1 illustrates the overall flow, and also lists the commands that can be used during each step of the operation.
1. Map volumes (LDEVs)

Map volumes (LDEVs) on external storage subsystems that are connected to a StorageWorks XP12000/XP10000 onto the StorageWorks XP12000/XP10000.

2. Create a storage domain

- Use the External Storage XP from StorageWorks XP12000/XP10000 to map the volumes (LDEVs) on external storage subsystems to StorageWorks XP12000/XP10000. Mapping involves determining the controller LDEV numbers on the domain control storage subsystem, for volumes (LDEVs) on external storage subsystems. Mapping enables volumes on external storage subsystems to be handled in the same manner as those on StorageWorks XP12000/XP10000.

3. Create a storage tier

- Use the CreateStorageTier command to create a storage tier in the storage domain. A storage tier is a collection of volumes that are migration target volume candidates. A storage tier is determined by the filter condition specified for the filtercondition parameter of the CreateStorageTier command.

4. Create a migration group

- Use a command to create a candidate migration plan and modify its contents manually.

5. Create and execute a migration task

- Execute a migration task.
NOTE: The storage tier must be created such that it contains a volume whose characteristics match those of the migration source volume.

4. Create a migration group

Use the CreateMigrationGroup command to create a migration group in a storage domain. A migration group is a collection of volumes on which application data is stored. Define a migration group to specify a collection of volumes to be migrated simultaneously.

5. Create a candidate migration plan

Use the CreateMigrationPlan command to create a candidate migration plan. A candidate migration plan is a text file that contains a pairing of a migration source volume and a migration target volume. A candidate volume that is chosen by Tiered Storage Manager is set in the migration target volume.

For details on how to create and edit candidate migration plans, see sections 1-2-3 and 1-2-4.

6. Create and execute a migration task

Use the CreateMigrationTask command with a migration plan specified to create a migration task. Created migration tasks can be executed immediately or executed using the ExecuteTask command. This can be selected using the execute option of the CreateMigrationTask command.

For details on creating and executing migration tasks, see section 1-2-5.

1-2-1 Storage Tier Filter Conditions

Storage tier filter conditions can be used for creating a storage tier, or for updating an existing storage tier. By specifying a storage subsystem or characteristics of volumes in a storage tier as filter conditions, you can select storage tiers that match the conditions.

Table 1-1 lists and describes the properties that can be specified for the filtercondition parameter of the CreateStorageTier command and the newfiltercondition parameter of the ModifyStorageTier command. The formats of the filter condition expressions that can be specified are:

- An expression consisting of a property name, operator, and value, for one property
- A logical expression consisting of several expressions connected by AND, for several properties
- A logical expression consisting of several expressions connected by OR, for several properties

<table>
<thead>
<tr>
<th>Property Name</th>
<th>Operators</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SubsystemDisplayModel</td>
<td>=,&lt;&gt;</td>
<td>The name used for displaying the model of the storage subsystem. This name is displayArrayType of Device Manager (not arrayType). Example: StorageWorks XP1024</td>
</tr>
<tr>
<td>SubsystemSerialNumber</td>
<td>=,&lt;&gt;,startsWith, contains</td>
<td>The serial number of the storage subsystem.</td>
</tr>
<tr>
<td>SubsystemName</td>
<td>=,&lt;&gt;</td>
<td>The name of the storage subsystem.</td>
</tr>
<tr>
<td>ArrayGroup</td>
<td>=,&lt;&gt;,startsWith, contains</td>
<td>The name of the array group.</td>
</tr>
<tr>
<td>SubsystemVendor</td>
<td>=,&lt;&gt;</td>
<td>The name of the storage subsystem vendor.</td>
</tr>
<tr>
<td>Capacity</td>
<td>&lt;,&lt;=,=,&lt;&gt;&gt;,&gt;</td>
<td>=</td>
</tr>
<tr>
<td>RAIDLevel</td>
<td>=,&lt;&gt;</td>
<td>The RAID level.</td>
</tr>
<tr>
<td>EmulationType</td>
<td>=,&lt;&gt;</td>
<td>The emulation type.</td>
</tr>
<tr>
<td>DiskType</td>
<td>=,&lt;&gt;</td>
<td>The disk type.</td>
</tr>
<tr>
<td>SLPRNumber</td>
<td>=,&lt;&gt;</td>
<td>The SLPR number.</td>
</tr>
<tr>
<td>CLPRNumber</td>
<td>=,&lt;&gt;</td>
<td>The CLPR number.</td>
</tr>
<tr>
<td>ControllerArrayGroup</td>
<td>=,&lt;&gt;,startsWith, contains</td>
<td>The name of the controller array group.</td>
</tr>
</tbody>
</table>

The following shows an example of a filter condition expression for a storage tier:

filtercondition="RAIDLevel='RAID5(3D+1P)' AND EmulationType='OPEN-8' "
1-2-2 Volume Search and Volume Filter Conditions

Volumes in a storage domain and storage tiers can be searched by their attributes. To search volumes, specify a volume filter condition expression.

Table 1-2 lists and describes the properties that can be specified for the filtercondition parameter of the GetVolumes command and the CreateMigrationPlan command. The formats of the filter condition expressions that can be specified are:

- An expression consisting of a property name, operator, and value, for one property
- A logical expression consisting of several expressions connected by AND, OR, NOT, or parentheses, for several properties

### Table 1-2 Properties That Can Be Specified for Volume Filter Conditions

<table>
<thead>
<tr>
<th>Property Name</th>
<th>Operators</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SubsystemDisplayModel</td>
<td>=,&lt;&gt;</td>
<td>The name used for displaying the model of the storage subsystem. This name is displayArrayType of Device Manager (not arrayType). Example: StorageWorks XP1024</td>
</tr>
<tr>
<td>SubsystemSerialNumber</td>
<td>=,&lt;&gt; startsWith, contains</td>
<td>The serial number of the storage subsystem.</td>
</tr>
<tr>
<td>SubsystemName</td>
<td>=,&lt;&gt;</td>
<td>The name of the storage subsystem.</td>
</tr>
<tr>
<td>SubsystemVendor</td>
<td>=,&lt;&gt;</td>
<td>The name of the storage subsystem vendor.</td>
</tr>
<tr>
<td>ControllerDeviceNumber</td>
<td>=</td>
<td>The controller LDEV number. Note that only a representative LDEV can be specified for a LUSE volume.</td>
</tr>
<tr>
<td>Host</td>
<td>=,&lt;&gt; startsWith, contains</td>
<td>The host name.</td>
</tr>
<tr>
<td>ArrayGroup</td>
<td>=,&lt;&gt; startsWith, contains</td>
<td>The name of the array group.</td>
</tr>
<tr>
<td>Capacity</td>
<td>&lt;,&lt;=,=,&lt;&gt;=&gt;</td>
<td>The volume capacity.</td>
</tr>
<tr>
<td>RAIDLevel</td>
<td>=,&lt;&gt;</td>
<td>The RAID level.</td>
</tr>
<tr>
<td>EmulationType</td>
<td>=,&lt;&gt;</td>
<td>The emulation type.</td>
</tr>
<tr>
<td>DiskType</td>
<td>=,&lt;&gt;</td>
<td>The disk type.</td>
</tr>
<tr>
<td>VolumeStatus</td>
<td>=</td>
<td>A string indicating whether or not the volume is being used.</td>
</tr>
<tr>
<td>VolumeLockStatus</td>
<td>=</td>
<td>A string indicating the lock status of the volume.</td>
</tr>
<tr>
<td>SLPRNumber</td>
<td>=,&lt;&gt;</td>
<td>The SLPR number.</td>
</tr>
<tr>
<td>CLPRNumber</td>
<td>=,&lt;&gt;</td>
<td>The CLPR number.</td>
</tr>
<tr>
<td>ControllerArrayGroup</td>
<td>=,&lt;&gt; startsWith, contains</td>
<td>The name of the controller array group.</td>
</tr>
</tbody>
</table>

The following shows an example of a filter condition expression for a volume:

```
filtercondition="RAIDLevel='RAID5(3D+1P)' AND DiskType='FC'
```

1-2-3 Creating a Candidate Migration Plan

Use the CreateMigrationPlan command to create a candidate migration plan.

Candidate migration plans are either output to the standard output in text format, or created in the redirect file specified by the output option. The following parameters must be specified for the CreateMigrationPlan command:

- The name of the storage domain
- The name of the migration source migration group
- The name of the migration target storage tier

For a migration target volume candidate for each migration group migration source volume, a volume of the same RAID level and same capacity as the migration source volume is chosen from the specified migration target storage tier.
When volume filter conditions are further specified by the `filtercondition` parameter, candidate migration target volumes are chosen from those that match the specified conditions. See Table 1-2 for details about the properties of the `filtercondition` parameter that can be specified for creating a candidate migration plan.

Table 1-3 lists the items specified for candidate migration plans created as information output for commands.

### Table 1-3 Candidate Migration Plan Items

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall plan information</td>
<td><code>plan-type</code></td>
<td>The plan type.</td>
</tr>
<tr>
<td></td>
<td><code>format-version</code></td>
<td>The format version of the plan. This is information for compatibility between different format versions. This is indicated as a string of two decimal numbers, separated by a period (.), such as in 1.0.</td>
</tr>
<tr>
<td></td>
<td><code>storageDomainName</code></td>
<td>The name of the storage domain.</td>
</tr>
<tr>
<td></td>
<td><code>migrationGroupName</code></td>
<td>The name of the migration group.</td>
</tr>
<tr>
<td></td>
<td><code>targetStorageTierName</code></td>
<td>The name of the migration target storage tier.</td>
</tr>
<tr>
<td></td>
<td><code>permitCrossSlprMigration</code></td>
<td>Indicates whether migration is permitted for transferring volume data between SLPRs. Yes: permitted. No: not permitted.</td>
</tr>
<tr>
<td></td>
<td><code>permitCrossClprMigration</code></td>
<td>Indicates whether migration is permitted for transferring volume data between CLPRs. Yes: permitted. No: not permitted.</td>
</tr>
<tr>
<td>Information for each pair of migration target volumes.</td>
<td><code>pair</code></td>
<td>Indicates the start of a description for a pair consisting of a migration source volume and a migration target volume.</td>
</tr>
<tr>
<td></td>
<td><code>sourceControllerDeviceNumber</code></td>
<td>The migration source volume. The controller LDEV number is displayed.</td>
</tr>
<tr>
<td></td>
<td><code>targetControllerDeviceNumber</code></td>
<td>The migration target volume. The controller LDEV number is displayed.</td>
</tr>
</tbody>
</table>

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

Figure 1-2 shows an example of a candidate migration plan.

```plaintext
# Example plan for migration
plan-type=Migration
format-version=1.0
storageDomainName=MegaTechXP12000-Primary
migrationGroupName=MG011
targetStorageTierName=MegaTech-HighCost
permitCrossSlprMigration=No
permitCrossClprMigration=No
pair
  # LUSE=No
  # LU=A3:A6
  # emulationType=OPEN-V
  # CVS=Yes
  # capacityInKB=10,240,320
  # SLPRNumber=0
```
# CLPRNumber=0
# cacheMode=Disable
# IOSupressionMode=Disable
sourceControllerDeviceNumber=3:A6
targetControllerDeviceNumber=2:80

pair
# emulationType=OPEN-V
# CVS=Yes
# capacityInKB=10,240,320
# SLPRNumber=0
# CLPRNumber=0
# arrayGroupName=1-9-1
sourceControllerDeviceNumber=3:A7
targetControllerDeviceNumber=2:84

# Target candidates for source LDEV - 3:A7, 3:A6
# emulationType=OPEN-V
# CVS=Yes
# capacityInKB=10,240,320
# SLPRNumber=0
# CLPRNumber=0
# arrayGroupName=1-10-1
# 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
Figure 1-2 Example Candidate Migration Plan

Even if migration target volume candidates cannot be selected for all migration source volumes, the specified candidate migration plan is created for those that can be selected.

A candidate for a migration target volume is selected from the logical partition (SLPR and CLPR) to which the migration source volume belongs. If a volume that can serve as a migration target volume is not found within the logical partition to which the migration source volume belongs, an empty string is output for the controller LDEV number of the migration target volume. In such a case, the command outputs the candidate migration plan and terminates with an error.

In candidate migration plans, comment lines (lines whose first column starts with a hash mark (#)), like those described below, are generated automatically by Tiered Storage Manager:

- Comment lines for a pair that consists of a migration source volume and a migration target volume
  The following information is displayed after the pair line (and before the lines that display the pair that consists of the migration source volume and migration target volume):
    - Information about attributes, capacity, and location for the migration source volume
      The LUSE volume attribute (LUSE)
      The LU device number (LU)
      The emulation type (emulationType)
      The CVS volume attribute (CVS)
      The volume capacity (capacityInKB)
      The SLPR number (SLPRNumber)
      The CLPR number (CLPRNumber)
      The cache mode (cacheMode)
      The IO suppression mode (IOSuppressionMode)

- Comment lines for a candidate migration target volume
  Comment lines start with the # Target candidates for source LDEV line and the following information is output: The items to be output and their order might differ depending on the version installed on the server.
    - Controller logical device number for the corresponding migration source volume
      This item is displayed in the # Target candidates for LDEV line. Multiple volume candidates are separated by commas and displayed if multiple candidates that can serve as migration target volumes exist.
    - Information about an attribute, capacity, and location for each migration target volume (candidate volume):
      The emulation type (emulationType)
      The CVS volume attribute (CVS)
      The volume capacity (capacityInKB)
      The name of model (subsystem)
      The SLPR number (SLPRNumber)
      The CLPR number (CLPRNumber)
      The name of the array group where the LDEV exists (arrayGroupName)
      The disk type (diskType)
      The RAID level (RAIDLevel)
      The cache mode (cacheMode)
      The IO suppression mode (IOSuppressionMode)

Controller logical device number for the corresponding migration target volume (candidate volume)

If multiple migration target volumes (candidate volumes) exist, multiple lines are displayed for each volume. For the first candidate (the volume that is paired with the migration source volume after the pair line), an asterisk (*) and controller logical device number for the migration source volume (in parentheses) are displayed following the controller logical device number.

All volumes other than the first candidate are chosen not only from the logical partition (SLPR and CLPR) to which the migration source volume belongs, but also from the other logical partitions (SLPRs and CLPRs).

Users can change the candidate volume easily by switching the first candidate migration target volume and one of the subsequent candidate volumes.
1-2-4 Editing a Migration Plan

A candidate migration plan created by the CreateMigrationPlan command can be used as-is for migration, or can be edited as text data by a user as needed.

The format for candidate migration plans 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`.

  **NOTE:** Item names are not case-sensitive (for example, `storagedomainname` and `STORAGEDOMAINNAME` are equivalent).

  **NOTE:** Item values are case-sensitive (for example, `groupName_1` and `GroupName_1` are different values).

- Any space characters before or after the item name, equal sign (=), and value are disregarded.
- Specify one item per line. The specification for an item cannot continue over multiple lines.
- Lines in which the first non-space character is a hash mark (#) are treated as comments.

Specify item names as follows:

- Specify each item name in the order listed in Table 1-3.
- Specify `plan-type`, `format-version`, `storageDomainName`, `migrationGroupName`, `targetStorageTierName`, `permitCrossSlprMigration`, and `permitCrossClprMigration` only once at the beginning of a migration plan.
- For each migration source volume belonging to the specified migration group, specify each of `pair`, `sourceControllerDeviceNumber`, and `targetControllerDeviceNumber`, once each and in that order.

Specify migration source volumes and migration target volumes as follows:

- Specify two controller LDEV numbers, one for the migration source volume and one for the migration target volume.
- For the migration source volume, specify a volume that belongs to the specified migration group.
- For the migration target volume, specify a volume that belongs to the specified storage tier.
- For migration source volumes that do not require migration, specify the same volume as the migration source volume for the migration target volume.

Note that different combinations of migration source volumes or migration target volumes cannot be specified redundantly.

1-2-5 Creating and Executing a Migration Task

When migration is performed based on a migration plan, a migration task must be created and then executed. Migration tasks can be created by executing the CreateMigrationTask command with a migration plan specified. A task ID is given to the created migration task.

There are two ways to execute a migration task:

- You can execute a migration task immediately by using the CreateMigrationTask command with the `execute` option specified.

  **NOTE:** Migration tasks not immediately executed using the CreateMigrationTask command with the `execute` option specified, remain in Standby status.

- You can use the ExecuteTask command (including the migration task ID) to execute a migration task that is in Standby status.

Migration task execution requires that a request be made for task execution to the Tiered Storage Manager server. The actual task execution is performed asynchronously to the CreateMigrationTask command and ExecuteTask command.

1-2-5-1 Migration task status

Migration tasks can be in any of the following statuses. The GetTasks command can be used to obtain the status of a task.

- **Standby:** Standby
- **Active.WaitingMigration**: Waiting for migration to be performed
- **Active.Migrating**: Migration is being performed
- **Active.WaitingDataErasure**: Waiting for erasure to be performed
- **Active.DataErasing**: Erasure is being performed
- **Success**: Ended in success
- **Failure.MigrationFailure**: Ended in migration failure
- **Failure.DataErasureFailure**: Ended in erasure failure
- **Failure**: Ended with a failure other than those mentioned above
- **Cancel**: Ended by cancellation

### 1-2-5-2 Volume migration reserve

When the `CreateMigrationTask` is used to execute a migration task, a volume migration reserve is performed for the migration source volume and migration target volume specified in the migration plan.

A volume migration reserve is released either when the migration terminates normally or the migration task changes to a terminated status, or when the `Cancel` command is executed to cancel the migration task. Refresh processing releases the volume migration reserve when the migration task ends with a failure.

### 1-2-5-3 Swapping controller LDEV numbers for migration source volumes and migration target volumes

Once migration terminates normally, the controller LDEV number of the migration source volume and the controller LDEV number of the migration target volume are swapped.

### 1-2-5-4 Deleting (erasing) migration source volume data

If the `erasedata` parameter of the `CreateMigrationTask` command is set to either `Yes` or omitted, the migration source volume data is deleted when migration terminates normally.
2 Requirements and Installation

This chapter explains the system requirements for operating the Tiered Storage Manager CLI. This chapter also explains installation and setup of the Tiered Storage Manager CLI, which is required for setting an environment where CLI commands can be executed on a Management client.

• 2-1 Requirements for CLI Operations
• 2-2 CLI Memory Requirements
• 2-3 Tiered Storage Manager CLI Installation and Setup
• 2-4 Tiered Storage Manager CLI Uninstallation and Unsetup
• 2-5 Precautions Regarding Execution of the CLI Commands

2-1 Requirements for CLI Operations

The system requirements for operating the Tiered Storage Manager CLI are:

• Storage subsystems
  All storage subsystems to be managed by Tiered Storage Manager must be connected to a LAN, and be accessible by the Management server and Management client for Tiered Storage Manager. Also, external storage subsystems must be connected to the domain control storage subsystem, and the LDEVs within external storage subsystems must be mapped to the domain control storage subsystem.

• Device Manager server
  Device Manager server must already be installed, set up, and fully ready for operation. For details, please refer to the HP StorageWorks Command View XP Advanced Edition Device Manager Server Installation and Configuration Guide.

• Tiered Storage Manager server
  Tiered Storage Manager server must already be installed, set up, and fully ready for operation. For details, please refer to the HP StorageWorks XP Tiered Storage Manager Server Installation and Configuration Guide.

• Platform for the Tiered Storage Manager CLI
  The platform used for the Tiered Storage Manager CLI must be running one of the following operating systems supported by Tiered Storage Manager 1.1 (01-10) for CLI:
  • Windows XP
  • Windows 2000 (Service Pack 3 or later)
  • Windows Server 2003 (32-bit version only)
  • Sun Solaris 8 (SPARC platform only)
  • Sun Solaris 9 (SPARC platform only)
  • HP-UX 11i V1.0
  • HP-UX 11i V2.0

• Java execution environment
  The Tiered Storage Manager CLI requires Java Runtime Environment (JRE) version 1.4.2.
  If the OS of the machine on which CLI is executed is Windows, the path in which java.exe is stored must be set in the Path environment variable.
  If the OS of the machine on which CLI is executed is Solaris or HP-UX, the path in which java is stored must be set in the PATH environment variable.

For details about requirements for installing and setting up CLI on the client, see section 2-3-1.

2-2 CLI Memory Requirements

The maximum memory size for running CLI must be set appropriately when CLI is executed. The maximum amount of memory 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 here must be a multiple of 1,024 bytes that is at least 2 MB. Since this value is set using notation in bytes, add k or K to specify kilobytes, or m or M to specify megabytes.
For commands such as the `GetVolumes` command that can obtain a large amount of information depending on parameter settings, the amount of memory secured must suit the parameter settings. The maximum amount of memory required for executing the `GetVolumes` command is about 150 MB.

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

```
Exception in thread "main" java.lang.OutOfMemoryError
<no stack trace available>
```

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

### 2-3 Tiered Storage Manager CLI Installation and Setup

To set up an environment for running CLI on the Management client, you must install CLI by copying its setup command from the Tiered Storage Manager server to the Management client, and then executing the setup command. Also, you must install the Java execution environment.

When CLI commands are executed on a Management server, there is no need to transfer the setup file or execute the setup command. When the server is installed, the CLI commands are also installed on the Management server. When the Tiered Storage Manager server is installed, the CLI setup files are ready to download from the Management server.

The name of the CLI setup file is:

- `TSM01-10-mm_Enn_WIN_CLI.zip` (Windows version)
- `TSM01-10-mm_Enn_SOL_CLI.tar.gz` (Solaris version)
- `TSM01-10-mm_Enn_HP_CLI.tar.gz` (HP-UX version)

`mm` indicates the number of revised versions. `nn` indicates the build number.

When the Tiered Storage Manager server is installed on a Management server, the CLI setup file is stored in the following location on the Management server:

```
HP-StorageWorksXP-Tiered-Storage-Manager-Installation-directory\Dist
```

**NOTE:** Operations described in this section, *Tiered Storage Manager CLI Installation and Setup*, are unnecessary for executing CLI commands on a Management server. When the server is installed, an environment where CLI commands can be executed is also created on the Management server.

### 2-3-1 Requirements for CLI Installation and Setup

The requirements for CLI installation and setup for a Management client are as follows:

- When the Management client is running on Windows:
  - Administrator login is required.
  - At least 100 MB of free space must exist on the disk on which the OS is installed.
  - The environment must allow `.zip` files to be decompressed.
- When the Management client is running on Solaris or HP-UX:
  - Administrator (root) login is required.
  - At least 100 MB of free space must exist on the disk to which `/opt` is allocated.

### 2-3-2 CLI Installation and Setup on a Windows System

To perform CLI installation and setup:

1. Log on to the Management client machine as a user who is a member of the Administrators group.
2. Use FTP or external media to transfer the setup file from the Management server machine of Tiered Storage Manager to the Management client machine. You can copy this file to any location.
3. Decompress the transferred setup file into the Windows system drive.

After decompression, files such as the batch file for setup, batch file for unsetup, batch file for running CLI, and properties files are decompressed and stored on the system drive:

```
system-drive\TieredStorageManager\0110\Setup\setup.bat
system-drive\TieredStorageManager\0110\Setup\unsetup.bat
```
### Requirements and Installation

1. **System Requirements**
   - Java Runtime Environment (JRE) version 1.4.2

2. **Installation**
   - **Installation Drive**
     - `system-drive:\TieredStorageManager\0110\CLI\htsmcli.bat`
   - **Properties Files**
     - `system-drive:\TieredStorageManager\0110\CLI\htsmcli.properties`
     - `system-drive:\TieredStorageManager\0110\CLI\htsmclienv.properties`

   **NOTE:** The decompressed properties file `htsmcli.properties` is a sample file, and examples of property setting are contained in the file as comment lines.

3. **Execution**
   - Execute `htsmcli.bat`, the batch file for setup.
     - This stores the common library for collecting trace information, sets the settings for the common library, and edits the batch file for running CLI. The common library is stored in the following directory:
       - `system-drive:\Program Files\Hitachi\HNTRLib2`

4. **Java Execution Environment**
   - The Tiered Storage Manager CLI requires Java Runtime Environment (JRE) version 1.4.2. To confirm that setup is complete:
     1. From the Start menu, choose Settings, then Control Panel, and then System. The System Properties dialog box is displayed.
     2. In the System Properties dialog box, choose the Advanced tab, and then click the Environment variables button. The Environment Variables dialog box is displayed.
     3. Verify that the Path value in the System environment variables list box contains the path in which `java.exe` is stored. If it does not, add the appropriate path.

5. **Properties File**
   - Once you have verified that setup is complete, edit the properties file as needed. Also, to use a previously backed up properties file, simply replace the existing one.

   **NOTE:** The properties file `htsmcli.properties` can be stored in any desired location; however, the directory containing this file must be set in the environment variable `HTSM_CLI_HOME` in advance.

### 2-3-3 CLI Installation and Setup on a Solaris or HP-UX System

To perform CLI installation and setup:

1. **Log on** to the Management client machine as a user with administrator privileges (`root`).
2. **Use FTP or external media** to transfer the setup file from the Management server machine of Tiered Storage Manager to the Management client machine. You can copy this file to any location, such as `/tmp`.
3. **Decompress** the transferred setup file into the `/opt` directory.
   - After decompression, files such as the shell script for setup, shell script for unsetup, shell script for running CLI, and properties files are decompressed and stored on the `/opt` directory:
     - `/opt/TieredStorageManager/0110/Setup/setup.sh`
     - `/opt/TieredStorageManager/0110/Setup/unsetup.sh`
     - `/opt/TieredStorageManager/0110/CLI/htsmcli`
     - `/opt/TieredStorageManager/0110/CLI/htsmcli.properties`
     - `/opt/TieredStorageManager/0110/CLI/htsmclienv.properties`

   **NOTE:** The decompressed properties file `htsmcli.properties` is a sample file, and examples of property settings are contained in the file as comment lines.

4. **Execute** `setup.sh`, the shell script for setup.
   - This stores the common library for collecting trace information and sets the settings for the common library. The common library is stored in the following directory:
     - `/opt/Hitachi/HNTRLib2`

   **Java Execution Environment**
   - The Tiered Storage Manager CLI requires Java Runtime Environment (JRE) version 1.4.2. To confirm that setup is complete:
1. Execute the `env` command to verify that the value set for the `PATH` system environment variable contains the path in which `java` is stored. If it does not, add the appropriate path to the system logon script (such as `/etc/profile`).

Once you have verified that setup is complete, edit the properties file as needed. Also, to use a previously backed up properties file, simply replace the existing one.

**NOTE:** The properties file `htsmcli.properties` can be stored in any desired location; however, the directory containing this file must be set in the environment variable `HTSM_CLI_HOME` in advance.
2-4 Tiered Storage Manager CLI Uninstallation and Unsetup

To perform unsetup of CLI, you must execute the batch file or shell script for unsetup. When unsetup of CLI is performed, the files for CLI are deleted and the common library for collecting trace information is uninstalled.

The batch file or shell script for unsetup is one of the files decompressed from the setup file during setup, and is located in the same directory as the batch file or shell script for setup.

When the Management client is running on Windows:
1. Back up the `htsmcli.properties` properties file.
2. Make sure that the two conditions below are met for the following directory:
   
   ```
   system-drive\TieredStorageManager
   ```
   
   • The current directory must not be in or under this directory.
   • Directories or files in or under this directory must not be in use.
     If these conditions are not met, directories might not be deleted, even if unsetup ends normally.

   3. Execute the following batch file for unsetup:
   
   ```
   system-drive\TieredStorageManager\0110\Setup\unsetup.bat
   ```
   
   The common library for collecting trace information is uninstalled, and the files and directories decompressed from the setup file during setup are deleted.

   When the Management client is running on Solaris or HP-UX:
1. Back up the `htsmcli.properties` properties file.
2. Execute the following shell script for unsetup:
   
   ```
   /opt/TieredStorageManager/0110/Setup/unsetup.sh
   ```
   
   The common library for collecting trace information is uninstalled, and the files and directories decompressed from the setup file during setup are deleted.

2-5 Precautions Regarding Execution of the CLI Commands

Note the following precautions regarding the execution of the CLI commands:

• Language on the CLI client
   
   We recommend that the language on the CLI client should match that of the locale on the server. Some messages output by Tiered Storage Manager contain information, such as message text, in the form that it was received from Device Manager. The language of this text depends on the machine that runs the Device Manager server or the machine that runs the Tiered Storage Manager server.

• Symbols that have special meanings for the OS
   
   Exercise caution when using symbols within a Tiered Storage Manager CLI command that have special meaning to the operating system (e.g., <, >, &, !). Enclose strings containing these symbols in double quotation marks ("), or use an escape character before each of these symbols so that they are not misinterpreted by the operating system.

• File names containing unusable characters
   
   An unexpected result might occur if an unusable character is contained in the name of a file such as a redirect file. For example, in Windows, if a file name containing a colon is specified for a redirect destination or output option, the file is created with a file name consisting of the characters preceding the colon, but nothing is output to that file.

• Path to be set for the Windows environment variable `HTSM_CLI_HOME`
   
   Note the following when setting the path for the Windows environment variable `HTSM_CLI_HOME`:
   
   • Do not enclose the path in double quotation marks (").
   • Do not specify the symbol \ at the end of the path.
   • Do not specify the directory that exists directly under the drive.

• Umask for the htsmcli script for Solaris and HP-UX.
   
   Umask 0 is used for the script htsmcli. Therefore, access permissions for the following files that htsmcli creates become "-rw-rw-rw-":
   
   • Trace log files created in `/opt/TieredStorageManager/0110/CLI/logs`.
   • Files specified in the output option to which the standard output is to be redirected.
By using the desired 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.

- Canceling a CLI command by pressing Ctrl + C or closing the window
  When a CLI command is canceled by pressing Ctrl + C or closing the window, the user does not know the execution result. In such a case, execute a view command, such as GetTasks, to check the execution result. If necessary, re-execute the update command such as DeleteTasks.
3 Using the Tiered Storage Manager CLI

This chapter provides an overview of the Tiered Storage Manager CLI and describes the structure and syntax of CLI commands.

- 3-1 CLI Command Overview
- 3-2 Description of the CLI Command Elements
- 3-3 CLI Command Syntax
- 3-4 Miscellaneous Operational Information
- 3-5 Starting the Tiered Storage Manager CLI
- 3-6 Displaying CLI Help

3-1 CLI Command Overview

There are four categories of CLI commands:

- Storage domain management
- Storage tier management
- Migration group management
- Migration

Table 3-1 lists and describes the CLI commands by category.

<table>
<thead>
<tr>
<th>Category</th>
<th>Command Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain management</td>
<td>CreateStorageDomain</td>
<td>Creates a new storage domain (by registering a domain control storage subsystem as a storage domain).</td>
</tr>
<tr>
<td></td>
<td>DeleteStorageDomain</td>
<td>Deletes a registered storage domain.</td>
</tr>
<tr>
<td></td>
<td>GetStorageDomains</td>
<td>Obtains information about storage domains.</td>
</tr>
</tbody>
</table>
|                           | ModifyStorageDomain                 | Changes attributes for a storage domain. The following attributes can be changed:  
                                             • Storage domain name  
                                             • Storage domain description |
|                           | GetVolumes                          | Obtains information about volumes within a storage domain. |
|                           | Refresh                             | Updates information about a storage domain. The refresh processing re-obtains subsystem information from Device Manager and registers it in the Tiered Storage Manager repository. |
| Storage tier management   | CreateStorageTier                   | Creates a storage tier within a storage domain. |
|                           | DeleteStorageTier                   | Deletes a storage tier. |
|                           | GetStorageTiers                     | Obtains information about storage tiers in a storage domain. |
|                           | ModifyStorageTier                   | Changes attributes for a storage tier. The following attributes can be changed:  
                                             • Storage tier name  
                                             • Filter condition for a storage tier  
                                             • Storage tier description |
|                           | GetVolumes (with storagetiername specified) | Obtains information about volumes within a storage tier. |
| Migration group management| CreateMigrationGroup                | Creates a migration group within a storage domain. |
|                           | DeleteMigrationGroup                | Deletes a migration group. |
|                           | GetMigrationGroups                  | Obtains information about migration groups in a storage domain. |
Table 3-1 CLI Command Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Command Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ModifyMigrationGroup</td>
<td>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</td>
<td></td>
</tr>
<tr>
<td>AddVolumeToMigrationGroup</td>
<td>Adds a volume to a migration group.</td>
<td></td>
</tr>
<tr>
<td>RemoveVolumeFromMigrationGroup</td>
<td>Removes a volume from a migration group.</td>
<td></td>
</tr>
<tr>
<td>GetVolumes</td>
<td>Obtains information about volumes in a migration group.</td>
<td></td>
</tr>
<tr>
<td>CreateMigrationPlan</td>
<td>Creates a migration plan.</td>
<td></td>
</tr>
<tr>
<td>CreateMigrationTask</td>
<td>Creates, and optionally executes, a migration task.</td>
<td></td>
</tr>
<tr>
<td>GetTasks</td>
<td>Obtains information about migration tasks.</td>
<td></td>
</tr>
<tr>
<td>ModifyTask</td>
<td>Changes attributes for a migration task. The following attribute can be changed: • Task description</td>
<td></td>
</tr>
<tr>
<td>ExecuteTask</td>
<td>Executes a migration task in standby status.</td>
<td></td>
</tr>
<tr>
<td>CancelTask</td>
<td>Cancels (places in terminated status) a migration task in standby status.</td>
<td></td>
</tr>
<tr>
<td>DeleteTasks</td>
<td>Deletes a terminated migration task.</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: A detailed description of each command is provided in 4.

3-2 Description of the CLI Command Elements

CLI commands can contain up to four elements. Table 3-2 lists and describes each element of the CLI command.

Table 3-2 Description of CLI Command Elements

<table>
<thead>
<tr>
<th>Command Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>server-location</td>
<td>Information indicating the location of the Tiered Storage Manager server on the network. Specify a value such as rmi://myhost.mydomain:20352/HTSMServer. Specify the host and port for the Tiered Storage Manager server in the following URL format: rmi://[host][:port]/HTSMServer • host: Specify the host name or IP address for Tiered Storage Manager. If this is omitted, the local host is used. • port: Specify the port number where client requests are received, as specified during HP StorageWorks XP Tiered Storage Manager installation. If this is omitted, 20352 (the default for HP StorageWorks XP Tiered Storage Manager installation) is used. You can omit the server-location when using the command line, by setting it in the properties file.</td>
</tr>
<tr>
<td>command</td>
<td>The name of a command requesting processing on the Tiered Storage Manager server, such as CreateStorageDomain or CreateMigrationTask. • The command name is not case-sensitive. As such, createstoragedomain is the same as CREATESTORAGEDOMAIN.</td>
</tr>
</tbody>
</table>
### Table 3-2 Description of CLI Command Elements

<table>
<thead>
<tr>
<th>Command Element</th>
<th>Description</th>
</tr>
</thead>
</table>
| options         | Options contain information for controlling the CLI operation. Use the general UNIX format when entering options. There are two kinds of such expressions: one-character expressions and one-word expressions. Insert one hyphen before one-character expressions, and two hyphens before one-word expressions. For example, a one-character expression should be specified like `–u`, and a one-word expression should be specified like `--username`. Some options require an argument to be specified after the option.  
- Specify arguments as command line parameter strings. Arguments that contain space characters should be enclosed in quotation marks (such as in `--output "C:\My Documents\redirect.txt"`), or whatever is appropriate for the command execution environment.  
- Options are case-sensitive.  
- Options can be specified in any order.  

IMPORTANT: Not all options are valid for all commands. Refer to the detailed command descriptions in 4 to determine which options are valid for each command. |
| 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, such as in `name=value`.  
- Specify parameters as command line parameter strings. Parameters that contain space characters should be enclosed in quotation marks (such as in `"filtercondition = capacity < '1024GB'"`), or whatever is appropriate for the command execution environment.  
- Names are not case-sensitive.  
- Values are case-sensitive. As such, `xp` and `XP` are considered two different values.  
- Parameters can be specified in any order.  
- Parameters can be omitted from the command line if they are set in the properties file.  

IMPORTANT: Refer to Table 3-3 to determine the range of valid parameter values for each parameter. |

---

### 3-3 CLI Command Syntax

Using the command line interface, you can initiate requests to the Tiered Storage Manager server and review responses from the server. CLI commands are executed from the command line. The syntax of Tiered Storage Manager CLI commands is:

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

**NOTE:** When commands are entered from the command line, shell escaping must be performed in accordance with the platform used.

---

### 3-3-1 CLI Command Parameters

Command parameters are specified as a combination of a `name` and a `value`. Specify a parameter as follows, with the name of the parameter first, followed by an equal sign, and then the value of the parameter:

```
controllerserialnumber=14011
```

Parameters can be specified in any order. Specify parameters as a single command line parameter character string. Parameters that contain space characters should suit the command execution environment. For example, enclose such parameters in quotation marks as follows:

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

**NOTE:** The parameter `name` is not case sensitive. The parameter `value` is case sensitive. For example, `xp` and `XP` are considered two different values.

Parameters can be set in the command line when the command is issued or the parameters can be set in the CLI properties file. Parameters that are set in the command line take precedence over parameters that were set in the properties file. For details about the Tiered Storage Manager CLI properties file, see 5.
## Table 3-3 Range of Valid Parameter Values

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Permissible Value or Range</th>
<th>Valid Characters and Parameter Restrictions</th>
<th>Size or Number of Characters</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td></td>
<td>- One of the following names provided in Tiered Storage Manager:</td>
<td>Up to 75 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, other characters are from 1 to 3 bytes.</td>
</tr>
</tbody>
</table>
|                        |                           | • storagedomainname  
• storagetiername  
• migrationgroupname                                                                                       |                                                                                              |
<p>| description            | --                        | No restrictions                                                                                                                                                  | Up to 500 bytes (when converted to UTF-8).                                                   |
| controllermodel        |                           | The value displayed for the arrayType attribute of the StorageArray object, in GetStorageArray for the Device Manager CLI.                                          | Up to 75 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, other characters are from 1 to 3 bytes. |
| controllerserialnumber |                           | The value displayed for the serialNumber attribute of the StorageArray object, in GetStorageArray for the Device Manager CLI.                                    | Up to 75 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, other characters are from 1 to 3 bytes. |
| controllername         |                           | The value displayed for the name attribute of the StorageArray object, in GetStorageArray for the Device Manager CLI.                                            | Up to 256 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, other characters are from 1 to 3 bytes. |</p>
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Permissible Value or Range</th>
<th>Valid Characters and Parameter Restrictions</th>
<th>Size or Number of Characters</th>
</tr>
</thead>
<tbody>
<tr>
<td>controllerdevicenumber</td>
<td>--</td>
<td>Two hexadecimal values less than 0x100, separated by a colon (:). Specify the first value as one or two characters, and second value as two characters.</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The value is not case sensitive.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Space characters cannot be specified.</td>
<td></td>
</tr>
<tr>
<td>canmigrate</td>
<td>Yes and No</td>
<td>• The value is not case sensitive.</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The value cannot contain space characters.</td>
<td></td>
</tr>
<tr>
<td>erasedata</td>
<td>Yes and No</td>
<td>• The value is not case sensitive.</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The value cannot contain space characters.</td>
<td></td>
</tr>
<tr>
<td>id</td>
<td>The task ID.</td>
<td>An ID created by CreateMigrationTask, this is the value displayed for the ID attribute of the MigrationTask object for CreateMigrationTask.</td>
<td>Up to 75 bytes, (when converted to UTF-8). 1 ASCII character is 1 byte, other characters are from 1 to 3 bytes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The specified value cannot start or end with a space character.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• An empty character string cannot be specified.</td>
<td></td>
</tr>
<tr>
<td>status</td>
<td>The status of the task.</td>
<td>Standby, Active.WaitingMigration, Active.Migrating, Active.WaitingData Erasure, Active.DataErasing, Success, Failure.MigrationFailure, Failure.DataErasureFailure, Cancel, Active, NotEnd, Failure, End</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The value is not case sensitive.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The value cannot contain space characters.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A lower-level status can be specified by omitting Active. or Failure.</td>
<td></td>
</tr>
<tr>
<td>datetype</td>
<td>Created, Ended</td>
<td>• The value is not case sensitive.</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The value cannot contain space characters.</td>
<td></td>
</tr>
<tr>
<td>daystobase</td>
<td>0 or a positive integer</td>
<td>0 or a positive integer</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• You cannot add the</td>
<td></td>
</tr>
</tbody>
</table>
### 3-3-2 Filter Condition Expressions

There are two types of filter condition expressions specified for the `filtercondition` parameter:

- **Filter condition expressions for a storage tier** (`storage_tier_filter_condition`). These are filter condition expressions specified for `CreateStorageTier` and `ModifyStorageTier`.
- **Filter condition expressions for a volume** (`volume_filter_condition`). These are filter condition expressions specified for `GetVolumes` and `CreateMigrationPlan`.

Figure 3-1 illustrates the syntax of these filter condition expressions, in Bachus Naur form (BNF):

```plaintext
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 ")"

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

The maximum number of `comparison_predicate` that can be contained in one filter condition expression is 30.

**NOTE:** Curly brackets ({{}}) indicate 0 or more repetitions.

If any of the following characters are included in `string_literal`, enclose `string_literal` in single quotation marks ('). For a single quotation mark (') used for enclosing a string, add a single quotation mark (') as an escape character (specify two single quotation marks sequentially).

Space character, parenthesis (), inequality sign <>, equal sign =, single quotation mark '

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 is an example specification for `filtercondition`, for a filter condition for a storage tier:

```
filtercondition="RAIDLevel='RAID5 (3D+1P)' AND DiskType='FC'"
```

Table 3-4 describes the values that can be specified in the properties for the filter condition expressions used for the `filtercondition` parameter.

**NOTE:** The term “properties for the filter condition expressions” refers to the `comparison_predicate` and `term` objects in the filter condition expressions shown in Figure 3-1.

<table>
<thead>
<tr>
<th>Property Name</th>
<th>Permissible Value or Range</th>
<th>Valid Characters and Character Restrictions</th>
<th>Size or Number of Characters</th>
</tr>
</thead>
</table>
| 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 not discriminated.  
  - The value is not case sensitive. | Up to 75 bytes (when converted to UTF-8).  
  1 ASCII character is 1 byte, other characters are from 1 to 3 bytes. |
| SubsystemSerialNumber  | The value displayed for the `serialNumber` attribute of the `StorageArray` object, in `GetStorageArray` for the Device Manager CLI. Part of the value can be specified by using `startsWith` or `contains`. |  
  - A to Z  
  - a to z  
  - 0 to 9  
  - Hyphen (-)  
  - Underscore (_)  
  - Period (.)  
  - At mark (@)  
  - Space character ( )  
  - Non-ASCII characters  
  - The specified value cannot start or end with a space character.  
  - An empty character string cannot 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. | Up to 75 bytes (when converted to UTF-8).  
  1 ASCII character is 1 byte, other characters are from 1 to 3 bytes. |
### Table 3-4 Range of Valid Property Values for Filter Condition Expressions

<table>
<thead>
<tr>
<th>Property Name</th>
<th>Permissible Value or Range</th>
<th>Valid Characters and Character Restrictions</th>
<th>Size or Number of Characters</th>
</tr>
</thead>
<tbody>
<tr>
<td>SubsystemName</td>
<td>The value displayed for the name attribute of the StorageArray object, in GetStorageArray for the Device Manager CLI.</td>
<td>No restrictions on the types of characters exist, but note the following restriction: · The specified value cannot start or end with a space character.</td>
<td>Up to 256 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, other characters are from 1 to 3 bytes.</td>
</tr>
<tr>
<td>SubsystemVendor</td>
<td>The value displayed for the vendor attribute of the VolumeConnection object, in GetStorageArray for the Device Manager CLI. If the vendor name is unknown, specify Unknown.</td>
<td>No restrictions on the types of characters exist, but note the following restriction: · The value is not case sensitive. · Space characters cannot be used.</td>
<td>Up to 75 bytes (when converted to UTF-8) 1 ASCII character is 1 byte, other characters are from 1 to 3 bytes.</td>
</tr>
<tr>
<td>ControllerDeviceNumber</td>
<td>--</td>
<td>The values specifiable for controllerdevicenumber in Table 3-3, separated by a comma (,) for an array, or by a hyphen (-) for a range. · Space characters at the start or end of controllerdevicenumber in Table 3-3 are disregarded.</td>
<td>The maximum number of elements separated by commas (,) is 100. · The range specified by a hyphen (-) is used as one element.</td>
</tr>
<tr>
<td>Host</td>
<td>Part of the value can be specified by using startsWith or contains</td>
<td>No restrictions on the types of characters exist, but note the following restriction: · If the operator is = or &lt;&gt;, 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.</td>
<td>Up to 256 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, other characters are from 1 to 3 bytes.</td>
</tr>
<tr>
<td>Property Name</td>
<td>Permissible Value or Range</td>
<td>Valid Characters and Character Restrictions</td>
<td>Size or Number of Characters</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>ArrayGroup</td>
<td>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 be specified by using startsWith or contains.</td>
<td>A to Z, a to z, 0 to 9, Hyphen (-), Underscore (_), Period (.), At mark (@), Space character ( ), Non-ASCII characters: • An empty character string cannot be specified. • If the operator is = or &lt;&gt;, 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 contains, space characters at the start or end are included in the search string.</td>
<td>The maximum number of elements separated by commas (,) is 100.</td>
</tr>
<tr>
<td>Capacity</td>
<td>--</td>
<td>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 assumed if omitted. • This cannot contain space characters. • You cannot add the symbol + to the value. • The value is not case sensitive.</td>
<td>--</td>
</tr>
<tr>
<td>RAIDLevel</td>
<td>The value displayed for the raidType attribute of the LogicalUnit object, in GetStorageArray(subtarget=LogicalUnit) for the Device Manager CLI.</td>
<td>No restrictions exist. Specify this in the RAIDLevel or RAIDLevel(Drive Conf.) format, such as the following: RAIDLevel: RAID5 or RAID0+1 Drive Conf.: 5D+1P • 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.</td>
<td>Up to 75 bytes (when converted to UTF-8). 1 ASCII character is 1 byte, other characters are from 1 to 3 bytes.</td>
</tr>
<tr>
<td>Property Name</td>
<td>Permissible Value or Range</td>
<td>Valid Characters and Character Restrictions</td>
<td>Size or Number of Characters</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------</td>
</tr>
</tbody>
</table>
| EmulationType       | The value displayed for the emulation attribute of the LogicalUnit object, in GetStorageArray(subtarget=LogicalUnit) for the Device Manager CLI. | No restrictions exist.  
- 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. | Up to 75 bytes (when converted to UTF-8).  
1 ASCII character is 1 byte, other characters are from 1 to 3 bytes. |
| DiskType            | FC  
AT  
BD                                                                                      | No restrictions exist.  
- The value cannot contain space characters.  
- The value is not case sensitive. | -- |
| VolumeStatus        | Used  
Free                                                                                   |  
- The value is not case sensitive.  
- The value cannot contain space characters. | -- |
| VolumeLockStatus    | Locked  
Unlocked                                                                               |  
- The value cannot contain space characters.  
- The value is not case sensitive. | -- |
| SLPRNumber/CLPRNumber | An integer from 0 to 31.  
You cannot add the symbol + to the value.                                                  | 0 or a positive integer.  
You cannot add the symbol + to the value. | -- |
### Table 3-4 Range of Valid Property Values for Filter Condition Expressions

<table>
<thead>
<tr>
<th>Property Name</th>
<th>Permissible Value or Range</th>
<th>Valid Characters and Character Restrictions</th>
<th>Size or Number of Characters</th>
</tr>
</thead>
<tbody>
<tr>
<td>ControllerArrayGroup</td>
<td>This value is displayed in the displayName attribute of the ArrayGroup object for the GetStorageArray (subtarget=ArrayGroup) in Device Manager CLI.</td>
<td>A to Z, a to z, 0 to 9, Hyphen (-), Underscore (_), Period (.), At mark (@), Space character ( ), Non-ASCII characters.</td>
<td>The maximum number of elements separated by commas (_) is 100.</td>
</tr>
</tbody>
</table>

*In expressing a value for the Capacity property in output information of CLI commands, the highest-order unit, which may be different from the unit that the user specified, is used to express the value as an integer. For example, the value 10240 KB is displayed as 10 MB.*

### 3-4 Miscellaneous Operational Information

This section contains information that you should be aware of before using the CLI.

#### 3-4-1 Recommended/Maximum Values for Tiered Storage Manager Operations

Table 3-5 lists and describes the recommended values and the maximum permissible values for several Tiered Storage Manager operations.

#### Table 3-5 Recommended/Maximum Values for Tiered Storage Manager Operations

<table>
<thead>
<tr>
<th>Type of Operation</th>
<th>Description</th>
<th>Recommended Value</th>
<th>Maximum Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain</td>
<td>The number of storage domains</td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
### Table 3-5 Recommended/Maximum Values for Tiered Storage Manager Operations

<table>
<thead>
<tr>
<th>Type of Operation</th>
<th>Description</th>
<th>Recommended Value</th>
<th>Maximum Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage tier</td>
<td>The number of storage tiers within the storage domain</td>
<td>30 or less</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Migration group</td>
<td>The number of migration groups within the storage domain</td>
<td>1.000</td>
<td>5.000</td>
<td></td>
</tr>
<tr>
<td>Volume</td>
<td>The number of volumes within the storage domain</td>
<td>Not applicable</td>
<td>16,384</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The number of volumes within the migration group</td>
<td>64 or less</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Migration task</td>
<td>The number of unfinished tasks that can be registered in Tiered Storage Manager</td>
<td>Not applicable</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The total number of volumes (within the storage domain) in the registered task</td>
<td>Not applicable</td>
<td>8192</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The number of volumes where migration can be performed concurrently</td>
<td>8</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The number of tasks that can be canceled concurrently</td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The number of volumes within the tasks that can be canceled concurrently</td>
<td>64 or less</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The number of task logs for finished migration tasks that can be saved</td>
<td>1.000</td>
<td>5.000</td>
<td></td>
</tr>
<tr>
<td>Server execution</td>
<td>The number of users who can access the Tiered Storage Manager server concurrently</td>
<td>3 or less</td>
<td>5</td>
<td>#</td>
</tr>
<tr>
<td>multiplexing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume filter condition</td>
<td>The number of condition elements that can be combined by using AND or OR in one filter condition expression</td>
<td>Not applicable</td>
<td>30</td>
<td>#</td>
</tr>
<tr>
<td></td>
<td>The number of elements that can be concurrently specified</td>
<td>Not applicable</td>
<td>100</td>
<td>#</td>
</tr>
</tbody>
</table>

* If the specified value exceeds the maximum value, an error occurs.

### 3-4-2 Common Options (Username, Password, and Output)

The username, password, and output options are valid options for all commands. Table 3-6 describes these options in detail.

As an alternative to specifying the server-location and the common options (username, password, and output) for each command, the server location and common options can be omitted from the command line if you include this information in the `htsmcli.properties` file of CLI. The precedence between values specified on the command line and those specified in the properties file is as follows.

- First: the value specified on the command line
- Second: the value specified within the properties file

**IMPORTANT:** There are restrictions on characters that are usable in the `htsmcli.properties` properties file. When specifying values in this file, such as parameter values, take care not to use invalid characters.

**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` properties file.

**NOTE:** Values specified in the command line take precedence over those specified in the properties file. For details about the `htsmcli.properties` file, see 5.
### Table 3-6 Common Options for the Tiered Storage Manager CLI

<table>
<thead>
<tr>
<th>Option</th>
<th>Option Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-u or --username</td>
<td>user-name</td>
<td>Specify the user name used to log on to Tiered Storage Manager server. This is the same as the logon user name for Device Manager.</td>
</tr>
<tr>
<td>-p or --password</td>
<td>password or @name-of-password-file</td>
<td>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, add @ before the file name. The string in the first line of the specified text file is assumed to be a password. For the file name, specify either an absolute path or a relative path from the directory from which the CLI command is executed.</td>
</tr>
<tr>
<td>-o or --output</td>
<td>name-of-the-standard-output-redirect-file</td>
<td>Specify the name of the redirect file to which the standard output is to be sent. 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.</td>
</tr>
</tbody>
</table>

**server-location**

Information indicating the location of the Tiered Storage Manager server on the network. Specify a value such as `rmi://myhost.mydomain:20352/HTSMServer`.

Specify the host and port for the Tiered Storage Manager server in the following URL format: `rmi://[host][:port]/HTSMServer`

- **host**: Specify the host name or IP address for HP StorageWorks XP Tiered Storage Manager. If this is omitted, the local host is used.
- **port**: Specify the port number where client requests are received, as specified during HP StorageWorks XP Tiered Storage Manager installation. If this is omitted, 20352 (the default for HP StorageWorks XP Tiered Storage Manager installation) is used.

You can omit the **server-location** when using the command line, by setting it in the properties file.

---

### 3-4-3 Tiered Storage Manager Repository Information

Executing some CLI commands causes Tiered Storage Manager repository information such as related storage domains, storage tiers, migration groups, and migration tasks to be displayed. Executing other CLI commands causes the repository information to be updated but not displayed. Table 3-7 shows which CLI commands cause the repository information to be displayed, and which commands cause repository information to be updated.

### Table 3-7 Impact of CLI Commands on Repository Information

<table>
<thead>
<tr>
<th>Category</th>
<th>Command Name</th>
<th>Repository Information Displayed</th>
<th>Repository Information Updated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain management</td>
<td>CreateStorageDomain</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>DeleteStorageDomain</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>GetStorageDomains</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>ModifyStorageDomain</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>GetVolumes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Category</td>
<td>Command Name</td>
<td>Repository Information Displayed</td>
<td>Repository Information Updated</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------------------</td>
<td>----------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Refresh</td>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Storage tier management</td>
<td>CreateStorageTier</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>DeleteStorageTier</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>GetStorageTiers</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>ModifyStorageTier</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>GetVolumes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>(with storagetiername specified)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migration group management</td>
<td>CreateMigrationGroup</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>DeleteMigrationGroup</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>GetMigrationGroups</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>ModifyMigrationGroup</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>AddVolumeToMigrationGroup</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>RemoveVolumeFromMigrationGroup</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>GetVolumes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>(with migrationgroupname specified)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migration</td>
<td>CreateMigrationPlan</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>CreateMigrationTask</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>GetTasks</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>ModifyTask</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>ExecuteTask</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>CancelTask</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>DeleteTasks</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### 3-4-4 CLI Return Responses

When a Tiered Storage Manager CLI process terminates, the process returns a value (to standard output) to indicate whether the process terminated normally or whether an error condition was detected. The ranges of the return values are shown in Table 3-8. For detailed information about the messages returned for each command, refer to the detailed command descriptions in 4.

<table>
<thead>
<tr>
<th>Return Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 or a positive value</td>
<td>CLI has terminated normally.</td>
</tr>
<tr>
<td>A negative value</td>
<td>An error (such as a parameter error) was detected in the CLI process.</td>
</tr>
</tbody>
</table>

### 3-5 Starting the Tiered Storage Manager CLI

The CLI commands are provided as Java applications but can be run as batch files (script files) to facilitate processing.

The batch file (script file) `htsmcli` used for starting CLI commands is stored in the following directory:

- `system-drive\TieredStorageManager\0110\CLI` (Windows)
- `/opt/TieredStorageManager/0110/CLI` (Solaris and HP-UX)
To start a CLI command on a Management client, specify the file as described below from the command line:

When the OS is Windows:
```
  system-drive\TieredStorageManager\0110\CLI\htsmcli arguments
```

When the OS is Solaris or HP-UX:
```
  # ./htsmcli arguments
```

CLI commands can be executed from a Management server. The batch file `htsmcli` on the Management server is stored in the following directory:
```
  HP-StorageWorks-XP-Tiered-Storage-Manager-Installation-directory\CLI
```

When CLI is run without any command line arguments specified, the CLI software version is displayed followed by a message describing how to obtain CLI Help.

Tiered Storage Manager CLI 1.1.0-00
FOR HELP, TYPE: "htsmcli help [command]"

### 3-5-1 Using CLI Commands in a Batch (Script) File

Note the following when CLI commands are executed from a batch (script) file that a user created by writing `htsmcli` in this file:

- To verify or check the execution results of the task:
  Reference the `status` and `refreshStatus` values in the command’s output to check the execution result of migration tasks or refresh processing. The `htsmcli` return value indicates the execution result of `htsmcli`. Execution results of the tasks that were executed asynchronously with CLI commands cannot be checked by just referencing the `htsmcli` return value.

### 3-6 Displaying CLI Help

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

In Windows:
```
  system-drive\TieredStorageManager\0110\CLI\htsmcli help
```

In Solaris and HP-UX:
```
  # ./htsmcli help
```

When CLI starts, the CLI software version is displayed along with the help topics shown below.

Sample CLI help information

Tiered Storage Manager CLI 1.1.0-00

USAGE: htsmcli [server-location] command[ option]...[ parameter]...

SPECIFYING SERVER-LOCATION:
  rmi://[host][:port]/HTMServer

AVAILABLE COMMANDS:
  CreateStorageDomain
  DeleteStorageDomain
  GetStorageDomains
  ModifyStorageDomain
  CreateStorageTier
  DeleteStorageTier
  ...
CancelTask
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
- `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 help information for a particular command, type `help` at the CLI command line prompt followed by the command that you want help information about. For example, to display help information for the `CreateStorageDomain` command you would type `help CreateStorageDomain` at the CLI command line prompt.

The help information displayed includes details about the format of the command, available options, and the permissible range of parameters.

In Windows:
```
system-drive\TieredStorageManager\0110\CLI\htsmcli help command-name
```

In Solaris and HP-UX:
```
# ./htsmcli help command-name
```
4 Detailed Command Descriptions

This chapter contains a detailed description for each CLI command. Each command is presented in the following format:

- A description of the command
- An example of the command syntax including options
- A table containing a list and description of the available options
- A table containing a list and description of the command’s parameters
- A table containing a list and description of the output that the command could potentially generate
- One or more examples showing command line input, and the resulting output

The commands are arranged by category:

- 4-1 Storage Domain Management Commands
- 4-2 Storage Tier Management Commands
- 4-3 Migration Group Management Commands
- 4-4 Migration Commands

4-1 Storage Domain Management Commands

This section includes a detailed description for each storage domain management command.

NOTE: The examples shown in this section assume that the user name, password, and location of the Tiered Storage Manager server have been set in the properties file.

4-1-1 CreateStorageDomain

The CreateStorageDomain command can be used to register a domain control storage subsystem as a storage domain. 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 execution of this command.

You can use either of the following methods to specify a domain control storage subsystem:

- A combination of model name and serial number
- The name of the storage subsystem set using Device Manager

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

When processing for the Tiered Storage Manager server to receive a refresh request fails after a storage domain has been registered, the error message KATS50210-E appears. In such a case, resolve the server failure, and then use the Refresh command to perform a refresh.

Command syntax

```bash
htsmcli server-location CreateStorageDomain
   { -u | --username } user-name
   { -p | --password } { password | @name-of-password-file }
   [ { -o | --output } name-of-the-standard-output-redirect-file ]
   [ { -d | --detail } ]
   { controllerserialnumber=serial-number controllermodel=model-name |
     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 ]
```
Table 4-1 Options of the CreateStorageDomain Command

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output information about the registered storage domain to the standard output, after command execution. If this is omitted, nothing is output to the standard output.</td>
</tr>
</tbody>
</table>

Table 4-2 Parameters of the CreateStorageDomain Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>controllerserialnumber</td>
<td>Required</td>
<td>Specify the serial number for the domain control storage subsystem. The following values are obtained using the GetStorageArray command for Device Manager: • controllerserialnumber: value of serialNumber • controllermodel: value of arrayType</td>
</tr>
<tr>
<td>controllermodel</td>
<td>Required</td>
<td>Specify in combination with controllerserialnumber. You cannot specify this parameter together with controllerdisplaymodel or controllername.</td>
</tr>
<tr>
<td>controllerdisplaymodel</td>
<td>Required</td>
<td>Specify in combination with controllerserialnumber. You cannot specify this parameter together with controllermodel or controllername.</td>
</tr>
<tr>
<td>controllername</td>
<td>Required</td>
<td>Specify in combination with controllerserialnumber, controllermodel, or controllerdisplaymodel.</td>
</tr>
<tr>
<td>name</td>
<td>Required</td>
<td>Specify the name of the storage domain to be registered. The name should be unique within Tiered Storage Manager.</td>
</tr>
<tr>
<td>description</td>
<td>Optional</td>
<td>Specify a description for the storage domain. This is optional.</td>
</tr>
</tbody>
</table>

Table 4-3 Items Output by the CreateStorageDomain Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain information</td>
<td>name</td>
<td>The name of the registered storage domain.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>controllerSerialNumber</td>
<td>The serial number of the domain control storage subsystem.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>controllerModel</td>
<td>The model name of the domain control storage subsystem.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>controllerDisplayModel</td>
<td>The display model name of the domain control storage subsystem.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>controllerName</td>
<td>The name of the domain control storage subsystem.</td>
<td>-d</td>
</tr>
</tbody>
</table>
Table 4-3 Items Output by the CreateStorageDomain Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td></td>
<td>A description of the storage domain.</td>
<td>-d</td>
</tr>
</tbody>
</table>

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

Example

In this example, a StorageWorks XP12000/XP10000 domain control storage subsystem and externally connected storage subsystem group are registered as a storage domain. The name of the storage domain is set as MegaTechXP12000-Primary.

D:\>htsmcli CreateStorageDomain --detail controllerserialnumber=14011 controllermodel=USP name="MegaTechXP12000-Primary" description="XP12000-Primary"

Output

RESPONSE:

An instance of StorageDomain(1 of 1)

   name=MegaTechXP12000-Primary
   controllerSerialNumber=14011
   controllerModel=USP
   controllerDisplayModel=XP12000
   controllerName=XP12000@10.208.151.151
   description=XP12000-Primary

D:\>

4-1-2 DeleteStorageDomain

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

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

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

You can use the GetTasks command to check the statuses of migration tasks.

Command syntax

htsmcli server-location DeleteStorageDomain

   { -u | --username } user-name
   { -p | --password } { password | @name-of-password-file }
   [ { -o | --output } name-of-the-standard-output-redirect-file ]
   [ { -d | --detail } ]
   name=storage-domain-name

Table 4-4 Options of the DeleteStorageDomain Command

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output information about the deleted storage domain to the standard output, after command execution. If this is omitted, nothing is output to the standard output.</td>
</tr>
</tbody>
</table>

Table 4-5 Parameters of the DeleteStorageDomain Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>Required</td>
<td>Specify the name of the storage domain to be deleted.</td>
</tr>
</tbody>
</table>
Table 4-6 Items Output by the DeleteStorageDomain Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
<th>Displayed as Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain information</td>
<td>name</td>
<td>The name of the deleted storage domain.</td>
<td>-d</td>
<td>Unknown</td>
</tr>
<tr>
<td></td>
<td>controllerSerialNumber</td>
<td>The serial number of the domain control storage subsystem.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>controllerModel</td>
<td>The model name of the domain control storage subsystem.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>controllerDisplayModel</td>
<td>The display model name of the domain control storage subsystem.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>controllerName</td>
<td>The name of the domain control storage subsystem.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>description</td>
<td>A description of the storage domain.</td>
<td>-d</td>
<td></td>
</tr>
</tbody>
</table>

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

#1 Unknown is output for items when refresh processing is being performed or has failed.

Example

In this example, the registration for the MegaTechXP12000-Primary storage domain is deleted.

D:\>htsmcli DeleteStorageDomain --detail name="MegaTechXP12000-Primary"

Output:

RESPONSE:

An instance of StorageDomain(1 of 1)

   name=MegaTechXP12000-Primary
   controllerSerialNumber=14011
   controllerModel=USP
   controllerDisplayModel=XP12000
   controllerName=XP12000@10.208.151.151
   description=XP12000-Primary

D:\>

4-1-3 GetStorageDomains

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

Some information may not be obtainable for storage domains in the refresh status, or for which refresh has failed. Output items for which no information could be obtained are output as Unknown.

Command Syntax

```bash
htsmcli server-location GetStorageDomains
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
[ name=storage-domain-name [ , storage-domain-name ] ... ]
```
Table 4-7 Options of the GetStorageDomains Command

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output all information about the storage domain to the standard output, after command execution. If this is omitted, only summary information is output.</td>
</tr>
</tbody>
</table>

Summary information consists of the information for items for which the Output by -d column is blank in Table 4-9.

Table 4-8 Parameters of the GetStorageDomains Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>Optional</td>
<td>Specify the name of the storage domain for 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 with a comma. Up to 255 storage domains can be specified, depending on the maximum number of characters allowed by the command line.</td>
</tr>
</tbody>
</table>

Table 4-9 Items Output by the GetStorageDomains Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
<th>Displayed as Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain information</td>
<td>name</td>
<td>The name of the storage domain.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>totalCapacityInGB</td>
<td>The total capacity of the volumes in the storage domain (units: GB). The decimal portion of the value is truncated to give a whole value.</td>
<td>#1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>usedCapacityInGB</td>
<td>The total amount of capacity used for the volumes in the storage domain (units: GB). The decimal portion of the value is truncated to give a whole value.</td>
<td>#1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>usedCapacityPercentage</td>
<td>The ratio (percentage) of usedCapacityInGB to totalCapacityInGB. The decimal portion of the value is rounded up to give a whole value.</td>
<td>#1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>freeCapacityInGB</td>
<td>The total amount of capacity free for the volumes in the storage domain (units: GB). The decimal portion of the value is truncated to give a whole value.</td>
<td>#1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>freeCapacityPercentage</td>
<td>The ratio (percentage) of freeCapacityInGB to totalCapacityInGB. The decimal portion of the value is truncated to give a whole value.</td>
<td>#1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>numberOfSubsystems</td>
<td>The number of storage subsystems in the storage domain.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>numberOfStorageTiers</td>
<td>The number of storage tiers in the storage domain.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>numberOfMigrationGroups</td>
<td>The number of migration groups in the storage domain.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>refreshStatus</td>
<td>The refresh status. NotInitialized Processing Success (ended in success) Failure (ended in failure)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4-9 Items Output by the GetStorageDomains Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
<th>Displayed as Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lastRefreshedTime</td>
<td>The date and time when the previous refresh finished. If the previous refresh has not finished, this is blank.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>controllerSerialNumber</td>
<td>The serial number of the domain control storage subsystem.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>controllerModel</td>
<td>The model name of the domain control storage subsystem.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>controllerDisplayModel</td>
<td>The display model name of the domain control storage subsystem.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>controllerName</td>
<td>The name of the domain control storage subsystem.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>description</td>
<td>A description of the storage domain.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>message</td>
<td>An error message.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend:
- -d indicates output only when either the -d or the --detail option is specified.
- #1 Unknown is output for items when refresh processing is being performed or has failed.

Example (1): In this example, detailed information is obtained for storage domains MegaTechXP12000-Primary and MegaTechXP12000-Secondary.

D:\>htsmcli GetStorageDomains --detail name="MegaTechXP12000-Primary","MegaTechXP12000-Secondary"

Output (1):
RESPONSE:
List of 2 StorageDomain elements:

An instance of StorageDomain(1 of 2)
  name=MegaTechXP12000-Primary
  totalCapacityInGB=8,552
  usedCapacityInGB=6,576
  usedCapacityPercentage=77
  freeCapacityInGB=1,975
  freeCapacityPercentage=23
  numberOfSubsystems=2
  numberOfStorageTiers=0
  numberOfMigrationGroups=0
  refreshStatus=Success
  lastRefreshedTime=
  controllerSerialNumber=14011
  controllerModel=USP
  controllerDisplayModel=XP12000
  controllerName=XP12000@10.208.151.151
  description=XP12000-Primary

An instance of StorageDomain(2 of 2)
  name=MegaTechXP12000-Secondary
totalCapacityInGB=Unknown
usedCapacityInGB=Unknown
usedCapacityPercentage=Unknown
freeCapacityInGB=Unknown
freeCapacityPercentage=Unknown
numberOfSubsystems=Unknown
numberOfStorageTiers=3
numberOfMigrationGroups=3
refreshStatus=Failure
lastRefreshedTime=
controllerSerialNumber=59432
controllerModel=USP
controllerDisplayModel=XP12000
controllerName=Unknown
description=XP12000-Secondary
List of 1 ErrorInfo elements:
  An instance of ErrorInfo(1 of 1)
    message=KATS50212-E An attempt to execute the refresh operation has failed.
D:\>

Example (2): In this example, summary information is obtained for storage domains MegaTechXP12000-Primary and MegaTechXP12000-Secondary.

D:\>htsmcli GetStorageDomains name="MegaTechXP12000-Primary","MegaTechXP12000-Secondary"

Output (2):
RESPONSE:
List of 2 StorageDomain elements:
  An instance of StorageDomain(1 of 2)
    name=MegaTechXP12000-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=MegaTechXP12000-Secondary
totalCapacityInGB=Unknown
usedCapacityInGB=Unknown
usedCapacityPercentage=Unknown
freeCapacityInGB=Unknown
freeCapacityPercentage=Unknown
numberOfSubsystems=Unknown
numberOfStorageTiers=3
numberOfMigrationGroups=3
refreshStatus=Failure
lastRefreshedTime=
controllerSerialNumber=59432
controllerModel=USP
controllerDisplayModel=XP12000
controllerName=Unknown
description=XP12000-Secondary
List of 1 ErrorInfo elements:
  An instance of ErrorInfo(1 of 1)
    message=KATS50212-E An attempt to execute the refresh operation has failed.
D:\>
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=KATS50212-E An attempt to execute the refresh operation has failed.
D:\>

Example (3): In this example, to obtain summary information for all storage domains, the GetStorageDomains command is executed without specifying the storage domain name. However, no storage domain exists.

D:\>htsmcli GetStorageDomains

Output (3):
   RESPONSE:
   (Command completed; empty list returned)
D:\>

4-1-4 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 statuses:
- Storage domains that contain migration tasks that have not ended (End)
- Storage domains that are being refreshed

You can use the GetTasks command to check the statuses of migration tasks.

Command Syntax
htsmcli server-location ModifyStorageDomain
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -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 ]

Table 4-10 Options of the ModifyStorageDomain Command

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output information about the changed storage domain to the standard output, after command execution. If this is omitted, nothing is output to the standard output.</td>
</tr>
</tbody>
</table>
Table 4-11 Parameters of the ModifyStorageDomain Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>Required</td>
<td>Specify the name of the storage domain for which you want to change information.</td>
</tr>
<tr>
<td>newname</td>
<td>Optional</td>
<td>Specify a new storage domain name. This name should be unique within Tiered Storage Manager. If this is omitted, the name of the storage domain will not change.</td>
</tr>
<tr>
<td>newdescription</td>
<td>Optional</td>
<td>Specify a new storage domain description. If this is omitted, the description of the storage domain will not change. If an empty character string is specified, the storage domain description that was previously set is deleted.</td>
</tr>
</tbody>
</table>

Table 4-12 Items Output by the ModifyStorageDomain Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain information</td>
<td>name</td>
<td>The name of the storage domain.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>controllerSerialNumber</td>
<td>The serial number of the domain control storage subsystem.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>controllerModel</td>
<td>The model name of the domain control storage subsystem.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>controllerDisplayModel</td>
<td>The display model name of the domain control storage subsystem.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>controllerName</td>
<td>The name of the domain control storage subsystem.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>description</td>
<td>A description of the storage domain.</td>
<td>-d</td>
</tr>
</tbody>
</table>

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

Example: In this example, the name of the MegaTechXP12000-Primary storage domain is changed to MyStorageDomain.

```
D:\>htsmcli ModifyStorageDomain --detail name="MegaTechXP12000-Primary" newname="MyStorageDomain"
```

Output:

```
RESPONSE:
An instance of StorageDomain(1 of 1)
  name=MyStorageDomain
  controllerSerialNumber=14011
  controllerModel=USP
  controllerDisplayModel=XP12000
  controllerName=XP12000@10.208.151.151
  description=XP12000-Primary
D:\>
```

4-1-5 GetVolumes

The GetVolumes command can be used to obtain a list of volumes (LUs) in the domain control storage subsystem within the storage domain.

You can specify or omit the storage tier name and migration group name parameters to limit the items obtained as follows:

- Storage domain (when no storage tier name or migration group name is specified)
- Storage tier (when a storage tier name is specified)
- Migration group (when a migration group name is specified)
You can also further limit the items obtained by specifying both a volume filter condition and each item such as a storage domain, storage tier, or migration group.

Detailed information cannot be obtained for volumes in storage domains that are being refreshed.

**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** is output as the value of the output items.

**Command Syntax**

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

<table>
<thead>
<tr>
<th>Table 4-13 Options of the GetVolumes Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option Name</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>-d</td>
</tr>
</tbody>
</table>

# Summary information consists of the information for items for which the *Output by -d* column is blank in Table 4-16.

**Table 4-14 Parameters of the GetVolumes Command**

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>storagedomainname</td>
<td>Required</td>
<td>Specify the name of the storage domain.</td>
</tr>
<tr>
<td>storagetiername</td>
<td>Optional</td>
<td>Specify the name of a storage tier. Note that this cannot be specified when migrationgroupname is specified.</td>
</tr>
<tr>
<td>migrationgroupname</td>
<td>Optional</td>
<td>Specify the name of a migration group. Note that this cannot be specified when storagetiername is specified.</td>
</tr>
<tr>
<td>filtercondition</td>
<td>Optional</td>
<td>Specify a filter condition. For details about filtercondition properties, see Table 4-15. If this is omitted, no filter condition is used to narrow down the obtained items.</td>
</tr>
</tbody>
</table>

**Table 4-15 Properties Specifiable for the filtercondition Parameter**

<table>
<thead>
<tr>
<th>Property Name</th>
<th>Operators</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SubsystemDisplayModel</td>
<td>=,&lt;&gt;</td>
<td>The name used for displaying the model of the storage subsystem. This name is displayArrayType of Device Manager (not arrayType). Example: StorageWorks XP1024</td>
</tr>
<tr>
<td>SubsystemSerialNumber</td>
<td>=,&lt;&gt;</td>
<td>The serial number of the storage subsystem.</td>
</tr>
<tr>
<td>SubsystemName</td>
<td>=,&lt;&gt;</td>
<td>The name of the storage subsystem.</td>
</tr>
</tbody>
</table>
Table 4-15 Properties Specifiable for the filtercondition Parameter

<table>
<thead>
<tr>
<th>Property Name</th>
<th>Operators</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SubsystemVendor</td>
<td>=,&lt;&gt;</td>
<td>The name of the storage subsystem vendor.</td>
</tr>
<tr>
<td>ControllerDeviceNumber</td>
<td>=</td>
<td>The controller LDEV number.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Only a representative LDEV can be specified for a LUSE volume.</td>
</tr>
<tr>
<td>Host</td>
<td>=,&lt;&gt;</td>
<td>The name of the host.</td>
</tr>
<tr>
<td></td>
<td>startsWith,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>contains</td>
<td></td>
</tr>
<tr>
<td>ArrayGroup</td>
<td>=,&lt;&gt;</td>
<td>The name of the array group.</td>
</tr>
<tr>
<td></td>
<td>startsWith,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>contains</td>
<td></td>
</tr>
<tr>
<td>Capacity</td>
<td>&lt;,&lt;=,=,&lt;&gt;</td>
<td>The volume capacity.</td>
</tr>
<tr>
<td>RAIDLevel</td>
<td>=,&lt;&gt;</td>
<td>The RAID level.</td>
</tr>
<tr>
<td>EmulationType</td>
<td>=,&lt;&gt;</td>
<td>The emulation type.</td>
</tr>
<tr>
<td>DiskType</td>
<td>=,&lt;&gt;</td>
<td>The disk type.</td>
</tr>
<tr>
<td>VolumeStatus</td>
<td>=</td>
<td>A character string indicating whether the volume is being used.</td>
</tr>
<tr>
<td>VolumeLockStatus</td>
<td>=</td>
<td>A character string indicating the lock status of the volume.</td>
</tr>
<tr>
<td>SLPRNumber</td>
<td>=,&lt;&gt;</td>
<td>The SLPR number.</td>
</tr>
<tr>
<td>CLPRNumber</td>
<td>=,&lt;&gt;</td>
<td>The CLPR number.</td>
</tr>
<tr>
<td>ControllerArrayGroup</td>
<td>=,&lt;&gt;</td>
<td>The name of the controller array group.</td>
</tr>
<tr>
<td></td>
<td>startsWith,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>contains</td>
<td></td>
</tr>
</tbody>
</table>

Table 4-16 Items Output by the GetVolumes Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
<th>Displayed as Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain information</td>
<td>name</td>
<td>The name of the storage domain.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LU information</td>
<td>controllerDeviceNumber</td>
<td>The controller LDEV number.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Only a representative LDEV is displayed for a LUSE volume.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>subsystemSerialNumber</td>
<td>The serial number of the storage subsystem in which the data is actually</td>
<td>-d</td>
<td>a1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>contained.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>subsystemDisplayModel</td>
<td>The display name of the storage subsystem model in which the data is</td>
<td>-d</td>
<td>a1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>actually contained.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the displayed model name is Unknown, the product name is displayed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>subsystemName</td>
<td>The name of the storage subsystem in which the data is actually contained.</td>
<td>-d</td>
<td>a1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the subsystem name is unknown, the product name and serial number are</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>displayed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>subsystemVendor</td>
<td>The vendor name of the storage subsystem in which actual data is stored.</td>
<td>-d</td>
<td>a1</td>
</tr>
<tr>
<td></td>
<td>migrationGroupName</td>
<td>The name of the migration group to which the volume belongs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>emulationType</td>
<td>The emulation type.</td>
<td></td>
<td>a1</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by <code>-d</code></th>
<th>Displayed as</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CVS</td>
<td>The CVS volume attribute of the volume. This can be either Yes or No.</td>
<td>-d</td>
<td>a1</td>
</tr>
<tr>
<td></td>
<td>capacityInKB</td>
<td>The resource capacity of the volume (units: KB).</td>
<td></td>
<td>a1</td>
</tr>
<tr>
<td></td>
<td>raidLevel</td>
<td>The RAID level.</td>
<td></td>
<td>a1, a2</td>
</tr>
<tr>
<td></td>
<td>diskType</td>
<td>The disk type.</td>
<td></td>
<td>a1, a2</td>
</tr>
<tr>
<td></td>
<td>arrayGroupNumber</td>
<td>The array group number of the LU in which the data is actually contained in the storage subsystem.</td>
<td>-d</td>
<td>a1, a2</td>
</tr>
<tr>
<td></td>
<td>controllerArrayGroupName</td>
<td>The LU array group name in the controller</td>
<td></td>
<td>a1</td>
</tr>
<tr>
<td></td>
<td>arrayGroupName</td>
<td>The array group name of the LU in which the data is actually contained in the storage subsystem.</td>
<td>a1, a2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>businessCopyXP</td>
<td>The Business Copy XP volume type.</td>
<td>-d</td>
<td>a1</td>
</tr>
<tr>
<td></td>
<td>continuousAccessXP</td>
<td>The Continuous Access XP volume type.</td>
<td>-d</td>
<td>a1</td>
</tr>
<tr>
<td></td>
<td>continuousAccessXPJournal</td>
<td>The Continuous Access XP Journal volume type.</td>
<td>-d</td>
<td>a1</td>
</tr>
<tr>
<td></td>
<td>snapshotXP</td>
<td>The volume type for Snapshot XP.</td>
<td>-d</td>
<td>a1</td>
</tr>
<tr>
<td></td>
<td>volumeStatus</td>
<td>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).</td>
<td></td>
<td>a1</td>
</tr>
<tr>
<td></td>
<td>volumeLockStatus</td>
<td>Indicates whether the volume is locked. This can be either Locked or Unlocked.</td>
<td></td>
<td>a1</td>
</tr>
<tr>
<td></td>
<td>path</td>
<td>Indicates whether the path has been set. This can be either Yes or No.</td>
<td>-d</td>
<td>a1</td>
</tr>
<tr>
<td></td>
<td>hostNames</td>
<td>The host name. If multiple host names exist, they are separated by commas (,).</td>
<td></td>
<td>a1</td>
</tr>
<tr>
<td></td>
<td>canMigrate</td>
<td>Indicates whether migration is possible. Yes: Can migrate. No: Cannot migrate.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cause of impossibility of migration</td>
<td>Displays a list showing the cause and reason for each problem, such as the cause of the inability to use the volume as a migration source volume or migration target volume. The sequence in which the information is output might differ depending on the version of the Tiered Storage Manager server and CLI.</td>
<td>-d</td>
<td></td>
</tr>
</tbody>
</table>
Table 4-16 Items Output by the GetVolumes Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
<th>Displayed as Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDEV information for the domain</td>
<td>controllerDeviceNumber</td>
<td>The controller LDEV number.</td>
<td>-d</td>
<td>Unknown</td>
</tr>
<tr>
<td>control storage subsystem</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>controllerSerialNumber</td>
<td>The serial number of the domain control storage subsystem.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>controllerModel</td>
<td>The model name of the domain control storage subsystem.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>controllerDisplayModel</td>
<td>The display model name of the domain control storage subsystem.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>controllerName</td>
<td>The name of the domain control storage subsystem.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>emulationType</td>
<td>The emulation type.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>CVS</td>
<td>The CVS volume attribute of the volume.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>capacityInKB</td>
<td>The capacity of the LDEV (units: KB).</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>SLPRNumber</td>
<td>The SLPR number.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>CLPRNumber</td>
<td>The CLPR number.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>raidLevel</td>
<td>The RAID level.</td>
<td>-d</td>
<td>#1,#2</td>
</tr>
<tr>
<td></td>
<td>diskType</td>
<td>The disk type.</td>
<td>-d</td>
<td>#1,#2</td>
</tr>
<tr>
<td></td>
<td>ControllerArrayGroupNumber</td>
<td>The array group number of the LDEV.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>ControllerArrayGroupName</td>
<td>The array group name of the LDEV.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>cacheMode</td>
<td>The cache mode.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>IOSuppressionMode</td>
<td>The IO suppression mode.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td>LU information for the actual data</td>
<td>subsystemDeviceNumber</td>
<td>The LDEV number of the volume in which the data is actually contained in the storage subsystem.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>subsystemSerialNumber</td>
<td>The serial number of the storage subsystem in which the data is actually contained.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>subsystemDisplayModel</td>
<td>The display name of the storage subsystem model in which the data is actually contained. If the displayed model name is Unknown, the product name is displayed.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>subsystemName</td>
<td>The name of the storage subsystem in which the data is actually contained. If the subsystem name is unknown, the product name and serial number are displayed.</td>
<td>-d</td>
<td>#1</td>
</tr>
</tbody>
</table>
### Table 4-16 Items Output by the GetVolumes Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
<th>Displayed as</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>subsystemVendor</td>
<td>The vendor name of the storage subsystem in which actual data is stored.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>arrayGroupNumber</td>
<td>The array group number of the LU in which the data is actually contained in the storage subsystem.</td>
<td>-d</td>
<td>#1, #2</td>
</tr>
<tr>
<td></td>
<td>arrayGroupName</td>
<td>The array group name of the LU in which the data is actually contained in the storage subsystem.</td>
<td>-d</td>
<td>#1, #2</td>
</tr>
</tbody>
</table>

Legend:

- **-d** indicates output only when either the `-d` or the `--detail` option is specified.

- **#1** `Unknown` is output when volume information cannot be obtained for the domain control storage subsystem.

- **#2** `Unknown` is output when information cannot be obtained for externally connected storage.

Table 4-17 shows the GUI-displayed character strings representing the reasons that a volume cannot be a migration target, and a description of those character strings.

### Table 4-17 GUI-Displayed Character Strings Representing Reasons a Volume Cannot Be a Migration Target, and a Description of those Character Strings

<table>
<thead>
<tr>
<th>Displayed character string</th>
<th>Description</th>
<th>Migration source volume</th>
<th>Migration target volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous Access XP (target)</td>
<td>A volume that makes up a Continuous Access XP pair and whose status is PSUS or PSUE</td>
<td>-</td>
<td>Y</td>
</tr>
<tr>
<td>Continuous Access XP Status</td>
<td>A volume that makes up a Continuous Access XP pair and whose status is neither PSUS nor PSUE</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Business Copy XP (target)</td>
<td>A volume that makes up a Business Copy XP pair</td>
<td>-</td>
<td>Y</td>
</tr>
<tr>
<td>Business Copy XP Configuration [Root]</td>
<td>A volume that makes up a Business Copy XP pair (This is a P-VOL that makes up a pair with three S-VOLs (three P-VOL/S-VOL pairs).)</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Business Copy XP Configuration [Node]</td>
<td>A volume that makes up a Business Copy XP pair (This is an SP-VOL that makes up a pair with two S-VOLs (two SP-VOL/S-VOL pairs).)</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Business Copy XP Configuration [Leaf]</td>
<td>A volume that makes up a Business Copy XP pair (This is an S-VOL that makes up a pair with an SP-VOL.)</td>
<td>-</td>
<td>Y</td>
</tr>
<tr>
<td>Migration Group (target)</td>
<td>A volume that is included in an migration group</td>
<td>-</td>
<td>Y</td>
</tr>
<tr>
<td>Already Reserved*</td>
<td>A volume reserved as a migration target</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Continuous Access XP Journal</td>
<td>A volume that makes up a Continuous Access XP Journal pair</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Snapshot XP</td>
<td>A volume that makes up a Snapshot XP pair</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Cache LUN XP</td>
<td>A volume for which Cache LUN XP is set</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Command Device</td>
<td>A volume used as a Command Device</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>LUSE (target)</td>
<td>A volume that makes up LUSE</td>
<td>-</td>
<td>Y</td>
</tr>
<tr>
<td>Path (target)</td>
<td>A volume for which a path is set</td>
<td>-</td>
<td>Y</td>
</tr>
<tr>
<td>Locked (target)</td>
<td>Volume that is locked (not Read/Write) by LUN Security XP Extension*</td>
<td>-</td>
<td>Y</td>
</tr>
</tbody>
</table>
Table 4-17 GUI-Displayed Character Strings Representing Reasons a Volume Cannot Be a Migration Target, and a Description of those Character Strings

<table>
<thead>
<tr>
<th>Displayed character string</th>
<th>Description</th>
<th>Migration source volume</th>
<th>Migration target volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAS (target)</td>
<td>NAS system volume</td>
<td>-</td>
<td>Y</td>
</tr>
<tr>
<td>Externally Locked</td>
<td>A volume that is using an external subsystem function and is locked (not Read/Write) by LUN Security XP Extension&lt;sup&gt;#2&lt;/sup&gt;</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

Legend:

Y: Corresponds to the reason that cannot be migrated (cannot be used as a volume for migration)

--: Does not correspond to the reason that cannot be migrated (can be used as a volume for migration)

#1 Includes volumes migrated by USP Performance Manager.

#2 LUN Security XP Extension is a product name. For details on this product, see the manual *HP StorageWorks LUN Security XP Extension User Guide for the XP12000/XP10000/XP1024/XP128*.

Example (1): In this example, detailed information is obtained for the volumes belonging to the MyStorageTier storage tier of the MegaTechXP12000-Primary storage domain.

D:\>htsmcli GetVolumes --detail storagedomainname="MegaTechXP12000-Primary" storagetiername="MyStorageTier"

Output (1):
RESPONSE:
An instance of StorageDomain(1 of 1)
  name=MegaTechXP12000-Primary
List of 2 LogicalUnit elements:
  An instance of LogicalUnit(1 of 2)
    controllerDeviceNumber=1:E0
    subsystemSerialNumber=14011
    subsystemDisplayModel=USP
    subsystemName=USP#14011
    subsystemVendor=HP
    migrationGroupName=
    emulationType=OPEN-V
    CVS=Yes
    capacityInKB=5,120,640
    raidLevel=Unknown
    diskType=Unknown
    arrayGroupNumber=Unknown
    controllerArrayGroupName= E9960-1
    arrayGroupName=Unknown
    businessCopyXP=Simplex
    continuousAccessXP=Simplex
    continuousAccessXPJournal=Simplex
    snapshotXP=Simplex
    volumeStatus=Free
volumeLockStatus=Unlocked
path=No
hostNames=
canMigrate=No

List of 2 reason(s) for volume migration exclusion:
  reason(1 of 2)=LUSE (target)
  reason(2 of 2)=Universal Replicator

List of 1 Ldev elements:
An instance of Ldev(1 of 1)
  controllerDeviceNumber=1:E0
  controllerSerialNumber=14011
  controllerModel=USP
  controllerDisplayModel=XP12000
  controllerName=XP12000@10.208.151.151
  emulationType=OPEN-V
  CVS=Yes
  capacityInKB=5,120,640
  SLPRNumber=0
  CLPRNumber=1
  raidLevel=Unknown
  diskType=Unknown
  controllerArrayGroupNumber=0
  controllerArrrayGroupName=E1-1
  subsystemDeviceNumber=1:E0
  subsystemSerialNumber=14011
  subsystemDisplayModel=128
  subsystemName=128#14011
  subsystemVendor=HP
  arrayGroupName=Unknown

An instance of LogicalUnit(2 of 2)
  controllerDeviceNumber=3:FF
  subsystemSerialNumber=14011
  subsystemDisplayModel=USP
  subsystemName=USP#14011
  subsystemVendor=HP
  migrationGroupName=
  emulationType=OPEN-V
  CVS=Yes
  capacityInKB=5,120,640
  raidLevel=Unknown
  diskType=Unknown
arrayGroupNumber=Unknown
controllerArrayGroupName=E9980-1
arrayGroupName=Unknown
businessCopyXP=Simplex
continuousAccessXP=Simplex
continuousAccessXPJournal=Simplex
snapshotXP=Simplex
volumeStatus=Free
volumeLockStatus=Unlocked
path=No
hostNames=
canMigrate=Yes
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
  controllerModel=USP
  controllerDisplayModel=XP12000
  controllerName=XP12000@10.208.151.151
  emulationType=OPEN-V
  CVS=Yes
  capacityInKB=5,120,640
  SLPRNumber=0
  CLPRNumber=0
  raidLevel=Unknown
  diskType=Unknown
  controllerArrayGroupNumber=1
  controllerArrrayGroupName=E1-2
  subsystemDeviceNumber=3:FF
  subsystemSerialNumber=14011
  subsystemDisplayModel=128
  subsystemName=128#14011
  subsystemVendor=HP
  arrayGroupName=Unknown
  arrayGroupName=Unknown

D:\>
Example (2): In this example, summary information is obtained for the volumes belonging to the MyStorageTier storage tier of the MegaTechXP12000-Primary storage domain.

D:\>htsmcli GetVolumes storagedomainname="MegaTechXP12000-Primary"
storagetiername="MyStorageTier"
Output (2):

RESPONSE:

An instance of StorageDomain(1 of 1)
name=MegaTechXP12000-Primary
List of 2 LogicalUnit elements:

An instance of LogicalUnit(1 of 2)
controllerDeviceNumber=1:E0
subsystemVendor=HITACHI
migrationGroupName=
emulationType=OPEN-V
capacityInKB=5,120,640
raidLevel=Unknown
diskType=Unknown
controllerArrayGroupName=E9960-1
arrayGroupName=Unknown
volumeStatus=Free
volumeLockStatus=Unlocked
hostNames=

An instance of LogicalUnit(2 of 2)
controllerDeviceNumber=3:FF
migrationGroupName=
emulationType=OPEN-V
capacityInKB=5,120,640
raidLevel=Unknown
diskType=Unknown
controllerArrayGroupName= E9980-1
arrayGroupName=Unknown
volumeStatus=Free
volumeLockStatus=Unlocked
hostNames=
canMigrate=Yes

D:\>

Example (3): In this example, a volume search is performed for the storage tier MyStorageTier in the storage domain MegaTechXP12000-Primary. However, no volume that matches the specified conditions exists.

D:\>htsmcli GetVolumes storagedomainname="MegaTechXP12000-Primary"
storagetiername="MyStorageTier" filtercondition="EmulationType='OPEN-V'"

Output (3):

RESPONSE:

(Command completed; empty list returned)

D:\>
4-1-6 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 the storage domain specified by the `storagedomainname` parameter.

Note that refresh processing is performed asynchronously to execution of this command. The `GetStorageDomains` command can be used to check the refresh status.

Command Syntax

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

Table 4-18 Parameters of the Refresh Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>storagedomainname</td>
<td>Optional</td>
<td>Specify the name of the storage domain. If this is omitted, all storage domains are refreshed.</td>
</tr>
</tbody>
</table>

Example: In this example, the `Refresh` command is issued for the MegaTechXP12000-Primary storage domain, and configuration information is re-obtained from Device Manager and registered in the Tiered Storage Manager repository.

D:\>htsmcli Refresh storagedomainname="MegaTechXP12000-Primary"

Output:
No information is output with this command.

4-2 Storage Tier Management Commands

This section includes a detailed description for each storage tier management command.

NOTE: The examples shown in this section assume that the user name, password, and location of the Tiered Storage Manager server have been set in the properties file.

4-2-1 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 that is being refreshed.

Command Syntax

```bash
htsmcli server-location CreateStorageTier
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
storagedomainname=storage-domain-name
name=storage-tier-name
filtercondition=filter-condition
[ description=description-for-the-storage-tier ]
```
Table 4-19 Options of the CreateStorageTier Command

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Option Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output information about the created storage tier to the standard output, after command execution. If this is omitted, nothing is output to the standard output.</td>
</tr>
</tbody>
</table>

Table 4-20 Parameters of the CreateStorageTier Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>storabledomainname</td>
<td>Required</td>
<td>Specify the name of the storage domain.</td>
</tr>
<tr>
<td>name</td>
<td>Required</td>
<td>Specify the name of the storage tier to be created. This name should be unique within the storage domain.</td>
</tr>
<tr>
<td>filtercondition</td>
<td>Required</td>
<td>Specify a filter condition. For details about the property specified in the filtercondition parameter, see Table 4-21.</td>
</tr>
<tr>
<td>description</td>
<td>Optional</td>
<td>Specify a description of the storage tier.</td>
</tr>
</tbody>
</table>

Table 4-21 Properties Specifiable for the filtercondition Parameter

<table>
<thead>
<tr>
<th>Property Name</th>
<th>Operators</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SubsystemDisplayModel</td>
<td>=,&lt;&gt;</td>
<td>The name used for displaying the model of the storage subsystem. This name is displayArrayType of Device Manager (not arrayType). Example: StorageWorks XP1024</td>
</tr>
<tr>
<td>SubsystemSerialNumber</td>
<td>=,&lt;&gt; ,startsWith, contains</td>
<td>The serial number of the storage subsystem.</td>
</tr>
<tr>
<td>SubsystemName</td>
<td>=,&lt;&gt;</td>
<td>The name of the storage subsystem.</td>
</tr>
<tr>
<td>SubsystemVendor</td>
<td>=,&lt;&gt;</td>
<td>The name of the storage subsystem vendor.</td>
</tr>
<tr>
<td>ArrayGroup</td>
<td>=,&lt;&gt; ,startsWith, contains</td>
<td>The name of the array group.</td>
</tr>
<tr>
<td>Capacity</td>
<td>&lt;,&lt;=, =&gt;</td>
<td>The volume capacity.</td>
</tr>
<tr>
<td>RAIDLevel</td>
<td>=,&lt;&gt;</td>
<td>The RAID level.</td>
</tr>
<tr>
<td>EmulationType</td>
<td>=,&lt;&gt;</td>
<td>The emulation type.</td>
</tr>
<tr>
<td>DiskType</td>
<td>=,&lt;&gt;</td>
<td>The disk type.</td>
</tr>
<tr>
<td>SLPRNumber</td>
<td>=,&lt;&gt;</td>
<td>The SLPR number.</td>
</tr>
<tr>
<td>CLPRNumber</td>
<td>=,&lt;&gt;</td>
<td>The CLPR number.</td>
</tr>
<tr>
<td>ControllerArrayGroup</td>
<td>=,&lt;&gt; ,startsWith, contains</td>
<td>The name of the controller array group.</td>
</tr>
</tbody>
</table>

Table 4-22 Items Output by the CreateStorageTier Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain</td>
<td>name</td>
<td>The name of the storage domain.</td>
<td>-d</td>
</tr>
<tr>
<td>information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage tier</td>
<td>name</td>
<td>The name of the created storage tier.</td>
<td>-d</td>
</tr>
<tr>
<td>information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>filterCondition</td>
<td>Filter conditions for the storage tier.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>description</td>
<td>A description of the storage tier.</td>
<td>-d</td>
</tr>
</tbody>
</table>

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

Example: In this example, a storage tier consisting of volumes of RAID level RAID5 (5D+1P) and the FC disk type is created in the MegaTechXP12000-Primary storage domain. The name of the storage tier is set as MegaTech-HighCost.
D:\>htsmcli CreateStorageTier --detail storagedomainname="MegaTechXP12000-Primary" name="MegaTech-HighCost" filterCondition="RAIDLevel='RAID5(3D+1P)' AND ArrayGroup='1-10-1'"

Output:
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechXP12000-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=

D:\>

4-2-2 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 migration tasks that have not ended (End)
- Storage tiers within the storage domains that are being refreshed

You can use the GetTasks command to check the statuses of migration tasks.

Command Syntax

htsmcli server-location DeleteStorageTier

{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
storagedomainname=storage-domain-name
name=storage-tier-name

Table 4-23 Options of the DeleteStorageTier Command

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Option Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output information about the deleted storage tier to the standard output, after command execution. If this is omitted, nothing is output to the standard output.</td>
</tr>
</tbody>
</table>

Table 4-24 Parameters of the DeleteStorageTier Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>storagedomainname</td>
<td>Required</td>
<td>Specify the name of the storage domain.</td>
</tr>
<tr>
<td>name</td>
<td>Required</td>
<td>Specify the name of the storage tier to be deleted.</td>
</tr>
</tbody>
</table>

Table 4-25 Items Output by the DeleteStorageTier Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain information</td>
<td>name</td>
<td>The name of the storage domain.</td>
<td>-d</td>
</tr>
</tbody>
</table>
### Table 4-25 Items Output by the DeleteStorageTier Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage tier information</td>
<td>name</td>
<td>The name of the deleted storage tier.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>filterCondition</td>
<td>Filter conditions for the storage tier.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>description</td>
<td>A description of the storage tier.</td>
<td>-d</td>
</tr>
</tbody>
</table>

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

**Example:** In this example, the MegaTech-HighCost storage tier is deleted from the MegaTechXP12000-Primary storage domain.

D:\>htsmcli DeleteStorageTier --detail storagedomainname="MegaTechXP12000-Primary" name="MegaTech-HighCost"

**Output:**

RESPONSE:

An instance of StorageDomain(1 of 1)

name=MegaTechXP12000-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=

D:\>

### 4-2-3 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 that are being refreshed.

**Command Syntax**

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

**Table 4-26 Options of the GetStorageTiers Command**

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Option Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output all information about the storage tier to the standard output, after command execution. If this is omitted, only summary information is output.</td>
</tr>
</tbody>
</table>

* Summary information consists of the information for items which the Output by -d column is blank in Table 4-28.
Table 4-27 Parameters of the GetStorageTiers Command

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>storagedomainname</td>
<td>Required</td>
<td>Specify the name of the storage domain.</td>
</tr>
<tr>
<td>name</td>
<td>Optional</td>
<td>Specify the name of the storage tier for which you want to obtain information. If this is omitted, this command will be applied to all storage tiers in the storage domain. When specifying multiple storage tier names, separate each with a comma. Up to 255 storage tier names can be specified, depending on the maximum number of characters allowed by the command line.</td>
</tr>
</tbody>
</table>

Table 4-28 Items Output by the GetStorageTiers Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain</td>
<td>name</td>
<td>The name of the storage domain.</td>
<td></td>
</tr>
<tr>
<td>information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage tier</td>
<td>name</td>
<td>The name of the storage tier.</td>
<td></td>
</tr>
<tr>
<td>information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>filterCondition</td>
<td></td>
<td>The filter condition for the storage tier.</td>
<td>-d</td>
</tr>
<tr>
<td>numberOfVolumes</td>
<td></td>
<td>The number of volumes in the storage tier.</td>
<td>-d</td>
</tr>
<tr>
<td>totalCapacityInGB</td>
<td></td>
<td>The total capacity of the volumes in the storage tier (units: GB). Values less than 1 GB are rounded down to display an integer.</td>
<td></td>
</tr>
<tr>
<td>totalCapacityPercentage</td>
<td></td>
<td>Ratio (percentage) of totalCapacityInGB to the total amount of capacity in the volumes within the storage domain. Values less than 1% are rounded up to display an integer.</td>
<td></td>
</tr>
<tr>
<td>ToStorageDomain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>usedCapacityInGB</td>
<td></td>
<td>The total amount of capacity of volumes being used in the storage tier (units: GB). Values less than 1 GB are rounded down to display an integer.</td>
<td></td>
</tr>
<tr>
<td>usedCapacityPercentage</td>
<td></td>
<td>The ratio (percentage) of usedCapacityInGB to totalCapacityInGB. Values less than 1% are rounded up to display an integer.</td>
<td></td>
</tr>
<tr>
<td>freeCapacityInGB</td>
<td></td>
<td>The total amount of capacity of the volumes that are free in the storage tier (units: GB). Values less than 1 GB are rounded down to display an integer.</td>
<td></td>
</tr>
<tr>
<td>freeCapacityPercentage</td>
<td></td>
<td>The ratio (percentage) of freeCapacityInGB to totalCapacityInGB. Values less than 1% are rounded down to display an integer.</td>
<td></td>
</tr>
<tr>
<td>description</td>
<td></td>
<td>A description of the storage tier.</td>
<td>-d</td>
</tr>
</tbody>
</table>

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

Example (1): In this example, detailed information is obtained for both the MegaTech-HighCost and MyStorageTier storage tiers, in the MegaTechXP12000-Primary storage domain.

D:\>htsmcli GetStorageTiers --detail storagedomainname="MegaTechXP12000-Primary" name="MegaTech-HighCost"," MyStorageTier"

Output (1):

RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechXP12000-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
description=

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
description=

Example (2): In this example, summary information is obtained for both the MegaTech-HighCost and MyStorageTier storage tiers, in the MegaTechXP12000-Primary storage domain.

D:\>htsmcli GetStorageTiers storagedomainname="MegaTechXP12000-Primary"
name="MegaTech-HighCost"," MyStorageTier"

Output (2):
RESPONSE:
An instance of StorageDomain (1 of 1)
name=MegaTechXP12000-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
An instance of StorageTier (2 of 2)
name=MyStorageTier
Detailed Command Descriptions

Example (3): In this example, to obtain summary information for all storage tiers in the storage domain MegaTechXP12000-Secondary, the GetStorageTiers command is executed without specifying the storage tier name. However, no storage tier exists.

D:\>htsmcli GetStorageTiers storagedomainname="MegaTechXP12000-Secondary"

Output (3):
RESPONSE:
(Command completed; empty list returned)
D:\>

4-2-4 ModifyStorageTier

The ModifyStorageTier command can be used to change information (the name, filter condition, or description) for a storage tier. Note that information about storage tiers in the following statuses cannot be changed:

- Storage tiers specified for migration tasks that have not ended (End)
- Storage tiers within the storage domains that are being refreshed

You can use the GetTasks command to check the statuses of migration tasks.

Command Syntax

htsmcli server-location ModifyStorageTier
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
storagedomainname=storage-domain-name
name=storage-tier-name
[ newname=storage-tier-name ]
[ newfiltercondition=filter-condition ]
[ description=description-for-the-storage-tier ]

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Option Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output information about the changed storage tier to the standard output, after command execution. If this is omitted, nothing is output to the standard output.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>storagedomainname</td>
<td>Required</td>
<td>Specify the name of the storage domain.</td>
</tr>
<tr>
<td>name</td>
<td>Required</td>
<td>Specify the name of the storage tier.</td>
</tr>
</tbody>
</table>
Table 4-30 Parameters of the ModifyStorageTier Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>newname</td>
<td>Optional</td>
<td>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.</td>
</tr>
<tr>
<td>newfiltercondition</td>
<td>Optional</td>
<td>Specify a filter condition. For details about the property specified in the newfiltercondition parameter, see Table 4-31. If this is omitted, the filter condition will not be updated.</td>
</tr>
<tr>
<td>newdescription</td>
<td>Optional</td>
<td>Specify a new storage tier description. If this is omitted, the description of the storage tier will not change. If an empty character string is specified, the storage tier description that was previously set is deleted.</td>
</tr>
</tbody>
</table>

Table 4-31 Properties Specifiable for the newfiltercondition Parameter

<table>
<thead>
<tr>
<th>Property Name</th>
<th>Operators</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SubsystemSerialNumber</td>
<td>=,&lt;&gt;</td>
<td>The serial number of the storage subsystem.</td>
</tr>
<tr>
<td>SubsystemName</td>
<td>=,&lt;&gt;</td>
<td>The name of the storage subsystem.</td>
</tr>
<tr>
<td>ArrayGroup</td>
<td>=,&lt;&gt;</td>
<td>The name of the array group.</td>
</tr>
<tr>
<td>Capacity</td>
<td>&lt;, &lt;=, =, &gt;, &gt;=</td>
<td>The volume capacity.</td>
</tr>
<tr>
<td>RAIDLevel</td>
<td>=, &lt;&gt;</td>
<td>The RAID level.</td>
</tr>
<tr>
<td>EmulationType</td>
<td>=, &lt;&gt;</td>
<td>The emulation type.</td>
</tr>
<tr>
<td>DiskType</td>
<td>=, &lt;&gt;</td>
<td>The disk type.</td>
</tr>
<tr>
<td>SLPRNumber</td>
<td>=, &lt;&gt;</td>
<td>The SLPR number.</td>
</tr>
<tr>
<td>CLPRNumber</td>
<td>=, &lt;&gt;</td>
<td>The CLPR number.</td>
</tr>
<tr>
<td>ControllerArrayGroup</td>
<td>=, &lt;&gt;</td>
<td>The name of the controller array group</td>
</tr>
</tbody>
</table>

Table 4-32 Items Output by the ModifyStorageTier Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain info</td>
<td>name</td>
<td>The name of the storage domain.</td>
<td>-d</td>
</tr>
<tr>
<td>Storage tier info</td>
<td>name</td>
<td>The name of the storage tier.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>filterCondition</td>
<td>The filter conditions of the storage tier.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>description</td>
<td>A description of the storage tier.</td>
<td>-d</td>
</tr>
</tbody>
</table>

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

Example: In this example, the name of the MyStorageTier storage tier in the MegaTechXP12000-Primary storage domain is changed to OurStorageTier.

D:\>htsmcli ModifyStorageTier --detail storagedomainname="MegaTechXP12000-Primary" name="MyStorageTier", newname="OurStorageTier"

Output:
RESPONSE:
An instance of StorageDomain(1 of 1)
  name=MegaTechXP12000-Primary
List of 1 StorageTier elements:
  An instance of StorageTier(1 of 1)
    name=OurStorageTier
    filterCondition=RAIDLevel <> 'RAID5(3D+1P)'
4-2-5 GetVolumes (with storagetiername Specified)

The GetVolumes command with storagetiername parameter specified can be used to obtain a list of volumes (LUs) in the storage tier of the storage domain to specify.

You can also limit the volumes obtained, by specifying a volume filter condition.

For details about how to specify options, parameters, and filter conditions, or about the items output by this command, see the GetVolumes command in the Storage Domain Management section 4-1-5.

Command Syntax

htsmcli server-location Getvolumes
   { -u | --username } user-name
   { -p | --password } { password | @name-of-password-file }
   [ { -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 ]

4-3 Migration Group Management Commands

This section includes a detailed description for each migration group management command.

NOTE: The examples shown in this section assume that the user name, password, and location of the Tiered Storage Manager server have been set in the properties file.

4-3-1 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 specify that migration is disabled, you can prevent the volume belonging to the migration group from being migrated by mistake.

Migration groups cannot be created within a storage domain that is being refreshed.

Command Syntax

htsmcli server-location CreateMigrationGroup
   { -u | --username } user-name
   { -p | --password } { password | @name-of-password-file }
   [ { -o | --output } name-of-the-standard-output-redirect-file ]
   [ { -d | --detail } ]
   storagedomainname=storage-domain-name
   name=migration-group-name
   [ canmigrate={ Yes | No } ]
   [ description=description-for-the-migration-group ]
### Table 4-33 Options of the CreateMigrationGroup Command

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Option Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output information about the created migration group to the standard output, after command execution. If this is omitted, nothing is output to the standard output.</td>
</tr>
</tbody>
</table>

### Table 4-34 Parameters of the CreateMigrationGroup Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>storagedomainname</td>
<td>Required</td>
<td>Specify the name of the storage domain.</td>
</tr>
<tr>
<td>name</td>
<td>Required</td>
<td>Specify the name of the migration group to be created. This name should be unique within the storage domain.</td>
</tr>
</tbody>
</table>
| canmigrate | Optional | Specify whether migration is possible.  
• Yes: Migration is possible (default).  
• No: Migration is not possible. |
| description | Optional | Specify a description of the migration group. |

### Table 4-35 Items Output by the CreateMigrationGroup Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain information</td>
<td>name</td>
<td>The name of the storage domain.</td>
<td>-d</td>
</tr>
<tr>
<td>Migration group information</td>
<td>name</td>
<td>The name of the created migration group.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>canMigrate</td>
<td>Indicates whether migration is possible.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>description</td>
<td>A description of the migration group.</td>
<td>-d</td>
</tr>
</tbody>
</table>

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

Example: In this example, a migration group named MG01 is created in the MegaTechXP12000-Primary storage domain.

D:\>htsmcli CreateMigrationGroup --detail storagedomainname="MegaTechXP12000-Primary" name="MG01" description="MigrationGroup01"

Output:

RESPONSE:

An instance of StorageDomain(1 of 1)

name=MegaTechXP12000-Primary

List of 1 MigrationGroup elements:

An instance of MigrationGroup(1 of 1)

name=MG01

canMigrate=Yes
description=MigrationGroup01

D:\>

### 4-3-2 DeleteMigrationGroup

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

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

- Migration groups specified for migration tasks that have not ended (End)
- Migration groups within the storage domains that are being refreshed

You can use the `GetTasks` command to check the statuses of migration tasks.
Command Syntax

htsmcli server-location DeleteMigrationGroup

{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]

storedomainname=storage-domain-name

name=migration-group-name

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Option Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output information about the deleted migration group to the standard output, after command execution. If this is omitted, nothing is output to the standard output.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>storagedomainname</td>
<td>Required</td>
<td>Specify the storage domain name.</td>
</tr>
<tr>
<td>name</td>
<td>Required</td>
<td>Specify the name of the migration group to be deleted.</td>
</tr>
</tbody>
</table>

Table 4-38 Items Output by the DeleteMigrationGroup Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain information</td>
<td>name</td>
<td>The name of the storage domain.</td>
<td>-d</td>
</tr>
<tr>
<td>Migration group information</td>
<td>name</td>
<td>The name of the deleted migration group.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>canMigrate</td>
<td>Indicates whether migration is possible.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>description</td>
<td>A description of the migration group.</td>
<td>-d</td>
</tr>
</tbody>
</table>

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

Example: In this example, the MG01 migration group is deleted from the MegaTechXP12000-Primary storage domain.

D:\>htsmcli DeleteMigrationGroup --detail storagedomainname="MegaTechXP12000-Primary" name="MG01"

Output:
RESPONSE:
An instance of StorageDomain(1 of 1)
  name=MegaTechXP12000-Primary
List of 1 MigrationGroup elements:
  An instance of MigrationGroup(1 of 1)
    name=MG01
    canMigrate=Yes
    description=MigrationGroup01
D:\>

4-3-3 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 that are being refreshed.

**Command Syntax**

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

**Table 4-39 Options of the GetMigrationGroups Command**

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Option Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output all information about the migration group to the standard output, after command execution. If this is omitted, only summary information is output.</td>
</tr>
</tbody>
</table>

# Summary information consists of the information for items for which the Output by -d column is blank in Table 4-41.

**Table 4-40 Parameters of the GetMigrationGroups Command**

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>storagedomainname</td>
<td>Required</td>
<td>Specify the name of the storage domain.</td>
</tr>
<tr>
<td>name</td>
<td>Optional</td>
<td>Specify the name of the migration group for which you want to obtain information. If this is omitted, this command will be applied to all migration groups in the storage domain. When specifying multiple migration groups, separate each with a comma. Up to 255 migration groups can be specified, depending on the maximum number of characters allowed by the command line.</td>
</tr>
</tbody>
</table>

**Table 4-41 Items Output by the GetMigrationGroups Command**

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain information</td>
<td>name</td>
<td>The name of the storage domain.</td>
<td></td>
</tr>
<tr>
<td>Migration group information</td>
<td>name</td>
<td>The name of the migration group.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>targetStorageTierName</td>
<td>The name of the storage tier for which the migration destination was last specified. If no migration task has ever been created, this is blank.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>canMigrate</td>
<td>Indicates whether migration is possible.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>totalCapacityInGB</td>
<td>The total capacity of the volumes in the migration group (units: GB). Values less than 1 GB are rounded down to display an integer.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>lastModifyUserGroup</td>
<td>The user group name of the user who created or last modified the migration group.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>creationTime</td>
<td>The date and time when the migration group was created.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>lastModifyTime</td>
<td>The date and time when the migration group information was last changed.</td>
<td>-d</td>
</tr>
</tbody>
</table>
### Table 4-41 Items Output by the GetMigrationGroups Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lastMigrationTime</td>
<td>The date and time when migration was performed for the storage tier specified in targetStorageTierName. If the previous migration has not finished, this is blank. If a new migration task is created, this is blank.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>migrationStatus</td>
<td>The status of the migration task. If migration has not previously been performed, this is blank. This can be any of the following: Standby Active.WaitingMigration (waiting for migration to be performed) Active.Migrating Active.WaitingDataErasure (waiting for erasure to be performed) Active.DataErasing Success (ended in success) Failure.MigrationFailure (ended in migration failure) Failure.DataErasureFailure (ended in erasure failure) Failure (ended with a failure other than those mentioned above) Cancel (ended by cancellation)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>numberOfVolumes</td>
<td>The number of volumes in the migration group.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>description</td>
<td>A description of the migration group.</td>
<td>-d</td>
</tr>
</tbody>
</table>

**Legend:**

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

**Example (1):** In this example, detailed information is obtained for all migration groups in the MegaTechXP12000-Primary storage domain.

```
D:\>htsmccli GetMigrationGroups --detail storagedomainname="MegaTechXP12000-Primary"
```

**Output (1):**

```
RESPONSE:
An instance of StorageDomain(1 of 1)
  name=MegaTechXP12000-Primary
List of 2 MigrationGroup elements
  An instance of MigrationGroup(1 of 2)
    name=MG01
    targetStorageTierName=
    canMigrate=Yes
    totalCapacityInGB=0
    lastModifyUserGroup=Admin
    creationTime=2005/03/31 11:57:23
    lastModifyTime=2005/03/31 12:05:59
    lastMigrationTime=
```

---

[Note: The text continues with more examples and detailed command descriptions, but the main focus here is on the table and the legend.]
An instance of MigrationGroup(2 of 2)
name=MyGroup
targetStorageTierName=
canMigrate=Yes
totalCapacityInGB=0
lastModifyUserGroup=Admin
creationTime=2005/03/31 12:06:41
lastModifyTime=2005/03/31 12:06:41
lastMigrationTime=
migrationStatus=
numberOfVolumes=0
description=MyMigrationGroup

Example (2): In this example, summary information is obtained for all migration groups in the MegaTechXP12000-Primary storage domain.

D:\>htsmcli GetMigrationGroups storagedomainname="MegaTechXP12000-Primary"

Output (2):
RESPONSE:
An instance of StorageDomain(1 of 1)
name=MegaTechXP12000-Primary
List of 2 MigrationGroup elements
An instance of MigrationGroup(1 of 2)
name=MG01
targetStorageTierName=
canMigrate=Yes
totalCapacityInGB=0
lastMigrationTime=
migrationStatus=
numberOfVolumes=0
An instance of MigrationGroup(2 of 2)
name=MyGroup
targetStorageTierName=
canMigrate=Yes
totalCapacityInGB=0
lastMigrationTime=
migrationStatus=
numberOfVolumes=0

D:\>
Example (3): In this example, to obtain summary information for all migration groups in the storage domain MegaTechXP12000-Secondary, the GetMigrationGroups command is executed without specifying the migration group name. However, no migration group exists.

D:\>htsmcli GetMigrationGroups storagedomainname="MegaTechXP12000-Secondary"

Output (3):
RESPONSE:
(Command completed; empty list returned)

D:\>

4-3-4 ModifyMigrationGroup

The ModifyMigrationGroup command can be used to change information (the name, attribute indicating whether the migration group is subject to migration operations, or description) for a migration group.

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

- Migration groups specified for migration tasks that have not ended (End)
- Migration groups within the storage domains that are being refreshed

You can use the GetTasks command to check the statuses of migration tasks.

Command Syntax

htsmcli server-location ModifyMigrationGroup
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -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 } ]
[ description=description-for-the-migration-group ]

Table 4-42 Options of the ModifyMigrationGroup Command

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Option Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output information about the changed migration group to the standard output, after command execution. If this is omitted, nothing is output to the standard output.</td>
</tr>
</tbody>
</table>

Table 4-43 Parameters of the ModifyMigrationGroup Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>storagedomainname</td>
<td>Required</td>
<td>Specify the name of the storage domain.</td>
</tr>
<tr>
<td>name</td>
<td>Required</td>
<td>Specify the name of the migration group.</td>
</tr>
<tr>
<td>newname</td>
<td>Optional</td>
<td>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.</td>
</tr>
</tbody>
</table>
| newcanmigrate | Optional | Specify whether migration is possible.
  - Yes: Migration is possible.
  - No: Migration is not possible.
  If this is omitted, the migration will remain the same. |
| newdescription | Optional | Specify a new migration group description. If this is omitted, the description of the migration group will not change. If an empty character string is specified, the migration group description that was previously set is deleted. |
Table 4-44 Items Output by the ModifyMigrationGroup Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain information</td>
<td>name</td>
<td>The name of the storage domain.</td>
<td>-d</td>
</tr>
<tr>
<td>Migration group information</td>
<td>name</td>
<td>The name of the migration group.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>canMigrate</td>
<td>Indicates whether migration is possible.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>description</td>
<td>A description of the migration group.</td>
<td>-d</td>
</tr>
</tbody>
</table>

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

Example: In this example, the name and description are changed for the MG01 migration group in the MegaTechXP12000-Primary storage domain.

D:\>htsmcli ModifyMigrationGroup --detail storagedomainname="MegaTechXP12000-Primary" name="MG01" newname="MG011" newdescription="MigrationGroup011"

Output:
RESPONSE:
An instance of StorageDomain(1 of 1)
  name=MegaTechXP12000-Primary
List of 1 MigrationGroup elements:
  An instance of MigrationGroup(1 of 1)
    name=MG011
    canMigrate=Yes
    description=MigrationGroup011
D:\>

4-3-5 AddVolumeToMigrationGroup

The AddVolumeToMigrationGroup command can be used to add a volume to the specified migration group. Use the LDEV number in the domain control storage subsystem (controller LDEV number) to specify a volume. Only volumes that do not belong to any migration groups can be added to a migration group. Note that volumes cannot be added to migration groups in the following statuses:

- Migration groups specified for migration tasks that have not ended (End)
- Migration groups within the storage domains that are being refreshed

You can use the GetTasks command to check the statuses of migration tasks.

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 is output as the value of the output items.

Command Syntax

```
htsmcli server-location AddVolumeToMigrationGroup
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
storagedomainname=storage-domain-name
name=migration-group-name
cotrollerdevicenumberr=controller-LDEV-number
```
### Table 4-45 Options of the AddVolumeToMigrationGroup Command

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Option Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output information about the volume added to the migration group, to the standard output, after command execution. If this is omitted, nothing is output to the standard output.</td>
</tr>
</tbody>
</table>

### Table 4-46 Parameters of the AddVolumeToMigrationGroup Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>storagedomainname</td>
<td>Required</td>
<td>Specify the name of the storage domain.</td>
</tr>
<tr>
<td>name</td>
<td>Required</td>
<td>Specify the name of the migration group.</td>
</tr>
<tr>
<td>controllerdevicenumber</td>
<td>Required</td>
<td>Specify the controller LDEV number.</td>
</tr>
</tbody>
</table>

### Table 4-47 Items Output by the AddVolumeToMigrationGroup Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
<th>Displayed as</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain information</td>
<td>name</td>
<td>The name of the storage domain.</td>
<td>-d</td>
<td>Unknown</td>
</tr>
<tr>
<td>Migration group information</td>
<td>name</td>
<td>The name of the migration group.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>canMigrate</td>
<td>Indicates whether migration is possible.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>description</td>
<td>A description of the migration group.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td>Information for added volumes (LUs)</td>
<td>controllerDeviceNumber</td>
<td>The controller LDEV number.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>emulationType</td>
<td>The emulation type.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>CVS</td>
<td>The CVS volume attribute of the volume.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>capacityInKB</td>
<td>The resource capacity of the volume (units: KB).</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>raidLevel</td>
<td>The RAID level.</td>
<td>-d</td>
<td>#1, #2</td>
</tr>
<tr>
<td></td>
<td>diskType</td>
<td>The disk type.</td>
<td>-d</td>
<td>#1, #2</td>
</tr>
<tr>
<td></td>
<td>ControllerArrayGroupName</td>
<td>The array group name of the LU in the controller</td>
<td></td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>arrayGroupName</td>
<td>The array group name of the LU in which the data is actually contained in the storage subsystem.</td>
<td>-d</td>
<td>#1, #2</td>
</tr>
<tr>
<td></td>
<td>VolumeStatus</td>
<td>Indicates whether the volume is being used.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>volumeLockStatus</td>
<td>Indicates whether the volume is locked.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>hostNames</td>
<td>The host name. If multiple host names exist, they are separated by commas (.).</td>
<td>-d</td>
<td>#1</td>
</tr>
</tbody>
</table>

**Legend:**
- `-d` indicates output only when either the `-d` or the `--detail` option is specified.
- #1 `Unknown` is output when volume information cannot be obtained for the domain control storage subsystem.
- #2 `Unknown` is output when information cannot be obtained for externally connected storage.
Example: In this example, a volume is added to the MG011 migration group in the MegaTechXP12000-Primary storage domain. The controller LDEV number for the added volume in the domain control storage subsystem is 3:A6.

D:\>htsmcli AddVolumeToMigrationGroup --detail
stорagedomainname="MegaTechXP12000-Primary" name="MG011"
controllerdevicenumber=3:A6

Output:

RESPONSE:

An instance of StorageDomain(1 of 1)
  name=MegaTechXP12000-Primary
List of 1 MigrationGroup elements
  An instance of MigrationGroup(1 of 1)
    name=MG011
    canMigrate=Yes
    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=

D:\>

4-3-6 RemoveVolumeFromMigrationGroup

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

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

- Migration groups specified for migration tasks that have not ended (End)
- Migration groups within the storage domains that are being refreshed

You can use the GetTasks command to check the statuses of migration tasks.

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 is output as the value of the output items.

Command Syntax

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

Table 4-48 Options, RemoveVolumeFromMigrationGroup Command

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Option Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output information about the volume removed from the migration group, to the standard output, after command execution. If this is omitted, nothing is output to the standard output.</td>
</tr>
</tbody>
</table>

Table 4-49 Parameters, RemoveVolumeFromMigrationGroup Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>storagedomainname</td>
<td>Required</td>
<td>Specify the name of the storage domain.</td>
</tr>
<tr>
<td>name</td>
<td>Required</td>
<td>Specify the name of the migration group.</td>
</tr>
<tr>
<td>controllerdevicenumber</td>
<td>Required</td>
<td>Specify the controller LDEV number.</td>
</tr>
</tbody>
</table>

Table 4-50 Output, RemoveVolumeFromMigrationGroup Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
<th>Displayed as Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage domain information</td>
<td>name</td>
<td>The name of the storage domain.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td>Migration group information</td>
<td>name</td>
<td>The name of the migration group.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>canMigrate</td>
<td>Indicates whether migration is possible.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>description</td>
<td>A description of the migration group.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td>Information for removed volumes (LUs)</td>
<td>controllerDeviceNumber</td>
<td>The controller LDEV number.</td>
<td>-d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>emulationType</td>
<td>The emulation type.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>CVS</td>
<td>The CVS volume attribute of the volume. This can be either Yes or No.</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>capacityInKB</td>
<td>The resource capacity of the volume (units: KB).</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>raidLevel</td>
<td>The RAID level.</td>
<td>-d</td>
<td>#1, #2</td>
</tr>
<tr>
<td></td>
<td>diskType</td>
<td>The disk type.</td>
<td>-d</td>
<td>#1, #2</td>
</tr>
<tr>
<td></td>
<td>ControllerArrayGroupName</td>
<td>The array group name of the LU in the controller</td>
<td>#1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>arrayGroupName</td>
<td>The array group name of the LU in which the data is actually contained in the storage subsystem.</td>
<td>-d</td>
<td>#1, #2</td>
</tr>
<tr>
<td></td>
<td>volumeStatus</td>
<td>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).</td>
<td>-d</td>
<td>#1</td>
</tr>
<tr>
<td></td>
<td>volumeLockStatus</td>
<td>Indicates whether the volume is locked. This can be either Locked or Unlocked.</td>
<td>-d</td>
<td>#1</td>
</tr>
</tbody>
</table>
Table 4-50 Output, RemoveVolumeFromMigrationGroup Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
<th>Displayed as</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>hostNames</td>
<td>The host name. If multiple host names exist, they are separated by commas (,).</td>
<td>-d</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

Legend:
- `-d` indicates output only when either the `-d` or the `--detail` option is specified.
- `#1` Unknown is output when volume information cannot be obtained for the domain control storage subsystem.
- `#2` Unknown is output when information cannot be obtained for externally connected storage.

Example: In this example, a volume is removed from the MG011 migration group in the MegaTechXP12000-Primary storage domain. The controller LDEV number for the removed volume in the domain control storage subsystem is 3:A7.

D:\>htsmcli RemoveVolumeFromMigrationGroup --detail
storagedomainname="MegaTechXP12000-Primary" name=" MG011"
controllerdevicenumber=3:A7

Output:
RESPONSE:
An instance of StorageDomain(1 of 1)
  name=MegaTechXP12000-Primary
List of 1 MigrationGroup elements
  An instance of MigrationGroup(1 of 1)
    name=MG011
    canMigrate=Yes
    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=

D:\>

4-3-7 GetVolumes (with migrationgroupname Specified)

The `GetVolumes` command with `migrationgroupname` parameter specified can be used to obtain a list of volumes (LUs) in the migration group of the storage domain to specify.

You can also limit the volumes obtained, by specifying a volume filter condition.

For details about how to specify options, parameters, and filter conditions, or about the items output by this command, see the `GetVolumes` command in the Storage Domain Management section 4-1-5.
Command Syntax

htsmcli server-location Getvolumes
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -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 ]

4-4 Migration Commands

This section includes a detailed description for each migration command.

NOTE: The examples shown in this section assume that the user name, password, and location of the Tiered Storage Manager server have been set in the properties file.

4-4-1 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 created in the redirect file specified by the output option.

Candidates for migration target volumes for each volume of a migration group are chosen from the specified migration target storage tier. When you use the filtercondition parameter to specify a volume filter condition, candidates for the migration target volume are chosen based on the condition.

Candidates chosen for migration target volumes are displayed in the candidate migration plan as pairs with the migration source volumes.

NOTE: A candidate for the migration target volume is chosen from the logical partition (SLPR and CLPR) to which the migration source volume belongs.

Even if you cannot select candidates for the migration target volume for all migration source volumes, the candidate migration plans for those selected are created. In this case, the command will end in an error.

Comment lines (with # in the first column) are generated in the candidate migration plan. If multiple migration target volume candidates exist, those are shown in comment lines as well. Note that all volumes other than the first candidate are chosen not only from the logical partition (SLPR and CLPR) to which the migration source volume belongs, but also from the other logical partitions (SLPRs and CLPRs).

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

NOTE: Volumes specified for migration tasks that have not ended (and are in any other status than End) cannot be selected as migration target volumes, because volume migration reserve is performed for such volumes.

NOTE: Candidate migration plans cannot be created in storage domains that are being refreshed.

Command Syntax

htsmcli server-location CreateMigrationPlan
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -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 ]

Table 4-51 Parameters of the CreateMigrationPlan Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>storagedomainname</td>
<td>Required</td>
<td>Specify the name of the storage domain.</td>
</tr>
<tr>
<td>migrationgroupname</td>
<td>Required</td>
<td>Specify the name of the migration group.</td>
</tr>
<tr>
<td>targetstoragetiername</td>
<td>Required</td>
<td>Specify the name of the storage tier (migration target storage tier name) to which migration is to be performed.</td>
</tr>
<tr>
<td>filtercondition</td>
<td>Optional</td>
<td>Specify a volume filter condition. For details about the property specified in the filtercondition parameter, see Table 4-52.</td>
</tr>
</tbody>
</table>

Table 4-52 Properties Specifiable for the filtercondition Parameter

<table>
<thead>
<tr>
<th>Property Name</th>
<th>Operators</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SubsystemDisplayModel</td>
<td>=,&lt;&gt;</td>
<td>The name used for displaying the model of the storage subsystem. This name is displayArrayType of Device Manager (not arrayType). Example: StorageWorks XP1024</td>
</tr>
<tr>
<td>SubsystemSerialNumber</td>
<td>=,&lt;&gt; startsWith, contains</td>
<td>The serial number of the storage subsystem.</td>
</tr>
<tr>
<td>SubsystemName</td>
<td>=,&lt;&gt;</td>
<td>The name of the storage subsystem.</td>
</tr>
<tr>
<td>SubsystemVendor</td>
<td>=,&lt;&gt;</td>
<td>The name of the storage subsystem vendor.</td>
</tr>
<tr>
<td>ControllerDeviceNumber</td>
<td>=</td>
<td>The controller LDEV number.</td>
</tr>
<tr>
<td>Host</td>
<td>=,&lt;&gt; startsWith, contains</td>
<td>The name of the host.</td>
</tr>
<tr>
<td>ArrayGroup</td>
<td>=,&lt;&gt; startsWith, contains</td>
<td>The name of the array group.</td>
</tr>
<tr>
<td>Capacity</td>
<td>&lt;,=&lt;,&gt;,&gt;,&gt;=</td>
<td>The volume capacity.</td>
</tr>
<tr>
<td>RAIDLevel</td>
<td>=,&lt;&gt;</td>
<td>The RAID level.</td>
</tr>
<tr>
<td>EmulationType</td>
<td>=,&lt;&gt;</td>
<td>The emulation type.</td>
</tr>
<tr>
<td>DiskType</td>
<td>=,&lt;&gt;</td>
<td>The disk type.</td>
</tr>
<tr>
<td>VolumeStatus</td>
<td>=</td>
<td>A character string indicating whether the volume is being used.</td>
</tr>
<tr>
<td>VolumeLockStatus</td>
<td>=</td>
<td>A character string indicating the lock status of the volume.</td>
</tr>
<tr>
<td>SLPRNumber</td>
<td>=,&lt;&gt;</td>
<td>The SLPR number.</td>
</tr>
<tr>
<td>CLPRNumber</td>
<td>=,&lt;&gt;</td>
<td>The CLPR number.</td>
</tr>
<tr>
<td>ControllerArrayGroup</td>
<td>=,&lt;&gt; startsWith, contains</td>
<td>The name of the controller array group.</td>
</tr>
</tbody>
</table>

Table 4-53 Items Output by the CreateMigrationPlan Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall plan information</td>
<td>plan-type</td>
<td>The plan type.</td>
</tr>
<tr>
<td></td>
<td>format-version</td>
<td>The plan format version. Specify this for compatibility between different format versions.</td>
</tr>
<tr>
<td></td>
<td>storageDomainName</td>
<td>The name of the storage domain.</td>
</tr>
<tr>
<td></td>
<td>migrationGroupName</td>
<td>The name of the migration group.</td>
</tr>
<tr>
<td></td>
<td>targetStorageTierName</td>
<td>The name of the migration target storage tier.</td>
</tr>
</tbody>
</table>
### Table 4-53 Items Output by the CreateMigrationPlan Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>permitCrossSlprMigration</td>
<td>Indicates whether migration is permitted for transferring volume data between SLPRs. Yes: permitted. No: not permitted.</td>
</tr>
<tr>
<td></td>
<td>permitCrossClprMigration</td>
<td>Indicates whether migration is permitted for transferring volume data between CLPRs. Yes: permitted. No: not permitted.</td>
</tr>
</tbody>
</table>

**Information about each volume pair for migration**

<table>
<thead>
<tr>
<th>Item Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pair</td>
<td>The symbol indicating the start of specification for a migration source volume and migration target volume.</td>
</tr>
<tr>
<td>sourceControllerDeviceNumber</td>
<td>The migration source volume.</td>
</tr>
<tr>
<td>targetControllerDeviceNumber</td>
<td>The migration target volume. Blank space characters are output when a migration target volume cannot be selected.</td>
</tr>
</tbody>
</table>

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

**Example (1):** In this example, a candidate migration plan is created for when each volume in the MG01 migration group is migrated to the MegaTech-HighCost storage tier, in the MegaTechXP12000-Primary storage domain.

D:\>htsmcli CreateMigrationPlan storagedomainname="MegaTechXP12000-Primary" migrationgroupname="MG01" targetstoragetiername= MegaTech-HighCost

**Output (1):**

```plaintext
#Example plan for migration
plan-type=Migration
format-version=1.0
storageDomainName=MegaTechXP12000-Primary
migrationGroupName=MG01
targetStorageTierName=MegaTech-HighCost
permitCrossSlprMigration=No
permitCrossClprMigration=No
pair
    # LUSE=No
    # LU=3:A6
    # emulationType=OPEN-V
    # CVS=Yes
    # capacityInKB=10,240,320
    # 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
# 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
# subsystem=USP#14011
# SLPRNumber=0
# CLPRNumber=0
# arrayGroupName=1-10-1
# diskType=FC
# RAIDLevel=RAID5(3D+1P)
# cacheMode=Disable
# IOSuppressionMode=Disable
# 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
Example (2): In this example, the conditions for creation of the candidate migration plan are the same as in example (1), but some of the candidate migration target volumes cannot be found.

D:\>htsmcli CreateMigrationPlan storagedomainname="MegaTechXP12000-Primary" migrationgroupname=" MG01" targetstoragetiername= MegaTech-HighCost

Output (2):

#Example plan for migration
plan-type=Migration
format-version=1.0
storageDomainName=MegaTechXP12000-Primary
  migrationGroupName=MG011
  targetStorageTierName=MegaTech-HighCost
  permitCrossSlprMigration=No
  permitCrossClprMigration=No
  pair
    #   LUSE=No
    #   LU=0:E7
    #   emulationType=OPEN-9
    #   CVS=No
    #   capacityInKB=7,211,520
    #   SLPRNumber=0
    #   CLPRNumber=0
    #   cacheMode=Disable
    #   IOSuppressionMode=Disable
    sourceControllerDeviceNumber=0:E7
    targetControllerDeviceNumber=

  pair
    #   LUSE=No
    #   LU=3:A6
    #   emulationType=OPEN-V
    #   CVS=Yes
    #   capacityInKB=10,240,320
    #   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
#     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
#     SLPRNumber=0
#     CLPRNumber=0
#     arrayGroupName=1-10-1
#     diskType=FC
#     RAIDLevel=RAID5(3D+1P)
#     cacheMode=Disable
#     IOSuppressionMode=Disable
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
An attempt to create a candidate migration plan has failed. There is a pair for which a target volume was not found.

4-4-2 CreateMigrationTask

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

When the `execute` option is specified for the created migration task, the task is executed immediately. Otherwise, the task is put in `Standby` status, and can subsequently be executed by using the `ExecuteTask` command.

You can use the `erasedata` parameter to specify whether the data for the migration source volume is to be deleted once after migration terminates normally.

**NOTE:** Migration tasks are executed by requests to the Tiered Storage Manager server. Actual task execution is performed asynchronously to this command.

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.

**NOTE:** Migration tasks cannot be created in storage domains that are being refreshed.

Command Syntax

```bash
htsmcli server-location CreateMigrationTask
    { -u | --username } user-name
    { -p | --password } { password | @name-of-password-file }
    [ { -o | --output } name-of-the-standard-output-redirect-file ]
    [ { -e | --execute } ]
    migrationplan=migration-plan-file-name
    [ erasedata={ Yes | No } ]
    [ description=description-of-the-migration-task ]
```

**Table 4-54 Options of the CreateMigrationTask Command**

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Option Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>-e</code> or <code>--execute</code></td>
<td>None</td>
<td>Optional</td>
<td>Specify this to immediately execute the created migration task. If this is omitted, the migration task is placed in <code>Standby</code> status.</td>
</tr>
</tbody>
</table>

**Table 4-55 Parameters of the CreateMigrationTask Command**

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>migrationplan</td>
<td>Required</td>
<td>Specify the name of the migration plan file. Specify it as an absolute path or relative path from the command execution directory.</td>
</tr>
</tbody>
</table>
Table 4-55 Parameters of the CreateMigrationTask Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>erasedata</td>
<td>Optional</td>
<td>Specify whether the data for the migration source volume is to be deleted once after migration task creation terminates normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Yes: Delete the data. (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No: Do not delete the data.</td>
</tr>
<tr>
<td>description</td>
<td>Optional</td>
<td>Specify a description of the migration task.</td>
</tr>
</tbody>
</table>

Table 4-56 Items Output by the CreateMigrationTask Command

<table>
<thead>
<tr>
<th>Information Level</th>
<th>Item Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task information</td>
<td>id</td>
<td>The task ID.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The task ID format is \textit{TK}\textsubscript{xmln}. The time and serial number are converted to base 36 and displayed in the format \textsubscript{xmln}.</td>
</tr>
<tr>
<td></td>
<td>status</td>
<td>The task status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standby</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active.WaitingMigration (waiting for execution)</td>
</tr>
<tr>
<td></td>
<td>creationTime</td>
<td>The date and time when the task was created.</td>
</tr>
<tr>
<td></td>
<td>storageDomainName</td>
<td>The name of the storage domain.</td>
</tr>
<tr>
<td></td>
<td>migrationGroupName</td>
<td>The name of the migration group.</td>
</tr>
<tr>
<td></td>
<td>targetStorageTierName</td>
<td>The name of the migration target storage tier.</td>
</tr>
<tr>
<td></td>
<td>eraseData</td>
<td>Indicates whether the data for the migration source volume is to be deleted once after migration terminates normally.</td>
</tr>
<tr>
<td></td>
<td>description</td>
<td>The task description.</td>
</tr>
</tbody>
</table>

Migration volume information

| SourceControllerDeviceNumber | The controller LDEV number of the migration source volume. |
| TargetControllerDeviceNumber | The controller LDEV number of the migration target volume. |

Example: In this example, a task for performing migration is created by loading the migration plan from the D:\tmp\plan.txt text file. The task is set to execute immediately.

D:\>htsmcli CreateMigrationTask --execute migrationplan=" D:\tmp\plan.txt"

Output:
RESPONSE:

An instance of MigrationTask(1 of 1)
    id=TK1f2lymqv
    status=Standby
    creationTime=2005/03/25 16:53:11
    storageDomainName=MegaTechXP12000-Primary
    migrationGroupName=MG011
    targetStorageTierName=MegaTech-HighCost
    eraseData=No
    description=

List of 2 MigrationInfo elements
    An instance of MigrationInfo(1 of 2)
        sourceControllerDeviceNumber=3:A6
        targetControllerDeviceNumber=2:80
    An instance of MigrationInfo(2 of 2)
sourceControllerDeviceNumber=3:A7
targetControllerDeviceNumber=2:84

D:\>

4-4-3 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 also specify a range of tasks by using the `status` parameter, which indicates the task status.

You can also use 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

Command Syntax

```
htsmcli server-location GetTasks
  { -u | --username } user-name
  { -p | --password } { password | @name-of-password-file }
  [ { -o | --output } name-of-the-standard-output-redirect-file ]
  [ { -d | --detail } ]
  [ { id=task-ID |
    storagedomainname=storage-domain-name
    [ migrationgroupname=migration-group-name ]
    [ targetstoragetiername=target-storage-tier-name ]
    [ status= status [, status ] ....]
    [ [ datatype= { Creation | End } daytobase=days-to the-base-date
    [ direction= { Before | After | Just } ] ] ] ]
```

Table 4-57 Options of the GetTasks Command

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Option Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output all information about the task to the standard output, after command execution. If this is omitted, only summary information is output.</td>
</tr>
</tbody>
</table>

* Summary information consists of the information for items for which the Output by -d column is blank in Table 4-59.

Table 4-58 Parameters of the GetTasks Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Optional</td>
<td>Specify the task ID. This parameter cannot be specified with other parameters.</td>
</tr>
<tr>
<td>storagedomainname</td>
<td>Optional</td>
<td>Specify the name of the storage domain. This must be specified when migrationgroupname or targetstoragetiername is specified.</td>
</tr>
<tr>
<td>migrationgroupname</td>
<td>Optional</td>
<td>Specify the name of the migration group, along with storagedomainname.</td>
</tr>
</tbody>
</table>
Table 4-58 Parameters of the GetTasks Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>targetstoragetiename</code></td>
<td>Optional</td>
<td>Specify the name of the migration target storage tier, along with storagedomainname.</td>
</tr>
<tr>
<td><code>status</code></td>
<td>Optional</td>
<td>Specify the status of the task. This can be any of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standby</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active.WaitingMigration (waiting for migration)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active.Migrating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active.WaitingDataErasure (waiting for erasure)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active.DataErasing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Success (ended in success)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Failure.MigrationFailure (ended in migration failure)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Failure.DataErasureFailure (ended in erasure failure)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cancel (ended by cancellation)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active (running, same as multiple specification of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active.WaitingMigration, Active.Migrating,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active.WaitingDataErasure and Active.DataErasing)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NotEnd (not ended, same as multiple specification of Standby and Active)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Failure (ended in one of the failures such as</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Failure.MigrationFailure and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Failure.DataErasureFailure)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>End (ended, same as multiple specification of Success, Failure, and Cancel)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When specifying multiple task statuses, separate each one with a comma.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Only a lower-level status can be specified by omitting Active or Failure.</td>
</tr>
<tr>
<td><code>datetype</code></td>
<td>Optional</td>
<td>Specify the type of date (creation date or end date) linked to the task,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for specifying a date range.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Creation (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>End</td>
</tr>
<tr>
<td><code>daystobase</code></td>
<td>Optional</td>
<td>Specify the number of days to the base date.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Specify how many days from the base date tasks should be obtained.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acceptable value is 0 or a positive integer.</td>
</tr>
<tr>
<td><code>direction</code></td>
<td>Optional</td>
<td>Specify the direction for daystobase.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Before (days on or before the base date)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>After (days on or after the base date)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Just (the base date itself, which is the default)</td>
</tr>
</tbody>
</table>

Table 4-59 Items Output by the GetTasks Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task information</td>
<td><code>id</code></td>
<td>The task ID. The task ID format is <code>TK############</code>. The time and serial number are converted to base 36 and displayed in the format <code>############</code>.</td>
</tr>
<tr>
<td></td>
<td><code>status</code></td>
<td>The status of the task:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standby</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active.WaitingMigration (waiting for migration)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active.Migrating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active.WaitingDataErasure (waiting for erasure)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active.DataErasing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Success (ended in success)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Failure.MigrationFailure (ended in migration failure)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Failure.DataErasureFailure (ended in erasure failure)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Failure (ended with a failure other than those mentioned above)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cancel (ended by cancellation)</td>
</tr>
</tbody>
</table>
### Table 4-59 Items Output by the GetTasks Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>creationTime</td>
<td>The date and time when the task was created.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>executionRequestTime</td>
<td>The execution request time and date for the task.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>endTime</td>
<td>The date and time when task execution ended.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>migrationStartedTime</td>
<td>The date and time when migration execution started.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>migrationCompletionTime</td>
<td>The date and time when migration execution completed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>migrationProgress</td>
<td>Indicates the migration progress, as a percentage. Values less than 1% are rounded down to display an integer.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>estimatedMigrationCompletionTime</td>
<td>The date and time when migration is estimated to end.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>dataErasureStartedTime</td>
<td>The date and time when erasure execution started.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dataErasureCompletionTime</td>
<td>The date and time when erasure execution completed.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>dataErasureProgress</td>
<td>Indicates the erasure progress, as a percentage. Values less than 1% are rounded down to display an integer.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>estimatedDataErasureCompletionTime</td>
<td>The date and time when erasure is estimated to end.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>ownerId</td>
<td>The user ID of the user that created the task.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ownerGroupId</td>
<td>The user group ID of the user that created the task.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>storageDomainName</td>
<td>The name of the storage domain.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>migrationGroupName</td>
<td>The name of the migration group.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>previousTargetStorageTierName</td>
<td>The name of the migration target storage tier for the previous migration. If no previous migration has been performed, this is blank.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>targetStorageTierName</td>
<td>The name of the migration target storage tier.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>eraseData</td>
<td>Indicates whether the data for the migration source volume is to be deleted once after migration terminates normally.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>totalCapacityInGB</td>
<td>The total capacity of the volumes in the migration group (units: GB). Values less than 1 GB are rounded down to display an integer.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>description</td>
<td>A description of the task.</td>
<td></td>
</tr>
<tr>
<td>Task error information</td>
<td>message</td>
<td>An error message.</td>
<td>-d</td>
</tr>
<tr>
<td>Migration volume information</td>
<td>sourceControllerDeviceNumber</td>
<td>The controller LDEV number of the migration source volume.</td>
<td>-d</td>
</tr>
<tr>
<td>Migration volume information</td>
<td>sourceSubsystemSerialNumber</td>
<td>The serial number of the storage subsystem on which data is actually stored for the migration source volume.</td>
<td>-d</td>
</tr>
<tr>
<td>Migration volume information</td>
<td>sourceSubsystemModel</td>
<td>The name of the storage subsystem model on which data is actually stored for the migration source volume. If the model name obtained from Device Manager is Unknown, the product name is displayed.</td>
<td>-d</td>
</tr>
<tr>
<td>Migration volume information</td>
<td>sourceSubsystemDisplayName</td>
<td>The display name of the storage subsystem model on which data is actually stored for the migration source volume. If the displayed model name is unknown, the product name is displayed.</td>
<td>-d</td>
</tr>
<tr>
<td>Type of Information</td>
<td>Item Name</td>
<td>Description</td>
<td>Output by -d</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>sourceSubsystemName</td>
<td>The name of the storage subsystem on which data is actually stored for the migration source volume. If the subsystem name is unknown, the product name and serial number are displayed.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>sourcesubsystemVendor</td>
<td>The vendor name of the storage subsystem in which actual data is stored.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>sourceSubsystemDeviceName</td>
<td>The LDEV number of the migration source volume on which data is actually stored in the storage subsystem.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>sourceSLPRNumber</td>
<td>The number for the SLPR to which the migration source volume belongs.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>sourceCLPRNumber</td>
<td>The number for the CLPR to which the migration source volume belongs.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>sourceRaidLevel</td>
<td>The RAID level of the migration source volume.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>sourceDiskType</td>
<td>The type of disks in which the migration source volume exists.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>sourceControllerArrayGroup</td>
<td>The name of the controller array group in which the migration source volume exists.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>sourceArrayGroupName</td>
<td>The array group name of the migration source volume.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>targetControllerDeviceName</td>
<td>The controller LDEV number of the migration target volume.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>targetSubsystemSerialNum</td>
<td>The serial number of the storage subsystem on which data is actually stored for the migration target volume.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>targetSubsystemModel</td>
<td>The name of the storage subsystem model on which data is actually stored for the migration target volume. If the model name obtained from Device Manager is Unknown, the product name is displayed.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>targetSubsystemDisplayModel</td>
<td>The display name of the storage subsystem model on which data is actually stored for the migration target volume. If the display model name is unknown, the product name is displayed.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>targetSubsystemName</td>
<td>The name of the storage subsystem on which data is actually stored for the migration target volume. If the subsystem name is unknown, the product name and serial number are displayed.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>targetsubsystemVendor</td>
<td>The vendor name of the storage subsystem in which actual data is stored.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>targetSubsystemDeviceName</td>
<td>The LDEV number of the migration target volume on which data is actually stored in the storage subsystem.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>targetSLPRNumber</td>
<td>The number for the SLPR to which the migration target volume belongs.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>targetCLPRNumber</td>
<td>The number for the CLPR to which the migration target volume belongs.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>targetRaidLevel</td>
<td>The RAID level of the migration target volume.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>targetDiskType</td>
<td>The type of disks in which the migration target volume exists.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>targetControllerArrayGroup</td>
<td>The name of the controller array group in which the migration target volume exists.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>targetArrayGroupName</td>
<td>The array group name of the migration target volume.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>emulationType</td>
<td>The emulation type.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>capacityInKB</td>
<td>The resource capacity of the volume (units: KB).</td>
<td>-d</td>
</tr>
</tbody>
</table>
### Table 4-59 Items Output by the GetTasks Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
</tr>
</thead>
</table>
|                     | status          | The migration status for each volume: Standby  
  Active.WaitingMigration (waiting for migration)  
  Active.Migrating  
  Active.WaitingDataErasure (waiting for erasure)  
  Active.DataErasing  
  Success (ended in success)  
  Failure.MigrationFailure (ended in migration failure)  
  Failure.DataErasureFailure (ended in erasure failure)  
  Failure (ended with a failure other than those mentioned above)  
  Cancel (ended by cancellation)  | -d            |
|                     | migrationProgress | Indicates the migration progress, as a percentage. Values less than 1% are rounded down to display an integer.                                                                                           | -d            |

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

**Example (1):** In this example, of the tasks in the MegaTechXP12000-Primary storage domain, detailed information is obtained about those tasks that ended five or more days ago for which results failed.

```bash
htsmcli GetTasks --detail storagedomainname="MegaTechXP12000-Primary" status="Standby" datetype="Creation" daystobase="5" direction="After"
```

**Output (1):**

```
RESPONSE:
List of 1 Task elements:
  An instance of MigrationTask(1 of 1)
    id=TK1f2lymqv
    status=Standby
    creationTime=2005/03/25 16:53:11
    executionRequestTime=
    endTime=
    migrationStartedTime=
    migrationCompletionTime=
    migrationProgress=0
    estimatedMigrationCompletionTime=
    dataErasureStartedTime=
    dataErasureCompletionTime=
    dataErasureProgress=0
    estimatedDataErasureCompletionTime=
    ownerId=user
    ownerGroupId=Admin
    storageDomainName=MegaTechXP12000-Primary
    migrationGroupName=MG011
    previousTargetStorageTierName=
    targetStorageTierName=MegaTech-HighCost
    eraseData=No
```
totalCapacityInGB=19
description=
List of 2 MigrationInfo elements:

An instance of MigrationInfo(1 of 2)
  sourceControllerDeviceNumber=3:A6
  sourceSubsystemSerialNumber=14011
  sourceSubsystemModel=USP
  sourceSubsystemDisplayModel=XP12000
  sourceSubsystemName=XP12000@10.208.151.151
  sourceSubsystemVendor=HP
  sourceSubsystemDeviceNumber=3:A6
  sourceSLPRNumber=0
  sourceCLPRNumber=0
  sourceRaidLevel=RAID5(3D+1P)
  sourceDiskType=Unknown
  sourceControllerArrayGroupName=E9960-1
  sourceArrayGroupName=1-9-1
  targetControllerDeviceNumber=2:80
  targetSubsystemSerialNumber=14011
  targetSubsystemModel=USP
  targetSubsystemDisplayModel=XP12000
  targetSubsystemName=XP12000@10.208.151.151
  targetSubsystemVendor=HP
  targetSubsystemDeviceNumber=2:80
  targetSLPRNumber=0
  targetCLPRNumber=0
  targetRaidLevel=RAID5(3D+1P)
  targetDiskType=Unknown
  targetControllerArrayGroupName=E9960-11
  targetArrayGroupName=1-10-1
  emulationType=OPEN-V
  capacityInKB=10,240,320
  status=Standby
  migrationProgress=0

An instance of MigrationInfo(2 of 2)
  sourceControllerDeviceNumber=3:A7
  sourceSubsystemSerialNumber=14011
  sourceSubsystemModel=USP
  sourceSubsystemDisplayModel=XP12000
  sourceSubsystemName=XP12000@10.208.151.151
  sourceSubsystemVendor=HP
  sourceSubsystemDeviceNumber=3:A7
Example (2): In this example, of the tasks in the MegaTechXP12000-Primary storage domain, summary information is obtained for those tasks that ended five or more days ago.

```
htsmcli GetTasks storagedomainname="MegaTechXP12000-Primary" status="Standby" datetype="Creation" daystobase="5" direction="After"
```

Output (2):

RESPONSE:

List of 1 Task elements:

An instance of MigrationTask(1 of 1)

```
id=TK1f2lymqv
status=Standby
creationTime=2005/03/25 16:53:11
executionRequestTime=
endTime=
migrationStartedTime=
migrationProgress=0
dataErasureStartedTime=
dataErasureProgress=0
ownerId=user
ownerGroupId=Admin
```
Example (3): In this example, to obtain summary information for all the tasks that finished 5 days ago or before among the tasks in the storage domain MegaTechXP12000-Secondary, the GetTasks command is executed. However, no task that matches the conditions exists.

D:\> htsmcli GetTasks storagedomainname="MegaTechXP12000-Primary" status="End" datetype="Creation" daystobase="5" direction="Before"

Output (3):
RESPONSE:
(Command completed; empty list returned)
D:\>

4-4-4 ModifyTask

The ModifyTask command can be used to change task information (the description).

Task information cannot be changed in the following statuses:

- Task has ended (End).
- Task is in a storage domain that is being refreshed.

Command Syntax

htsmcli server-location ModifyTask
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -d | --detail } ]
id =task-ID
[newdescription=description-of-the-task ]

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Option Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d or --detail</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to output the changed task information to the standard output, after command execution. If this is omitted, nothing is output to the standard output.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Required</td>
<td>Specify the task ID.</td>
</tr>
<tr>
<td>newdescription</td>
<td>Optional</td>
<td>Modify a description of the task. If this is omitted, the task description does not change. If an empty character string is specified, the task description that was previously set is deleted.</td>
</tr>
</tbody>
</table>
Table 4-62 Items Output by the ModifyTask Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
<th>Output by -d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task information</td>
<td>id</td>
<td>The task ID. The task ID format is TK:#######. The time and serial</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td></td>
<td>number are converted to base 36 and displayed in the format TK:#######.</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>status</td>
<td>The status of the task:</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standby</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active.WaitingMigration (waiting for migration)</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active.Migrating</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active.WaitingDataErasure (waiting for erasure)</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active.DataErasing</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>creationTime</td>
<td>The date and time when the task was created.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>executionRequestTime</td>
<td>The execution request time and date for the task.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>storageDomainName</td>
<td>The name of the storage domain.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>migrationGroupName</td>
<td>The name of the migration group.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>targetStorageTierName</td>
<td>The name of the migration target storage tier.</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td>eraseData</td>
<td>Indicates whether the data for the migration source volume is</td>
<td>-d</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to be deleted once after migration terminates normally.</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>description</td>
<td>A description of the task.</td>
<td>-d</td>
</tr>
<tr>
<td>Migration volume</td>
<td>sourceControllerDeviceNumber</td>
<td>The controller LDEV number of the migration source volume.</td>
<td>-d</td>
</tr>
<tr>
<td>information</td>
<td></td>
<td></td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>targetControllerDeviceNumber</td>
<td>The controller LDEV number of the migration target volume.</td>
<td>-d</td>
</tr>
</tbody>
</table>

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

Example: In this example, the description is changed for the task whose ID is TK1f2lymqv.

D:\>htsmcli ModifyTask --detail id="TK1f2lymqv" newdescription="This property was changed."

Output:
RESPONSE:
An instance of MigrationTask(1 of 1)
id=TK1f2lymqv
status=Standby
creationTime=2005/03/25 16:53:11
executionRequestTime=
storageDomainName=MegaTechXP12000-Primary
migrationGroupName=MG011
targetStorageTierName=MegaTech-HighCost
eraseData=No
description=This property was changed.
List of 2 MigrationInfo elements:
An instance of MigrationInfo(1 of 3)
sourceControllerDeviceNumber=3:A6
targetControllerDeviceNumber=2:80
An instance of MigrationInfo (2 of 2)
sourceControllerDeviceNumber=3:A7
targetControllerDeviceNumber=2:84

D:\>

4-4-5 ExecuteTask

The `ExecuteTask` command can be used to request execution of a specified task in the Standby status, on the Tiered Storage Manager server. Task execution is performed asynchronously to this command.

Execution cannot be requested on the Tiered Storage Manager server, for a task in a storage domain that is being refreshed. The `GetTasks` command can be used to check the status of a task.

Command Syntax

```
htsmcli server-location ExecuteTask
   { -u | --username } user-name
   { -p | --password } { password | @name-of-password-file }
   [ { -o | --output } name-of-the-standard-output-redirect-file ]
   [ { -d | --detail } ]
   id=task-ID
```

Table 4-63 Parameters of the ExecuteTask Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Required</td>
<td>Specify the task ID.</td>
</tr>
</tbody>
</table>

No output is generated by this command.

Example: In this example, the task whose ID is TK1ev677gu was executed.

D:\>htsmcli ExecuteTask id=TK1ev677gu

Output:

No output is generated by this command.

4-4-6 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 (ended by cancellation). 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 executing status (Active).
- Tasks are in the ended status (End).
- Tasks are in a storage domain that is being refreshed.

Command Syntax

```
htsmcli server-location CancelTask
   { -u | --username } user-name
   { -p | --password } { password | @name-of-password-file }
   [ { -o | --output } name-of-the-standard-output-redirect-file ]
   id=task-ID
```
Table 4-64 Items Output by the CancelTask Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Required</td>
<td>Specify the task ID.</td>
</tr>
</tbody>
</table>

Example: In this example, the task whose ID is TK1ev677gu is cancelled.

D:\>htsmcli CancelTask id=TK1ev677gu

Output:
No output is generated by this command.

4-4-7 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 use 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 is output to the standard error output.

Command Syntax

```
htsmcli server-location DeleteTasks
{ -u | --username } user-name
{ -p | --password } { password | @name-of-password-file }
[ { -o | --output } name-of-the-standard-output-redirect-file ]
[ { -f | --force } ]
[ { id=task-ID } ]
[ storagedomainname=storage-domain-name ]
[ migrationgroupname=migration-group-name ]
{ targetstoragetiername=target-storage-tier-name ]
[ status= status [, status ] ....]
[ { datetype= { Creation | End } datetobase=days-to-the-base-date ]
[ { direction= { Before | After | Just } ] } ]
```

Table 4-65 Options of the DeleteTasks Command

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Option Arguments</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-f or --force</td>
<td>None</td>
<td>Optional</td>
<td>Specify this to perform deletion without confirmation. If this is omitted, deletion will need to be confirmed for each task.</td>
</tr>
</tbody>
</table>

Table 4-66 Parameters of the DeleteTasks Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Optional</td>
<td>Specify the task ID. This parameter cannot be specified with other parameters.</td>
</tr>
</tbody>
</table>
### Table 4-66 Parameters of the DeleteTasks Command

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Optional or Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>storagedomainname</td>
<td>Optional</td>
<td>Specify the name of the storage domain. This must be specified when migrationgroupname or targetstoragetiername is specified.</td>
</tr>
<tr>
<td>migrationgroupname</td>
<td>Optional</td>
<td>Specify the name of the migration group, along with storagedomainname.</td>
</tr>
<tr>
<td>targetstoragetiername</td>
<td>Optional</td>
<td>Specify the name of the migration target storage tier, along with storagedomainname.</td>
</tr>
<tr>
<td>status</td>
<td>Optional</td>
<td>Specify the status of the task. This can be any of the following: Success (ended in success) Failure.MigrationFailure (ended in migration failure) Failure.DataErasureFailure (ended in erasure failure) Cancel (ended by cancellation) Failure (ended in one of the failures such as Failure.MigrationFailure and Failure.DataErasureFailure) End (ended, same as multiple specification of Success, Failure, and Cancel) When specifying multiple task statuses, separate each one with a comma. Only a lower-level status can be specified by omitting Failure.</td>
</tr>
<tr>
<td>datetype</td>
<td>Optional</td>
<td>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</td>
</tr>
<tr>
<td>daystobase</td>
<td>Optional</td>
<td>Specify the number of days to the base date. Specify how many days from the base date tasks should be obtained.</td>
</tr>
<tr>
<td>direction</td>
<td>Optional</td>
<td>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)</td>
</tr>
</tbody>
</table>

### Table 4-67 Items Output by the DeleteTasks Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task information</td>
<td>id</td>
<td>The task ID. The task ID format is TK########. The time and serial number are converted to base 36 and displayed in the format # #######.</td>
</tr>
<tr>
<td></td>
<td>status</td>
<td>The status of the task: Success (ended in success) Failure.MigrationFailure (ended in migration failure) Failure.DataErasureFailure (ended in erasure failure) Failure (ended with a failure other than those mentioned above) Cancel (ended by cancellation)</td>
</tr>
<tr>
<td></td>
<td>creationTime</td>
<td>The date and time when the task was created.</td>
</tr>
<tr>
<td></td>
<td>executionRequestTime</td>
<td>The execution request time and date for the task.</td>
</tr>
<tr>
<td></td>
<td>endTime</td>
<td>The date and time when task execution ended.</td>
</tr>
<tr>
<td></td>
<td>migrationStartedTime</td>
<td>The date and time when migration execution started.</td>
</tr>
<tr>
<td></td>
<td>migrationCompletionTime</td>
<td>The date and time when migration execution completed.</td>
</tr>
<tr>
<td></td>
<td>migrationProgress</td>
<td>Indicates the migration progress, as a percentage. Values less than 1% are rounded down to display an integer.</td>
</tr>
</tbody>
</table>
Table 4-67 Items Output by the DeleteTasks Command

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Item Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DataErasureStartedTime</td>
<td>The date and time when erasure execution started.</td>
<td></td>
</tr>
<tr>
<td>DataErasureCompletionTime</td>
<td>The date and time when erasure execution completed.</td>
<td></td>
</tr>
<tr>
<td>DataErasureProgress</td>
<td>Indicates the erasure progress, as a percentage. Values less than 1% are rounded down to display an integer.</td>
<td></td>
</tr>
<tr>
<td>ownerId</td>
<td>The user ID of the user that created the task.</td>
<td></td>
</tr>
<tr>
<td>ownerGroupId</td>
<td>The user group ID of the user that created the task.</td>
<td></td>
</tr>
<tr>
<td>storageDomainName</td>
<td>The name of the storage domain.</td>
<td></td>
</tr>
<tr>
<td>migrationGroupName</td>
<td>The name of the migration group.</td>
<td></td>
</tr>
<tr>
<td>previousTargetStorageTierName</td>
<td>The name of the migration target storage tier for the previous migration. If no previous migration has been performed, this is blank.</td>
<td></td>
</tr>
<tr>
<td>targetStorageTierName</td>
<td>The name of the migration target storage tier.</td>
<td></td>
</tr>
<tr>
<td>eraseData</td>
<td>Indicates whether the data for the migration source volume is to be deleted once after migration terminates normally.</td>
<td></td>
</tr>
<tr>
<td>totalCapacityInGB</td>
<td>The total capacity of the volumes in the migration group (units: GB). Values less than 1 GB are rounded down to display an integer.</td>
<td></td>
</tr>
<tr>
<td>description</td>
<td>A description of the task.</td>
<td></td>
</tr>
</tbody>
</table>

If the applied task does not exist within the specified task range, nothing is output.

**Example:** In this example, the command deletes canceled tasks from the tasks in the MegaTechXP12000-Primary storage domain. Since the force option is not specified in this example, a message is output confirming deletion for each task.

```
D:\>htsmcli DeleteTasks storagedomainname="MegaTechXP12000-Primary" status="Cancel"
```

**Output:**

```
CONFIRMATION:
An instance of MigrationTask(1 of 1)
  id=TK1f2lymqv
  status=Cancel
  creationTime=2005/03/25 16:53:11
  executionRequestTime=
  endTime=2005/03/25 16:53:45
  migrationStartedTime=
  migrationCompletionTime=
  migrationProgress=0
  dataErasureStartedTime=
  dataErasureCompletionTime=
  dataErasureProgress=0
  ownerId=user
  ownerGroupId=Admin
  storageDomainName=MegaTechXP12000-Primary
  migrationGroupName=MG011
  previousTargetStorageTierName=
```
targetStorageTierName=MegaTech-HighCost
eraseData=No
totalCapacityInGB=19
description=This property was changed.

Do you agree with deletion of this task? (Y/N) :
5 Tiered Storage Manager Properties Files

This chapter describes the properties files for the Tiered Storage Manager CLI.

- 5-1 Overview of Properties for Tiered Storage Manager CLI
- 5-2 Specifying Values in the htsmcli.properties File
- 5-3 Specifying Values in the htsmclienv.properties File

5-1 Overview of Properties for Tiered Storage Manager CLI

There are two kinds of properties for the Tiered Storage Manager CLI: those stored in the htsmcli.properties file, and those stored in the htsmclienv.properties file.

- Properties pertaining to options and parameters for the Tiered Storage Manager CLI are stored in the htsmcli.properties file.
- Properties pertaining to the trace log for the Tiered Storage Manager CLI are stored in the htsmclienv.properties file.

When decompressing the CLI setup file into the following directory during installation of the Tiered Storage Manager CLI on a Management client, the files htsmcli.properties and htsmclienv.properties are revealed in this directory:

- system-drive\TieredStorageManager\0110\CLI (in Windows)
- /opt/TieredStorageManager/0110/CLI (in Solaris and HP-UX)

The revealed htsmcli.properties file contains comment lines which show sample property settings to use as a guide. Based on this sample, a user can create a new htsmcli.properties file in a desired location. The directory containing the htsmcli.properties file must be set to the environment variable HTSM_CLI_HOME in advance.

**NOTE:** HTSM_CLI_HOME is an environment variable used for reporting, to the Tiered Storage Manager CLI, the location of the htsmcli.properties file that is to be used. If you do not set the directory containing the htsmcli.properties file to HTSM_CLI_HOME, Tiered Storage Manager will not use the htsmcli.properties file.

The default values for each property have been set in the htsmclienv.properties file that is revealed when the CLI setup file is decompressed. The htsmclienv.properties file must be located in the directory containing the htsmCLI.jar file. The htsmCLI.jar file is revealed in the same directory where the properties file was revealed when the CLI setup file was decompressed.

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 the line-break character defined for the OS.

In the properties files for the Tiered Storage Manager CLI, any lines that start with the # character 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 the backslash is not treated as a normal character. Instead, the character following the backslash 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:\CVXPARE\docroot\foo.bar must be entered as c:\\CVXPARE\\docroot\\foo.bar. For property specifications, other characters do not generally need to be preceded by an escape character.

Table 5-1 lists and describes the properties for the Tiered Storage Manager CLI.

<table>
<thead>
<tr>
<th>Type</th>
<th>File Name</th>
<th>Property</th>
<th>For Details:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Properties pertaining to CLI</td>
<td>htsmcli.properties</td>
<td>htsmserver.location</td>
<td>See section 5-2-1</td>
</tr>
<tr>
<td>options and parameters</td>
<td></td>
<td>option.output</td>
<td>See section 5-2-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>option.password</td>
<td>See section 5-2-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>option.username</td>
<td>See section 5-2-4</td>
</tr>
</tbody>
</table>
Table 5-1 Properties Specifiable for the Tiered Storage Manager CLI

<table>
<thead>
<tr>
<th>Type</th>
<th>File Name</th>
<th>Property</th>
<th>For Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>parameter.&lt;parameter-name&gt;</td>
<td>See section 5-2-5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>logger.fileCount</td>
<td>See section 5-3-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>logger.filePath</td>
<td>See section 5-3-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>logger.maxFileSize</td>
<td>See section 5-3-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>logger.tracelogLevel</td>
<td>See section 5-3-4</td>
</tr>
<tr>
<td>Properties pertaining to the trace log of the CLI</td>
<td>htsmclienv.properties</td>
<td>logger.fileCount</td>
<td>See section 5-3-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>logger.filePath</td>
<td>See section 5-3-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>logger.maxFileSize</td>
<td>See section 5-3-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>logger.tracelogLevel</td>
<td>See section 5-3-4</td>
</tr>
</tbody>
</table>

5-2 Specifying Values in the htsmcli.properties File

You can set the location of Tiered Storage Manager server, and the options and parameters used during execution of CLI commands as properties in the htsmcli.properties file.

**IMPORTANT:** Usable characters are restricted to printable ASCII characters, including \u0020 - \u007E (which are recognized as printable ASCII characters), when they are used for values of properties in the htsmcli.properties file.

Table 5-2 shows sample settings for the location of the Tiered Storage Manager server, and options in the htsmcli.properties properties file.

Table 5-2 Sample htsmcli.properties Property Values

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>htsmserver.location</td>
<td>rmi://myhost.mydomain:20352/HTSMServer</td>
</tr>
<tr>
<td>Option.username</td>
<td>usertaro</td>
</tr>
<tr>
<td>Option.password</td>
<td>@C:\TieredStorageManager\0110\CLI\pass.txt</td>
</tr>
</tbody>
</table>

The following shows an example of the above properties and values.

```
#HP StorageWorks XP Tiered Storage Manager CLI – Configuration
#Mon May 17 18:53:54 JST 2004
htsmserver.location=rmi://myhost.mydomain:20352/HTSMServer

option.username=usertaro

#option.password=hogehoge
#option.password=~/home/taro/htsmclipassword

option.password=@C:\\TieredStorageManager\\0110\\CLI\\pass.txt
```

5-2-1 htsmsserver.location Property

Specify the location of the Tiered Storage Manager server.

For details about how to specify the location of the Tiered Storage Manager server, see section 3-3.

5-2-2 option.output Property

Specify 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 section 3-3.

5-2-3 option.password Property

Specify the password that corresponds to the user name set for the option.username property. You can specify the password directly, or specify the name of a text file that contains the password. The file name can be specified using an absolute path or a relative path from the CLI installation directory.
When specifying a file name, precede the file name with the @ character. When a string starting with the @ character is specified, the first line of the text file indicated by the string is treated as the password.

For details about how to specify the value of this property, see the explanation of the password option in section 3-3.

5-2-4 option.username Property

Specify 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 section 3-3.

5-2-5 parameter.parameter-name Property

Specify 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 section 3-3.

5-3 Specifying Values in the htsmclienv.properties File

You can set each type of value for the log output function of the Tiered Storage Manager CLI as properties in the htsmclienv.properties file.

| IMPORTANT: Usable characters are restricted to printable ASCII characters, including \u0020 - \u007E (which are recognized as printable ASCII characters), when they are used for values of properties in the htsmclienv.properties file. |
| NOTE: Property names are case sensitive. |

5-3-1 logger.fileCount Property

Specify the maximum number of trace log files output by the log output function of the Tiered Storage Manager CLI.

Trace log files are created with the size specified for the 4.3.3 logger.maxFileSize Property, with a log number appended to the file name (for example, HTSMCLITrace1.log and HTSMCLITrace2.log). Trace information is written to log files in the order of the log numbers. If the last file becomes full, the first file is overwritten.

Acceptable values: 2 to 16.
Default: 10

5-3-2 logger.filePath Property

Specify 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).

| IMPORTANT: Do not use any characters or file names or directory names that are not permitted by the OS, or that are reserved by the OS. |

Default:

installation-directory\logs\HTSMCLITrace (in Windows)
installation-directory/logs/HTSMCLITrace (in Solaris and HP-UX)
The installation directory is that which contains the htsmcli.jar file.

5-3-3 logger.maxFileSize Property

Specify 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.

Acceptable values: From 32,768 bytes to 2,147,483,647 bytes (less than 2 GB).
Default: 1 MB
5-3-4 logger.tracelogLevel Property

Specify 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 contents 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.

Default: 20
6 Troubleshooting

This chapter describes the actions to be taken if problems occur with the Tiered Storage Manager CLI.

6-1 Troubleshooting Tiered Storage Manager CLI

If a problem occurs with the Tiered Storage Manager CLI, perform the following operations:

- Make sure that the cause of the problem is not the software, nor the computer nor the LAN hardware, and then restart the computer.
- Make sure that no problems exist with the Tiered Storage Manager server. For details about troubleshooting for the Tiered Storage Manager server, refer to the *HP StorageWorks XP Tiered Storage Manager Server Installation and Configuration Guide*.
- For details about troubleshooting specific to the Tiered Storage Manager CLI, see Table 6-1.
- For troubleshooting information common to both the CLI client and the Web client of Tiered Storage Manager, refer to the *HP StorageWorks XP Tiered Storage Manager User's Guide*.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Recommended Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannot log in to Tiered Storage Manager.</td>
<td>The Tiered Storage Manager server is not running.</td>
<td>Start the Tiered Storage Manager server.</td>
</tr>
<tr>
<td></td>
<td>The Tiered Storage Manager server was not found.</td>
<td>See the server location that was specified at the command line or property, and make sure that the specified port number is correct.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See the server location that was specified at the command line or property, and make sure that the specified host address is correct.</td>
</tr>
<tr>
<td>No users have been registered in Device Manager.</td>
<td></td>
<td>Register users in Device Manager.</td>
</tr>
<tr>
<td>You do not have the permissions needed to log in to Tiered Storage Manager.</td>
<td></td>
<td>Use Device Manager to change the user permissions to System Administrator, Storage Administrator, or Guest.</td>
</tr>
<tr>
<td>The user name or password is incorrect.</td>
<td></td>
<td>Change the user name or password that was specified at the command line or property to the correct one.</td>
</tr>
<tr>
<td>The contents set in the properties file <code>htsmclienv.properties</code> have not been executed properly.</td>
<td>Operation is not possible because there is an incorrect setting in the properties file.</td>
<td>Follow the instructions in the output error message to correct the settings in the properties file.</td>
</tr>
<tr>
<td>The contents set in the properties file <code>htsmcli.properties</code> have not been executed properly.</td>
<td>The parameter has been specified directly from the command line.</td>
<td>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 take preference.</td>
</tr>
<tr>
<td></td>
<td>Operation is not possible because there is an incorrect setting in the properties file.</td>
<td>Follow the instructions in the output error message to correct the settings in the properties file.</td>
</tr>
<tr>
<td>The environment variable <code>HTSM_CLI_HOME</code> has not been set up.</td>
<td></td>
<td>Set the directory containing the properties file <code>htsmcli.properties</code> to the environment variable <code>HTSM_CLI_HOME</code>.</td>
</tr>
<tr>
<td>An error occurred that indicated the specified command was not found.</td>
<td>A path to java.exe (or java) has not been established.</td>
<td>In Windows, add the directory containing java.exe to the environment variable Path.</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Recommended Action</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>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.</td>
<td>The time settings on the Management client differ from those on the Management server.</td>
<td>In Windows, make the date and time properties and the environment variable TZ the same as those on the Management server.</td>
</tr>
</tbody>
</table>
| Some of the LDEVs that make up the LUSE volume are not included in the same storage tier. | Situation (1) A migration plan was created so that LDEVs other than the representative LDEV that do not meet the conditions of the migration destination storage tier would not be migrated. | Both of the following conditions exist:  
  - The representative LDEV is included in the storage tier.  
  - LDEVs other than the representative LDEV are not included in the storage tier. | Review the migration plan. If you migrate LDEVs other than the representative LDEV, first re-specify the migration destination volume, and then perform migration. |
| Situation (2) A migration plan was created so that LDEVs that meet the conditions of the migration destination storage tier would be migrated unnecessarily. | Both of the following conditions exist:  
  - The representative LDEV is not included in the storage tier.  
  - LDEVs other than the representative LDEV are included in the storage tier. | Review the migration plan. Create a storage tier that includes the representative LDEV, and the status will change to situation (1). See the recommended action column for situation (1) and take appropriate action. |
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>API</td>
<td>application programming interface</td>
</tr>
<tr>
<td>BNF</td>
<td>Bachus Naur form</td>
</tr>
<tr>
<td>CLI</td>
<td>command line interface</td>
</tr>
<tr>
<td>GB</td>
<td>gigabyte</td>
</tr>
<tr>
<td>GUI</td>
<td>graphical user interface</td>
</tr>
<tr>
<td>HTSM</td>
<td>HP StorageWorks XP® Tiered Storage Manager</td>
</tr>
<tr>
<td>JRE</td>
<td>Java™ Runtime Environment</td>
</tr>
<tr>
<td>KB</td>
<td>kilobyte</td>
</tr>
<tr>
<td>LAN</td>
<td>local area network</td>
</tr>
<tr>
<td>LU</td>
<td>logical unit</td>
</tr>
<tr>
<td>MB</td>
<td>megabyte</td>
</tr>
<tr>
<td>OS</td>
<td>operating system</td>
</tr>
<tr>
<td>SAN</td>
<td>storage area network</td>
</tr>
<tr>
<td>TB</td>
<td>terabyte</td>
</tr>
<tr>
<td>TID</td>
<td>target ID</td>
</tr>
</tbody>
</table>
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