



**Administration Guide**





## Administration Guide

**Note**

Before using this information and the product it supports, read the information in "Notices" on page 169.

This edition applies to Version 6.1 of IBM Tivoli Storage Manager and to all subsequent releases and modifications until otherwise indicated in new editions or technical newsletters.

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## Preface

This publication provides the information to install, configure, monitor, and troubleshoot problems with the HSM for Windows® client.

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## Who should read this publication

This publication is intended for persons who are responsible for installing, configuring, monitoring, and troubleshooting the HSM for Windows client.

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## Publications

Tivoli® Storage Manager publications and other related publications are available online.

You can search all publications in the Tivoli Storage Manager Information Center: <http://publib.boulder.ibm.com/infocenter/tsminfo/v6>.

You can download PDF versions of publications from the Tivoli Storage Manager Information Center or from the IBM® Publications Center at <http://www.ibm.com/shop/publications/order/>.

You can also order some related publications from the IBM Publications Center Web site. The Web site provides information for ordering publications from countries other than the United States. In the United States, you can order publications by calling 800-879-2755.

## Tivoli Storage Manager publications

Publications are available for the server, storage agent, client, and Data Protection.

*Table 1. Tivoli Storage Manager server publications*

<b>Publication title</b>	<b>Order number</b>
<i>IBM Tivoli Storage Manager Messages</i>	GC23-9787
<i>IBM Tivoli Storage Manager Performance Tuning Guide</i>	GC23-9788
<i>IBM Tivoli Storage Manager Problem Determination Guide</i>	GC23-9789
<i>IBM Tivoli Storage Manager for AIX® Installation Guide</i>	GC23-9781
<i>IBM Tivoli Storage Manager for AIX Administrator's Guide</i>	SC23-9769
<i>IBM Tivoli Storage Manager for AIX Administrator's Reference</i>	SC23-9775
<i>IBM Tivoli Storage Manager for HP-UX Installation Guide</i>	GC23-9782
<i>IBM Tivoli Storage Manager for HP-UX Administrator's Guide</i>	SC23-9770
<i>IBM Tivoli Storage Manager for HP-UX Administrator's Reference</i>	SC23-9776
<i>IBM Tivoli Storage Manager for Linux® Installation Guide</i>	GC23-9783
<i>IBM Tivoli Storage Manager for Linux Administrator's Guide</i>	SC23-9771
<i>IBM Tivoli Storage Manager for Linux Administrator's Reference</i>	SC23-9777
<i>IBM Tivoli Storage Manager for Sun Solaris Installation Guide</i>	GC23-9784
<i>IBM Tivoli Storage Manager for Sun Solaris Administrator's Guide</i>	SC23-9772

*Table 1. Tivoli Storage Manager server publications (continued)*

<b>Publication title</b>	<b>Order number</b>
<i>IBM Tivoli Storage Manager for Sun Solaris Administrator's Reference</i>	SC23-9778
<i>IBM Tivoli Storage Manager for Windows Installation Guide</i>	GC23-9785
<i>IBM Tivoli Storage Manager for Windows Administrator's Guide</i>	SC23-9773
<i>IBM Tivoli Storage Manager for Windows Administrator's Reference</i>	SC23-9779
<i>IBM Tivoli Storage Manager for z/OS® Installation Guide</i>	GC23-9786
<i>IBM Tivoli Storage Manager for z/OS Administrator's Guide</i>	SC23-9774
<i>IBM Tivoli Storage Manager for z/OS Administrator's Reference</i>	SC23-9780
<i>Program Directory for IBM Tivoli Storage Manager for z/OS</i>	GI11-8910
<i>IBM Tivoli Storage Manager Server Upgrade Guide</i>	SC23-9554
<i>IBM Tivoli Storage Manager for System Backup and Recovery Installation and User's Guide</i>	SC32-6543

*Table 2. Tivoli Storage Manager storage agent publications*

<b>Publication title</b>	<b>Order number</b>
<i>IBM Tivoli Storage Manager for SAN for AIX Storage Agent User's Guide</i>	SC23-9797
<i>IBM Tivoli Storage Manager for SAN for HP-UX Storage Agent User's Guide</i>	SC23-9798
<i>IBM Tivoli Storage Manager for SAN for Linux Storage Agent User's Guide</i>	SC23-9799
<i>IBM Tivoli Storage Manager for SAN for Sun Solaris Storage Agent User's Guide</i>	SC23-9800
<i>IBM Tivoli Storage Manager for SAN for Windows Storage Agent User's Guide</i>	SC23-9553

*Table 3. Tivoli Storage Manager client publications*

<b>Publication title</b>	<b>Order number</b>
<i>IBM Tivoli Storage Manager for NetWare: Backup-Archive Clients Installation and User's Guide</i>	SC23-9790
<i>IBM Tivoli Storage Manager for UNIX and Linux: Backup-Archive Clients Installation and User's Guide</i>	SC23-9791
<i>IBM Tivoli Storage Manager for Windows: Backup-Archive Clients Installation and User's Guide</i>	SC23-9792
<i>IBM Tivoli Storage Manager for Space Management for UNIX and Linux: User's Guide</i>	SC23-9794
<i>IBM Tivoli Storage Manager for HSM for Windows Administration Guide</i>	SC23-9795
<i>IBM Tivoli Storage Manager Using the Application Program Interface</i>	SC23-9793
<i>Program Directory for IBM Tivoli Storage Manager z/OS Edition Backup-Archive Client</i>	GI11-8912
<i>Program Directory for IBM Tivoli Storage Manager z/OS Edition Application Program Interface</i>	GI11-8911

Table 4. Tivoli Storage Manager Data Protection publications

Publication title	Order number
<i>IBM Tivoli Storage Manager for Advanced Copy Services: Data Protection for Snapshot Devices Installation and User's Guide</i>	SC33-8331
<i>IBM Tivoli Storage Manager for Databases: Data Protection for Microsoft SQL Server Installation and User's Guide</i>	SC32-9059
<i>IBM Tivoli Storage Manager for Databases: Data Protection for Oracle for UNIX and Linux Installation and User's Guide</i>	SC32-9064
<i>IBM Tivoli Storage Manager for Databases: Data Protection for Oracle for Windows Installation and User's Guide</i>	SC32-9065
<i>IBM Tivoli Storage Manager for Enterprise Resource Planning: Data Protection for SAP Installation and User's Guide for DB2</i>	SC33-6341
<i>IBM Tivoli Storage Manager for Enterprise Resource Planning: Data Protection for SAP Installation and User's Guide for Oracle</i>	SC33-6340
<i>IBM Tivoli Storage Manager for Mail: Data Protection for Lotus Domino® for UNIX, Linux, and OS/400® Installation and User's Guide</i>	SC32-9056
<i>IBM Tivoli Storage Manager for Mail: Data Protection for Lotus Domino for Windows Installation and User's Guide</i>	SC32-9057
<i>IBM Tivoli Storage Manager for Mail: Data Protection for Microsoft Exchange Server Installation and User's Guide</i>	SC23-9796
<i>Program Directory for IBM Tivoli Storage Manager for Mail (Data Protection for Lotus Domino)</i>	GI11-8909

## Support information

You can find support information for IBM products from a variety of sources.

### Getting technical training

Information about Tivoli technical training courses is available online.

Go to <http://www.ibm.com/software/tivoli/education/>.

### Searching knowledge bases

If you have a problem with Tivoli Storage Manager, there are several knowledge bases that you can search.

You can begin with the Tivoli Storage Manager Information Center at <http://publib.boulder.ibm.com/infocenter/tsminfo/v6>. From this Web site, you can search all Tivoli Storage Manager publications.

### Searching the Internet

If you cannot find an answer to your question in the Tivoli Storage Manager information center, search the Internet for the latest, most complete information that might help you resolve your problem.

To search multiple Internet resources, go to the support Web site for Tivoli Storage Manager at <http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html>. From there, you can search a variety of resources including:

- IBM technotes
- IBM downloads

- IBM Redbooks®

If you still cannot find the solution to the problem, you can search forums and newsgroups on the Internet for the latest information that might help you resolve your problem. To share your experiences and learn from others in the user community, go to the Tivoli Storage Manager wiki at <http://www.ibm.com/developerworks/wikis/display/tivolistoragemanager/Home>.

## Using IBM Support Assistant

At no additional cost, you can install on any workstation the IBM Support Assistant, a stand-alone application. You can then enhance the application by installing product-specific plug-in modules for the IBM products that you use.

The IBM Support Assistant helps you gather support information when you need to open a problem management record (PMR), which you can then use to track the problem. The product-specific plug-in modules provide you with the following resources:

- Support links
- Education links
- Ability to submit problem management reports

For more information, see the IBM Support Assistant Web site at <http://www.ibm.com/software/support/isa/>.

## Finding product fixes

A product fix to resolve your problem might be available from the IBM Software Support Web site.

You can determine what fixes are available by checking the Web site:

1. Go to the IBM Software Support Web site at <http://www.ibm.com/software/tivoli/products/storage-mgr/product-links.html>.
2. Click the **Support Pages** link for your Tivoli Storage Manager product.
3. Click **Download**, and then click **Fixes by version**.

## Getting e-mail notification of product fixes

You can get notifications about fixes and other news about IBM products.

To receive weekly e-mail notifications about fixes and other news about IBM products, follow these steps:

1. From the support page for any IBM product, click **My support** in the upper-right corner of the page.
2. If you have already registered, skip to the next step. If you have not registered, click **Register** in the upper-right corner of the support page to establish your user ID and password.
3. Sign in to **My support**.
4. On the My support page, click **Edit profiles** in the left navigation pane, and scroll to **Select Mail Preferences**. Select a product family and check the appropriate boxes for the type of information you want.
5. Click **Submit**.
6. For e-mail notification for other products, repeat steps 4 and 5.

## Contacting IBM Software Support

You can contact IBM Software Support if you have an active IBM software maintenance contract and if you are authorized to submit problems to IBM.

Before you contact IBM Software Support, follow these steps:

1. Set up a software maintenance contract.
2. Determine the business impact of your problem.
3. Describe your problem and gather background information.

Then see “Submit the problem to IBM Software Support” on page xiv for information on contacting IBM Software Support.

### Setting up a software maintenance contract

Set up a software maintenance contract. The type of contract that you need depends on the type of product you have.

- For IBM distributed software products (including, but not limited to, Tivoli, Lotus®, and Rational® products, as well as IBM DB2® and IBM WebSphere® products that run on Microsoft Windows or UNIX® operating systems), enroll in IBM Passport Advantage® in one of the following ways:
  - **Online:** Go to the Passport Advantage Web page at <http://www.ibm.com/software/lotus/passportadvantage/>, click **How to enroll**, and follow the instructions.
  - **By Phone:** For the phone number to call in your country, go to the IBM Software Support Handbook Web page at <http://www14.software.ibm.com/webapp/set2/sas/f/handbook/home.html> and click **Contacts**.
- For server software products, you can purchase a software maintenance agreement by working directly with an IBM sales representative or an IBM Business Partner. For more information about support for server software products, go to the IBM Technical support advantage Web page at <http://www.ibm.com/servers/>.

If you are not sure what type of software maintenance contract you need, call 1-800-IBMSERV (1-800-426-7378) in the United States. For a list of telephone numbers of people who provide support for your location, go to the Software Support Handbook page at <http://www14.software.ibm.com/webapp/set2/sas/f/handbook/home.html>.

### Determine the business impact

When you report a problem to IBM, you are asked to supply a severity level. Therefore, you need to understand and assess the business impact of the problem you are reporting.

<b>Severity 1</b>	<b>Critical</b> business impact: You are unable to use the program, resulting in a critical impact on operations. This condition requires an immediate solution.
<b>Severity 2</b>	<b>Significant</b> business impact: The program is usable but is severely limited.
<b>Severity 3</b>	<b>Some</b> business impact: The program is usable with less significant features (not critical to operations) unavailable.
<b>Severity 4</b>	<b>Minimal</b> business impact: The problem causes little impact on operations, or a reasonable circumvention to the problem has been implemented.

## Describe the problem and gather background information

When explaining a problem to IBM, it is helpful to be as specific as possible. Include all relevant background information so that IBM Software Support specialists can help you solve the problem efficiently.

To save time, know the answers to these questions:

- What software versions were you running when the problem occurred?
- Do you have logs, traces, and messages that are related to the problem symptoms? IBM Software Support is likely to ask for this information.
- Can the problem be recreated? If so, what steps led to the failure?
- Have any changes been made to the system? For example, hardware, operating system, networking software, and so on.
- Are you currently using a workaround for this problem? If so, be prepared to explain it when you report the problem.

## Submit the problem to IBM Software Support

You can submit the problem to IBM Software Support online or by phone.

### Online

Go to the IBM Software Support Web site at <http://www.ibm.com/software/support/probsub.html>. Enter your information into the appropriate problem submission tool.

### By phone

For the phone number to call in your country, go to the contacts page of the IBM Software Support Handbook at <http://www14.software.ibm.com/webapp/set2/sas/f/handbook/home.html>.

If the problem that you submit is for a software defect or for missing or inaccurate documentation, IBM Software Support creates an Authorized Program Analysis Report (APAR). The APAR describes the problem in detail. If a workaround is possible, IBM Software Support provides one for you to implement until the APAR is resolved and a fix is delivered. IBM publishes resolved APARs on the Tivoli Storage Manager product support Web site at <http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html>, so that users who experience the same problem can benefit from the same resolutions.

---

## Conventions used in this manual

This manual uses the following typographical conventions:

Example	Description
<b>cancel</b>	Boldface type indicates a parameter or a user interface control.
<i>optionvalue</i>	Italic type indicates a placeholder for information you provide, or for special emphasis in the text.
user input	Monospace type indicates fragments of a program or information as it might appear on a display screen, such as a command example.
plus sign (+)	A plus sign between two keys indicates that you press both keys at the same time.

---

## HSM for Windows client updates

Several features in HSM for Windows client Version 6.1 are new for previous HSM for Windows client users.

The following features are new for IBM Tivoli Storage Manager HSM for Windows client in Version 6.1.3:

### **You can specify the management class of migrated files**

In version 6.1.3, you can specify a management class for files that are migrated to the Tivoli Storage Manager server. This gives you more opportunities to control the retention period of migration copies on the Tivoli Storage Manager server. You can specify different management classes, which can have different retention policies, for different migrations. In previous versions of HSM for Windows client, all migration copies are retained according to the policy of the default management class.

You can specify a management class with event-based retention. With such a retention policy you can use IBM System Storage™ Archive Manager and IBM System Storage DR500.

### **You can specify the options file of files that are backed up before migration**

In version 6.1.3, you can specify an options file for backing up migrated files before they are migrated. You can specify a different options file for different jobs and for threshold migration on different volumes.

This change affects only the backup before migration. HSM for Windows client still uses its own single option file in the HSM for Windows client installation directory for migration. Hence, you can define different options files to be used for backup before migration, but only one options file for migration. You can send backup copies to several different Tivoli Storage Manager servers, but migration is possible to only one Tivoli Storage Manager server.

In previous versions, the backup-archive client used its own process to determine which options file to use for the backup.

### **Support for back up before migration on cluster volumes**

Previous versions of the HSM for Windows client did not support backup before migration on cluster volumes. Version 6.1.3 supports backup before migration on cluster volumes.

### **Supported operating systems**

For recent additions to the list of supported operating systems, see Hardware and software requirements for IBM Tivoli Storage Manager (TSM) HSM for Windows Version 6.1 at <http://www.ibm.com/support/docview.wss?rs=2348&context=SSATMW&uid=swg21319299>.

The following features are new for IBM Tivoli Storage Manager HSM for Windows client in Version 6.1.0:

### **Threshold migration**

Threshold migration provides the capability to automatically maintain a certain amount of free space on protected file systems. No further interaction and manual inspection or monitoring is needed to prevent out-of-space conditions.

**Support for IPv6**

You can configure a connection with the Tivoli Storage Manager server that uses only IPv4, or a connection that uses either IPv4 or IPv6. In the latter case, the version depends on the network configuration of the file server where HSM for Windows client is installed, and the capabilities of the Tivoli Storage Manager server. The default setting is `commethod v6tcpip`. For details on the `commethod` option, see the *Backup-Archive Clients Installation and User's Guide for Windows*.

**Support for Microsoft® Windows Server 2008**

With the HSM for Windows client, you can use 64-bit versions of Microsoft Windows Server 2008, Standard Edition and Enterprise Edition.

**Related concepts**

“Configuring the retention period of migration copies” on page 22

“Threshold migration” on page 57

**Related tasks**

“Configuring the connection between the HSM for Windows client and the Tivoli Storage Manager server” on page 13

**Related reference**

“Hardware and software requirements” on page 9

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## Chapter 1. HSM for Windows client overview

IBM Tivoli Storage Manager for HSM for Windows client provides hierarchical storage management (HSM) for Windows NTFS file systems.

HSM is a data storage system that automatically moves data between high-cost and low-cost storage media. HSM exists because high-speed storage devices, such as hard disk drives, are more expensive per byte stored than slower devices, such as optical discs and magnetic tape drives. While it would be ideal to have all data available on high-speed devices all the time, this is prohibitively expensive for many organizations. Instead, you can use HSM to store the bulk of your enterprise's data on slower devices, and then copy data to faster disk drives only when needed.

In effect, HSM turns the fast disk drives into caches for the slower mass storage devices. The HSM for Windows client monitors the way files are used and lets you automate policies as to which files can safely be moved (migrated) to slower devices and which files should stay on the hard disks.

The HSM for Windows client manages the migration of individual files, files from parts of NTFS file systems, or complete NTFS file systems, to remote storage in Tivoli Storage Manager. Migrated files can be accessed, opened, and updated by the Windows application corresponding to the file extension. The migration of files is transparent to Windows users and applications, with the following caveats:

- Files that have been migrated are marked:
  - In the Windows Explorer, a migrated file has an overlay icon.
  - On a Command Prompt window, a migrated file is enclosed in brackets.
- Access to migrated files can be slower, if the file operation recalls the migrated file from Tivoli Storage Manager storage.

In addition to the migration and recall of files and the reconciliation of file systems, the HSM for Windows client provides additional functions beyond the scope of traditional HSM:

- An administrator can define migration jobs for each volume, including or excluding files based on the file type (extension) and various criteria related to the age of a file (creation, modification, last access). The files eligible for each migration job can be stored in separate file spaces in Tivoli Storage Manager storage.
- An administrator can define recall quotas to limit the number of file recalls during a specified time period. Quotas can apply to the entire system, to user groups, or to specific users.
- The HSM for Windows client can also be used for archiving purposes. In this case, files are archived in Tivoli Storage Manager and the original files are either kept on disk or deleted.
- Search and retrieve options are available to the administrator for migrated and archived files. Selected files or complete file spaces can be retrieved either to their original location in the file system or to a different location in the file system.
- When migrated files are recalled and changed by a user, several versions of a migrated file are kept in Tivoli Storage Manager storage until the file system is

reconciled. A user recall always accesses the latest version of a file. However, an administrator can retrieve any available version of a file.

- Threshold migration monitors file-system space usage and migrates files when space is needed.
- Threshold migration migrates older and larger files from your file system. You configure whether file age or file size is a better qualifier for migration.

The following are some advantages of these facilities beyond those of the classical HSM approach:

- The scope of individual migration jobs can be limited with regard to the number of files and data volume.
- Individual jobs can be executed at different times.
- Migration jobs can be organized according to the logical structure of a volume (including different parts of the directory structure) and thus potentially reflect the structure of an organization or user groups.
- Migration jobs can be organized according to different types of files such as office documents, images, and text files. This organization provides a more logical view on data than traditional HSM.
- With proper configuration, threshold migration can automatically prevent your volumes from running out of free space.
- With threshold migration's age weighting, active files are kept on the volume. Less-active files are migrated to Tivoli Storage Manager storage.
- With threshold migration's size weighting, larger files are migrated to Tivoli Storage Manager storage. Larger files provide a more efficient migration.
- You can implement migration jobs and threshold migration on the same volume. You can build a policy that is based on both file values (migration jobs) and space usage (threshold migration).

The HSM for Windows client comes with a graphical user interface (HSM for Windows client GUI) that you use to define and run migration jobs, threshold migration, reconciliation, searches and file retrieval, and to define general settings. You can also do many of these tasks using HSM for Windows client commands from a Command Prompt window.

The HSM for Windows client supports NTFS file systems. Windows FAT partitions are not supported. The HSM for Windows client acts as a Tivoli Storage Manager client exploiting the Tivoli Storage Manager API.

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## Migration overview

Migration is the core process you perform with the HSM for Windows client. You can configure two kinds of migration, and configure the behavior of migrated files.

You can configure migration jobs and threshold migration. Migration jobs allow you to specify precisely which files can be migrated, but they do not consider the space capacity of the volume. Threshold migration allows you to control space usage of the volume, but allows less control of which files are migrated.

A migration job defines a set of files and their migration behavior. When you run the job, the files specified in the job are copied to Tivoli Storage Manager storage. HSM for Windows client can delete the original files, replace the original files with stub files, or do nothing to the original files, depending on your configuration.

You can start the migration job immediately with the HSM for Windows client GUI or with an HSM for Windows client command from a Command Prompt window. You can also start the migration job at a later time with a scheduling program acquired from another vendor.

Threshold migration provides for migration based on space usage. When the used space on a volume reaches a high threshold, migration begins automatically. Files are migrated to free up space until used space falls to a low threshold. The files that are migrated meet a minimum age and size, and are prioritized for migration so that less dynamic and larger files are migrated before more dynamic and smaller files. With proper configuration, threshold migration can automatically prevent the volume from running out of space.

For migration jobs and threshold migration, you configure whether files will be backed up before migrating.

Threshold migration replaces the original file with a stub file. A migration job can replace the original file with stub files, delete the original file, or do nothing to the original file, depending on your configuration. The stub file provides the appearance of the original file, and provides the means for the HSM for Windows client to automatically and transparently recall the original file to the originating file system, if necessary for any file operations.

Migrating a file does not change the last access time of the file.

If you configure the HSM for Windows client to delete the original file or keep the original file on the originating file system after migration, the file will be stored in Tivoli Storage Manager storage and managed as an archive copy group.

**Attention:** The default management class will delete migrated files from Tivoli Storage Manager storage after 365 days. This is true whether the original file is replaced with a stub, deleted, or left on the local file system. To store files longer than 365 days, specify a management class that is suitable for retaining the migration copies, or change the retention period of the default management class. See “Configuring the retention period of migration copies” on page 22.

The following table summarizes the similarities and differences between migration jobs and threshold migration.

*Table 5. Migration jobs compared to threshold migration.* The table is a summary of differences and similarities between migration jobs and threshold migration.

Criterion	Migration job	Threshold migration
Which files are migrated?	You configure the path, type (file extension), minimum age and minimum size of files to migrate. All files that meet this criteria are migrated.	You configure the minimum file age and minimum file size, and the importance of file age relative to file size. HSM for Windows client creates a ranked list of migration candidates based on this criteria. Files from this list are migrated as needed to meet the space usage targets.

Table 5. Migration jobs compared to threshold migration (continued). The table is a summary of differences and similarities between migration jobs and threshold migration.

Criterion	Migration job	Threshold migration
When does migration occur?	You start migration manually, or with a scheduling tool that is provided by another vendor.	HSM for Windows client automatically starts migration when it detects that space usage on the volume has reached the high threshold.
When does migration end?	Migration ends when all files that meet the criteria have been migrated.	Migration ends when space usage on the volume reaches the low threshold, or when there are no more candidates for migration.
What is left on the volume from which the files were migrated?	HSM for Windows client can do one of three things, as you configure:  Replace the original file with a stub file  Leave the original file  Delete the original file, create no stub file.	HSM for Windows client replaces the original file with a stub file.
When are files automatically recalled to the originating file system?	If a stub file exists, and the file system requests an operation that cannot be satisfied by the stub file, the migrated file is automatically and transparently recalled.	If a stub file exists, and the file system requests an operation that cannot be satisfied by the stub file, the migrated file is automatically and transparently recalled.
Can I retrieve the migrated files manually?	Using the HSM for Windows client GUI or dsmlc.exe command.	Using the HSM for Windows client GUI or dsmlc.exe command.

### Related concepts

“Migration jobs” on page 35

“Threshold migration” on page 57

“Manually retrieving migrated or archived files” on page 64

### Related reference

“Backing up files before migrating them” on page 68

## Stub files

A stub file can replace each migrated file. On the local file system, a stub file looks and acts like a regular file.

When you or a Windows application accesses a migrated file stub, the Windows operating system transparently directs a file access request to the HSM for Windows client file system filter driver. This driver retrieves the full file from the repository to which it was migrated.

The HSM for Windows client utilizes an Installable File System (IFS) filter driver and uses Windows reparse points and sparse files to leave stubs of migrated files on the local disks. The reparse points generated by the HSM for Windows client have a worldwide unique ID, which has been provided and registered by Microsoft.

When a file is restored but not changed, that file is "re-stubbed" during the next migration process.

When a file is recalled, modified, and migrated again, that new version of the file is stored in Tivoli Storage Manager storage. More than one version of the file exists in Tivoli Storage Manager storage until the file system is reconciled. Any file operation that requires the file to be recalled yields the most recently migrated version.

An administrator can use more advanced retrieve functions to obtain previous versions of a file. An administrator can also obtain a file whose stub was deleted if the file was not deleted by reconciliation in the meantime.

**Note:** The file system filter driver and the recall application must be installed on all servers on which files are migrated. When files are migrated from a server where these components are not installed, or the recall application is not active, each attempt to access a migrated file results in an error.

The HSM for Windows client file system filter driver (ithsmdrv.sys) is an Installable File System (IFS) filter driver. When a user or application accesses a migrated file stub, the file system filter driver and the IBM TSM HSM Recall Service (hsmsservice.exe) running in the Windows user space perform the following steps:

1. The file system filter driver connects to the recall application running in the Windows user space and requests to recall the file.
2. The IBM TSM HSM Recall Service reads the file data and restores the file content.
3. The file system filter driver returns control to the Windows operating system and the I/O request is completed.

## Previously migrated files

After a file is migrated, it can be migrated again, depending on how you change it. Whether the file is migrated again depends on how the file is changed. HSM for Windows client can replace the existing version in Tivoli Storage Manager storage with the changed version of the file, or only modify the stub file, or only modify the metadata in the Tivoli Storage Manager database.

If you change a file that has been replaced with a stub file, HSM for Windows client will track the change depending on how the file is changed.

When you change the content of a file, HSM for Windows client first recalls the file from Tivoli Storage Manager storage. When you run the next migration job targeting this file, or when threshold migration chooses this file for migration, the HSM for Windows client sends the new version of the file to Tivoli Storage Manager storage. The Tivoli Storage Manager server maintains versions of the migrated file until you run reconciliation.

When only file attributes or times (creation time or last modification time) are changed, the file is not migrated again to Tivoli Storage Manager storage. Instead, the attributes or file times are updated in the Tivoli Storage Manager metadata database the next time. The updates are made the next time the file is the object of a migration job.

File security attributes are part of the binary data large object (BLOB), and they cannot be updated or modified by the HSM for Windows client. When security

attributes change, HSM for Windows client recalls the file at the next migration job. When you run the next migration job targeting this file, the HSM for Windows client sends the new version of the file to Tivoli Storage Manager storage. The version number of the file, as tracked by Tivoli Storage Manager, does not change. The previous copy of the file in Tivoli Storage Manager storage is deleted.

**Note:** Because files are recalled when security attributes change, ensure that you have sufficient free disk space for the largest recalled file when you change security attributes of migrated files.

Even if a migrated file has not changed in any way, it is possible that it is a candidate for migration. This would be the case, for example, if you ran the same migration job twice, and a file did not change between runs. In this case HSM for Windows client replaces the existing stub file with a stub pointing to the existing file copy in Tivoli Storage Manager storage.

If you configured HSM for Windows client to leave the original copy of the file on local storage after sending a copy of the file to Tivoli Storage Manager storage, the file is not considered migrated, but rather archived. When you change the file, HSM for Windows client does not automatically recall the file from Tivoli Storage Manager storage, and does not automatically track the changes to the file on the Tivoli Storage Manager server. Archived files remain unchanged on Tivoli Storage Manager storage.

**Related tasks**

“Retrieving migrated or archived files using the HSM for Windows client GUI” on page 64

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## Reconciliation overview

Reconciliation is the process of synchronizing a file system with the Tivoli Storage Manager server. After running reconciliation, exactly one migrated object exists on the Tivoli Storage Manager server for each migrated file.

By removing old and obsolete objects from the Tivoli Storage Manager server storage, reconciliation helps you to reduce your storage and license expenses. Reconciliation also checks that there is a migrated object on the Tivoli Storage Manager server for every stub file on the volume.

The HSM for Windows client performs reconciliation automatically at intervals specified with the *reconcileinterval* option you define using the HSM for Windows client GUI or with Command Prompt window tool `dsmhsmcl.exe`. An administrative user can also start reconciliation manually at any time.

**Related tasks**

“Configuring reconciliation with the graphical user interface” on page 78

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## Client commands and GUI overview

After you install and register the HSM for Windows client, you can use the HSM for Windows client GUI or run commands from a Command Prompt window.

Start the GUI with the `dsmgui.exe` executable file in the installation directory. Once the GUI is started, you can configure, monitor, and administer space management with the controls in the GUI. You can perform all HSM operations with the GUI, but not all operations are supported by the commands.

You must start the HSM for Windows client GUI with administrative rights on the file server on which it is administered. Each file server on which the HSM for Windows client is installed must be administered locally.

Many operations that you perform with the HSM for Windows client GUI, you can also perform with commands from a Command Prompt window. Each command has its own executable file, also in the installation directory.

### **Related concepts**

Chapter 5, “HSM for Windows commands,” on page 83



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## Chapter 2. Installing the HSM for Windows client

This topic provides the information you need to install the HSM for Windows client.

The HSM for Windows client uses the Tivoli Storage Manager API, which is installed when you install the Tivoli Storage Manager backup-archive client. Install, configure, and register the Tivoli Storage Manager backup-archive client before you install, configure and use the HSM for Windows client.

For the most up-to-date installation instructions and last minute addenda, see the release notes that are located on the IBM Tivoli Storage Manager for HSM for Windows Quick Start CD. This file is also available online at the Tivoli Information Center Web site: <http://publib.boulder.ibm.com/infocenter/tsminfo/v6>

### Related information

Chapter 3, “Configuring the HSM for Windows client,” on page 13

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## Planning to install HSM for Windows client version 6.1

Plan the necessary hardware and software, and consider compatibility with other software.

### Hardware and software requirements

HSM for Windows client has hardware requirements and software requirements.

For current software and hardware requirements, see Hardware and software requirements for IBM Tivoli Storage Manager (TSM) HSM for Windows Version 6.1 at <http://www.ibm.com/support/docview.wss?rs=2348&context=SSATMW&&uid=swg21319299>.

### Compatibility with other software

There are restrictions with file names length and cluster support.

#### File name limitations

The length of file names is limited by Tivoli Storage Manager API, and by Windows Explorer when using the HSM for Windows client GUI.

An HSM for Windows client file name cannot exceed 256 bytes. The path length (the API high-level qualifier) cannot exceed 1024 bytes. A path and file name includes the file server name, the volume, and the directory portion of the full Uniform Naming Convention (UNC) name, for example \\FILESERVER\E:\directory\filename.ext. The Unicode representation of a character can occupy several bytes, so the maximum number of characters that a file name might contain can vary.

When using the HSM for Windows client GUI, path names can be a maximum of 254 characters only. For path names that exceed 254 characters, you must use **dsmc.exe** from a Command Prompt window.

## Cluster environment limitations

There are limitations in a cluster environment.

The HSM for Windows client supports the following cluster environments:

- A Microsoft cluster (MSCS) environment with the following configurations:
  - Local volumes mounted into local volumes
  - Cluster volumes mounted into cluster volumes

**Note:** In these configurations, both cluster volumes belong to the same cluster resource to guarantee that both are always online on the same cluster node.

You cannot use the following configurations, because in these configurations HSM for Windows client cannot recall migrated files after failover:

- Cluster volumes mounted into local volumes
- Local volumes mounted into cluster volumes

## Alternate data streams limitations

Alternate data streams (ADS) are not supported.

Do not use the HSM for Windows client to migrate files that are associated with more than one data stream.

## Extended attributes limitations

Extended attributes are not supported.

Due to a restriction of the NTFS file system, extended attributes and reparse points are mutually exclusive. Because the HSM for Windows client uses reparse points, files with extended attributes cannot be migrated.

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## Preparing for the installation

You can prepare for installation by distributing the installer to the network.

### Distributing the installer to the network

You can distribute the HSM for Windows client installer to a shared drive. Users on the network can then install HSM for Windows client from the shared drive.

Use the following steps to distribute the HSM for Windows client installer to a shared drive on the network:

1. Insert the product CD into a CD-ROM drive.
2. Open a Command Prompt window.
3. Change to the *cd-drive*:\ location where *cd-drive* is the drive letter of the CD-ROM drive.
4. Type `msiexec /a "IBM Tivoli Storage Manager HSM for Windows client.msi"` and press **Enter**.
5. Step through the user interface dialogs by typing the necessary information. The file `IBM Tivoli Storage Manager HSM for Windows client.msi` is copied to the assigned network drive.

Users on the network can install HSM for Windows client using the `IBM Tivoli Storage Manager HSM for Windows client.msi` executable file from the shared drive.

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## Installing the HSM for Windows client from the product CD

You can install the HSM for Windows client from the product CD by clicking the setup icon.

Use the following steps to install the HSM for Windows client from the product CD:

1. Insert the product CD into a CD-ROM drive.
2. Open Windows Explorer.
3. Change to the *cd-drive*:\ location, where *cd-drive* is the drive letter of the reader where you placed the installation CD.
4. Double-click the setup.exe file.

You must restart the system to load the file system filter driver and complete the installation. Do not configure the HSM for Windows client until after you restart the system.

### Related information

Chapter 3, “Configuring the HSM for Windows client,” on page 13

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## Installing the HSM for Windows client in a cluster environment

The HSM for Windows client can be installed on a Microsoft MSCS cluster. With proper configuration, the HSM for Windows client can manage migration during failover and failback.

The Tivoli Storage Manager backup-archive client must be installed, configured, and registered appropriately for a MSCS cluster environment. Configure one Tivoli Storage Manager node for each cluster group. The Tivoli Storage Manager node name is the cluster name. Use this node name when configuring the HSM for Windows client on each node of the cluster.

When running in a cluster environment, the HSM for Windows client uses the cluster name as a file space name. If the Tivoli Storage Manager backup-archive client is configured with `clusternode no`, the cluster node must be granted proxy node authority to the cluster group node. You can do this with the Tivoli Storage Manager administrative command `grant proxynode`.

You must install the HSM for Windows client on each node of the cluster.

The HSM for Windows client must store configuration and migration job files in a cluster resource path, so that if a node fails, the configuration and job information is available to the node that acquires the resource. Use the **Path configuration** tab of the Preferences window to specify a cluster resource path for configuration and migration job files.

**Attention:** HSM for Windows client stores the cluster virtual-server name as file recall information in stub files. If you remove a volume from a cluster, the cluster virtual server name that was stored in stub files of that volume becomes meaningless, and HSM for Windows client cannot recall files for that volume.

### Related concepts

“File location preferences” on page 28

“Stub files” on page 4



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## Chapter 3. Configuring the HSM for Windows client

This topic indicates when and how to configure the HSM for Windows client.

After installing the HSM for Windows client, you must configure your connection with the Tivoli Storage Manager server before you can use HSM for Windows client. The first time you start the GUI, the configuration wizard guides your choices. After the initial configuring the connection to the Tivoli Storage Manager server, you can use the configuration wizard at any time to change the initial settings.

The HSM for Windows client is installed with default values for regional settings, file recall settings, and the location of configuration, log, and job files. You can change these values at any time with the Preferences window.

You can configure migration jobs, threshold migration, or reconciliation at any time after configuring connection with the Tivoli Storage Manager server.

After adding new hard disks or volumes to a computer that is already running the HSM for Windows client, you must restart the recall service (`hsm.service.exe`) and the monitor service (`hsmmonitor.exe`).

### Related concepts

“Migration jobs” on page 35

“Threshold migration” on page 57

“Reconciliation” on page 76

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## Configuring the connection between the HSM for Windows client and the Tivoli Storage Manager server

You must configure the connection between the HSM for Windows client and the Tivoli Storage Manager server before you can use the HSM for Windows client.

You must install, configure, and register the Tivoli Storage Manager backup-archive client before you configure and use the HSM for Windows client.

When running the HSM for Windows client graphical user interface (GUI) for the first time, the Configuration wizard guides you through the steps to configure a connection between the HSM for Windows client and the Tivoli Storage Manager server. You can also run the Configuration wizard any time from the **Tools** menu.

Start the HSM for Windows client graphical user interface (GUI) by issuing the `dsmgui.exe` command in the HSM for Windows client installation directory:

1. In the Option File Task page, choose whether to create a new options file or update an existing options file. If there is currently no options file, you can only create a new options file. Click **Next**.

The HSM for Windows client stores configuration information in the `dsm.opt` file located in the HSM for Windows client installation directory. It does not use the `dsm.opt` file that is used by the Tivoli Storage Manager backup-archive client.

**Attention:** Use only the HSM for Windows client GUI to change HSM for Windows client options. Editing the HSM for Windows client `dsm.opt` file by another method risks corrupting the file, and can lead to loss of data. Password and names of file spaces are also stored and managed separately from the backup-archive client. They are stored and managed with the Windows registry entries of the HSM for Windows client.

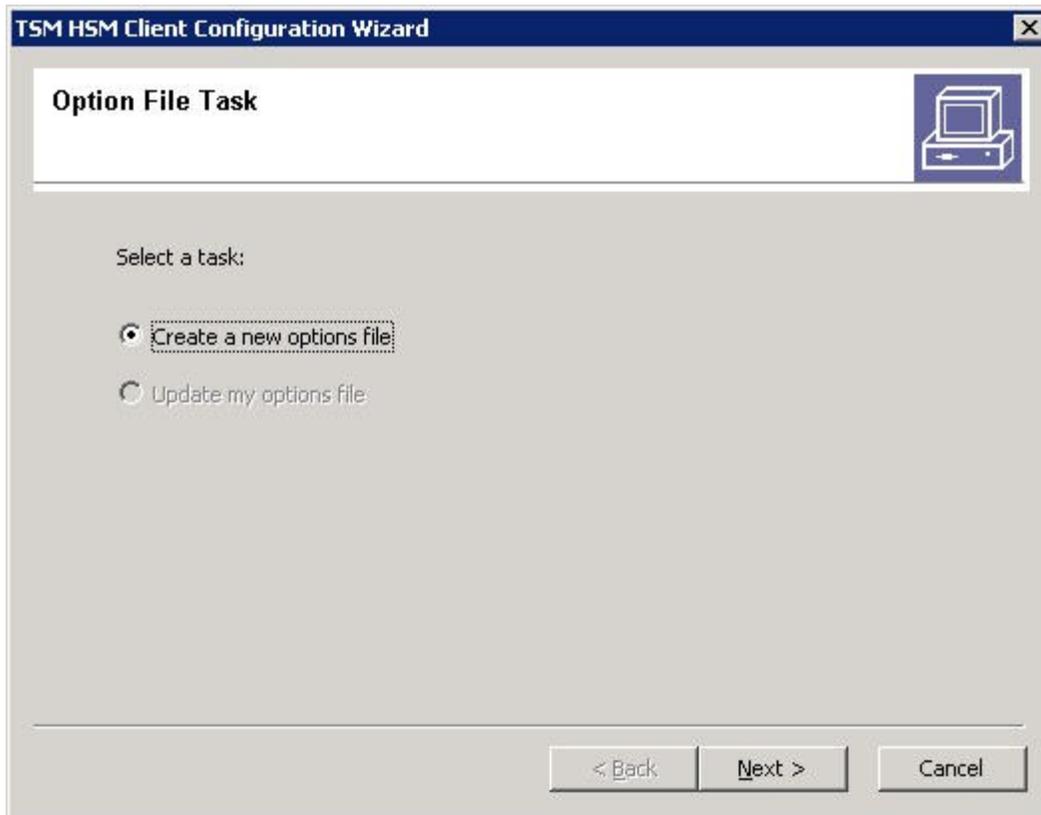


Figure 1. Configuration:Option File Task window

2. In the TPC/IP Parameters window, enter the server address and port for the Tivoli Storage Manager server. Each HSM for Windows client can connect to only one Tivoli Storage Manager server. This server can be different from the one that is used by the backup-archive client. Select the box to allow TCP/IP V4 and TCP/IP V6. This creates an entry in `dsm.opt` configuration file for the `commmethod` option: `commmethod v6tcpip`. If the box is not selected the HSM for Windows client will use only TCP/IP V4. Select **Next**.

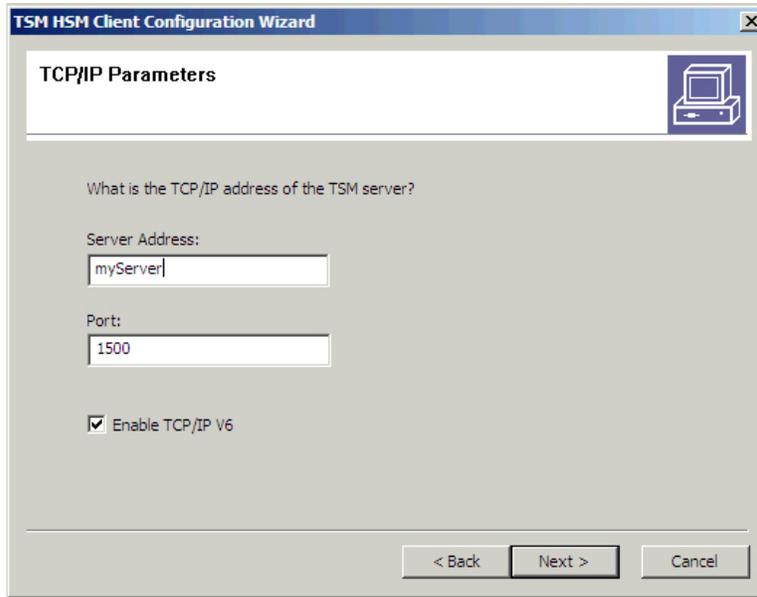


Figure 2. Configuration: TPC/IP Parameters window

3. In the TSM Authentication window, enter the Tivoli Storage Manager client node name. The node name must be registered with the Tivoli Storage Manager server. Click **Next**.



Figure 3. Configuration: TSM Authentication window

4. In the TSM Password Access window, select the password access option and click **Next**.

The recommended option is **Password Generate**. With this option, Tivoli Storage Manager automatically handles the password. As a result, there is no need to maintain a password or deal with password expiration.

The Tivoli Storage Manager API uses the registry entry of the backup-archive client to store the automatically generated password. If you want to keep the logon parameters of the HSM for Windows client separate from those of the backup-archive client, register the HSM for Windows client under a node name different from the one used by the backup-archive client.

If you select the **Password Prompt** option, you must specify a password to be used by the HSM for Windows client to logon to the Tivoli Storage Manager server. This password is stored and encrypted by the HSM for Windows client and is used automatically for each logon to the Tivoli Storage Manager server. In addition, in **Password Prompt** mode, a password is not needed to perform functions such as running migration jobs or searching a file space.

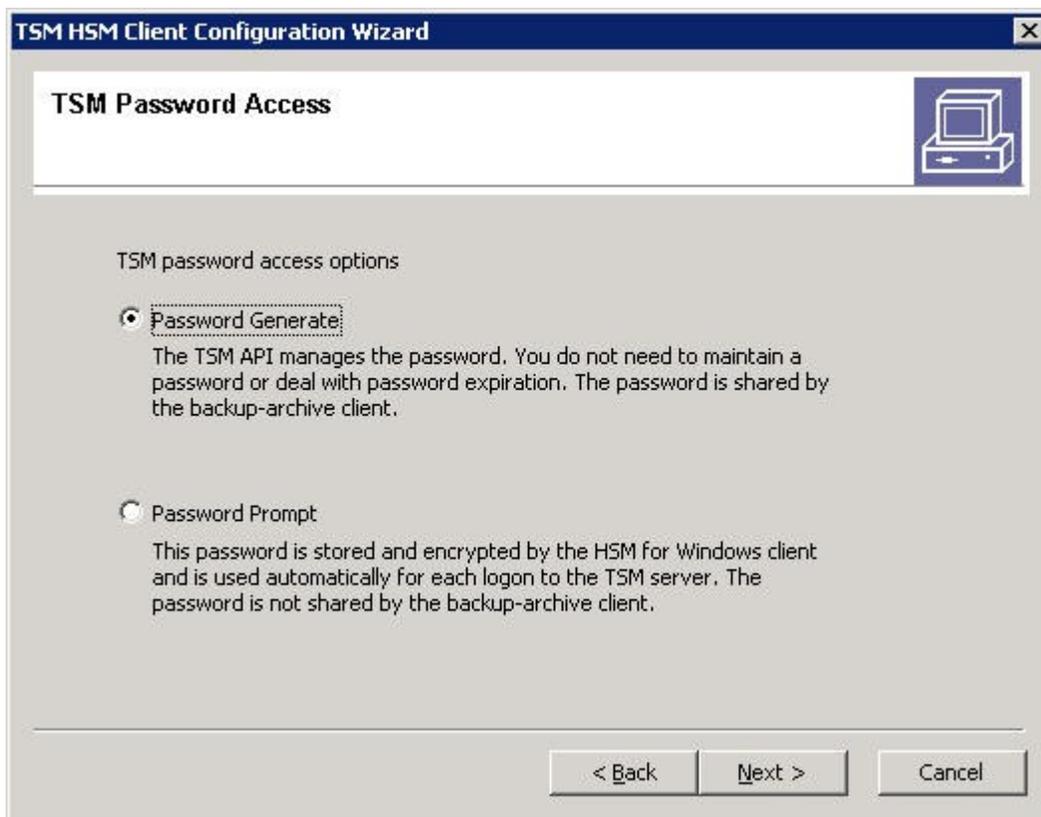


Figure 4. Configuration: TSM Password Access window

5. In the Set or Change Password window, type the password for the node. The password was created when the node was registered with the Tivoli Storage Manager server. You can change the password in this panel. Click **Next**.

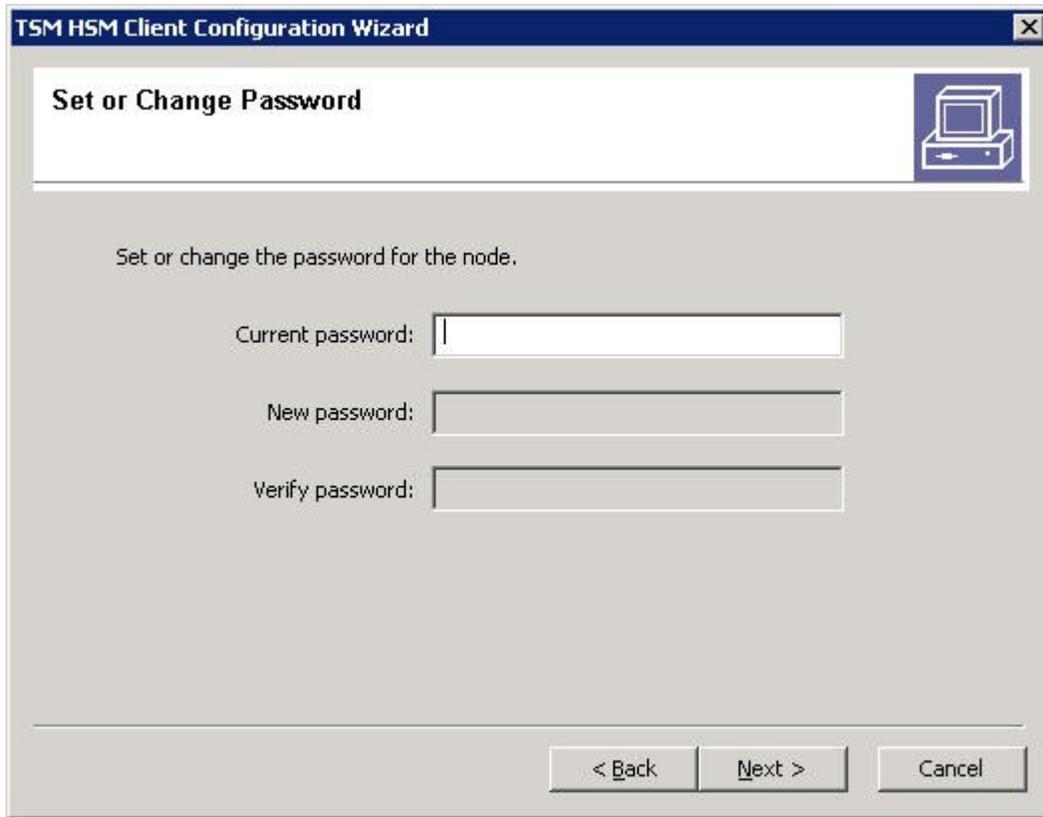


Figure 5. Configuration: Set or Change Password window

6. In the TSM Server Connection window, verify the values that you configured in the previous windows. Click **Apply**.

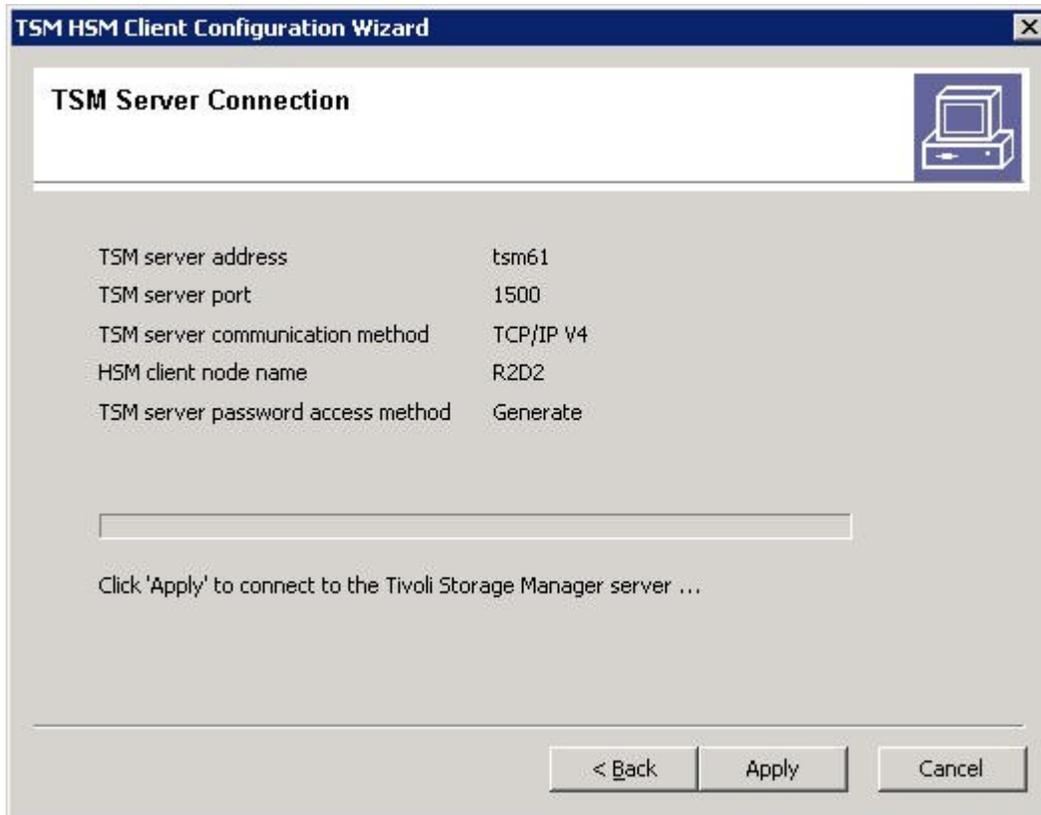


Figure 6. Configuration: TSM Server Connection window

7. In the TSM Server Management Class window, select the management class that is the default when you create a migration job or configuration threshold migration. You can specify other management classes when you create or start migration jobs and configure threshold migrations. Information at the bottom of the window indicates the suitability of the management class for archived migration copies. Click **Next**.

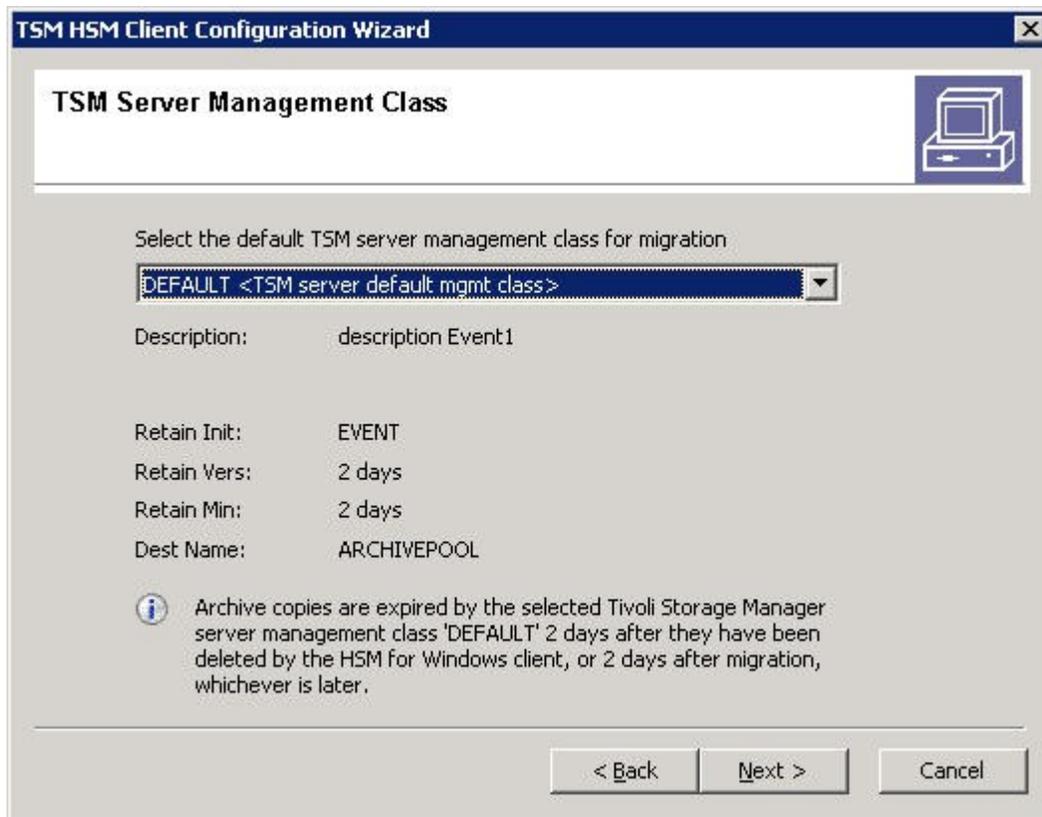


Figure 7. Configuration: TSM Server Management Class window

8. In the Backup Before Migration window, configure whether files are by default backed up before they are migrated. If you choose to back up files before migration, select an options file for the backup. If this option is cleared, the default when creating a migration job or configuring threshold migration is not to back up before migration. The setting can be changed for each migration job and for threshold migration on each volume. Click **Next**.

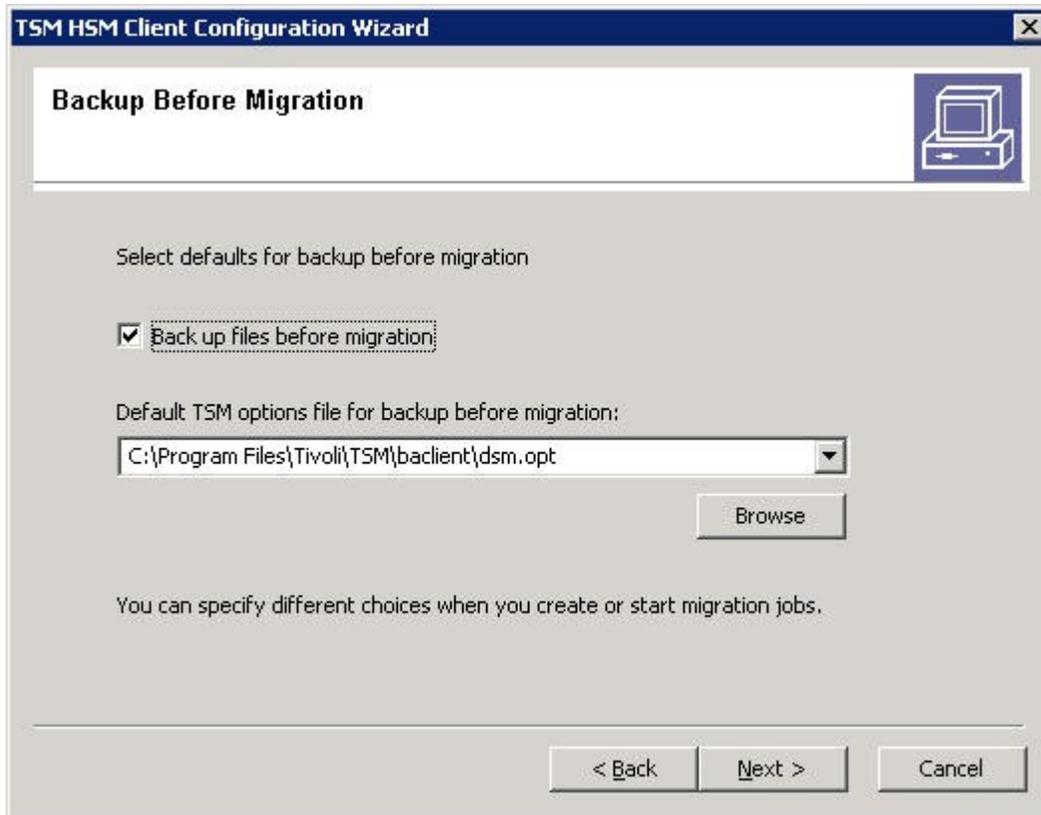


Figure 8. Configuration: Backup Before Migration window

9. Optional: If no file space has been registered, the Initial File Space Registration window is displayed. Enter the name of the file space that will be used as the default, to store migrated files from your client node on the Tivoli Storage Manager server. The file space will be generated automatically. If you want to create a file space later, select the **Skip file space creation** check box. Click **Next**.

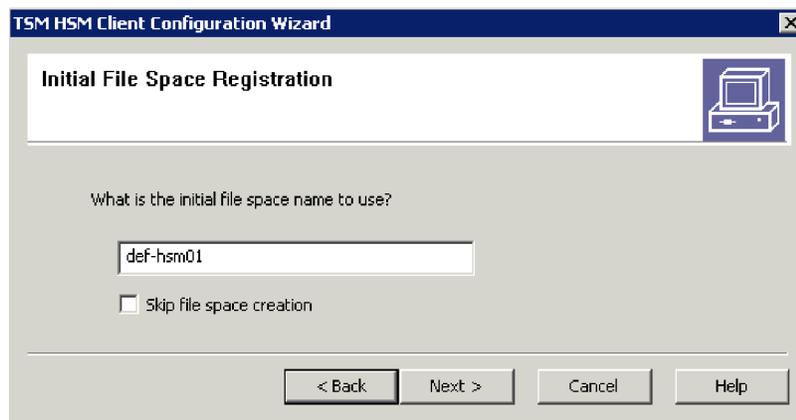


Figure 9. Configuration: Initial File Space Registration window

10. If the computer is a node of a cluster, the Cluster Configuration window is displayed. You must register the cluster target and the agent to the Tivoli Storage Manager server. You must define the proxy node relationship with the command that is indicated in the panel.

Click Next.

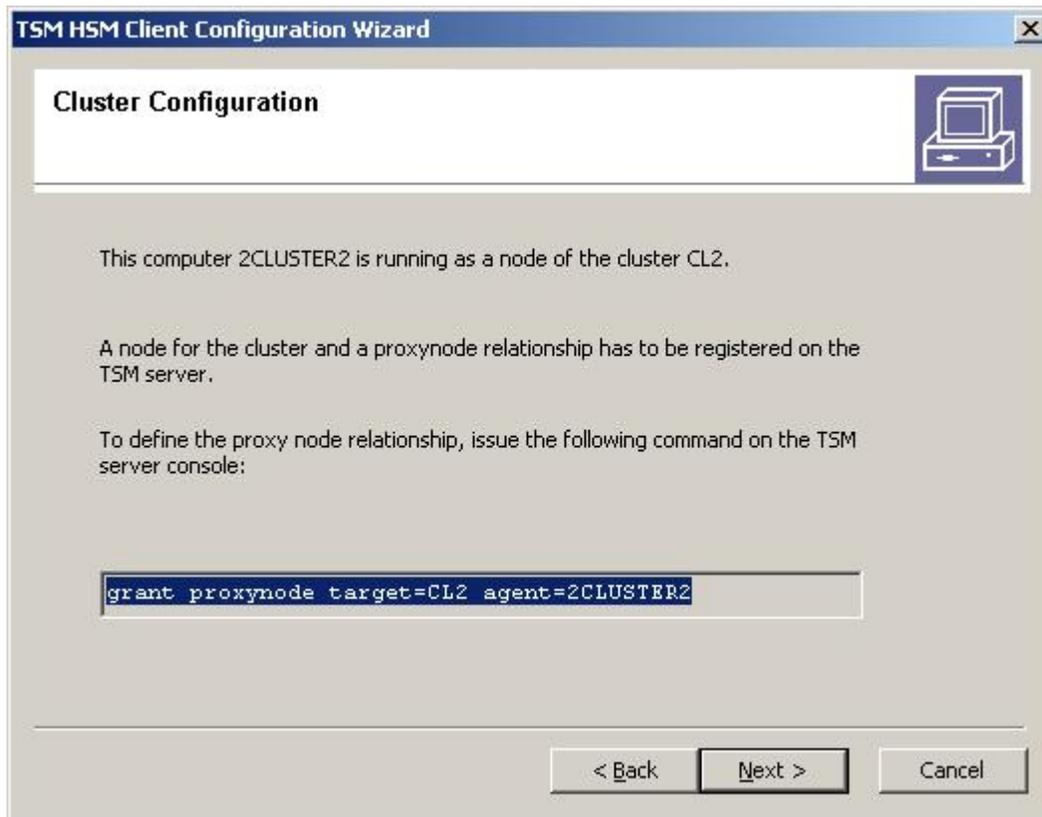


Figure 10. Configuration: Cluster Configuration

11. Confirm the settings in the Completing the TSM HSM Configuration Wizard window. If all options are correct, click **Finish**. If you need to make corrections click **Back**.



Figure 11. Configuration: Completing the TSM HSM Configuration Wizard window

When the HSM for Windows client connects successfully to the Tivoli Storage Manager server you can configure migration jobs, threshold migration, and reconciliation.

**Related concepts**

“Migration jobs” on page 35

“Threshold migration” on page 57

“Reconciliation” on page 76

“Configuring the retention period of migration copies”

**Related tasks**

“Configuring a new file space” on page 26

**Related reference**

“Backing up files before migrating them” on page 68

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## Configuring the retention period of migration copies

You can control the period for which migration copies are stored in Tivoli Storage Manager storage. If you accept the installed-default data management policy, migration copies can be deleted from Tivoli Storage Manager storage in one year.

Files that are migrated or archived by HSM for Windows client are stored as migration copies on a Tivoli Storage Manager server in an HSM pool. When migration copies are created in the HSM pool, they are bound to a management class. The migration copies are retained according to the policy specified in the archive copy group of the management class and the results of reconciliation. If the retention period is too short, Tivoli Storage Manager can delete the migration

copies on the Tivoli Storage Manager server and leave orphan stubs on the local file system. In this case, the migrated files cannot be recalled, and must be restored from backup copies.

If you do not specify a management class for your migration copies, they are bound to the default management class. The default policy values in the archive copy group of the standard management class retain migration copies for only one year.

If the default management class has no archive copy group, the migration copies are retained according to the **ARCHREtention** value defined for the domain.

The archive copy group specifies three attributes that determine the period that migration copies can be retained on the Tivoli Storage Manager server.

- **RETVer** determines the number of days to retain a migration copy.
- **RETInit** determines when the **RETVer** attribute is applied.

If **RETInit=Event**, the **RETVer** attribute applies when a HSM for Windows client reconciliation process determines that a migration copy is no longer needed. Migration copies are retained like this:

1. A stub is deleted from the file system.
2. Reconciliation determines that the migration copy on the Tivoli Storage Manager server is no longer needed. Reconciliation sends an event notice to the Tivoli Storage Manager server.
3. When the Tivoli Storage Manager server receives the event notice from the reconciliation process, the retention period specified by **RETVer** begins.
4. When the retention period specified by **RETVer** ends, the Tivoli Storage Manager server marks the file for deletion.
5. When the Tivoli Storage Manager server runs an expiration process, the migration copy is deleted from the Tivoli Storage Manager server.

If **RETInit=CREATION**, the **RETVer** attribute applies when a migration copy is created. If the **RETVer** period expires before a stub is deleted, Tivoli Storage Manager server deletes the migration copy. This leaves an orphan stub on the file system. If a stub is deleted before the **RETVer** period expires, a migration copy is retained like this:

1. A stub is deleted from the file system.
2. Reconciliation determines that the migration copy on the Tivoli Storage Manager server is no longer needed. Reconciliation sends a deletion notice to the Tivoli Storage Manager server.
3. When the Tivoli Storage Manager server receives the deletion notice from the reconciliation process, the Tivoli Storage Manager server immediately marks the migration copy for deletion.
4. When the Tivoli Storage Manager server runs an expiration process, the migration copy is deleted from the Tivoli Storage Manager server.

After a copy group is defined, the **RETInit** value cannot be updated.

- **RETMin** determines the minimum period to retain a migration copy after it is created. This attribute applies only when **RETVer=Event**.

Choose a management class with an archive copy group that meets your data retention needs.

When you configure the connection between the HSM for Windows client and the Tivoli Storage Manager server, you can specify a management class. This

management class becomes the default management class for new migration jobs and new threshold migration configurations. You can specify a different management class for migration when you configure a job or threshold migration, and when you start a migration using `dsmc1c.exe`. The management class that you specify when you configure a job or threshold migration overrides the default management class for migration. The management class that you specify when you start a migration using `dsmc1c.exe` overrides the configured management class for migration.

Jobs and threshold migration that were configured prior to version 6.1.3 did not specify a management class, and they used the default management class for the policy set. Those jobs and threshold migration continue to use the default management class for the policy set until you reconfigure them. Note that the default management class for the policy set can be the same as the default management class for new migration jobs and threshold configuration, but is not necessarily the same.

**Related information:**

For guidelines on implementing policies for client data, see the *Tivoli Storage Manager Administrator's Guide*.

For descriptions of commands to implement policy, see the *Tivoli Storage Manager Administrator's Reference*.

## **HSM for Windows client earlier than version 6.1.3: Configuring the default management class**

HSM for Windows client earlier than version 6.1.3 cannot specify the management class for migration copies. But you can configure the default management class to retain migration copies as long as you need.

Files migrated with HSM for Windows client earlier than version 6.1.3 are bound to the Tivoli Storage Manager default management class. The default retention period specified by the archive copy group of the standard management class is 365 days. With the standard management class, migration copies are deleted from Tivoli Storage Manager storage after 365 days.

To keep migration copies in Tivoli Storage Manager storage for an unlimited time, verify that the archive copy group of the default management class specifies `RETver=NOLim`. Migration copies that are so retained can be deleted from Tivoli Storage Manager storage by a reconciliation process that determines that the migration copy is no longer needed.

**Related information:**

For guidelines on implementing policies for client data, see the *Tivoli Storage Manager Administrator's Guide*.

For descriptions of commands to implement policy, see the *Tivoli Storage Manager Administrator's Reference*.

**Related concepts**

“Changing the retention period of migration copies” on page 25

## Changing the retention period of migration copies

You can change the retention period of migration copies that are stored on a Tivoli Storage Manager server.

When files are migrated or archived by HSM for Windows client, they are bound to a management class. The retention period of migration copies are determined by the archive copy group settings of that management class. To change the retention period of the migration copies, you must change the archive copy group settings.

There are several ways you can change archive copy group settings. The simplest change is to update the archive copy group settings of the management class that is currently bound to the migration copies. Although the change is simple, the change affects all archive copies that are bound to this management class. This can include copies of files that are archived by the backup-archive client. And you are limited because when you update an archive copy group, you cannot change the **RETInit** value.

A more complex change involves creating a new domain for HSM for Windows client migration copies. Tivoli Storage Manager policy allows many ways to change the archive copy group settings, and you can choose the option that works best for your business. Several options are suggested below. These suggestions assume that migration copies are currently bound to the default management class. This would be the case for migration copies created by HSM for Windows client earlier than version 6.1.2. These suggestions can be modified to account for migration copies that are not currently bound to the default management class.

### **Define a new policy domain that isolates the HSM for Windows client from other client nodes.**

Define a new policy domain just for the HSM for Windows client. Define a policy set for the new domain. Define a new management class with an archive copy group that specifies an appropriate retention period for migration copies. Assign the new management class as the default for the new policy domain and policy set. Validate and activate the policy set. Update the HSM for Windows client node to become a member of the new policy domain.

As a result, all migration and archive copies on the Tivoli Storage Manager server that are associated with the HSM for Windows client node and that were previously bound to the old default management class are rebound to the new default management class.

If the HSM for Windows client node name is the same as the backup-archive client node name, this change can also affect the archive copies created by the backup-archive client.

This solution works for all versions.

### **Define a new default management class for the existing domain**

Define a new management class with an archive copy group that specifies an appropriate retention period for migration copies. Assign the new management class as the default for the existing policy domain and policy set.

As a result, all migration and archive copies on the Tivoli Storage Manager server that are associated with the existing policy domain and that were previously bound to the old default management class are rebound to the new default management class. This change can affect the migration and archive copies of all nodes that are members of the policy domain.

This solution also works for HSM for Windows client versions earlier than 6.1.2, which cannot specify a management class for migration copies.

#### **Recall and remigrate files with a new management class**

Define a new management class with an archive copy group that specifies an appropriate retention period for migration copies. The new management class does not have to be the default for the active policy set. Recall all migrated files. Delete the existing file spaces. Migrate the files again, and specify the new management class.

As a result, the migration copies on the Tivoli Storage Manager server that were created by the HSM for Windows client are bound to the new management class. This change does not affect the archive copies that were created by the backup-archive client. This process can cause significant network traffic and use significant local storage resources.

#### **Related information:**

For guidelines on implementing policies for client data, see the *Tivoli Storage Manager Administrator's Guide*.

For descriptions of commands to implement policy, see the *Tivoli Storage Manager Administrator's Reference*.

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## **Configuring a new file space**

You can create new file spaces on the Tivoli Storage Manager server directly from the HSM for Windows client GUI.

Use the steps in this task to create a new file space:

1. To create a new file space select **Tools** → **Create New File Space**.
2. Enter a name for the new file space.
3. Select the **OK** button.

---

## **Configuring regional settings**

Use the **Regional Settings** tab of the Preferences window to set your language, time format, date format, number format, and define if you want log, listing, and trace files in Unicode.

**Note:** You must restart the HSM for Windows client GUI for any of the settings in Figure 12 on page 27 changes to take effect.

1. Select **Tools** → **Preferences** and then select the Regional Settings tab.
2. Make changes as needed and select the **OK** button.

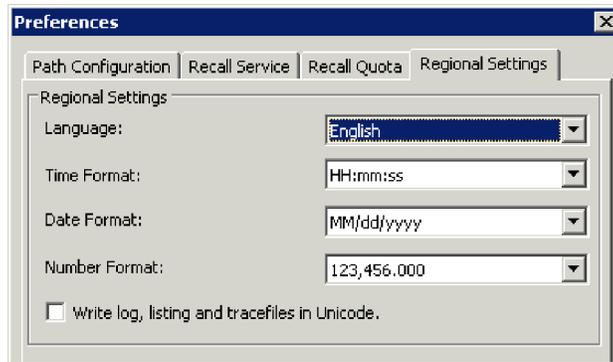


Figure 12. Preferences windows for regional and Unicode settings

## HSM advanced parameters and file location settings

Although most parameters' default settings are appropriate, you can customize some settings.

Table 6 displays the advanced parameters. For all parameters except the *Timeout* parameter, the Parameter name column shows you the parameter name and Windows registry path from the end of this common path: HKLM\SOFTWARE\IBM\ADSM\CurrentVersion\HsmClient\. The Timeout parameter's full path is listed in the Parameter Name column.

**Note:** Change these parameters only on technical advice from IBM.

Table 6. Advanced parameters descriptions

Parameter name	description	Default
dsmcl\FileAttributesFilter	Configures the registry to prevent files with certain attributes from migration. Affects dsmcl.exe.	6 - hidden and system
dsmgui\FileAttributesFilter	Configures the registry to prevent files with certain attributes from migration. Affects dsmgui.exe.	6 - hidden and system
hsmmonitor\FileAttributesFilter	Configures the registry to prevent files with certain attributes from migration. Affects hsmmonitor.exe.	6 - hidden and system
dsmcl\DirectoryAttributesFilter	Configures folders with certain attributes that are generally not entered for selecting files for migration. Affects dsmcl.exe.	6 - hidden and system
dsmgui\DirectoryAttributesFilter	Configures folders with certain attributes that are generally not entered for selecting files for migration. Affects dsmgui.exe.	6 - hidden and system
hsmmonitor\DirectoryAttributesFilter	Configures folders with certain attributes that are generally not entered for selecting files for migration. Affects hsmmonitor.exe..	6 - hidden and system

## File location preferences

Use the HSM for Windows client GUI Preferences window's Path Configuration tab to define the location of the HSM for Windows client configuration file, migration job files, and temporary files.

Access the Preferences Path Configuration tab by selecting HSM for Windows client GUI. Select **Tools** → **Preferences** → **Path Configuration**.

Figure 13 contains three fields where you select the path of the three different file types: configuration, migration, and temporary. Click **Browse** to select an existing directory.

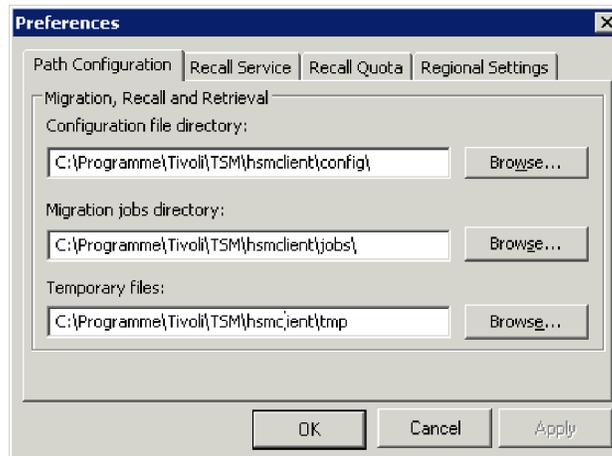


Figure 13. Trace Preferences->Path Configuration window

## File recall quotas

You can create file recall quotas to limit the number of possible file recalls for a specific time period. You can use a system-wide (Default Quota) quota or create quotas for particular Windows (local or domain) users and groups.

When a file recall quota is exceeded, a subsequent file recall request is rejected, and the HSM for Windows client returns the code `STATUS_FILE_IS_OFFLINE`. The actual behavior of the calling application depends on the response of the calling application to this return code. Quotas only affect the recall of migrated files from users accessing stub files. Quotas do not have any influence on retrieving files with the HSM for Windows client GUI.

Because some backup and archive operations recall files, too low of a file recall quota might not allow you to back up or archive all files.

Group and user quotas can be defined for local users and groups as well as for Active Directory (Domain) users and groups (domain local groups). Quotas currently cannot be defined for domain global groups.

Group quotas define the allowed number of recalls in a time unit for user groups. If a user is a member of two or more groups and has no defined user quota, the group with the least restrictive quota will be applied for this user.

User quotas define the allowed number of recalls in a time unit for an individual user. If a user quota is defined, only this quota is applied for the user. Default and group quotas do not have any influence in this case.

Quotas can be updated at any time using the HSM GUI. The update is effective immediately without restarting the HSM for Windows client.

**Note:**

- The default quota defines the general number of possible file recalls in a time period for group and users for which no specific quota has been defined.
- The quota configuration is stored in `..\<hsmclient_installdir>\config\quota.cfg`. After changing quotas, a backup of `quota.cfg` is saved in `..\<hsmclient_installdir>\config\backup\quota.cfg`.

### Viewing file recall quotas

Use the HSM for Windows client GUI to view define quotas.

1. Select **Tools** → **Quotas** → **View Quotas** to display the Users and defined quotas window.
2. Use the **Look in** control to choose whether you want to view quotas for local or domain users. You can also filter the view by entering a name or a part of a name and pressing the **Filter** button.
3. You can now scroll the list and view quotas. The second column displays the type of quota, and the third column displays the quota.

### Defining file recall quotas

Use the HSM for Windows client GUI to define the default, user, and group quotas.

1. Select **Tools** → **Quotas** → **Define Quotas** to display the Recall Quotas window.

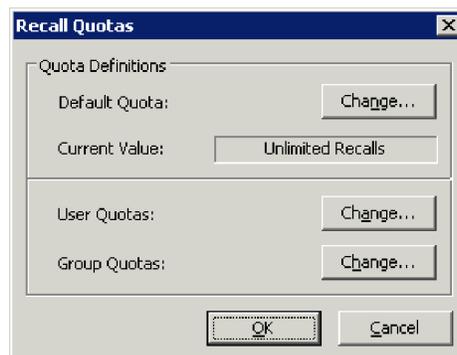


Figure 14. Recall Quotas window

2. To change the default quota using the System Default Quota window, select the **Change** button that is to the right of **Default Quota**.

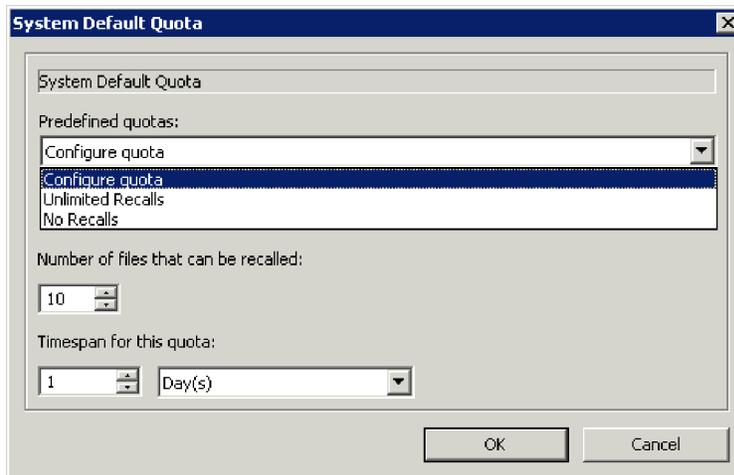


Figure 15. System Default Quota window

- a. If you want to define this quota as **Unlimited Recalls** or **No Recalls**, select one of those options in the **Predefined quotas** list and then select the **OK** button.
  - b. If you want to define a time span for this quota, select the **Configure quota** option in the **Predefined quotas** list, enter a numeric value in the **Number of files that can be recalled** box, select values for the **Timespan for this quota** values, and select the **OK** button. Figure 15 sets a default quota of one file per day. You can also choose hours, minutes, and seconds.
3. To change a user quota click the **Change** button that is to the right of **User Quota** (see Figure 14 on page 29).
    - a. In the User Quotas window, use the **Look in** control to choose whether you want to assign quotas to local or domain users. You can filter users by entering a name or a part of a name and pressing the **Filter** button.

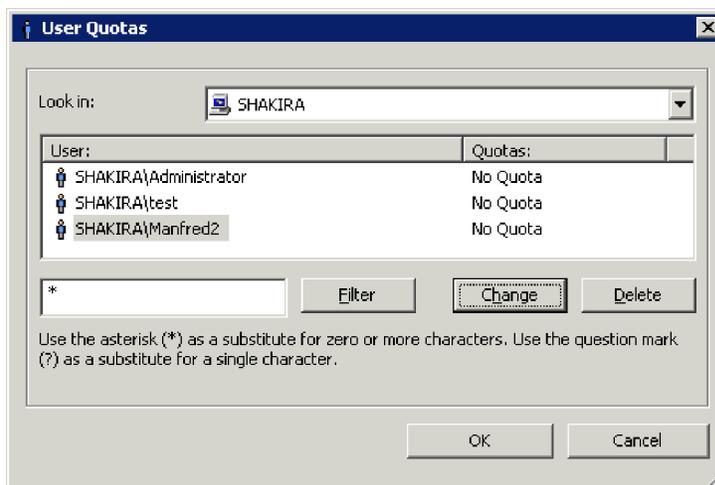


Figure 16. User Quotas window

- b. Select the user for whom you want to define a user quota and click the **Change** button. After selecting a user, you can also delete their defined quota by clicking the **Delete** button.

- c. Follow the substeps in step 2 on page 29 to define the quota for the selected user.
4. To define a group quota, click the **Change** button that is to the right of **Group Quotas** (see Figure 14 on page 29).
  - a. In the Group Quota window, use the **Look in** control to choose whether you want to assign quotas to local or domain groups. You can filter groups by entering a name or a part of a name and pressing the **Filter** button.

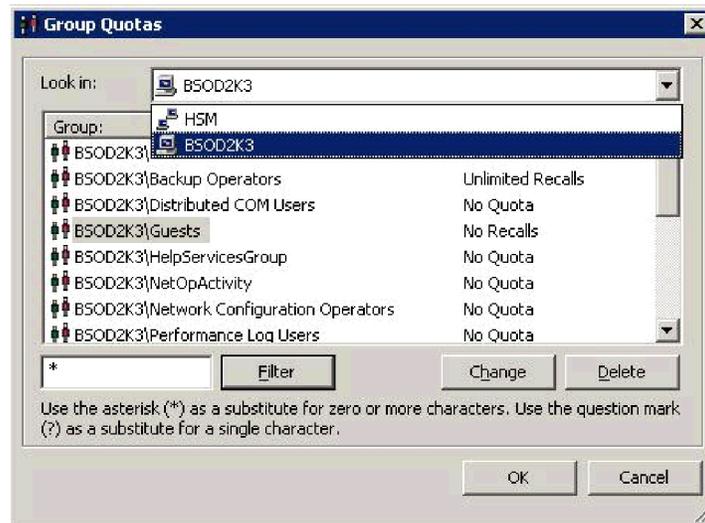


Figure 17. Group Quotas window

- b. Select the group which you want to define a user quota and click the **Change** button. After selecting a group, you can also delete their defined quota by clicking the **Delete** button.
- c. Follow the sub-steps in step 2 on page 29 to define the quota for the selected group.

### Recall quota entries deletion interval

Use the HSM for Windows client GUI to define the interval that the program uses to delete recall quota entries. These entries are created to track quota allocations.

Access the Recall Service tab of the Preferences window by selecting **Tools** → **Preferences** → **Recall Quota**.

Use the **Minute(s)** box to define the number of minutes for the interval the recall service uses to delete expired quota entries. Changing this value to a smaller interval than the default of sixty minutes might give you some hard disk space gain but at a higher CPU performance. Increasing the value has the contrary effect.



Figure 18. Preferences windows Recall Service tab

## Recall service settings

Use the HSM for Windows client GUI to define the recall service settings (IBM TSM HSM Recall Service).

Access the Recall Service tab of the Preferences window by selecting **Tools** → **Preferences** → **Recall Service**.

Only change the value in the **Thread(s)** box on advice from IBM. This value determines the number of concurrent connections you can have for the recall service. The default is 4 and the maximum is 64.

Use the **Second(s)** box to define the number of seconds after which the recall service closes the connection to the Tivoli Storage Manager server. The default is 600.

**Note:** If a file is recalled from a tape, the connection is reset to ensure the tape is not locked after the recall.

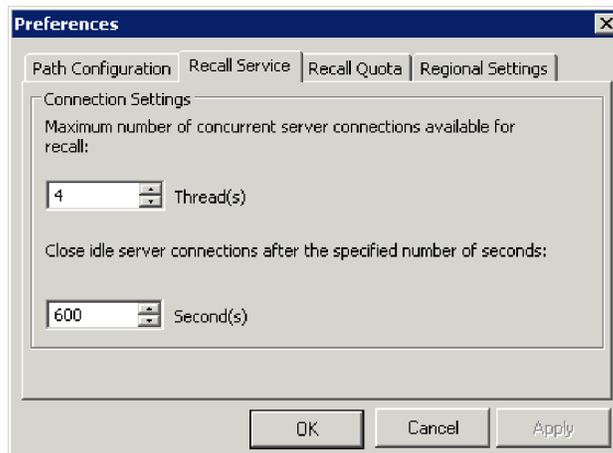


Figure 19. Preferences windows Recall Service tab

## Tracing preferences

HSM for Windows client processing, from both the GUI and the commands, creates several log files, trace files, and listings files.

You can set the logging levels, log file sizes and log file locations in the Trace Preferences window in the HSM for Windows client GUI. You can also set the log levels with HSM for Windows client commands. You cannot set the log file location or the size with HSM for Windows client commands.

In normal production, the defaults log values are sufficient. The default level records warnings and errors and does not record trace-level messages. Increase the logging level only when you need to perform advanced diagnostics. The **Severe** and **Error** logging levels are active by default and cannot be deactivated.

When you change log levels in the **hsmervice** or **hsmmonitor** or **dsmgui** tab, you do not need to restart those programs for those settings to become active. However other changes, such as file location, require a restart for which you will see a message box telling you to restart the client (the HSM for Windows client GUI) or the IBM TSM HSM Recall Service (**hsmervice.exe**), or the IBM TSM HSM Monitor Service (**hsmmonitor.exe**).

There are three types of settings you define for the logs: their recording level, their size, the log file location. To access these settings from the HSM for Windows client GUI, select **Tools** → **Trace Preferences**. Figure 20 contains the trace levels and size settings you can select for each executable file or plug-in in the HSM for Windows client program. The example Figure 20 is for the **dsmgui.exe** executable file, but most other tabs (for example, **dsminfo**, **dsmhsmclc**, and **dsmclc**) are identical. The **Path Configuration** tab is different from these other tabs (see Figure 21 on page 35). Table 7 on page 34 describes each setting.

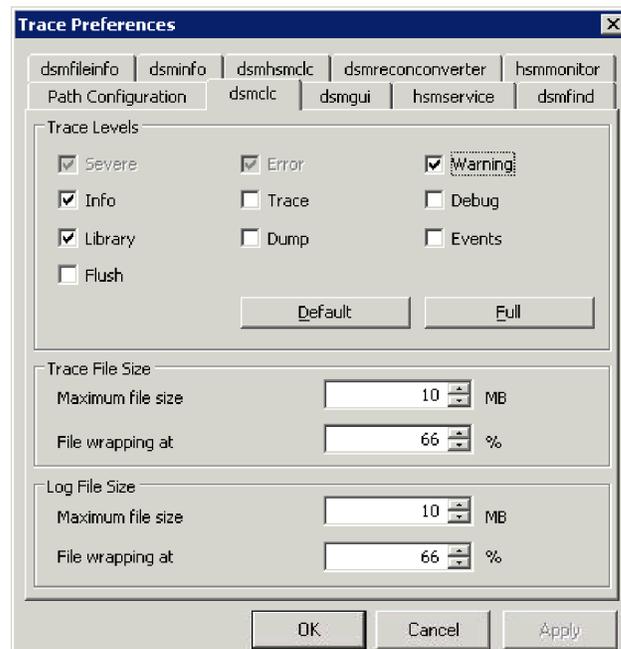


Figure 20. Tracing Preferences window

Table 7. Tracing preferences window field definitions

Field	Description
<b>Trace Levels section</b>	
<b>Severe</b>	Records HSM Windows messages that are categorized as severe.
<b>Error</b>	Records HSM Windows messages that are categorized as errors.
<b>Warning</b>	If checked, records HSM Windows messages that are categorized as warnings.
<b>Info</b>	If checked, records HSM Windows messages that are categorized as information only.
<b>Trace</b>	If checked, turns on the tracing of program events and should be used for advanced diagnostics or for problem analysis.
<b>Debug</b>	If checked, records special debugging information and codes should be used for advanced diagnostics or for problem analysis.
<b>Library</b>	If checked, records specific library information and should be used for advanced diagnostics or for problem analysis.
<b>Dump</b>	If checked, records additional information about issues and should be used for advanced diagnostics or for problem analysis.
<b>Events</b>	If checked, records diagnostic information such as function entries and exits, and so on.
<b>Flush</b>	If checked, records each message to disk before processing continues instead of buffering them. This records all messages one-by-one but may impact system performance, so it should be used for advanced diagnostics.
<b>Default</b>	Returns the settings in the Trace Levels section of this window to their default values.
<b>Full</b>	Returns all available logging and tracing levels.
<b>Trace File Size section</b>	
<b>Maximum file size</b>	Sets a size limit in megabytes for the selected trace file. The default is 10.
<b>File wrapping at</b>	Defines the percentage of the log file that is kept when the <b>Maximum file size</b> value is reached. The default is 66.
<b>Log File Size section</b>	
<b>Maximum file size</b>	Sets a size limit in megabytes for the selected log file. The default is 10.
<b>File wrapping at</b>	Defines the percentage of the log file that is kept when the <b>Maximum file size</b> value is reached. The default is 66.

Figure 21 on page 35 contains three text boxes where you select the path of the three different files: trace, log and listing. Click **Browse** to select an existing directory.

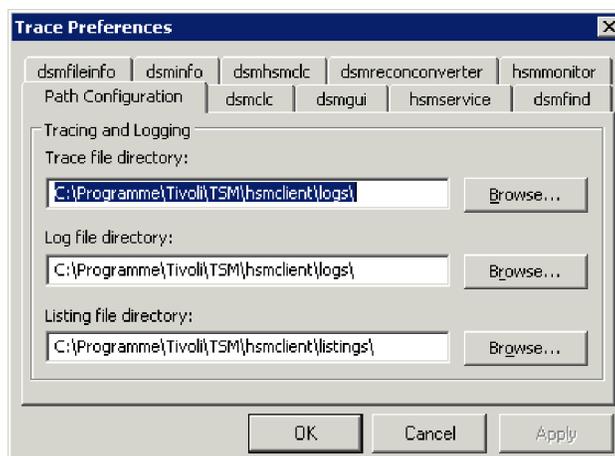


Figure 21. Trace Preferences->Path Configuration window

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## Chapter 4. Managing space with HSM for Windows

You can manage space on Windows file servers by creating and running migration jobs, and by configuring threshold migration.

You can manually retrieve migrated files with the HSM for Windows client or with the Tivoli Storage Manager backup-archive client.

Changes on your file system need to periodically be reconciled with the Tivoli Storage Manager server.

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### Migration jobs

Specify files to migrate and what to do with the original file on the originating file system.

A migration job specifies files to migrate and some migration actions to perform on those files. You can specify the files to migrate using the HSM for Windows client GUI or HSM for Windows client `dsmclt.exe` command.

The HSM for Windows client GUI allows you to browse local NTFS file systems. You can exclude or include parts of the directory structure in a migration job. For each selection, filters can be applied to include or exclude files based on the file type (extension), file size, and various criteria related to the age of a file (creation, modification, last access). Each migration job is stored in an XML structured file (job file). The actual migration can be scheduled using any standard scheduler, or it can be started manually from a Command Prompt window. In addition, the HSM for Windows client administrator can initiate immediate execution of a migration job directly from the HSM for Windows client GUI. It is highly recommended to have a valid backup before migrating any file. This can be ensured by selecting the "backup before migrate" option when you define a migration job in the HSM for Windows client GUI. When a security descriptor is changed on a migrated file on the file server, the next migration job on that file will recall and remigrate the file, so that the security of the file is stored correctly on the Tivoli Storage Manager Server.

When deciding what files to include in a migration job, consider both the frequency of use of the files and their recall times (the time to recall the file from the storage repository). Although most file recall is transparent to users, network bandwidth, storage repository speed, and file size all determine the file recall speed.

#### Related reference

“dsmc.exe” on page 84

## Creating migration jobs

Use the HSM for Windows client GUI to define migration jobs. The core function of migration jobs, and why you have more than one, is to select different file sets to migrate by selecting different include and exclude conditions such as file age, size, subdirectory, and groups on files or directories.

#### Note:

- An HSM for Windows client file name cannot exceed 256 bytes. The path length (the API high-level qualifier) cannot exceed 1024 bytes. A path and file name includes the file server name, the volume, and the directory portion of the full Uniform Naming Convention (UNC) name, for example \\FILESERVER\E:\directory\filename.ext. The Unicode representation of a character can occupy several bytes, so the maximum number of characters that a file name might contain can vary.
- When using the HSM for Windows client GUI, path names can be a maximum of 254 characters only. For path names that exceed 254 characters, you must use **dsmc.exe** from a Command Prompt window.

To complete the following steps to define a migration job, run the HSM for Windows client GUI.

1. Select **Job** → **New Job** or right-click in the window’s white space and select **New Job**.

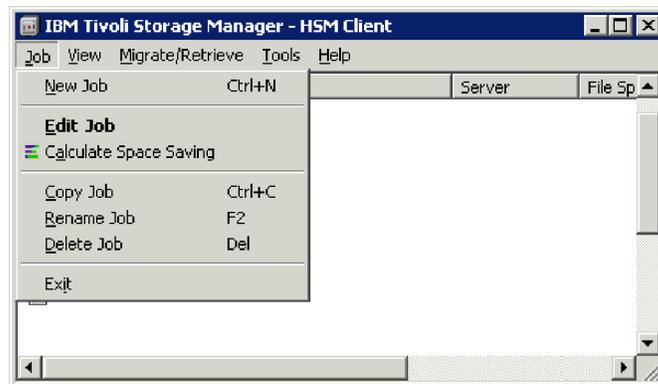


Figure 22. New Job menu selection

2. Name the new job icon to a name of your choice.



Figure 23. New migration job: rename window

3. Double-click the new job icon to display the job creation window.

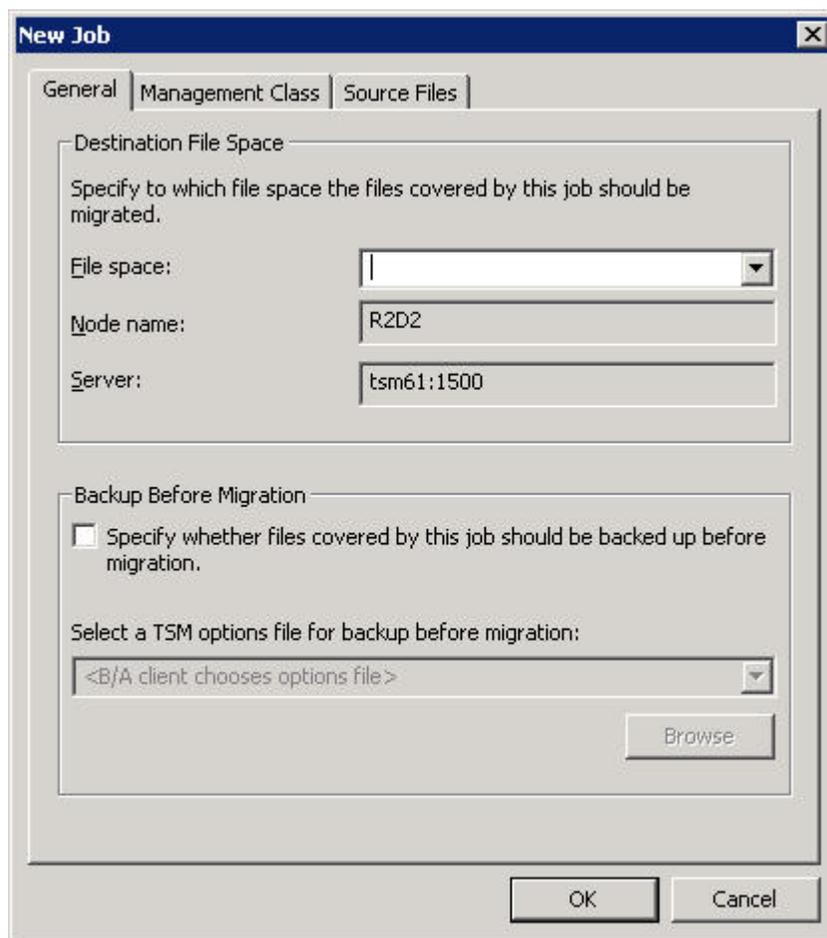


Figure 24. New migration job: General tab

4. In the **General** panel, use the **File Space** menu to select the name of the file space in which you want to store migrated files.
5. In the **Backup before migration** box, you can specify that files must be backed up before they are migrated. If a job specifies a file that has not been backed up, the file is backed up and then it is migrated. If you select this option, you must also indicate an options file for the backup before migration. You can specify an options file, or you can specify that the backup-archive client determines the options file.

6. In the **Management class** panel, select a management class for migrated files. A message at the bottom of the panel indicates the suitability of the management class for retaining the migrated files.

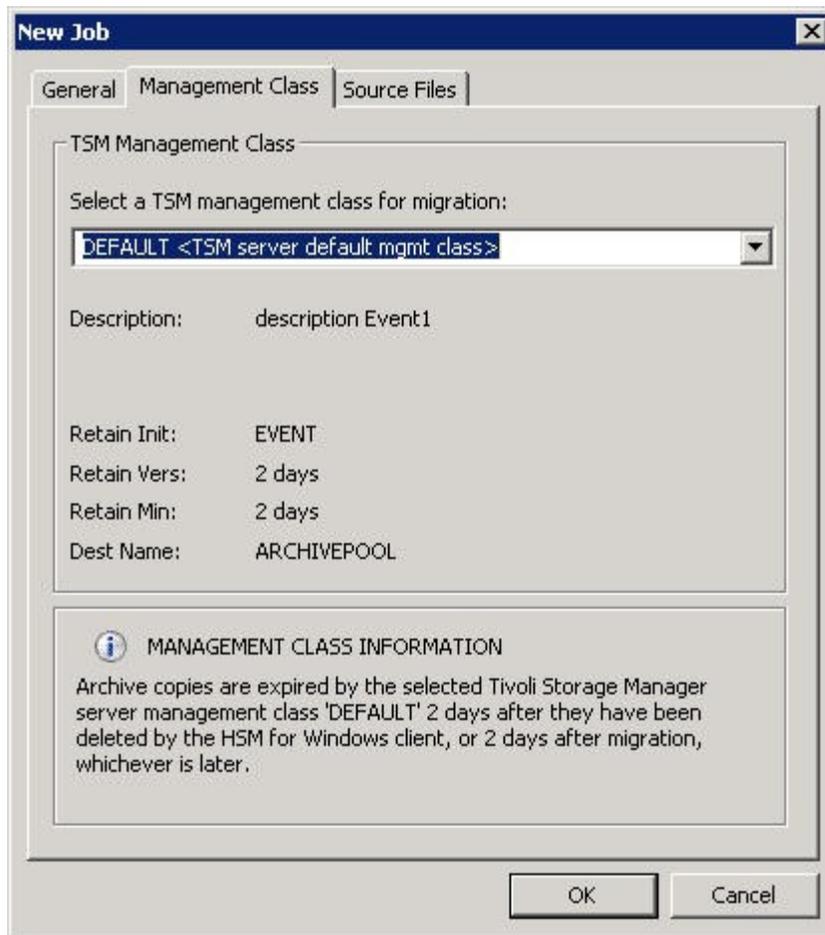


Figure 25. New migration job: Management class tab

7. Select the **Source Files** tab so that you can begin to select files to migrate by files or by directories.

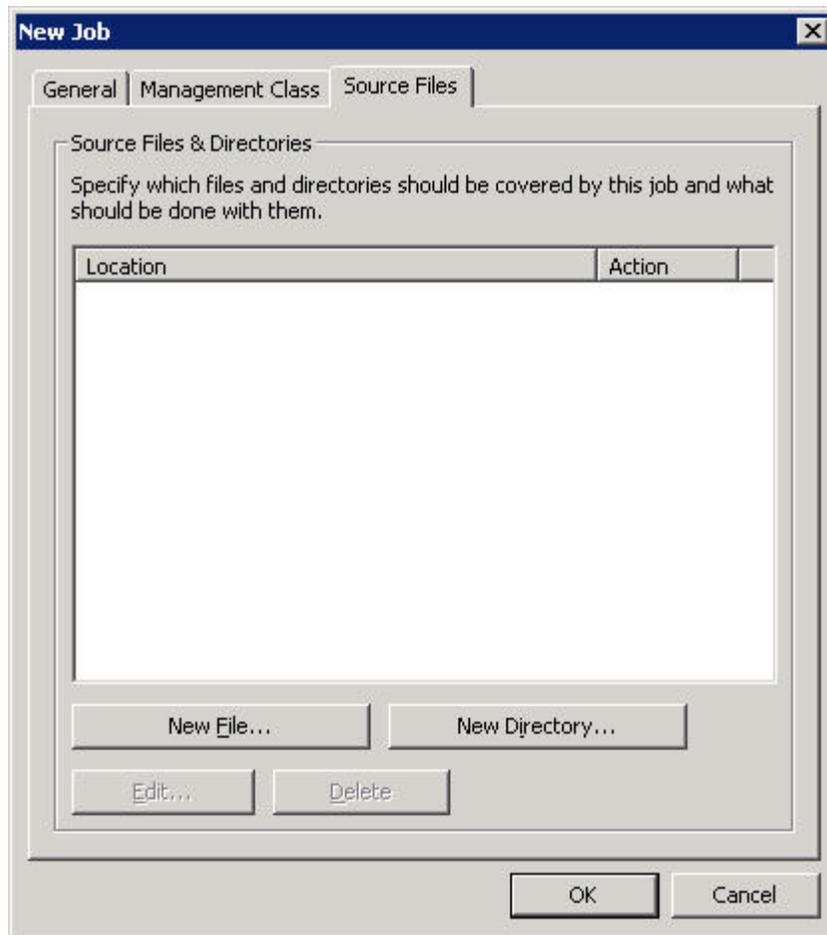


Figure 26. New migration job: Source Files tab

8. To add a new directory, skip to step 9 on page 42. For each file you want to add, follow these substeps:
  - a. Select the Source Files tab's **New File** button.
  - b. Select the **Browse** button. In the Browse for File window, select the drive you want and select **OK**.
  - c. Use the file selection window that displays to drill down to the file you want and select the **OK** button.
  - d. Select a migration action. The default **Replace the file with a shortcut to the file space** option performs a migration and creates a stub file. The **Keep the original file** archives the file, but keeps the original file as is on the local system, while **Delete the file** archives the file and then deletes it from the local system.

**Note:** Do not run reconciliation on the file spaces used for this job, if you select **Delete the file**.

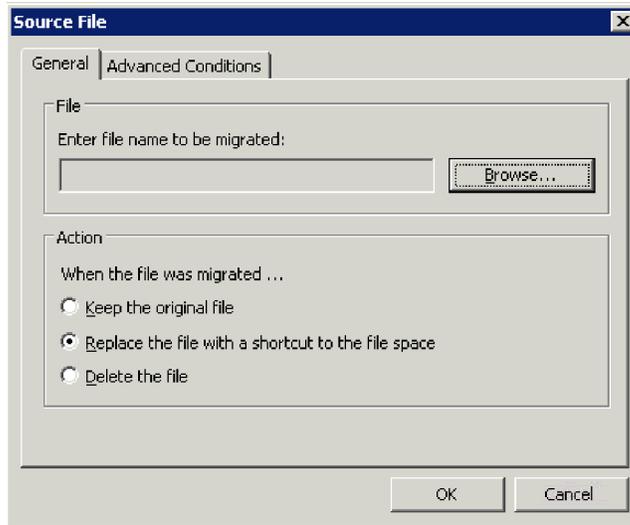


Figure 27. New migration job: File General tab Action (migration) window

- e. Select the Source File window's Advanced Conditions tab and select the **New Include** button. The following steps use the Include Conditions windows as examples, but you can also choose the **New Exclude** button, which follows the same convention. And you can combine include and exclude conditions.

**Note:** The files that are selected for migration with a combination of include and exclude conditions are based not only on the include and exclude condition type and parameters you select, but are also determined by the **order** of the include and exclude statements.

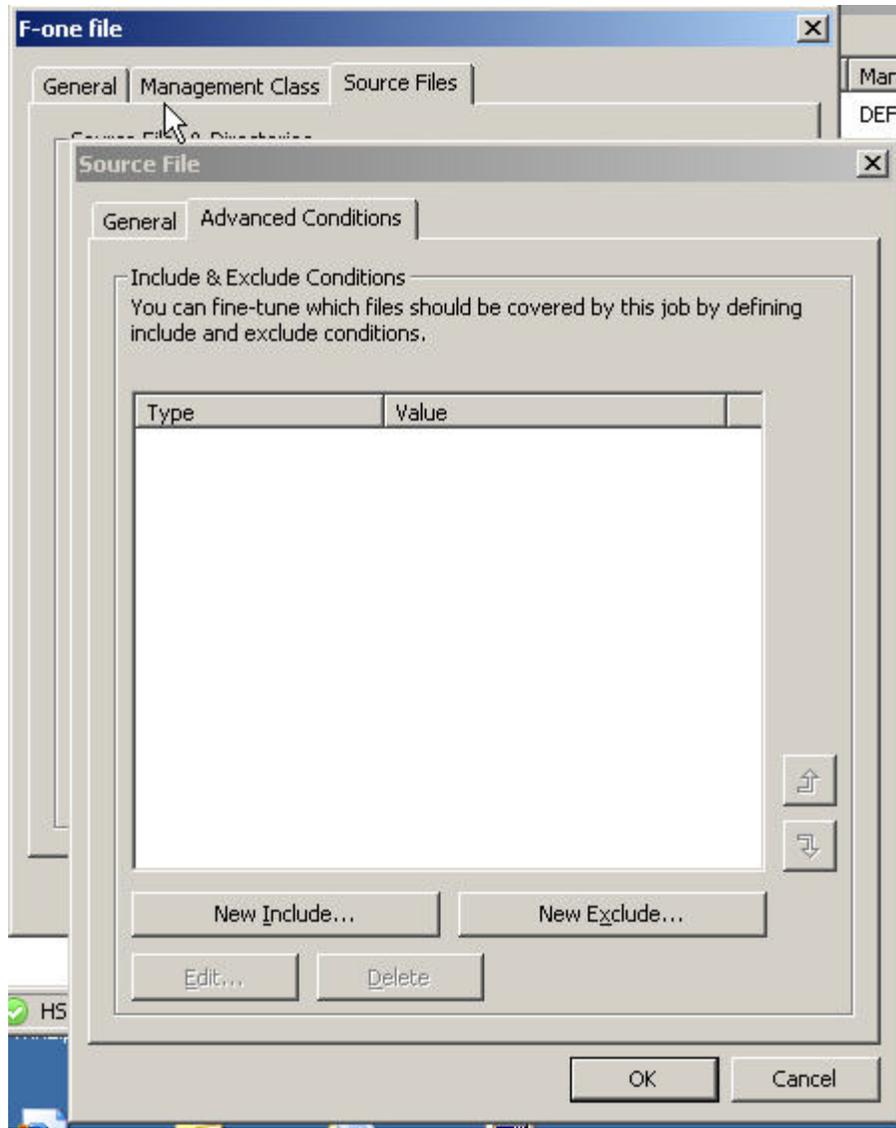


Figure 28. New migration job: Source File Advanced Conditions tab

- f. From the Include Condition window's top drop-down menu choose the type of condition you want for the selected file(s), define the settings for the condition specific settings and select **OK**. Use Figure 29 on page 42 through Figure 31 on page 42 as examples to continue to define your include and exclude conditions.

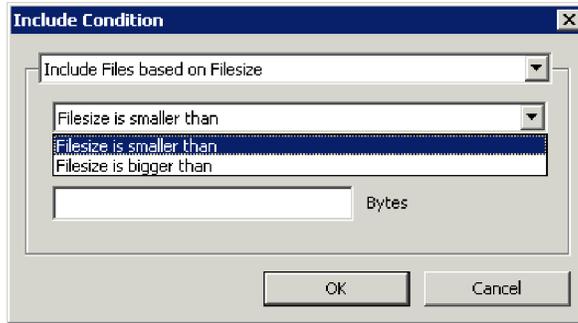


Figure 29. New migration job window to include files based on file size

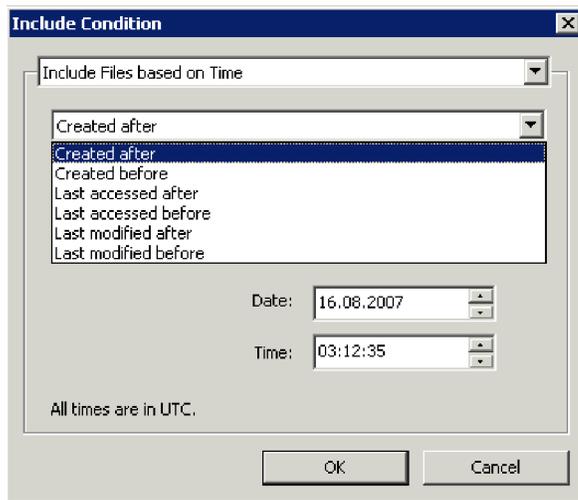


Figure 30. New migration job window to include files by time

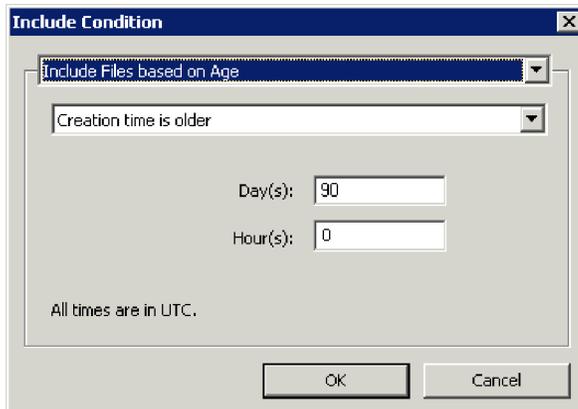


Figure 31. New migration job window to include files based on age

- g. Continue to define include and exclude conditions for the selected file(s) and select **OK** when complete.
9. To add new directories from the New Job window's Source Files tab, select the **New Directory** and then **Browse** buttons. Select the directory you want to add and select the **OK** button to add it. Continue to add as many directories as you need, then follow these substeps to define the details of the migration job:

**Note:** The migration action and include and exclude conditions you apply to a subdirectory-based migration job applies to the individual files in the selected subdirectories.

- a. Select a migration action. The default **Replace the file with a shortcut to the file space** option performs a migration and creates a stub file. The **Keep the original file** archives the file, but keeps the original file as is on the local system, while **Delete the file** archives the file and then deletes it from the local system.

**Note:** Don't run reconciliation on the file spaces used for this job, if you select **Delete the file**.

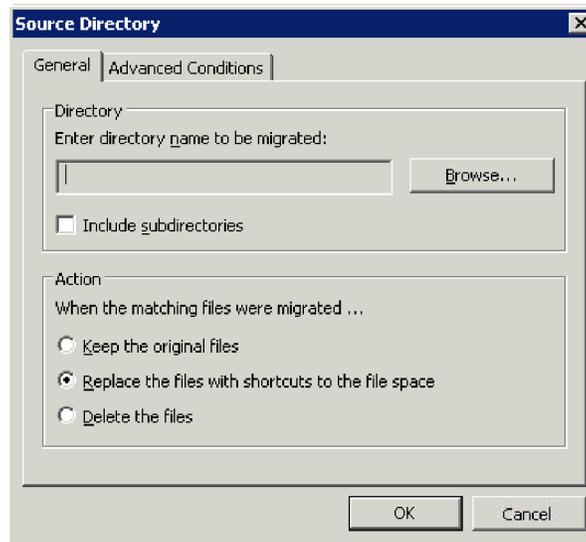


Figure 32. New migration job: Source Directory General tab

- b. Select the **Include Subdirectories** check box if you want to include all files in the selected directory's subdirectories.
- c. Select the Advanced Conditions tab and then, the type of include condition you want to define. Use Figure 33 on page 44 through Figure 38 on page 46 to understand the conditions in each of the include or exclude types.

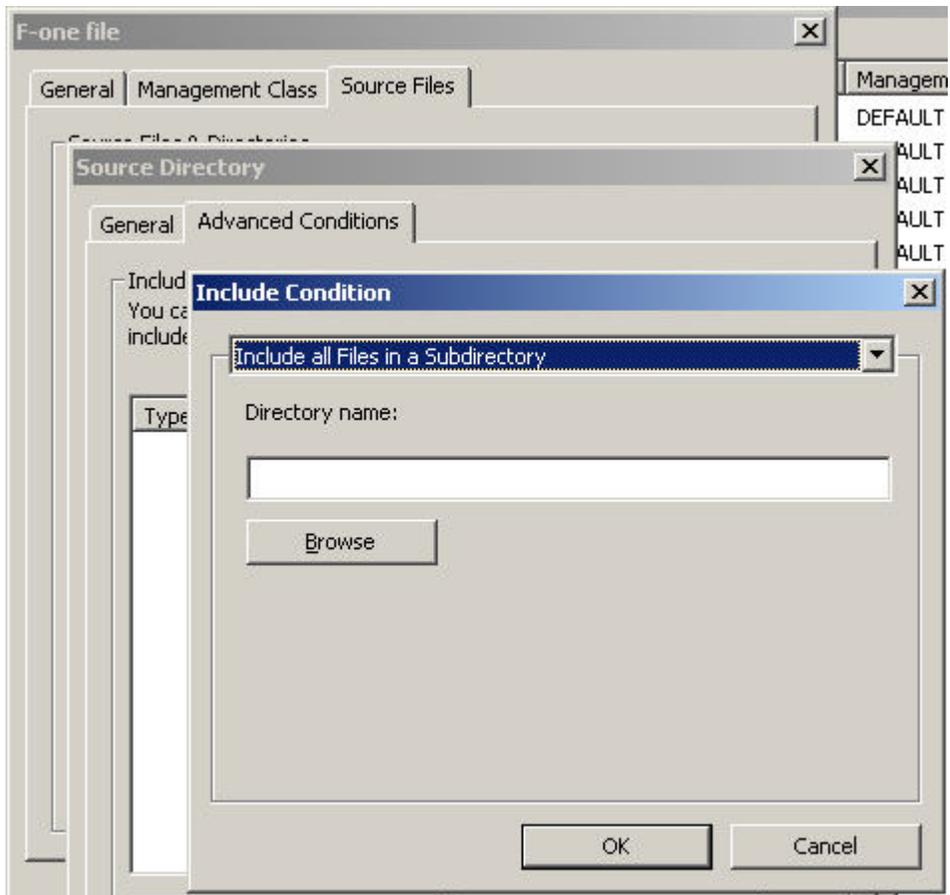


Figure 33. New migration job: Advanced Conditions window Include Condition options

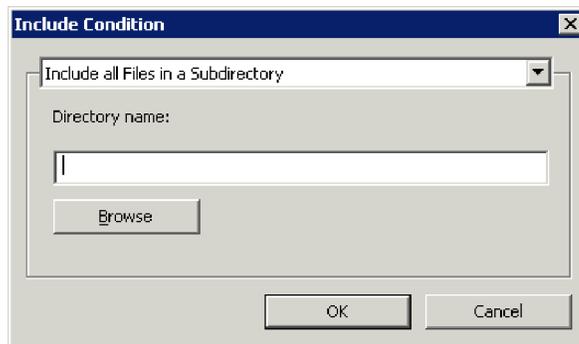


Figure 34. New migration job window to include files by subdirectory

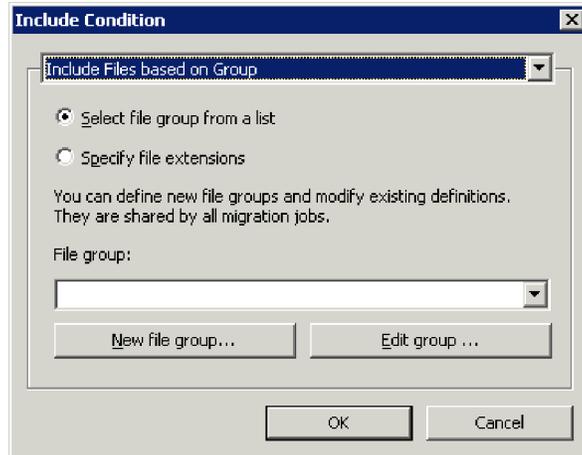


Figure 35. New migration job window to include files by group (by directory)

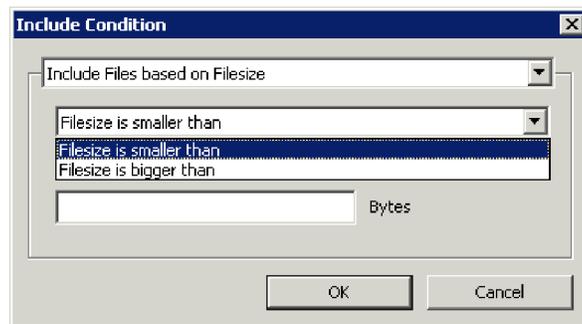


Figure 36. New migration job window to include files based on file size (by directory)

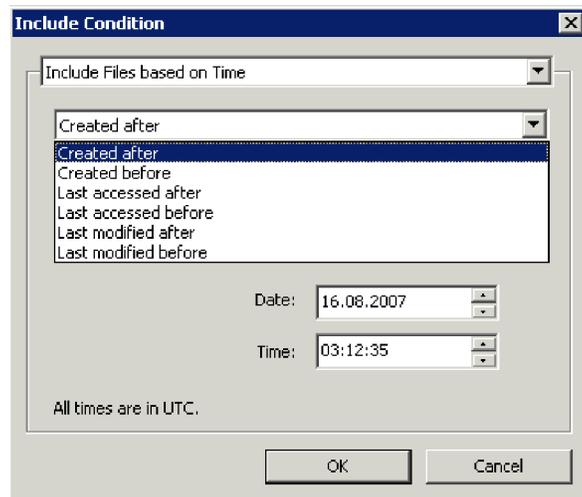


Figure 37. New migration job window to include directories by time (by directory)

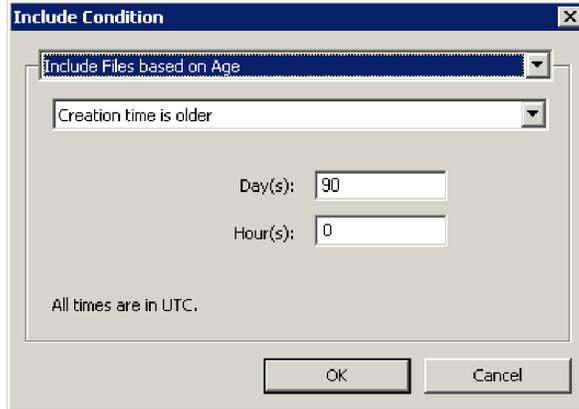


Figure 38. New migration job window to include directories based on age (by directory)

**Related concepts**

“Running migration jobs” on page 53

**Related tasks**

“Configuring a new file space” on page 26

“Creating a new file group” on page 51

“Edit a file group” on page 51

“Calculate a migration job’s space savings” on page 52

**Related reference**

“Examples of including and excluding files”

“Backing up files before migrating them” on page 68

**Examples of including and excluding files**

By reviewing a base set of example files and different include and exclude conditions, you can understand how the HSM Windows client determines which files to include and which to exclude.

**Note:** The following examples are to help you get started with building your own include and exclude conditions. Before relying on a set of these conditions, make sure you test them thoroughly.

Table 8 lists the base file set used in these include and exclude examples. A base file set includes all files in the selected disk, folders, and, if selected, all subfolders. The content of the base set never changes. Include and exclude conditions you define create a subset of the base files that are valid for the selected operation. This valid subset of files is called the “target set”. If there is no advanced condition imposed on the base set, the HSM for Windows client uses a default of “include all”, and thus the base set and the target set are identical.

Table 8. Example base file set

File name	File size
test.log	1.5 GB
test.html	50 K
test.bmp	250 MB
test.pdf	2.7 GB
test2.pdf	11 GB

Table 8. Example base file set (continued)

File name	File size
test.dwg	100 GB

Table 9 summarizes the include and exclude examples. The examples are not cumulative, in that each is a stand-alone example to show you various ways to create the subset of files you need for your file system.

Table 9. Summary of include and exclude examples

Table	Include / exclude condition
Table 10	include all files < 300 MB
Table 11 on page 48	exclude all files < 300 MB
Table 12 on page 48	exclude all files < 30 GB
Table 13 on page 48	include all files < 300 MB include all files with extension = pdf
Table 14 on page 49	exclude all files < 300 MB exclude all files with extension = pdf
Table 15 on page 49	exclude all files < 3 GB include all files with extension = pdf
Table 16 on page 50	include all files with extension = pdf exclude all files < 2 GB
Table 17 on page 50	include all files with extension = html exclude all files with extension = log

## Example 1: one include condition

This example is an include condition that creates a target set of all files that match the include condition. The files that do not match the include condition are excluded. Table 10 shows the target set that results from the following include condition:

```
include all files < 300 MB
```

Table 10. Target set for include condition example 1

Base file set		Target file set	
File name	File size	File name	File size
test.log	1.5 GB		
test.html	50 K	test.html	50 K
test.bmp	250 MB	test.bmp	250 MB
test.pdf	2.7 GB		
test2.pdf	11 GB		
test.dwg	8 GB		

## Example 2: one exclude condition

This example shows an exclude condition. The first exclude condition includes all files into the target set which are not excluded by the condition. Table 11 on page 48 shows the target set that results from the following exclude condition:

```
exclude all files < 300 MB
```

Table 11. Target set for exclude condition example 2

Base file set		Target file set	
File name	File size	File name	File size
test.log	1.5 GB	test.log	1.5 GB
test.html	50 K		
test.bmp	250 MB		
test.pdf	2.7 GB	test.pdf	2.7 GB
test2.pdf	11 GB	test2.pdf	11 GB
test.dwg	8 GB	test.dwg	8 GB

### Example 3: one exclude condition

In this example, Table 12 shows that no file is in the target set from the following exclude condition:

```
exclude all files < 30 GB
```

Table 12. Target set for exclude condition example 3

Base file set		Target file set	
File name	File size	File name	File size
test.log	1.5 GB		
test.html	50 K		
test.bmp	250 MB		
test.pdf	2.7 GB		
test2.pdf	11 GB		
test.dwg	8 GB		

### Example 4: two include conditions

In this example, two include conditions create a target set that includes all files that match either include condition. Files that do not match either include condition are excluded from the target set. Table 13 shows the target set that results from the following include conditions:

```
include all files < 300 MB
include all files with extension = pdf
```

Table 13. Target set for include conditions example 4

Base file set		Target file set	
File name	File size	File name	File size
test.log	1.5 GB		
test.html	50 K	test.html	50 K
test.bmp	250 MB	test.bmp	250 MB
test.pdf	2.7 GB	test.pdf	2.7 GB
test2.pdf	11 GB	test2.pdf	11 GB
test.dwg	8 GB		

## Example 5: two exclude conditions

In this example, two exclude conditions combine to exclude any files that matches either exclude condition. Files that do not match either exclude condition make up the files that are included into the target set. Table 14 shows the target set that results from the following exclude conditions:

```
exclude all files < 300 MB
exclude all files with extension = pdf
```

Table 14. Target set for exclude conditions example 5

Base file set		Target file set after first exclude condition		Final target file set	
File name	File size	File name	File size	File name	File size
test.log	1.5 GB	test.log	1.5 GB	test.log	1.5 GB
test.html	50 K				
test.bmp	250 MB				
test.pdf	2.7 GB	test.pdf	2.7 GB		
test2.pdf	11 GB	test2.pdf	11 GB		
test.dwg	8 GB	test.dwg	8 GB	test.dwg	8 GB

## Example 6a: incorrect mixed include and exclude conditions

This example is an incorrect example to show how mixed conditions are evaluated from the top down. Assume you want a target set of only .pdf files that are larger than 3 GB. Table 15 shows the target set that results from the following include and exclude conditions are not part of the original goal.

```
exclude all files < 3 GB
include all files with extension = pdf
```

Table 15. Incorrect target set for include and exclude conditions in example 6a

Base file set		Final target file set	
File name	File size	File name	File size
test.log	1.5 GB		
test.html	50 K		
test.bmp	250 MB		
test.pdf	2.7 GB	test.pdf	2.7 GB
test2.pdf	11 GB	test2.pdf	11 GB
test.dwg	8 GB	test.dwg	8 GB

## Example 6b: correct mixed include and exclude conditions

The next example is the correct example of obtaining the same goal of a target set of all .pdf files that are greater than 3 GB. With the include condition as the first condition, the top-down ordering creates the target set in Table 16 on page 50.

```
include all files with extension = pdf
exclude all files < 3 GB
```

**Note:** Remember that *any* include condition uses *all* of the base target set regardless of the include or exclude conditions that precede it.

Table 16. Correct target set for include and exclude conditions in example 6b

Base file set		Final target file set	
File name	File size	File name	File size
test.log	1.5 GB		
test.html	50 K		
test.bmp	250 MB		
test.pdf	2.7 GB		
test2.pdf	11 GB	test2.pdf	11 GB
test.dwg	8 GB		

## Example 7: redundant exclude condition

This example illustrates how an exclude condition might be redundant. Table 17 shows the target set that results from the following include and exclude conditions.

```
include all files with extension = html
exclude all files with extension = log
```

Table 17. Example target set for example 7 redundant exclude condition

Base file set		Target file set after first include condition		Final target file set	
File name	File size	File name	File size	File name	File size
test.log	1.5 GB				
test.html	50 K	test.html	50 K	test.html	50 K
test.bmp	250 MB				
test.pdf	2.7 GB				
test2.pdf	11 GB				
test.dwg	8 GB				

## File groups

To facilitate the grouping of files for migration, you can create and edit file groups. You define file groups by file extension types.

You can associate any number of file types to one file group. For example, you can have a group called "Image Files" consisting of these file extensions: bmp, jpg, eps, and gif. You can define another file group called "Office Files" consisting of the following file extensions: doc, xls, and ppt.

### Note:

- A file group can be used in the definition of migration jobs.
- Every file group is global and any changes to the group will change its definition anywhere that group is used or selected.
- You can define a file group, on-the-fly, within other tasks, such as when defining a migration job.

## Creating a new file group

Use these steps to create a new group using the HSM for Windows client GUI.

**Note:** The creation of a new file group is global. The new file type you create here will be included in the lists of types under **Tools** → **File Groups**.

1. Select **Tools** → **File Groups**.
2. Click the **New file group** button.
3. Enter the name of the file group you want to define.



Figure 39. File Group: New file group window

4. Enter the file extensions you want to be included in this file group, separated by spaces as shown in Figure 40.

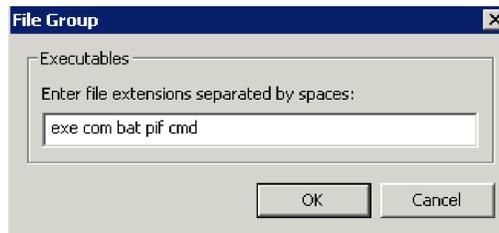


Figure 40. File Group: Executables window

5. Click the **OK** button.

### Related tasks

“Edit a file group”

## Edit a file group

Use these steps to edit an existing file group using the HSM for Windows client GUI.

**Note:** Any changes you make to a file group affect that file group globally, wherever it is used or selected.

1. Select **Tools** → **File Group**.
2. Select the file group you want to edit and select the **Edit** button.

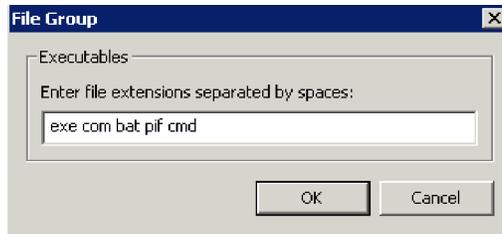


Figure 41. File Group: Executables window (edit)

3. Edit the file extensions you want to be included in this file group.

**Related tasks**

“Creating a new file group” on page 51

## Calculate a migration job’s space savings

Before finalizing a migration job, you can calculate the amount of space that will be saved by a migration without having to run the migration job.

To calculate a migration job’s space savings perform the following:

Right-click on the migration job you want to calculate and select **Calculate Space Saving**. Alternatively, select the job and select **Job** → **Calculate Space Saving**. You see three sets of information in both files count and kilobytes:

- Current Disk Usage
- Disk Usage after Migration
- Free Disk space Gain

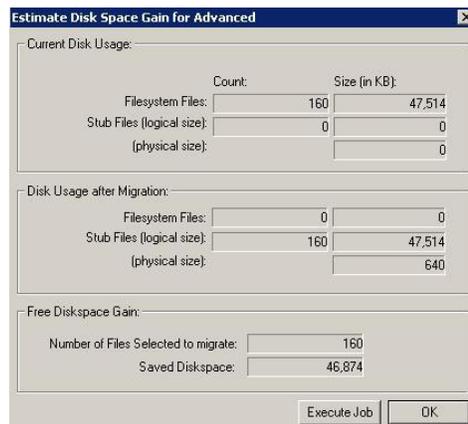


Figure 42. Estimate Disk Space Gain window

## Running migration jobs

Most migrations jobs are run from a standard scheduler. However, there are a few other methods for running migration jobs.

You can run migrations jobs any of the following ways:

- From the HSM for Windows client
- From the Command Prompt window using the `dsmclc` command
- From a scheduled task

### Related reference

“`dsmclc.exe`” on page 84

## Running migration jobs from the HSM for Windows client GUI

After defining migration jobs, you can run them at any time from the HSM for Windows client GUI.

Run migration jobs from the HSM for Windows client GUI by right-clicking on a migration job and selecting **Execute Job Immediately**.

## Viewing migration job results

When a migration job finishes, you can view the results.

When a migration job finishes, an information window displays.



Figure 43. Migration complete window

1. Click **OK** . The **Task List** window opens.

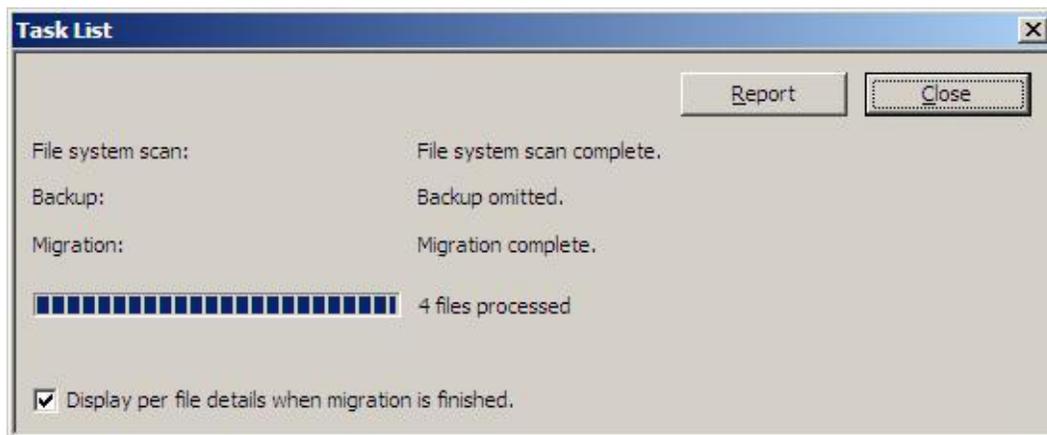


Figure 44. Task List window

2. Check the **Display per file details when migration is finished** box. The detailed result is displayed when you close the **Task List** window.

3. Click **Report**. The **Migration Report** window opens.

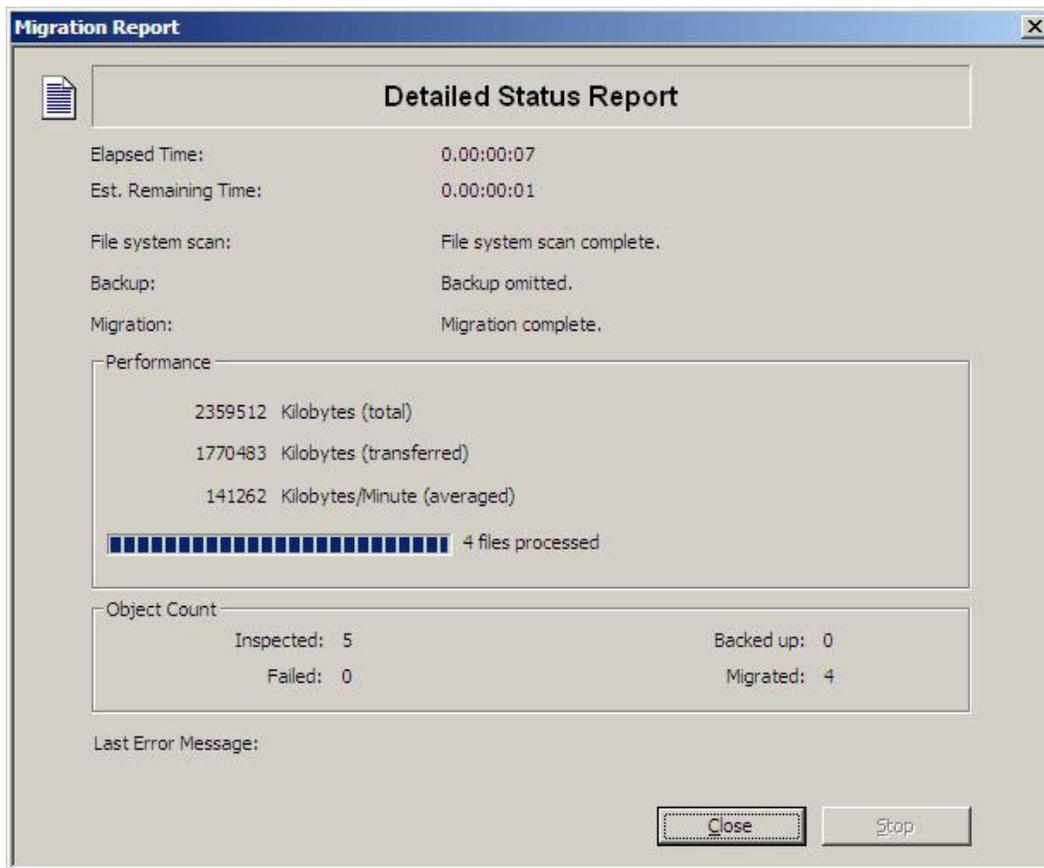


Figure 45. Migration report window

4. In the **Migration Report** window, click **Close** . The **Migration Report** window closes.
5. In the **Task List** window, click the **Close** button. The **Task List** window closes. The **Result** details window opens.

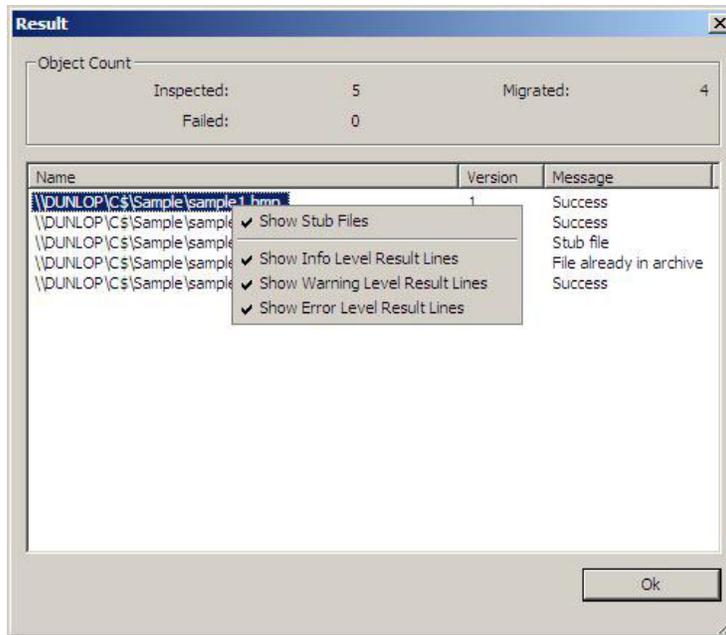


Figure 46. Result details window

The **Result** window contains a list of the processed files and a message about the migration result for each file. Click the column headers to sort the **Name** and **Message** columns. Right-click a row to display information filters. Check or uncheck the filters to apply the filters to the list. The Show Stub Files filter is persistent and remains activated or deactivated until the status is changed by the user. The other three filters are activated by default and changes are valid only for the current GUI session.

### Scheduling a migration job

You can schedule migration jobs to run automatically by using a scheduler provided by another vendor. Schedule the `dsmclc.exe` command, specifying the job file as an argument when `dsmclc.exe` is started.

The following steps show how to configure the Windows Scheduler to start a migration job weekly.

1. From **Windows Start** menu, select **Administrative Tools** → **Task Scheduler**. The Task Scheduler window opens.

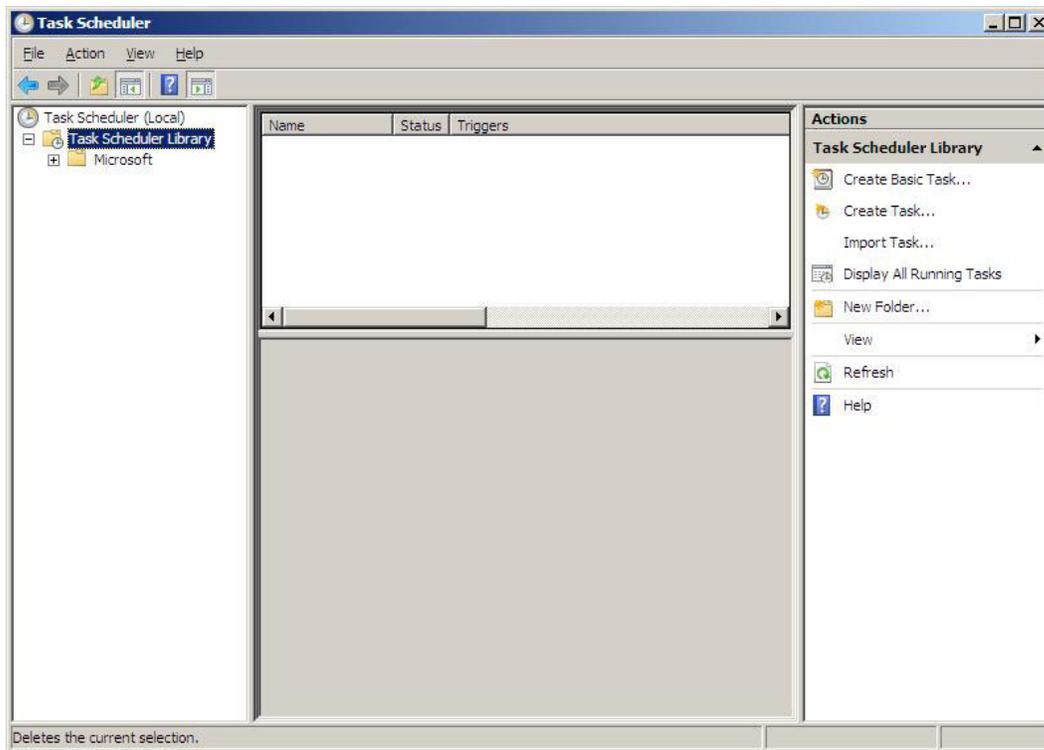


Figure 47. Task Scheduler window

2. Click **Create Basic Task**. The Create Basic Task Wizard window opens.
3. Type a task name and description. Click **Next**. The Trigger window opens.
4. Click weekly (or as often as you want to run the task). Click **Next**. The Weekly window opens.
5. Enter schedule details. Click **Next**. The Action window opens.
6. Check **Start a program**. Click **Next**. The Start a program window opens.
7. Type the path of the `dsmc\c.exe` command in the **Program/script** field. Type the job file name in the **Add arguments (optional)** field. Click **Next**. The Summary window opens.
8. Click **Finish**. Windows creates the scheduled task.

---

## Migrating a list of files

You can migrate a list of files contained in a text file.

Migration jobs migrate files that meet a job's selection criteria. Threshold migration uses file size and age to determine which files to migrate, but you cannot specify which files are migrated. If you want to migrate specific files, regardless of age and size, you can do a list migration.

The list file must meet these specifications:

- The file is encoded in the Windows default ANSI system code page or in Unicode. If the file is encoded in Unicode, it must be UCS-2LE, with a Byte Order Mark (BOM) as the first 2 bytes in the file. The BOM (0xFF,0xFE) is

automatically written when you save the file from a Notepad editor and specify Unicode encoding. UCS-2LE supports all languages supported by the HSM for Windows client.

- Each line of the file contains the complete path name of one file.
- Each line of the file is separated by carriage return and line feed (CRLF).

You can use another application to create the list file. Invoke the `dsmc\c.exe` command, specifying the `migratelist` option, and specify the name of the list file.

**Related reference**

“`dsmc\c.exe`” on page 84

---

## Threshold migration

You can migrate files from your volumes according to high and low thresholds of space usage. With proper configuration, you can greatly reduce the chance of your volumes running out of space.

Threshold migration provides automatic control of space usage of the volume. You set the high and low space-usage thresholds that trigger the HSM for Windows client to automatically start and stop migration. You configure guidelines for migration candidates. HSM for Windows client uses those guidelines to choose which files to migrate, and when, to meet the space usage settings.

You can configure threshold migration with the Threshold Migration settings window in the GUI, or with the `dsmhsmc\c.exe` command.

**Related concepts**

“Configuring the retention period of migration copies” on page 22

**Related reference**

“Backing up files before migrating them” on page 68

“Managing threshold migration with `dsmhsmc\c.exe`” on page 93

## Migration candidates

HSM for Windows client chooses larger and older files as candidates for threshold migration.

Files that are frequently modified or accessed are poor candidates for migration. They should be resident on the volume so that resources are not used to move them back and forth between the volume and Tivoli Storage Manager storage. HSM for Windows client assumes that the last access date or modification date or creation date is an indicator of how dynamic a file is. Hence, HSM for Windows client chooses migration candidates that have a greater age, as measured by access, modification, or creation date. You configure which of these dates (access, modification, or creation) HSM for Windows client uses to determine file age. You also configure the minimum age for a migration candidate. Among files that meet the minimum age, and are the same size, HSM for Windows client migrates only the oldest files.

Small files are also not good candidates for migration, because migrating a small file frees up less space than migrating a large file. There is a transaction cost for every file migration and recall. The transaction cost is the same regardless of file size, even though migrating larger files frees up more space. Hence, HSM for Windows client looks for large files when choosing migration candidates. You can

configure the minimum size for a migration candidate, but among files with the same age, HSM for Windows client migrates only the largest files.

You can also configure the weight (importance) of age, relative to size, for migration candidates. For example, if you know that your volume contains some large files that tend to be dynamic, you can decrease their chance of being migrated by decreasing the weight of file size.

To find the migration candidates, HSM for Windows client scans the volume. HSM for Windows client scans all directories in the volume in an orderly manner, but typically not all at once. A scan continues until enough migration candidates are found. The next scan starts where the previous scan finished, until, over time, the entire volume can be scanned. Further scans will traverse the volume again and again. You can configure how often to scan for migration candidates.

If not enough migration candidates are found, HSM for Windows client can scan the entire volume in a single scan. If the entire volume is scanned without yielding sufficient candidates, HSM for Windows client issues a warning. At the next opportunity for a scan, it is possible that some files will have become large enough or old enough to add to the pool of migration candidates.

The files in the most recent scan are compared with the files in the migration pool regarding age and size, to yield a new ranked list of migration candidates. The oldest and largest files are at the top of the list, ready to be migrated first.

A scan begins in these situations:

- The configured time interval since the last scan elapses.
- You manually start a scan.
- Before a threshold migration, the pool that holds migration candidates does not contain enough files to reduce the space usage from the high threshold to the low threshold.
- During a threshold migration, the pool of migration candidates becomes empty.

Migration candidates are stored in a pool, ready to be migrated when space usage reaches the high threshold. Before the start of a migration, there should be enough migration candidates in the pool to reduce the space usage from the high threshold to the low threshold.

The pool contains more files than are needed, in case some candidates are no longer valid by the time of the next threshold migration. Between the time they are chosen as candidates and the time of the next threshold migration, a file might no longer be valid for migration due to several reasons:

- The file was deleted from the file system.
- The file was modified, and it no longer meets the minimum age or the minimum size for migration.
- The configured minimum age or minimum size for migration was increased.

Periodically HSM for Windows client validates the files in the pool. Files that are no longer valid are eliminated from the pool. If the pool does not contain enough files to reduce the space usage from the high threshold to the low threshold, a scan for more candidates begins. You can configure the frequency of the validation.

## Migration triggers

Migration is automatically triggered when the HSM for Windows client detects that space usage has reached the high threshold. You can also start threshold migration manually, any time that space usage is above the low threshold.

The IBM TSM HSM Monitor Service monitors space usage on an interval that you configure. Migration is triggered when the IBM TSM HSM Monitor Service detects a high threshold of space usage, and continues until usage reaches the low threshold. The HSM for Windows client can decrease the interval when space usage approaches the high threshold. Nevertheless, if space usage increases rapidly and is not checked frequently enough, it is possible that space usage can exceed the high threshold before migration begins.

## Configuring threshold migration with the graphical user interface

You can configure threshold migration with the graphical user interface (GUI) with the Threshold Migration settings window.

Access the Threshold Migration settings window by selecting HSM for Windows client GUI. Select **Tools** → **Threshold Migration**.

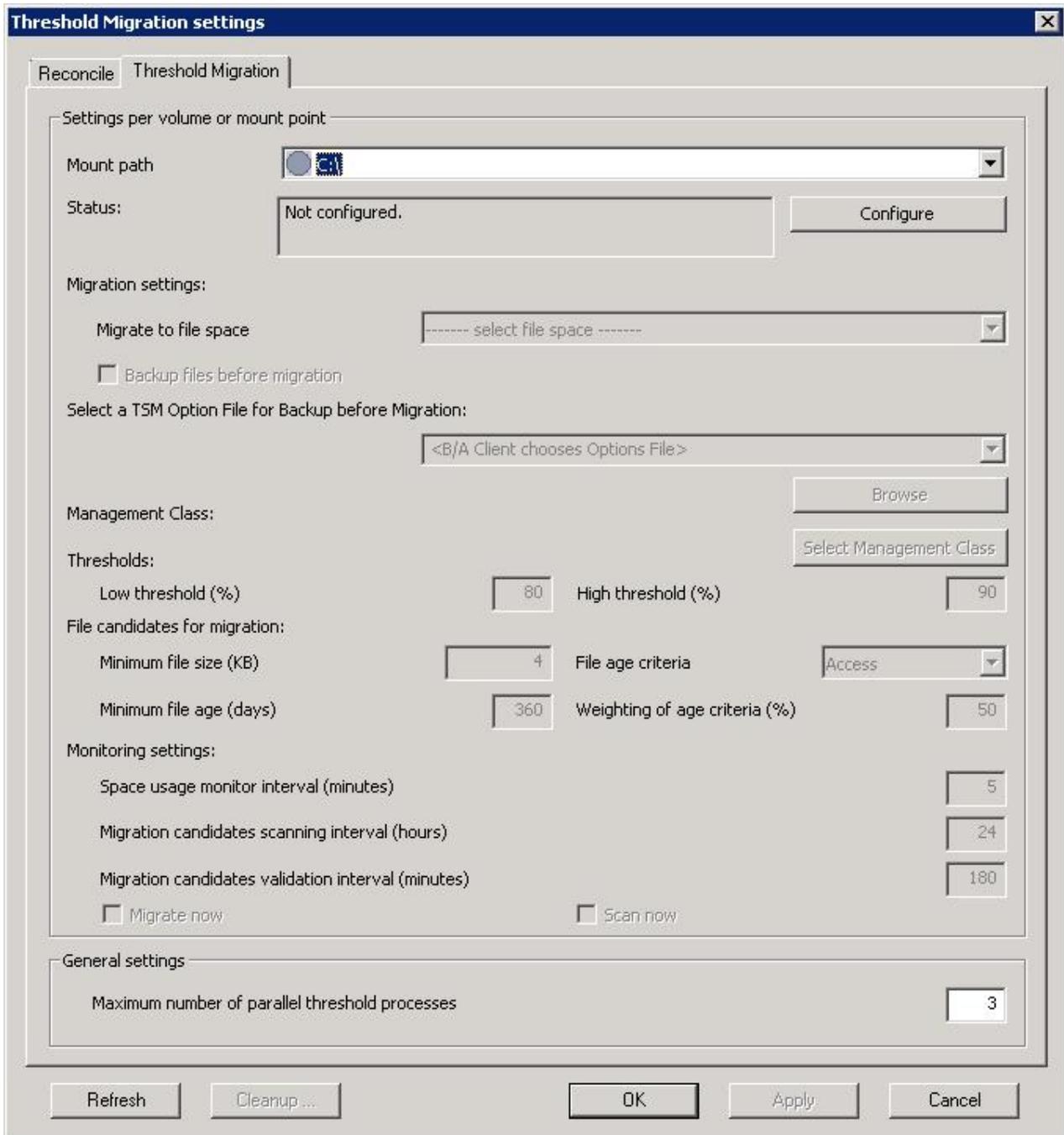


Figure 48. Configuration: Threshold Migration settings window

The Threshold Migration settings window displays configuration information. If the volume has been configured for threshold migration, the current configuration values are displayed in the fields.

### Mount path

Specify the volume to configure. Because it is possible for a single volume to be mounted by more than one path, always specify that volume by the same mount path. Reconciliation, threshold migration, and migration jobs should all reference the volume by the same path.

The icon indicates the status of the volume:

- Not configured:



- Configured:



- Not configurable:



The volume of this mount path is already configured through another mount path and cannot be configured through the path now selected.

### Status

The field displays the current configuration status of the selected volume and whether a migration, scan, or validation process is running. Click **Refresh** at the bottom of the panel to refresh the status.

### Configure/Unconfigure button

When the volume is not configured, the button displays **Configure**. Click this button to activate the fields and controls in the window, and populate the fields with default values.

When the volume is configured, the button displays **Unconfigure**. Click this button to remove the configuration of the volume.

### Migrate to file space

Use this option to configure the file space that is used for threshold migration.

### Backup files before migration

Use this option to configure whether migration requires backup. The default is the value that you set in the initial configuration wizard.

### Select a TSM options file for backup before migration

Use this option to specify the options file for backup before migration.

### Management class

Use this option to configure the management class that is used for threshold migration of this volume. Specify an existing management class with an archive copy group, or specify **DEFAULT** to use the default management class of the active policy set. If the retention period of the selected management class is finite, a warning is issued.

### Low threshold (%)

Use this option to configure the disk usage that triggers when to stop threshold migration. After the disk usage reaches this percent of capacity, threshold migration stops. The low threshold must be less than the high threshold. Specify a value from 0 to 99. The default is 80.

### High threshold (%)

Use this option to configure the disk usage that triggers when to start threshold migration. After the disk capacity reaches this percent of capacity, threshold migration begins. Specify a value from 1 to 100. The default is 90.

#### **Minimum file size (KB)**

Use this option to configure minimum file size for a valid migration candidate. The size is measured in kilobytes (KB). Specify a value from 4 to 2147483647 (2 TB). The default is 4.

#### **Minimum file age (days)**

Use this option to configure minimum file age for a valid migration candidate. The age is measured in days. Specify a value from 0 to 99999. The default is 360.

#### **File age criteria**

Use this option to configure which time stamp is used to calculate the age of a file. Changing this option can make many files in the current pool of migration candidates no longer valid. The choices correspond to the file system time stamps for file creation, file modification, and file access.

#### **Weighting of age criteria (%)**

Use this option to configure the importance of file age (relative to file size) when determining migration candidates.

The age weight and size weight of a file are computed relative to the configured minimum age and minimum size. Hence, a file that is twice as old as the minimum age has an age weight of 2. If the file is the minimum size, it has a size weight of 1.

When the importance of age relative to size is considered, the file's weight is computed in this way:  $\text{computed weight} = (\text{AGEWeight} * (\text{age weight})) + ((1 - \text{AGEWeight}) * (\text{size weight}))$ .

For example, when  $\text{AGEWeight} = 50$ , the file has the same weight  $((.5 * (2)) + ((1 - .5) * (1)) = 1.5)$  as a file that is only as old as the minimum age, but twice as big as the minimum size  $((.5 * (1)) + (.5 * (2)) = 1.5)$ . The weight of both files is 1.5.

If the  $\text{AGEWeight}$  option is not 50%, but 75%, the first file has a computed weight of 1.75  $((.75 * (2)) + ((1 - .75) * (1)) = 1.75)$ , while for the younger but larger file, the computed weight is 1.25  $((.75 * (1)) + ((1 - .75) * (2)) = 1.25)$ .

Specify a value from 0 to 100. The default is 50.

#### **Space usage monitor interval (minutes)**

Use this option to configure how frequently the HSM monitor service checks space usage on the disk. The time is measured in minutes. If the monitor interval is set to 0, monitoring is deactivated. Specify a value from 0 to 9999. The default is 5.

#### **Migration candidates scanning interval (hours)**

Use this option to configure how frequently the HSM monitor service starts the file system scan to find candidates. The time is measured from the end of the last scan to the beginning of the next scan. The time is measured in hours. Specify a value from 1 to 9999. The default is 24.

If a scan yields better quality candidates (older and larger files) than the previous scan, the interval is automatically decreased by a small amount. If a scan yields poorer quality candidates (newer and smaller files) than the previous scan, the interval is automatically increased by a small amount.

#### **Migration candidates validation interval (minutes)**

Use this option to configure how frequently the HSM monitor service validates the candidates in the candidates pool. The time is measured from the end of the last validation to the beginning of the next validation. The time is measured in minutes. If the interval is set to zero, validation is deactivated. Specify a value from 0 to 9999. The default is 180.

#### **Migrate now**

Use this option to configure an immediate threshold migration. If disk usage is above the low threshold, files are migrated until the low threshold is reached. The default is no.

#### **Scan now**

Use this option to configure an immediate scan of the volume. The default is no.

#### **Maximum number of parallel threshold processes**

Use this option to configure the number of migration tasks that can occur simultaneously. This applies to migration, scan, and validation tasks running on all volumes. If this number is reached, any pending migration tasks are delayed until one of the running tasks finishes. The range of values is 1 to 16. The default is 3.

#### **Cleanup**

When one or more configured volumes are no longer available, the **Cleanup** button is activated. Click this button to erase the configuration information for each of these volumes.

#### **Refresh**

Click **Refresh** to show the latest values. For example, if you added a file space since opening the window, click **Refresh** to show the current file spaces.

#### **Apply**

Click **Apply** to apply the configuration to the volume and leave the window open. Use **Apply** to reuse configuration setting when configuring several volumes.

#### **OK**

Click **OK** to apply the configuration to the volume and close the window.

#### **Related reference**

“Managing threshold migration with dsmhsmclc.exe” on page 93

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## Manually retrieving migrated or archived files

You can manually retrieve files that have been migrated or archived. HSM for Windows client provides GUI and Command Prompt window methods to retrieve files.

If you configure HSM for Windows client to replace migrated files with stub files, HSM for Windows client automatically manages the recall of files to local storage whenever needed. If you configure HSM for Windows client to keep the original files on local storage or delete the original files on local storage, you can access the archived copies on Tivoli Storage Manager storage only by manually retrieving the files. You can also manually retrieve versions of migrated files from Tivoli Storage Manager storage.

To search for and retrieve files that have been migrated or archived, you can use the HSM for Windows client GUI , or you can use the HSM for Windows client `dsmc.exe` command on a Command Prompt window.

**Note:** You cannot use the Tivoli Storage Manager Backup-Archive client to retrieve files that were migrated or archived by the HSM for Windows client.

### Related reference

“`dsmc.exe`” on page 84

## Retrieving migrated or archived files using the HSM for Windows client GUI

When using the HSM for Windows client GUI to search for and retrieve files that have been migrated or archived, first obtain a list files based on your criteria. From this list, select the files that you want to retrieve, and then define specific retrieval options, such a specific version to retrieve or to be prompted before overwriting files.

Follow these steps to search for and retrieve migrated or archived files:

1. Select **Migrate Retrieve** → **Search & Retrieve**.
2. Select the **File Space** in which you want to search for files.
3. Specify your search criteria and click **Search**. If you do not specify at least one search criterion, you receive a warning, and all of the files stored in the file space are shown. The **Path** and **Filename** fields are case sensitive, but the **Volume** field is not case sensitive. You can use wildcards in any field: an asterisk matches zero or more characters, and a question mark matches a single character.

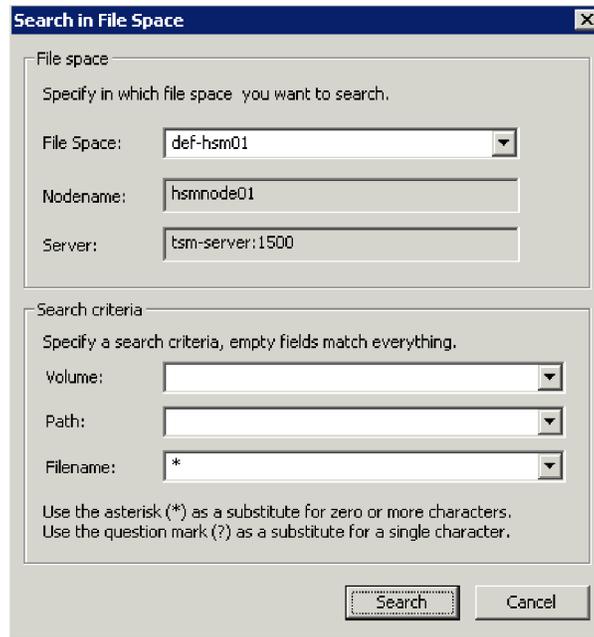


Figure 49. Search in File Space window

4. After the list of matching files is displayed in the Search Results window, click **Select All** to retrieve all files or select individual files and then click **Retrieve**. If you select just one file to retrieve, you can select a specific version to retrieve (see step 5 on page 66). If you select more than one file, you cannot select specific versions, but can select the directory into which they are saved (see step 6 on page 67). In the Search Results window, you can also click **Search**

again to obtain a different set of files to retrieve.  
After clicking **Retrieve** in the Search Results window with only one file

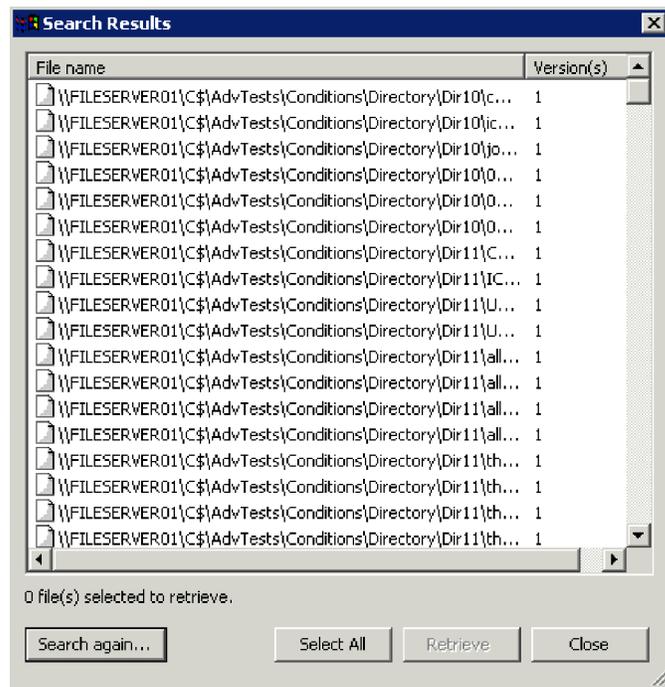


Figure 50. Search Results window

selected, the Retrieve options window displays.

5. Use the **Version** menu to select the version of the file that you want to retrieve. Also select one of the following three options in the Overwrite section: **Keep existing file(s)**, **stubs will be overwritten**, **Prompt before overwriting existing file(s)**, **stubs will be overwritten**, **Overwrite existing files**. When you have made your selections, click **Retrieve** to retrieve the selected file.

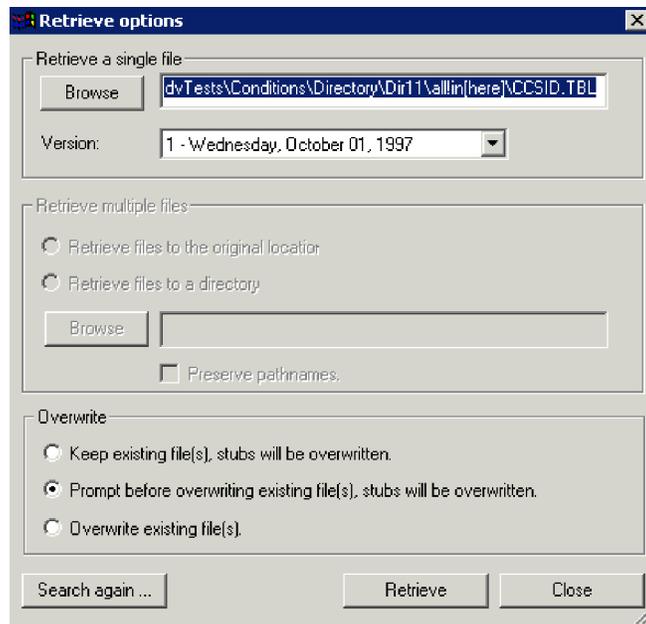


Figure 51. Search in File Space window

After clicking **Retrieve** in the Search Results window with more than one file selected, the Retrieve options window displays.

6. Select to either save the files to their original location or select a directory into which you want to save the selected files. Also select one of the following three options in the Overwrite section: **Keep existing file(s), stubs will be overwritten, Prompt before overwriting existing file(s), stubs will be overwritten, Overwrite existing files.** When you have made your selections, click **Retrieve** to retrieve the selected files.

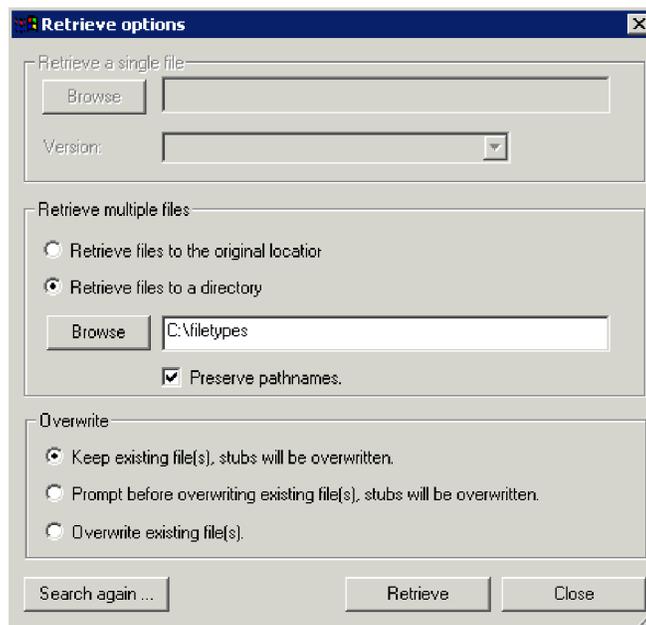


Figure 52. Search in File Space window

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## Backing up files before migrating them

Before a migration operation, files should be backed up for disaster recovery.

You can migrate a file without creating a backup copy of the file. But you cannot back up a stub file unless there exists a backup copy of the original file. The backup-before-migrate feature allows files to be backed up automatically before they are migrated.

The HSM for Windows client does not replace the practice of routinely backing up files and the backup-before-migrate feature is not a substitute for regularly backing up your files.

Even if backup before migration is enabled, the HSM for Windows client does not back up stubs. And it does not back up files that do not match the migration criteria. It only backs up files before they are migrated, if no backup copy exists.

In the Configuration wizard for the HSM for Windows client, in the Backup before migration window, you can select the default backup option for all new migration jobs and threshold migrations. In each job or threshold migration, you can accept that default or you can specify another option. In each case, you can choose whether to back up files before migration, and which options file to use for the backup. The backup-archive client automatically backs up the necessary files before migration. If the backup is successful, the file is migrated.

The backup-archive client typically changes the access time stamp of a file when the backup-archive client backs up a file. If a migration job or threshold migration is configured to check a file's access time (-minagetype access), the file might not be migrated afterwards because the access time has been changed. To avoid this you can use the preservelastaccessdate option of the backup-archive client.

**Restriction:** The path-name length limits differ for migrated files and for files backed up before migration. When backing up files before migration, the file name is subject to the limitations of the backup-archive client. When migrating a file, the file name is subject to the limitations of the API.

### Related concepts

"Tivoli Storage Manager backup-archive client options for backing up migrated files" on page 70

### Related tasks

"Creating migration jobs" on page 36

## Choosing a backup options file

When files are backed up before migration, you can specify a backup options file, or you can let the backup-archive client determine the options file.

If you do not specify a backup options file for a backup before migration, the backup-archive client will determine the options file. The backup-archive client uses four methods to find an options file. The precedence of the methods is as follows:

1. An options file in a path specified by an environment variable
2. An options file in the directory from which the backup-archive client is invoked
3. An options file in the backup-archive client installation directory

If a file is regularly backed up with the backup-archive client default options file, then backing it up before migration with the backup-archive client default options file maintains a consistent set of backups. However, if a file is regularly backed up with an options file other than the default, you can specify this other options file for backups before migration. Using one options file for regular backups and a different options file for backups before migration can result in backup copies of the same file on two different Tivoli Storage Manager servers.

If you specify a backup options file during the initial configuration of the HSM for Windows client, that options file is the default for all backups before migration. The backup-archive client does not determine the options file. You can specify different options files when you configure migration jobs and threshold migration. You can also specify a backup options file when you start migration using a HSM for Windows client command on the Command Prompt window.

#### **Related concepts**

“Configuring threshold migration with the graphical user interface” on page 59

#### **Related tasks**

“Creating migration jobs” on page 36

#### **Related reference**

“dsmcl.exe” on page 84

“Managing threshold migration with dsmhsmcl.exe” on page 93

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## **Backing up and restoring migrated files**

Five backup-archive client options control the backup and restore of migrated files.

The **Skip migrated files** option regulates backup of migrated files. The two restore options, **Restore as migrated file**, and **Restore resident if not accessible**, define how migrated files are restored. The **Reset modified last access date** option determines whether the access time is changed when a file is backed up. The access time can affect migration. The **Staging Directory** option controls where retrieved copies of migrated files are temporarily stored by the backup-archive client.

The backup-archive client and the HSM for Windows client work together. The backup-archive client always maintains a copy of the resident file in the backup pool, whether this file is migrated or not. In other words, for migrated files there are two identical versions of the file on the Tivoli Storage Manager server: one is in the HSM pool, created by the HSM for Windows client; and one is the backup copy in the backup pool, created by the backup-archive client. When restoring files, the backup-archive client can always recreate the resident file from the backup copy, even if the copy in the HSM pool has been deleted.

#### **Related concepts**

“Tivoli Storage Manager backup-archive client options for backing up migrated files” on page 70

“Tivoli Storage Manager backup-archive client options for restoring migrated files” on page 74

#### **Related reference**

“Backing up files before migrating them” on page 68

## Setting backup-archive client options

Set the backup-archive client options in the backup-archive preferences editor, or directly edit the backup-archive `dsm.opt` configuration file.

Use the **HSM for Windows** tab in the preferences editor in the backup-archive client GUI to set the **Skip migrated files**, **Restore as migrated file**, and **Restore resident if not accessible** options. Use the **Backup** tab in the preferences editor in the backup-archive client GUI to set the **Reset modified last access date** option. Use the **General** tab in the preferences editor in the backup-archive client GUI to set the **Staging directory** option. You access the preferences editor by running the backup-archive client GUI (`dsm.exe`), and selecting **Edit** → **Preferences**. The **HSM for Windows** tab in the backup-archive client preferences editor only displays if HSM for Windows client is installed. You can also change the options values by editing the `baclient\dsm.opt` options file in the backup-archive client installation directory. Do not edit the HSM client `dsm.opt` file, which is separate from the backup-archive client `dsm.opt` file. A `yes` value is equivalent to setting a check box and a `no` value is equivalent to clearing the check box.

Table 18 relates the name of the check box in the HSM for Windows tab with the option name used in the backup-archive client `dsm.opt` file and on the Command Prompt window.

Table 18. Backup-archive HSM for Windows option names

HSM for Windows preferences tab check box name	Option name for <code>dsm.opt</code> and commands	Default
Skip migrated files	<code>skipmigrated</code>	Cleared (no)
Restore as migrated file	<code>restoremigstate</code>	Set (yes)
Restore resident if not accessible	<code>restorecheckstubaccess</code>	Set (yes)
Reset modified last access date	<code>preservelastaccessdate</code>	Cleared (no)
Staging directory	<code>stagingdirectory</code>	See <code>stagingdirectory</code> option in Backup-Archive Clients Installation and User's Guide for Windows.

## Tivoli Storage Manager backup-archive client options for backing up migrated files

Use the **Skip migrated files** (`skipmigrated`) option of the Tivoli Storage Manager backup-archive client to manage whether migrated files are backed up and archived by the backup-archive client. Use the **Staging directory** (`stagingdirectory`) option of the backup-archive client to control where retrieved copies of migrated files are temporarily stored by the backup-archive client.

If the `skipmigrated` option is not set to `yes`, the backup-archive client backs up all files during an incremental backup, regardless of the migration status of the files. When the `skipmigrated` option is set to `yes`, the backup-archive client does not back up or archive any stub files. The default value of the `skipmigrated` option is `no`.

The backup-archive client ensures that whenever a stub is backed up, there is a copy of the migrated file in the backup pool. If a migrated file was not backed up

before migration, the migrated file is temporarily retrieved and is backed up. In this way, Tivoli Storage Manager associates the backup copy of the migrated file with the backup copy of the stub. After the backup, the temporary file is removed by the backup-archive client. You can control the location to which the backup-archive client retrieves the temporary file by using the stagingdirectory option of the backup-archive client. During this backup the stub is not changed. The next backup creates a backup copy of the stub file on the Tivoli Storage Manager server in the backup pool.

If the backup-archive client cannot create a backup copy of the migrated file, the backup-archive client does not back up the stub file. (The backup of the migrated file can be unsuccessful if the stub is an orphan.)

When Tivoli Storage Manager maintains a backup copy of both the migrated file and the stub, the backup copy of the migrated file does not expire until the backup copy of the stub expires. Either the migrated file or the stub can be recreated using the backup-archive client.

If you have many files that have not been backed up before migration, and the skipmigrated option has the default value no, all of those files are retrieved when they are backed up. The number of files that are retrieved during a backup can be great in these situations:

- You have many stubs that were backed up with backup-archive client version 5.4 and earlier versions. These files are temporarily retrieved during backups with backup-archive client version 6.1 and later.
- You renamed or changed the security settings of stubs or directories containing stubs.
- You changed the backup policies for a volume by including for backup many files that were not previously included.

There are some limitations for backing up migrated files:

- Only an incremental backup or image backup can back up stub files. Other types of backup and archive will process resident files only. When a stub file is archived or backed up by selective backup, a retrieve is triggered. An incremental by date backup will neither trigger a retrieve of the migrated file nor back up the stub file.
- You cannot perform adaptive subfile backup to back up changed portions of a migrated file. You can only back up the entire migrated file.

#### **Related concepts**

“Tivoli Storage Manager backup-archive client options for restoring migrated files” on page 74

“Impacts of changing file encryption” on page 72

#### **Related tasks**

“Limiting retrieves during backup” on page 73

## Potential performance issues when upgrading from a version earlier than 5.5

Migrating the backup-archive client from a version earlier than 5.5 to a version 5.5 or later can lead to a lengthy initial backup on volumes that are managed with the HSM for Windows client.

The lengthy initial backup occurs in the following scenario:

1. With version 5.4 or earlier, you migrated files to Tivoli Storage Manager storage, leaving stub files on the volume.
2. With version 5.4 or earlier, you backed up the stub files. The stub file backup copies were not associated with the resident file backup copies.
3. You upgraded the backup-archive client to version 6.1 or later.
4. You attempt to back up the stubs with backup-archive client version 6.1 or later.

In versions earlier than 5.5, the backup-archive client can back up a stub file without verifying that a backup copy of the resident file exists in the Tivoli Storage Manager backup pool. In version 6.1 and later, the backup-archive client verifies that a backup copy of the resident file exists in the Tivoli Storage Manager backup pool before backing up a stub. If a backup copy of the resident file does not exist in the Tivoli Storage Manager backup pool, the backup-archive client must create it before backing up the stub. The resident file is created by temporarily retrieving the migrated copy from the Tivoli Storage Manager HSM pool to the volume. If many migrated files are retrieved at one time, the backup can last a long time. You can avoid excessive retrieves of migrated files by limiting the backup of migrated files.

**Note:** If you are upgrading from version 5.5 and all files have been backed up with that version previously, no new backups are required.

### Related concepts

“Backing up and restoring migrated files” on page 69

“Tivoli Storage Manager backup-archive client options for backing up migrated files” on page 70

### Related tasks

“Limiting retrieves during backup” on page 73

## Impacts of changing file encryption

You need to take special care when applying encryption to or removing encryption from resident files or stub files.

When you change the encryption of a file, the backup version and the resident file content is no longer the same. When the encryption of a file has changed, the backup-archive client treats this as content change. If this applies to a migrated file, a temporary retrieve is triggered at the next incremental backup.

Thus, if you change the encryption status of many stubs, any retrieves might be triggered at the next incremental backup, which will slow down the performance of the backup. To avoid this situation, set the encryption status of files before backing up the resident files.

If you need to change the encryption status of many stub files, follow these steps:

1. Change the encryption status of the appropriate files in one directory of a file system.

2. Run an incremental backup of the changed files in the directory. Stub files with a modified encryption status are retrieved and backed up.
3. Repeat steps 1 and 2 for each directory in the file system that contains files with a changed encryption status.

### Limiting retrieves during backup

Backup performance on a volume managed by the HSM for Windows client can be jeopardized by many retrieves.

If you have many files that have not been backed up before migration, and the `skipmigrated` option is specified with the default value `no`, all of those files are temporarily retrieved when they are backed up. This can have a significant impact on the backup performance.

You can limit the temporary retrieve of migrated files by limiting the backup of migrated files. You can do this by setting the **Skip migrated files** (`skipmigrated`) option or by backing up one section of the volume at a time.

The default value of the `skipmigrated` option is `no`. If you set `skipmigrated yes`, the backup-archive client skips stubs, so no migration copies are temporarily retrieved.

The following backup-archive client command runs an incremental backup that skips migrated files:

```
dsmc inc N:\budgets\ -skipmigrated=yes
```

You can also limit the temporary retrieves by backing up one section of the volume at a time.

1. For your regular backups, set `skipmigrated=yes`. This will change your regular backup to exclude migrated files, and allows you to continue backups on your regular backup schedule.
2. In parallel, run one backup with `skipmigrated=no`. This backup will temporarily retrieve migrated files that were not previously backed up. This backup can take a long time.
3. When the backup in 2 is complete, set `skipmigrated=no` for your regular backups. The volume of migrated files that need to be temporarily recalled is now limited to those that have been migrated since the backup in 2.

Retrieve will be triggered only by files that have changed in the following ways:

- The resident file was modified, and then migrated again. When the file was migrated, the option to back up before migration was not checked.
- The stub was modified in some other way. For example, you renamed the stub, or changed the encryption settings of the stub. (Renaming the stub or changing encryption settings will not recall the file).

## Tivoli Storage Manager backup-archive client options for restoring migrated files

Use the **Restore as migrated file** (`restoremigstate`) and **Restore resident if not accessible** (`restorecheckstubaccess`) backup-archive client options to manage how the backup-archive client restores migrated files from Tivoli Storage Manager storage.

For files that are backed up with the backup-archive client, in the Tivoli Storage Manager backup pool there is a backup copy of a resident file for every corresponding stub file. With the backup-archive client, you can restore the stub file or the resident file.

There are times when Tivoli Storage Manager HSM pool does not contain a copy of the migrated file, as shown in the following scenario:

1. A resident file is migrated to the Tivoli Storage Manager HSM pool. A stub file is left on the volume.
2. The stub file is backed up. The backup-archive client ensures that there is a backup copy of the stub file and a backup copy of the resident file in the Tivoli Storage Manager backup pool.
3. The stub file is deleted from the volume.
4. During reconciliation, the migration copy in the Tivoli Storage Manager HSM pool is deleted.

In this case, restoring the stub file can lead to problems, because the HSM for Windows client cannot recall the migration copy of the file. If there is no migration copy in Tivoli Storage Manager HSM pool, it would be better to restore the resident file rather than restore the stub. The backup-archive client can check whether a migration copy exists before restoring a stub file. If a migration copy does not exist, the backup-archive client can automatically restore the resident file instead of the stub file.

The **Restore resident if not accessible** (`restorecheckstubaccess`) and **Restore as migrated file** (`restoremigstate`) options configure how migrated files are restored by the backup-archive client. The options yield the restore results described in Table 19

*Table 19. Results of using `restoremigstate` and `restorecheckstubaccess` options..* This table shows the results of using `restoremigstate` and `restorecheckstubaccess` options.

<b>restorecheckstubaccess value</b>	<b>restoremigstate=no</b>	<b>restoremigstate=yes (the default)</b>
<code>restorecheckstubaccess=no</code>	Restore the resident file; do not restore the stub	Restore the stub. Do not check if a migration copy exists.
<code>restorecheckstubaccess=yes</code> (the default)	Restore the resident file; do not restore the stub	If a migration copy exists in the HSM pool, restore the stub. If a migration copy does not exist in the HSM pool, restore the resident file from the backup copy pool.

In addition to the preceding options settings, the following conditions must also be true to restore a stub:

- The file was migrated at the time of the last backup

- The HSM for Windows client is installed
- The stub backup copy is an active version backup.
- The original file system and the target file system are of the same type (NTFS)
- The stub is restored to the same path, and the file space name matches the volume name

There are some advantages to restoring a stub without checking that a migration copy exists in the HSM pool:

- Less temporary space is needed during restore
- There is less network traffic during a restore
- The restore is faster

The disadvantage to restoring a stub without checking that a migration copy exists in the HSM pool is that there might be no migration copy in the HSM pool. If you restore a stub for which there is no migration copy, you create a stub file orphan. However, you can use reconciliation to report the stubs that are orphans. Then you can restore the resident files from the backup pool with the option `restoremigstate=no`.

In the following examples, `N:\file.txt` was migrated, and a stub file was left on the volume. The stub file was backed up with the backup-archive client. Both the stub file and the resident file are available to the backup-archive client. The migrated file is restored by the backup-archive client with the restore command.

**Task** Restore the resident file `N:\file.txt`.

**Command:** `dsmc rest N:\file.txt -restoremigstate=no`

**Task** Restore a stub file `N:\file.txt`, regardless of whether a migration copy exists in Tivoli Storage Manager HSM pool.

**Command:** `dsmc rest N:\file.txt -restoremigstate=yes -restorecheckstubaccess=no`

**Task** Restore a stub file `N:\file.txt`, if a migration copy exists in Tivoli Storage Manager HSM pool. If a migration copy does not exist in Tivoli Storage Manager HSM pool, restore the resident file.

**Command:** `dsmc rest N:\file.txt`

Because the default option values are `-restoremigstate=yes` and `-restorecheckstubaccess=yes`, it is not necessary to specify the options.

**Restriction:**

- If the HSM for Windows client is not installed, or if the IBM TSM HSM Recall Service is not running, default security attributes are applied to restored files.
- If a backup-archive client restore process is stopped in an unusual way (for example by pressing Ctrl+C or by restarting your system), files can be left in a temporary subdirectory (`\~tsmtemp\`) in the volume root. In this case you must manually delete the `\~tsmtemp\` directory.

**Related concepts**

“Backing up and restoring migrated files” on page 69

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## Reconciliation

Reconciliation synchronizes your file system with the Tivoli Storage Manager server by logging orphan stubs and by deleting obsolete copies of files.

You can use the HSM for Windows client graphical user interface (GUI) and the `dsmhsmcl.exe` command to both configure and start reconciliation. You can start reconciliation at any time and can define reconciliation to run automatically in defined intervals.

The two main advantages of reconciliation are to reduce costs and to maintain integrity of your file systems. Reconciliation can reduce your costs by removing unnecessary or obsolete migrated objects from the Tivoli Storage Manager server storage. With fewer files, you need less storage and fewer licenses because the HSM for Windows client is volume-licensed based on the amount of terabytes used on the Tivoli Storage Manager server for migrated data.

The HSM for Windows client helps you maintain the integrity of your file systems by finding orphan stubs. Orphan stubs are stubs for which there is no migrated copy in Tivoli Storage Manager storage. Those orphans are recorded in the `hsmmonitor-orphan.log`. When you check that log file, you decide if you want to delete the orphan stub or if you want to restore the stub from a backup.

If the reconciliation process finds any orphan stubs, the reconciliation process will not delete any object from Tivoli Storage Manager storage until all orphans are resolved. Resolve orphan stubs either by deleting the stub from the volume or restoring the complete file backup version.

If you delete a file but do not empty the Recycle Bin, the reconciliation process will find the file in the recycle bin, and will not delete the migrated copy from Tivoli Storage Manager storage.

Because reconciliation deletes objects on the server, it is **strongly recommended** to back up all migrated files before starting reconciliation.

Reconciliation supports files that have been migrated, and replaced with stubs on the local volume. Reconciliation is not intended for file spaces or volumes with migration jobs that have the action **Keep the original file** or **Delete the file**.

Reconciliation only works with stub files that have been created by HSM for Windows client version 5.4 or higher. When upgrading from HSM for Windows client earlier than version 5.4, use the `dsmReconConverter` command to convert your stub files into a format that the reconciliation tasks can process. Run `dsmReconConverter` once, before the first reconciliation.

| If files were migrated before a file-system image backup was created, the  
| file-system image backup can contain stub files. After the image backup, the files  
| can be recalled, and reconciliation can expire migration copies on the Tivoli Storage  
| Manager server. When you restore the file-system image, there can be stub files for  
| which there are no corresponding migration copies on the Tivoli Storage Manager  
| server. In this case, you can restore an orphaned stub with the backup copy of the  
| file that was created prior to migrating the file.

If files were migrated after a file-system image backup was created, the Tivoli Storage Manager server can contain migration copies for which there are no stub files. You can restore the stub files after the file-system image restore. Restore the

stubs before you run reconciliation. If you run reconciliation before restoring the stub files, the migration copies are deleted from the Tivoli Storage Manager server. Restoring stubs after the migration copies are deleted from the Tivoli Storage Manager server leaves orphan stubs on the file system.

**Tip:**

- To improve reconciliation performance and avoid having to use the backup-archive client to restore files, use separate file spaces for each local file system and do not rename volumes. Before configuring a file space for reconciliation, understand the following multiple conditions and consequences:
  - The HSM for Windows reconciliation process needs to find all migrated objects for one file system on the Tivoli Storage Manager server.
  - If files from one file system are migrated to several file spaces, the reconciliation process queries all these file spaces.
  - If files from several local file systems are migrated to the same file space, then the server eventually (depending on the names of the files) returns not only the files from the file system, which is currently reconciled, but also other files to the HSM client.
  - Using the current name of the volume and the name of the currently nested volumes, the reconciliation process sorts out the files which do not belong to the file system that is being reconciled.
  - If you rename a volume after migrating files, the reconciliation process can erroneously assume that the files have been deleted, and can delete the files from the Tivoli Storage Manager server. If this situation occurs, use the backup-archive client to restore the complete file space to the renamed volume.
  - If this situation occurs, you can use the backup-archive client to restore the complete file space using the backup-archive client. But again, it is recommended to avoid this situation by not renaming volumes after files have been migrated from them.

**Related concepts**

“Tivoli Storage Manager backup-archive client options for backing up migrated files” on page 70

**Related tasks**

“Creating migration jobs” on page 36

**Related reference**

“dsmhsmclc.exe” on page 90

“dsmReconConverter.exe” on page 100

## Changing volume mount paths

Although you can change volume mount paths after files are migrated, it is strongly recommended that you do not because this change might affect reconciliation. There are some methods to mitigate issues, such as lost data, if you must change volume mount paths.

As an administrator, you can change the path of a volume. For example, you can change the volume letter from e: to f: or you can change the mount path from e:\nested to f:\nested. This modification does not recall files nor does it affect the accessibility of migrated files. The stubs can still be recalled after such a rename. However, the following example shows how it can affect reconciliation.

If you have a volume `e:`, a nested volume `e:\nested`, and a file `e:\nested\file`, when the file is migrated, it can be found on the Tivoli Storage Manager server under the name `\\mynode\e$\nested\file`. If you move the nested volume from `e:\nested` to `f:\nested`, and you, or another user, then runs a reconciliation on `e:`, the process cannot determine that there was a nested volume `e:\nested`. Thus, the process assumes that `\\mynode\e$\nested\file` is a file that has been deleted. As a consequence, reconciliation removes the object `\\mynode\e$\nested\file` from the Tivoli Storage Manager server.

In order to avoid such a situation, you can migrate the files of each volume to a separate file space on the Tivoli Storage Manager server. Reconciliation can then be limited to this file space, only. In this case, the Tivoli Storage Manager server query, which is performed at the beginning of the reconciliation for a volume, does not return any objects from other volumes and consequently does not delete any objects from other volumes.

**Note:**

- This is only necessary, if the drive letter or volume mount path is changed. If the configuration is unchanged, reconciliation correctly identifies the volume for each object on the Tivoli Storage Manager server and thus does not delete any data in error.
- You can manage which file spaces are used during reconciliation with the *FILESPacelist* option of `dsmhsmclic` command or by using the Reconcile settings window of the HSM for Windows client GUI.

If reconciliation has already deleted objects in such a case, you then have to restore the files from the backup copies. Because the HSM for Windows client is integrated with the backup-archive client, you are able to restore the complete data, even if the migration copy has been deleted from Tivoli Storage Manager storage.

**Related concepts**

“Tivoli Storage Manager backup-archive client options for restoring migrated files” on page 74

## Configuring reconciliation with the graphical user interface

Configure reconciliation with the graphical user interface (GUI) with the Reconcile settings window.

Access the Reconcile settings window by selecting HSM for Windows client GUI. Select **Tools** → **Reconcile**.

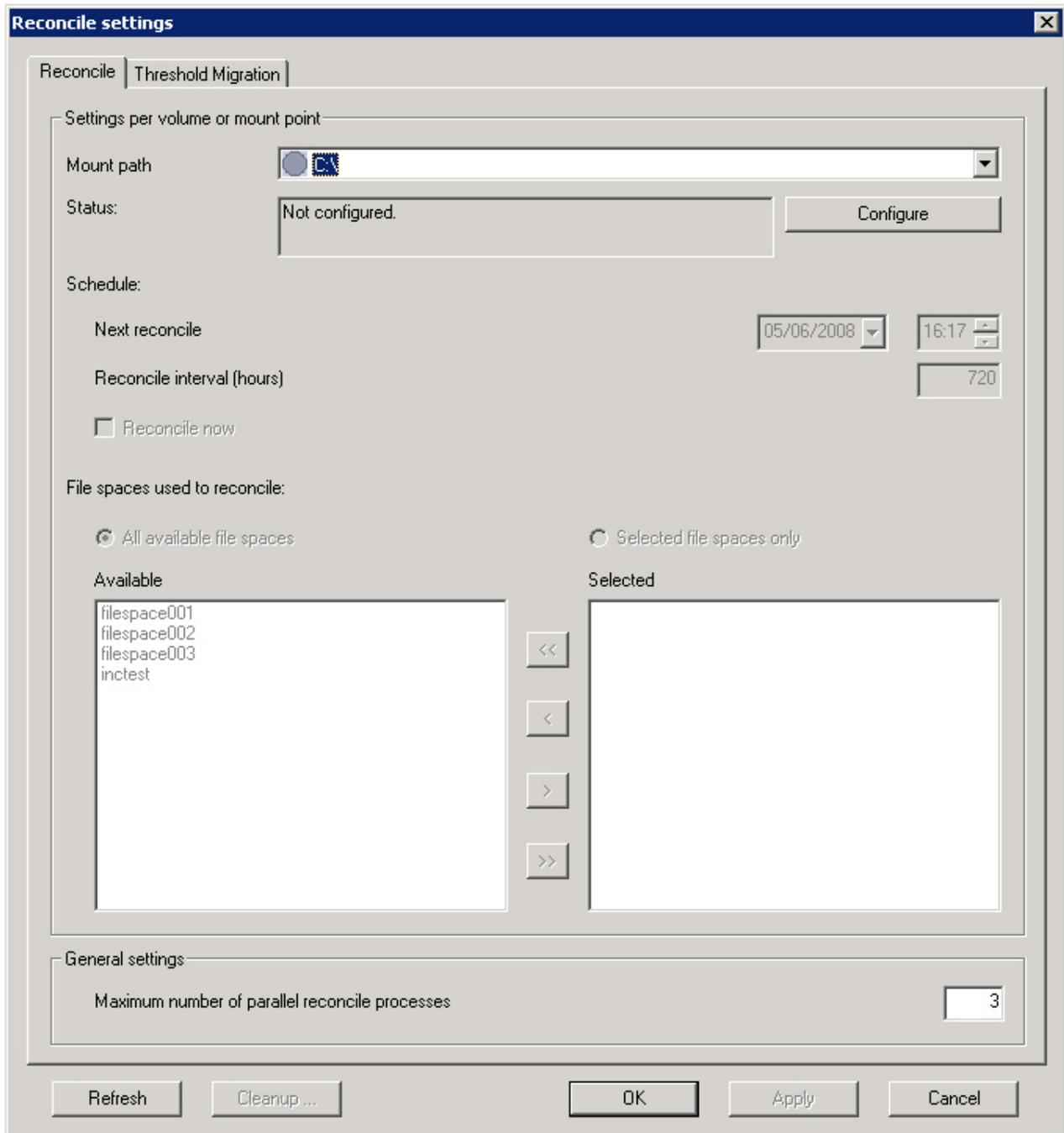


Figure 53. HSM for Windows client Reconcile settings window

The Reconcile settings window displays configuration information. If the volume has not been configured, the fields display default values. If the volume has been configured, the fields display the current configuration.

### Mount path

Specify the volume to configure. Because it is possible for a single volume to be mounted by more than one path, always specify that volume by the same mount path. Reconciliation, threshold migration, and migration jobs should all reference the volume by the same path.

### Status

The field displays the current configuration status of the selected volume and whether a reconciliation process is running. Click **Refresh** at the bottom of the panel to refresh the status.

### **Configure/Unconfigure button**

When the volume is not configured, the button displays **Configure**. Click this button to activate the fields and controls in the window, and populate the fields with default values.

When the volume is configured, the button displays **Unconfigure**. Click this button to remove the configuration of the volume.

### **Next reconcile**

Use this option to change the time of the next reconciliation. The field displays the date and time of the next reconciliation. If reconciliation has not been configured, the default is the current date and time. If reconciliation has been configured, the field displays the date calculated by adding the **Reconcile interval (hours)** to the last reconciliation.

### **Reconcile interval (hours)**

Use this option to configure the number of hours between reconciliations. The interval starts when a reconciliation ends. If this option is set to 0, automatic reconciliation is deactivated. The range of acceptable values is 0 to 876000. The default is 720 hours.

### **Reconcile now**

Use this option to reconcile the volume immediately. This action does not affect the **Reconcile interval (hours)** or the **Next reconcile** date.

### **File spaces used to reconcile**

Use this option to configure the file spaces that are used when reconciling this volume.

You can improve the reconciliation performance by restricting the list to the files spaces that contain migrated files of the volume that you are configuring.

### **Maximum number of parallel reconcile processes**

Use this option to configure the number of reconciliation tasks that can run at the same time. If this number is reached, any additional reconciliation tasks are delayed until the running reconciliation task finishes. Specify a value from 1 to 16. The default is 3.

### **Cleanup**

When one or more configured volumes are no longer available, the **Cleanup** button is activated. Click this button to erase the configuration information for each of these volumes.

### **Refresh**

Click **Refresh** to show the latest values. For example, if you added a file space since opening the window, click **Refresh** to show the current file spaces.

### **Apply**

Click **Apply** to apply the configuration to the volume and leave the window open. Use **Apply** to reuse configuration setting when configuring several volumes.

**OK**

Click **OK** to apply the configuration to the volume and close the window.



---

## Chapter 5. HSM for Windows commands

The HSM for Windows client has several commands you can run from a Command Prompt window. With these commands you can do most of the tasks that you can do with the GUI.

Table 20 summarizes the HSM commands.

*Table 20. HSM for Windows client Command Prompt window commands*

Command	Description
dsmclic.exe	Use this command to run a migration job from the Command Prompt window. You can also list files and file spaces, and set the level of information that is saved in log, trace, and listings files.
dsminfo.exe	Use this command to list various settings of your installation such as the version of libraries, actual log level settings, the operating system version, and disk information.
dsmfileinfo.exe	Use this command to list attributes of migrated and non-migrated files.
dsmfind.exe	Use this command to list files that are eligible by a job file or that correspond to a pattern.
dsmhsmclic.exe	Use this command to manage reconciliation and threshold migration. You can also set the level of information that is saved in log, trace, and listings files.
dsmReconConverter.exe	Use this command once to convert version 5.3 and earlier stubs and server objects to the version 6.1 format for enhanced reconciliation. You can also set the level of information that is saved in log, trace, and listings files.

### Entering command parameters

#### Case sensitivity

Command options are not case sensitive. You can type them in uppercase or lowercase.

#### Minimum abbreviation

In the syntax diagrams, the minimum abbreviation of a command option is printed in upper case. For example, if the syntax diagram includes the option **-UNCONFIGUREReconcile**, the minimum abbreviation is UNCONFIGURER.

### Wait for a command to finish before entering that command again

Do not enter a command when an instance of that command is running, or you will get the following error message:

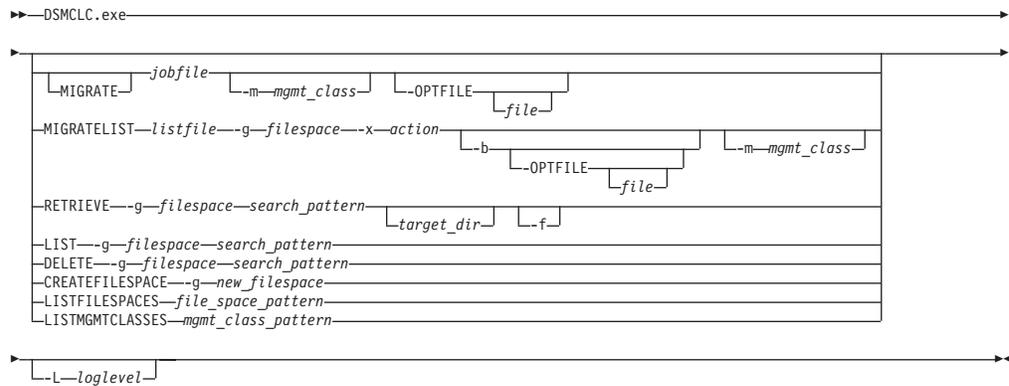
```
Could not open log file.  
Exiting.
```

## dsmclc.exe

You can run a migration job from the Command Prompt window using the **dsmclc.exe** command. You can also list files and file spaces, and start migration of a list of files.

You can configure reconciliation, deactivate reconciliation, and set the limit for reconciliation processes.

### Syntax



### Options

#### MIGRATE

Use this option to start a migration job. You can omit this option and merely specify *jobfile*.

#### *jobfile*

Specify the path of a migration job file that was created with the HSM for Windows client GUI.

#### **-m** *mgmt\_class*

Specify a management class for the migration job or list migration. This value overrides the management class specified when the job was created. Specify DEFAULT to use the Tivoli Storage Manager server default management class of the active policy set.

#### **-OPTFILE** *file*

Specify the path of an options file for backup before migration.

When used with a migration job, this option is valid only if you configured the migration job for backup before migration.

When used with a list of files, this option is valid only if you also specify backup before migration. In other words, with MIGRATELIST, OPTFILE is valid only if you also specify -b.

If *file* is blank, the backup-archive client uses its default options file. This is true even if a migration job was configured to use another options file.

#### MIGRATELIST

Use this option to migrate files that are listed in a list file.

#### **-x** *action*

Specify one of the following actions.

**replace**

Replace migrated files with stubs

**keep**

Archive the file to Tivoli Storage Manager storage, and keep the complete file on the local volume.

**delete**

Archive the file to Tivoli Storage Manager storage, and delete the file from the local volume.

*listfile*

Specify the path of a list file. The list file contains a list of files. Within the list, each file is on a separate line. Each file is identified by a complete path from the root. For example, c:\projects\2009\budget1.xls. The list file is not created by the HSM for Windows client GUI.

*-b* Use this option to back up files before migration.

**RETRIEVE**

Use this option to manually retrieve migrated files from Tivoli Storage Manager storage.

**-g** *filespace*

Specify a file space on Tivoli Storage Manager storage. The file space name is case sensitive.

*search\_pattern*

Specify a pattern for migrated objects. The pattern has three parts. Separate the parts with a blank space. If any of the parts contains a blank space, surround that part with quotes. Search pattern elements are case sensitive. You can use wildcard characters \* and ?.

*volume\_pattern*

Specify a pattern that matches volume names. The *volume\_pattern* is required.

*directory\_pattern*

Specify a pattern that matches directory names. The *directory\_pattern* is required.

*file\_pattern*

Specify a pattern that matches file names. The *file\_pattern* is optional

*target\_dir*

Specify an alternative directory for the retrieved file.

*-f* Force writing the retrieved file if a copy exists on the local volume.

**LIST**

Use this option to list files that were migrated to Tivoli Storage Manager storage.

**DELETE**

Use this option to delete migrated files from Tivoli Storage Manager storage.

**CREATEFILESPACE**

Use this option to create a new file space on Tivoli Storage Manager storage. After you create a file space, you can migrate files to that file space.

**-g** *new\_filespace*

Specify a new file space name on Tivoli Storage Manager storage.

**LISTFILESPACES**

Use this option to list file spaces. The HSM for Windows client lists all file spaces that you are authorized to see.

| *file\_space\_pattern*

| Specify a pattern for file spaces. If there is a blank space in the pattern,  
| surround the pattern with quotes. Search pattern elements are case  
| sensitive. You can use wildcard characters \* and ?.

| **LISTMGMTCLASSES**

| Use this option to list management classes that contain an archive copy group.  
| (A management class must contain an archive copy group to store files that are  
| migrated.) You can use a pattern to filter management class names.

| *mgmt\_class\_pattern*

| Specify a pattern for management classes. If there is a blank space in the  
| pattern, surround the pattern with quotes. Search pattern elements are case  
| sensitive. You can use wildcard characters \* and ?.

| **-L loglevel**

Use this option to configure the type of information that is recorded in logs  
and trace files. You can specify one or more values with no commas or blank  
space separators. Severe and error information is always recorded, even if you  
do not specify this type of information. The default combination is severe,  
error, warning, information, and library (SEWIL). The possible values are the  
following:

- C (event)
- D (debug)
- E (error)
- F (flush)
- I (information)
- K (driver)
- L (library)
- S (severe)
- T (trace)
- U (user)
- W (warning)
- X (dump)

| **Examples**

| **Task** Migrate files using the job defined in c:\hsmclient\jobs\migrate011.osj.

| **Command:** dsmc1c c:\hsmclient\jobs\migrate011.osj

| **Task** Migrate files using the job defined in c:\hsmclient\jobs\migrate011.osj.  
| Use management class MC2. Let the backup-archive client determine the  
| options file, even if you specified another options file when you configured  
| this job.

| **Command:** dsmc1c -m MC2 c:\hsmclient\jobs\migrate011.osj -optfile

| **Task** Migrate files in the list file c:\hsmclient\jobs\xlsfiles.txt to file space  
| def-hsm01. Replace the migrated files with stubs. Back up files before  
| migrating. Use options file d:\backupAdmin\optionsFiles\  
| backup\_options\_set3.opt.

| **Command:** dsmc1c migratelist -g def-hsm01 -x replace  
| c:\hsmclient\jobs\xlsfiles.txt -b -optfile d:\backupAdmin\  
| optionsFiles\backup\_options\_set3.opt

**Task** Retrieve the archived .xls files in the c:\big projects\2009\ directory to a new path: c:\projects\spreadsheets\. The archive copies are in file space def-hsm01.

**Command:** dsmc1c retrieve -g def-hsm01 c: "\big projects\2009" \*.xls c:\projects\spreadsheets.

Spaces separate the three parts of the *search\_pattern*: c: "\big projects\2009" \*.xls. Because the *directory\_pattern* (\big projects\2009) contains a blank space, it is enclosed in quotation marks.

**Task** List all .doc archives in the c:\big projects\2009\ directory . The archive copies are in file space def-hsm01.

**Command:** dsmc1c list -g def-hsm01 c: "\big projects\2009" \*.doc

**Task** Delete the archive copies in the c:\projects\2005\ directory. The archive copies are in file space def-hsm01.

**Command:** dsmc1c delete -g def-hsm00 c: \projects\2005

**Task** Create a new file space: def-hsm02.

**Command:** dsmc1c createfile space -g def-hsm02

**Task** List all file spaces.

**Command:** dsmc1c listfile spaces

**Task** List the properties of the default management class.

**Command:** dsmc1c listmgmtclasses DEFAULT

**Task** Display help for the dsmc1c.exe command.

**Command:** dsmc1c

### Related concepts

"Configuring the retention period of migration copies" on page 22

"Migration jobs" on page 35

"Migrating a list of files" on page 56

"Manually retrieving migrated or archived files" on page 64

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## dsmfileinfo.exe

Run the dsmfileinfo.exe program from a Command Prompt window to view file attributes.

### Syntax

►►—DSMFILEINFO.exe—info\_options—file\_path—►►

### Options

#### info\_options

You can specify any of the following options. Separate options with a blank space.

Table 21. Options for dsmfileinfo.exe

Option	Description
-a	Display information for all options in this table
-d	Show data streams
-i	Show file object ID
-ic	Create file object ID
-m	Calculate MD5 key (complete files only)
-q	Query backend version(s) (stub files only)
-r	Show reparse data (stub files only)
-rb	Show binary reparse data (stub files only)
-s	Show file security data
-sb	Show binary security data
-t	Show file times, size, and attributes (complete files only). This option is the default option.

### file\_path

Specify the path of a complete file or a stub file. Specify only one file.

### Examples

**Task** Display the access time, creation time, modification time, size, and attributes of the file: c:\projects\2009\budget.xls.

**Command:** dsmfileinfo c:\projects\2009\budget.xls

**Task** Create object ID for file c:\projects\2009\budget.xls.

**Command:** dsmfileinfo -ic c:\projects\2009\budget.xls

**Task** Display binary security data for c:\projects\2009\budget.xls.

**Command:** dsmfileinfo -sb c:\projects\2009\budget.xls

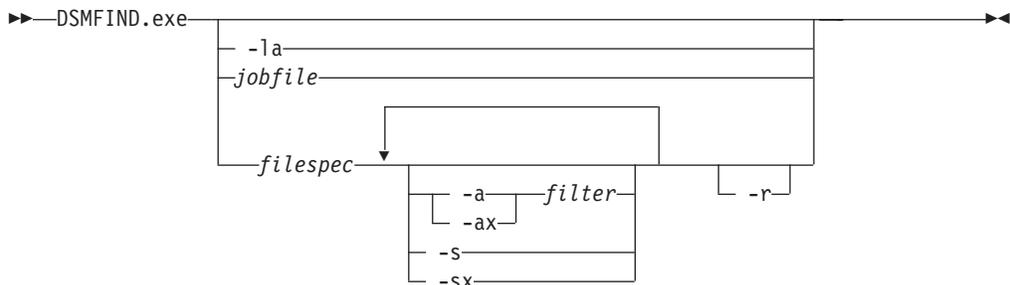
**Task** Display help for dsmfileinfo.exe command.

**Command:** dsmfileinfo

## dsmfind.exe

Run the dsmfind.exe program from a Command Prompt window to show files that are described by a job file or by a file path and file attribute filters.

### Syntax



## Options

### **-la**

List Windows supported file attributes. Use the listed values to determine the filter for a dsmfind.exe command.

### **jobfile**

Specify the path of a migration job file. The command displays all files that meet the criteria that is defined in a migration job file.

### **filter**

Use this option with the attribute options (-a and -ax). Specify a filter for file attributes. The filter must be in the format 0xn timer, where n is a hexadecimal number. You can combine file attributes. For example, the filter with value 0x00001600 is a combination of these file attributes:

- 0x00000200 (FILE\_ATTRIBUTE\_SPARSE\_FILE)
- 0x00000400 (FILE\_ATTRIBUTE\_REPARSE\_POINT )
- 0x00001000 (FILE\_ATTRIBUTE\_OFFLINE)

### **-a or -ai**

Use this option with a filter. This option displays only files that have all attributes defined by the filter.

### **-ax**

Use this option with a filter. This option excludes files that have all attributes defined by the filter.

### **-s or -si**

This option displays stub files only. This is the same as -a 0x00001600.

When stub files are created, stub files have these attributes:

- 0x00000200 (FILE\_ATTRIBUTE\_SPARSE\_FILE)
- 0x00000400 (FILE\_ATTRIBUTE\_REPARSE\_POINT )
- 0x00001000 (FILE\_ATTRIBUTE\_OFFLINE)

**Note:** Some anti-virus programs can remove the attribute FILE\_ATTRIBUTE\_OFFLINE from stub files.

### **-sx**

This option excludes stub files. This is the same as -ax 0x00001600.

**-r** The command displays files in all subdirectories.

Invoke the command with no options to display help for the command.

## Examples

**Task** Display all files that meet the criteria that is defined in the job file c:\hsmclient\jobs\migrate011.osj.

**Command:** dsmfind c:\hsmclient\jobs\migrate011.osj

**Task** Display all Excel files in c:\projects\2009\.

**Command:** dsmfind c:\projects\2009\\*.xls

**Task** Display all Excel files in c:\projects\ and all subdirectories.

**Command:** dsmfind c:\projects\\*.xls -r

**Task** Display all stub files in c:\projects\ and all subdirectories.

**Command:** dsmfind c:\projects\ -r -s

**Task** Display all read-only stub files in c:\projects\ and all subdirectories. Read-only files have attribute FILE\_ATTRIBUTE\_READONLY (0x00000001). Read-only stub files with other attributes are not displayed. Only files with combined attributes of 0x00001601 are displayed.

**Command:** dsmfind c:\projects\ -r -s -a 0x00000001

**Task** Display help for the dsmfind.exe command.

**Command:** dsmfind

## dsmhsmclic.exe

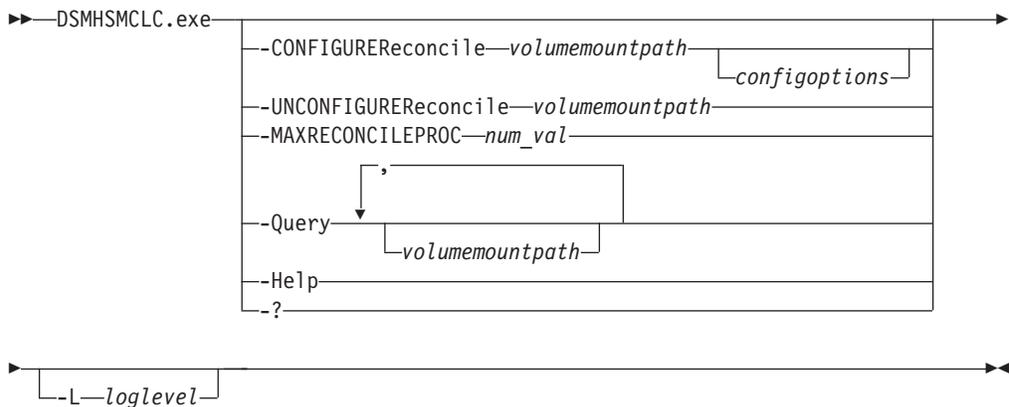
Use the dsmhsmclic.exe command to manage reconciliation and threshold migration.

### Managing reconciliation with dsmhsmclic.exe

Use the **dsmhsmclic.exe** command to configure reconciliation on the Command Prompt window.

You can configure reconciliation, deactivate reconciliation, and set the limit for reconciliation processes.

#### Syntax



#### Options

##### -CONFIGUREREconcile

Use this option to configure reconciliation for the specified volume or mount path.

##### -UNCONFIGUREREconcile

Use this option to remove reconciliation from the specified volume or mount path. When you specify this option, reconciliation is deactivated and all configuration values are erased.

##### -MAXRECONCILEPROC *num\_val*

Use this option to configure the number of reconciliation tasks that can run at the same time. If this number is reached, any additional reconciliation tasks are delayed until the running reconciliation task finishes. Specify a value from 1 to 16. The default is 3.

### **-Query**

Use this option to query the threshold migration configuration and reconciliation configuration of one or more volumes. Separate volume names with a comma and no blank space. The default is all configured volumes.

In addition to configuration values, the query can display the following information for each volume, depending on whether threshold migration, reconciliation, or both, are configured for the volume:

- Time of next reconcile process
- Space usage
- Running processes:
  - Reconcile
  - Threshold migration
  - Scan
  - Validation

### *volumemountpath*

Specify the volume to configure. Because it is possible for a single volume to be mounted by more than one path, always specify that volume by the same mount path. Reconciliation, threshold migration, and migration jobs should all reference the volume by the same path.

### **configoptions**

You can specify any of the following configuration options. Specify each option no more than once. If the volume is not configured, omitting the option from the command configures the volume with the default value for the option. If the volume is configured, omitting the option from the command leaves that configuration value unchanged.

#### **-NEXTREConcile** *YYYY-MM-DD-hh-mm*

Use this option to configure when the next regular reconciliation will occur. The date and time must indicate year (*YYYY*), month (*MM*), day (*DD*), hour (*hh*), and minute (*mm*), in the order indicated, and separated by a dash (-). The default is the current date and time.

#### **-RECONCILEINTErval** *hours*

Use this option to configure the number of hours between reconciliations. The interval starts when a reconciliation ends. If this option is set to 0, automatic reconciliation is deactivated. The range of acceptable values is 0 to 876000. The default is 720 hours.

#### **-RECONCILENOW** no | yes

Use this option to start reconciliation immediately. The default is no.

#### **-FILESPEclist** ALL | *file space,file space*

Use this option to configure the file spaces that are used when reconciling this volume. Separate file space names with a comma and with no blank spaces. If you specify no file space names, or specify ALL, all available file spaces are used for reconciliation.

You can improve the reconciliation performance by restricting the list to the files spaces that contain migrated files of the volume that you are configuring.

### **-L** *loglevel*

Use this option to configure the type of information that is recorded in logs and trace files. You can specify one or more values with no commas or blank space separators. Severe and error information is always recorded, even if you do not specify this type of information. The default combination is severe, error, warning, information, and library (SEWIL). The possible values are the following:

- C (event)
- D (debug)
- E (error)
- F (flush)
- I (information)
- K (driver)
- L (library)
- S (severe)
- T (trace)
- U (user)
- W (warning)
- X (dump)

#### **-Help**

Use this option to display help for the command. Entering the command with no options also displays help for the command.

-? Use this option to display help for the command. Entering the command with no options also displays help for the command.

### **Examples**

**Task** Volume e:\ is not yet configured for reconciliation. Configure volume e:\ for reconciliation. Accept the default values for all parameters.

**Command:** dsmhsmc lc -configurer e:\

**Task** Configure the next reconciliation to start at midnight on the 1 December 2009 using file spaces filespaceA and filespaceC, with an interval of one year (8760 hours) until the next reconciliation.

**Command:** dsmhsmc lc -configurer e:\ -nextrec 2010-12-01-00-00 -filesp filespaceA,filespaceC -reconcileint 8760

**Task** Volume f:\ is not yet configured for reconciliation. Configure volume f:\ for reconciliation. Accept the default values for all parameters except **reconcileinterval**.

**Command:** dsmhsmc lc -configurer f:\ -reconcileinterval 1000

**Task** Volume g:\ is already configured for reconciliation. Change only the **reconcileinterval** value for this volume.

**Command:** dsmhsmc lc -configurer g:\ -reconcileint 800

**Task** Limit reconciliation among all volumes to 1 reconciliation process at a time.

**Command:** dsmhsmc lc -maxreconcileproc 1

**Task** Deactivate automatic reconciliation but do not erase reconciliation configuration of volume e:\.

**Command:** dsmhsmc lc -configurer e:\ -reconcileint 0

**Task** Deactivate reconciliation and erase reconciliation configuration for volume e:\.

**Command:** dsmhsmc1c -unconfigurer e:\

**Task** Query the configuration of volumes e:\ and g:\.

**Command:** dsmhsmc1c -q e:\,g:\

**Task** Change the information that is recorded in log and trace files. Record dump and trace information, and (by default) severe and error information.

**Command:** dsmhsmc1c -l XT

**Task** Change the information that is recorded in log and trace files to the default.

**Command:** dsmhsmc1c -l

**Task** Display help for the dsmhsmc1c.exe command (three methods are shown).

**Command:** dsmhsmc1c -?

**Command:** dsmhsmc1c -help

**Command:** dsmhsmc1c

**Related concepts**

“Tracing preferences” on page 33

**Related tasks**

“Configuring reconciliation with the graphical user interface” on page 78

**Related reference**

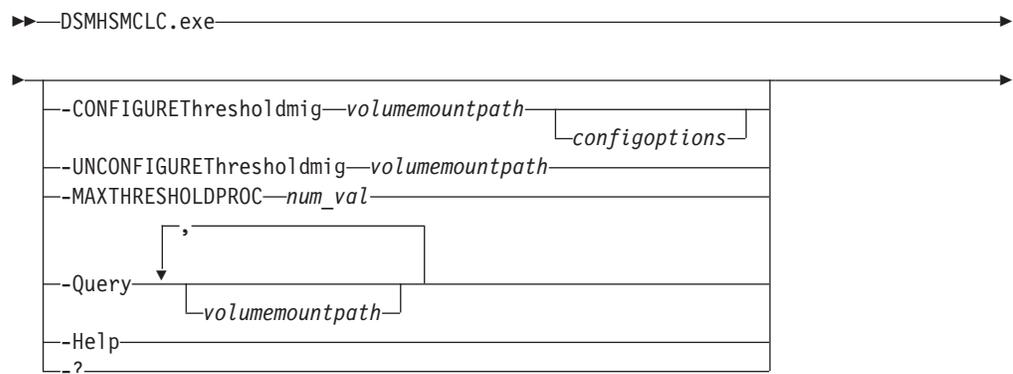
“Managing threshold migration with dsmhsmc1c.exe”

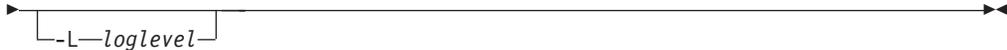
## Managing threshold migration with dsmhsmc1c.exe

Use the **dsmhsmc1c.exe** command to configure threshold migration from the Command Prompt window.

You can configure threshold migration, deactivate threshold migration, and set the limit for threshold migration processes.

### Syntax





## Options

### **-CONFIGUREThresholdmig**

Use this option to configure threshold migration for the specified volume or mount path.

### **-UNCONFIGUREThresholdmig**

Use this option to remove threshold migration from the specified volume or mount path. When you specify this option, threshold migration is deactivated and all configuration values are erased.

### **-MAXTHRESHOLDPROC** *num\_val*

Use this option to configure the number of migration tasks that can occur simultaneously. This applies to migration, scan, and validation tasks running on all volumes. If this number is reached, any pending migration tasks are delayed until one of the running tasks finishes. The range of values is 1 to 16. The default is 3.

### **-Query**

Use this option to query the threshold migration configuration and reconciliation configuration of one or more volumes. Separate volume names with a comma and no blank space. The default is all configured volumes.

In addition to configuration values, the query can display the following information for each volume, depending on whether threshold migration, reconciliation, or both, are configured for the volume:

- Time of next reconcile process
- Space usage
- Running processes:
  - Reconcile
  - Threshold migration
  - Scan
  - Validation

### *volumemountpath*

Specify the volume to configure. Because it is possible for a single volume to be mounted by more than one path, always specify that volume by the same mount path. Reconciliation, threshold migration, and migration jobs should all reference the volume by the same path.

## **configoptions**

You can specify any of the following configuration options. Specify each option no more than once. If the volume is not configured, omitting the option from the command configures the volume with the default value for the option. If the volume is configured, omitting the option from the command leaves that configuration value unchanged.

### **-FILES***Space file space*

Use this option to configure the file space that is used for threshold migration.

On the initial configuration, you must specify a file space. After the initial configuration, this parameter is optional. Until you specify a different file space, files migrated from this volume will be stored in this file space.

| **-MGMTclass** *management class*

| Use this option to configure the management class that is used for  
| threshold migration of this volume. Specify an existing management  
| class with an archive copy group, or specify DEFAULT to use the  
| default management class of the active policy set. If the retention  
| period of the selected management class is finite, a warning is issued.

| **-HIGHthreshold** *percent*

| Use this option to configure the disk usage that triggers when to start  
| threshold migration. After the disk capacity reaches this percent of  
| capacity, threshold migration begins. Specify a value from 1 to 100. The  
| default is 90.

| **-LOWthreshold** *percent*

| Use this option to configure the disk usage that triggers when to stop  
| threshold migration. After the disk usage reaches this percent of  
| capacity, threshold migration stops. The low threshold must be less  
| than the high threshold. Specify a value from 0 to 99. The default is 80.

| **-MONitorinterval** *minutes*

| Use this option to configure how frequently the HSM monitor service  
| checks space usage on the disk. The time is measured in minutes. If  
| the monitor interval is set to 0, monitoring is deactivated. Specify a  
| value from 0 to 9999. The default is 5.

| **-SCANinterval** *hours*

| Use this option to configure how frequently the HSM monitor service  
| starts the file system scan to find candidates. The time is measured  
| from the end of the last scan to the beginning of the next scan. The  
| time is measured in hours. Specify a value from 1 to 9999. The default  
| is 24.

| If a scan yields better quality candidates (older and larger files) than  
| the previous scan, the interval is automatically decreased by a small  
| amount. If a scan yields poorer quality candidates (newer and smaller  
| files) than the previous scan, the interval is automatically increased by  
| a small amount.

| **-CHECKCANDidatesinterval** *minutes*

| Use this option to configure how frequently the HSM monitor service  
| validates the candidates in the candidates pool. The time is measured  
| from the end of the last validation to the beginning of the next  
| validation. The time is measured in minutes. If the interval is set to  
| zero, validation is deactivated. Specify a value from 0 to 9999. The  
| default is 180.

| **-MINMIGFILESIZE** *kilobytes*

| Use this option to configure minimum file size for a valid migration  
| candidate. The size is measured in kilobytes (KB). Specify a value from  
| 4 to 2147483647 (2 TB). The default is 4.

| **-MINMIGFILEAGE** *days*

Use this option to configure minimum file age for a valid migration candidate. The age is measured in days. Specify a value from 0 to 99999. The default is 360.

**-MINAGETYPE** Access | Create | Modify

Use this option to configure which time stamp is used to calculate the age of a file. Changing this option can make many files in the current pool of migration candidates no longer valid. The choices correspond to the file system time stamps for file creation, file modification, and file access.

**-AGEWeight** *percent*

Use this option to configure the importance of file age (relative to file size) when determining migration candidates.

The age weight and size weight of a file are computed relative to the configured minimum age and minimum size. Hence, a file that is twice as old as the minimum age has an age weight of 2. If the file is the minimum size, it has a size weight of 1.

When the importance of age relative to size is considered, the file's weight is computed in this way:  $\text{computed weight} = (\text{AGEWeight} * (\text{age weight})) + ((1 - \text{AGEWeight}) * (\text{size weight}))$ .

For example, when AGEWeight = 50, the file has the same weight  $((.5 * (2)) + ((1 - .5) * (1)) = 1.5)$  as a file that is only as old as the minimum age, but twice as big as the minimum size  $((.5 * (1)) + (.5 * (2)) = 1.5)$ . The weight of both files is 1.5.

If the AGEWeight option is not 50%, but 75%, the first file has a computed weight of 1.75  $((.75 * (2)) + ((1 - .75) * (1)) = 1.75)$ , while for the younger but larger file, the computed weight is 1.25  $((.75 * (1)) + ((1 - .75) * (2)) = 1.25)$ .

Specify a value from 0 to 100. The default is 50.

**-BACKUPBEforemigrate** yes | no

Use this option to configure whether migration requires backup. The default is the value that you set in the initial configuration wizard.

Migration does not protect your data. If a migrated file's stub file is deleted or damaged, and the file was not backed up or not archived, you can not recover the file. To protect your data, back up the files before migrating.

**-OPTFILE** *options\_file*

Use this option to specify the options file for backup before migration. If you specify -OPTFILE=DEFAULT, the backup-archive client chooses the options file. This is true even if the volume was previously configured to use another options file, and even if you specified another options file in the initial configuration wizard.

**-THRESHOLDMIGNOW** yes | no

Use this option to configure an immediate threshold migration. If disk usage is above the low threshold, files are migrated until the low threshold is reached. The default is no.

**-SCANNOW** yes | no

Use this option to configure an immediate scan of the volume. The default is no.

#### **-L loglevel**

Use this option to configure the type of information that is recorded in logs and trace files. You can specify one or more values with no commas or blank space separators. Severe and error information is always recorded, even if you do not specify this type of information. The default combination is severe, error, warning, information, and library (SEWIL). The possible values are the following:

- C (event)
- D (debug)
- E (error)
- F (flush)
- I (information)
- K (driver)
- L (library)
- S (severe)
- T (trace)
- U (user)
- W (warning)
- X (dump)

#### **-Help**

Use this option to display help for the command. Entering the command with no options also displays help for the command.

-? Use this option to display help for the command. Entering the command with no options also displays help for the command.

## **Examples**

**Task** Volume e:\ is not yet configured for threshold migration. Configure volume e:\ for threshold migration. Accept the default values for all parameters. (The file space name must be specified on the initial configuration).

**Command:** `dsmhsmc1c -configuret e:\ -files computer10`

**Task** Volume e:\ was configured with default values. Raise the high and low thresholds for volume e:\. Monitor the volume more frequently.

**Command:** `dsmhsmc1c -configuret e:\ -high 95 -low 90 -monitor 2`

**Task** Volume e:\ was configured with default values. Change the importance of size (relative to age) when picking migration candidates. Scan the volume for new candidates immediately.

**Command:** `dsmhsmc1c -configuret e:\ -agew 25 -scannow yes`

**Task** Immediately begin a migration of volume e:\. Continue migrating files until the disk usage is 40% of capacity.

**Command:** `dsmhsmc1c -configuret e:\ -low 40 -migratenow yes`

**Task** Limit threshold migration among all volumes to 1 threshold migration process at a time.

**Command:** `dsmhsmc1c -maxthresholdproc 1`

- Task** Deactivate threshold migration but do not erase threshold migration configuration of volume e:\.
- Command:** `dsmhsmc1c -configuret e:\ -monitorinterval 0`
- Task** Deactivate threshold migration and erase threshold migration configuration for volume e:\.
- Command:** `dsmhsmc1c -unconfiguret e:\`
- Task** Set a new management class MC2 for files that are migrated from volume f:\ by threshold migration.
- Command:** `dsmhsmc1c -configuret f:\ -mgmt MC2`
- Task** Query the configuration of volumes e:\ and g:\.
- Command:** `dsmhsmc1c -q e:\,g:\`
- Task** Change the information that is recorded in log and trace files. Record dump and trace information, and (by default) severe and error information.
- Command:** `dsmhsmc1c -l XT`
- Task** Change the information that is recorded in log and trace files to the default.
- Command:** `dsmhsmc1c -l`
- Task** Display help for the `dsmhsmc1c.exe` command (three methods are shown).
- Command:** `dsmhsmc1c -?`
- Command:** `dsmhsmc1c -help`
- Command:** `dsmhsmc1c`

**Related concepts**

- “Tracing preferences” on page 33
- “Threshold migration” on page 57

## dsminfo.exe

Run the **dsminfo.exe** command from a Command Prompt window to view HSM for Windows client settings.

When you run this command the log file `dsminfo.log` is created.

### Syntax



### Options

**info\_options**

You can specify any of the following options. Separate options with a space.

Table 22. Options for *dsminfo.exe*

Option	Description
all	Displays information for all options in this table
allquota	Displays quotas of all users on the given server
clclog	Displays the dsmclc.exe command's log level
disk	Displays hard disk(s) information
domain	Displays domain information.
domgroups	Lists the domain local groups
domusergr	Lists the domain local users and the groups of each user
domusers	Lists the domain local users
driver	Displays HSM for Windows file system driver version
errors	Displays only messages containing installation errors
filter	Displays the attribute file filter and minimum file size
guilog	Displays the dsmsgui.exe command's log level
help	Displays the help for the options for this command
infolog	Displays dsminfo.exe command's log level
installdir	Displays the installation directory
ip	Displays local computer IP addresses
locgroups	Display the computer local groups
locusers	Lists the computer local users
locusergr	Lists the computer local users, list the groups of each user.
locusers	Lists the computer local users
quota	Displays only defined quotas
save	Saves the output to check_installation.txt (any further run of the command will delete this file)
servicelog	Displays the hsmervice.exe command's log level
stamps	Displays version information of HSM for Windows client binary files
tivoli	Displays the versions of the Tivoli Storage Manager backup-archive client and API
user	Displays the current user name
version	Displays the HSM for Windows client version
win	Displays the Windows version and fix pack
wincp	Displays the Windows default ANSI code page

## Help

Use this option to display help for the command. Entering the command with no options also displays help for the command.

## Examples

**Task** Display the version of the HSM for Windows client client and the version of the binary files.

**Command:** `dsminfo version stamp`

**Task** Display the logging level of the following commands: hsmervice.exe, dsmsgui.exe, dsmlc.exe.

**Command:** dsminfo servicelog guilog clclog

**Task** Display help for the dsminfo.exe command (two methods are shown).

**Command:** dsminfo help

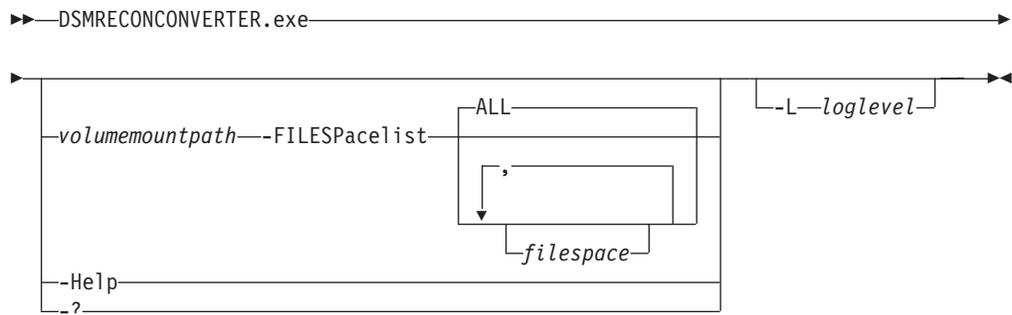
**Command:** dsminfo

---

## dsmReconConverter.exe

The **dsmReconConverter** command converts pre-V5.4 stubs to a format compatible with reconciliation. The command also checks all stub files and their Tivoli Storage Manager server objects for inconsistencies and tries to resolve them.

### Syntax



### Options

*volumemountpath*

Specify the volume to convert. Because it is possible for a single volume to be mounted by more than one path, always specify that volume by the same mount path. Reconciliation, threshold migration, and migration jobs should all reference the volume by the same path.

**ALL**

Search all file spaces.

*filespace*

Specify one or more file spaces, separated by commas, with no blank spaces. The HSM for Windows client searches only the specified file spaces for objects from that volume. Only objects in those file spaces are converted.

**-L loglevel**

Use this option to configure the type of information that is recorded in logs and trace files. You can specify one or more values with no commas or blank space separators. Severe and error information is always recorded, even if you do not specify this type of information. The default combination is severe, error, warning, information, and library (SEWIL). The possible values are the following:

- C (event)
- D (debug)
- E (error)
- F (flush)

I (information)  
K (driver)  
L (library)  
S (severe)  
T (trace)  
U (user)  
W (warning)  
X (dump)

### **-Help**

Use this option to display help for the command. Entering the command with no options also displays help for the command.

-? Use this option to display help for the command. Entering the command with no options also displays help for the command.

### **Examples**

**Task** Convert all stubs on volume F:.

**Command:** `dsmReconConverter F: -filesp ALL`

**Task** Convert all stubs on E:\Mounted Volumes\Volume07. Files from this volume were migrated to file spaces def-hsm01 and def-hsm02.

**Command:** `dsmReconConverter "E:\Mounted Volumes\Volume07" -filesp def-hsm01,def-hsm02`

### **Related concepts**

"Reconciliation overview" on page 6

"Tracing preferences" on page 33



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## Chapter 6. Troubleshooting the HSM for Windows client

You can diagnose and fix some common problems, such as those caused by antivirus software.

---

### Troubleshooting steps and information

You can follow some general guidelines on troubleshooting and preparing information for IBM support.

#### Retrying the action

1. Shut down IBM TSM HSM Recall Service. Shut down IBM TSM HSM Monitor Service, if it is installed.
2. Save and delete the log files.
3. Set the log levels to the highest level (**Full**) and ensure that the log file size is sufficiently large..
4. Restart the IBM TSM HSM Recall Service (`hsmsservice.exe`) and verify that the service is running.
5. Restart the IBM TSM HSM Monitor Service(`hsmmonitor.exe`) and verify that the service is running.
6. Retry the action, if you still have an issue, retry the action using another method, for example:
  - Use the HSM for Windows client GUI instead of the Command Prompt window or vice versa.
  - Check permissions by creating a file in the directory of the stub file you are trying to retrieve.
  - From an application, such as MS Word, open and save the file in question.

#### Collecting data and files for IBM support

##### Note:

1. If you did not follow steps 1 through 3 in prior section, follow those steps.
2. Select one or two files and use them to recreate the problem.
3. Write down each step, pipe screen output into text files, and capture screenshots.
4. Zip up logs files into logs.zip.
5. Use the IBM Support Assistant plug-in for the HSM for Windows client to gather and send the base information needed by the IBM support team.

#### Descriptive information to send to IBM support

- Collect program versions and environment information. Some of this information is displayed from the `dsminfo.exe` command.
  - The entire HSM for Windows client version
  - Tivoli Storage Manager versions (server, backup-archive, API)
  - Windows version
  - Disk layout: cluster, shares, local disks, iSCSI, SAN, NAS
  - Types of files involved: MS Office, big, small, where from

- Your ownership and permissions
- Status of the HSM for Windows client installation
  - New / upgraded / or running for 'xx' months
  - Are you migrating new files
  - Have you added new users
  - Have you increased volumes or the number of files involved
  - Did you change a configuration setting recently
  - Have file permissions changed
- What you want to accomplish
- Steps and events you used to create the problem
- The logs.zip file you collected
- Related screen shots or system messages

**Related concepts**

“Tracing preferences” on page 33

## Antivirus considerations

Although in-depth testing occurs with each HSM for Windows client release in regards to industry leading antivirus programs, there are a few considerations you need to periodically review.

**Note:**

- Be sure a virus scan runs on files before they are migrated.
- Updates of virus signatures and antivirus scan engines can lead to different behavior with the HSM for Windows client. During any troubleshooting, always ask the question “What changed?” and take special consideration of antivirus updates.
- Use antivirus software that supports sparse or offline files. Be sure it has a setting that allows it to skip offline or sparse files to avoid unnecessary recall of migrated files.
- The HSM for Windows client has been successfully tested for compatibility with the following programs with the specified settings:
  - McAfee VirusScan Enterprise 7.0 and 8.0
  - Symantec AntiVirus 8.0 and 9.0 Corporate Edition with the following setting:
    - Under **Scan Advanced Options** → **Storage migration options**, check **Skip offline and sparse files**.
  - Symantec AntiVirus 10.0 Corporate Edition with the following two settings:
    - Under **Scan Advanced Options** → **Storage migration options**, check **Skip offline files**.
    - Under **Autoprotect Advanced Options** → **Scan files when**, clear **Opened for backup**.

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## Appendix A. HSM for Windows client messages reference

Explanations are available for HSM for Windows client messages.

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### HSM for Windows 6.1.0 messages changes

This section contains lists of the new, changed, and deleted HSM for Windows 6.1.0 messages. The changes occurred since version 5.5.0, November 2007.

#### New HSM for Windows 6.1.0 messages

- ANS27496E
- ANS27497E
- ANS27498E
- ANS27499E
- ANS27500E
- ANS27501E
- ANS27502E
- ANS27508E
- ANS27579E
- ANS27580E
- ANS27581E
- ANS27582E
- ANS27583E
- ANS27584E
- ANS27585E
- ANS27590E
- ANS27591E
- ANS27627E
- ANS27663E
- ANS27664E
- ANS27667E
- ANS27668E
- ANS27669E
- ANS27681E
- ANS27682E
- ANS27683W
- ANS27684E
- ANS27685E
- ANS27686W
- ANS27687W
- ANS27688W
- ANS27689E
- ANS27690E

## Changed HSM for Windows 6.1.0 messages

In addition to the message number, the part of the message that has changed is listed.

Message Number	Change
ANS27368	Message type
ANS27379	Message type
ANS27388	Message type
ANS27390	Message type
ANS27392	Message type
ANS27407	Message type
ANS27410	Message type
ANS27416	Message type
ANS27453	Message type
ANS27454	Message type
ANS27481	Message text
ANS27482	Message text
ANS27483	Message text
ANS27484	Message text
ANS27485	Message text

## Deleted HSM for Windows 6.1.0 messages

There are no deleted messages.

---

## HSM for Windows 6.1.3 messages changes

This section contains lists of the new, changed, and deleted HSM for Windows 6.1.3 messages. The changes occurred since version 6.1.0.

### New HSM for Windows 6.1.3 messages

- ANS27496E
- ANS27497E
- ANS27697E
- ANS27701E
- ANS27702E
- ANS27740E
- ANS27744E
- ANS27745E
- ANS27746E
- ANS27786E
- ANS27791E
- ANS27811E
- ANS27813E
- ANS27814E
- ANS27879E
- ANS27882E
- ANS27883E
- ANS27888E

- ANS27889E
- ANS27890E
- ANS27897W
- ANS27898W
- ANS27900W
- ANS27901W
- ANS27902W

## Changed HSM for Windows 6.1.3 messages

In addition to the message number, the part of the message that has changed is listed.

Message Number	Change
ANS27464	Message text and explanation

---

## HSM for Windows 6.1.3 messages (ANS27000–ANS27999)

This section contains a listing of messages for HSM for Windows 6.1.3.

The messages contain a common **ANS** message prefix and a unique message number. The messages are listed in numeric order.

This section also contains Diagnosis, Modification, or Tuning Information. Some of these messages include information about the Tivoli Storage Manager error log that you can use when working with your service representative.

### **ANS27024E: Failure creating TSM file space 'file space name': error text**

#### **Explanation**

The TSM file space could be not created.

#### **System action**

The desired operation can not be executed.

#### **User response**

Check if the archive already exists, and check server permissions.

### **ANS27025E: Failure deleting TSM file space 'file space name': error text**

#### **Explanation**

The TSM file space could be not deleted.

#### **System action**

The desired operation can not be executed.

**User response**

Check if the archive exists, and check server permissions.

**ANS27026E: The file space '*file space name*' does not exist**  
**Explanation**

The file space does not exist on the server.

**System action**

The operation can not be performed due to a missing file space.

**User response**

Specify an existing file space for the desired operation.

**ANS27027E: Failure querying if file space '*file space name*' exists: *error text***  
**Explanation****Explanation**

Querying the TSM server for a file space failed.

**System action**

The desired operation can not not be performed.

**User response**

Check server permissions.

**ANS27028E: Failure parsing configuration file '*config file name*'**  
***error text***  
**Explanation****Explanation**

The global XML configuration file could not be parsed correctly and may contain corrupted data.

**System action**

The desired operation can not be performed.

**User response**

Correct the global XML configuration file with an editor or re-install the product.

**ANS27029E: The configuration file '*file name*' could not be found**

**Explanation**

The global XML job configuration file could not be found.

**System action**

The desired operation can not be performed.

**User response**

Restore the global XML configuration file or re-install the product.

**ANS27030E: Failure parsing job file '*job file name*': *error text***

**Explanation**

The job file could not be parsed correctly and may contain corrupted data.

**System action**

The desired migration operation can not be performed.

**User response**

Restore the job file from backup, or delete the corrupted file and re-create the job from scratch.

**ANS27031E: The job file '*job file name*' could not be found**

**Explanation**

A migration XML job file could not be found.

**System action**

The migration job can not be executed.

**User response**

Specify an existing job file or create the missing job file.

**ANS27032E: Failure parsing TSM option file '*opt file name*': *error text***

**Explanation**

The TSM option file could not be parsed correctly.

**System action**

The desired operation can not be performed as necessary TSM configuration data is missing.

### **User response**

Correct the option file or create a new option file in the installation directory using the wizard.

## **ANS27033E: The configuration file '*config file name*' could not be found**

### **Explanation**

The TSM option file could not be found

### **System action**

The desired operation can not be performed as necessary TSM configuration data is missing.

### **User response**

Create a new option file in the installation directory using the wizard or copy an existing option file in the installation directory.

## **ANS27034E: The connection to server *server name*, could not be closed correctly: *error text***

### **Explanation**

The application could not close the TCP/IP connection to the TSM server correctly.

### **System action**

The system will release the connection after a timeout.

### **User response**

No user response necessary. However, you may restart your server and the application.

## **ANS27035E: The connection to TSM server *server name*, port *port number*, could not be established: *error text***

### **Explanation**

The application could not connect to the configured TSM server.

### **System action**

The server operation is not performed.

### **User response**

Check if the repository server is reachable and well configured, and check your connection data in the TSM option file.

**ANS27036E: Failure deleting TSM server entries for file 'file name': error text**

**Explanation**

A repository file entry could not be deleted on server.

**System action**

An error log entry is written and the system continues with next file entries.

**User response**

Check the TSM server permissions and sanity. Retry server entry file deletion.

**ANS27037E: Failure querying the TSM server for file entries with pattern search pattern: error text**

**Explanation**

Querying the server for the requested files failed.

**System action**

The TSM server entry deletion operation is not performed.

**User response**

Check TSM server permissions and sanity. Retry the deletion operation.

**ANS27038E: Failure opening file deletion transaction: error text**

**Explanation**

The application could not establish the transaction context for entry deletion on the TSM server.

**System action**

The file entry or the file entries are not deleted on the TSM server.

**User response**

Check TSM server permissions and sanity. Retry the deletion operation.

**ANS27039E: Failure closing file deletion transaction: error text**

**Explanation**

The application could not close the transaction context for entry deletion on the TSM server.

**System action**

None. The operation continues with the next action.

**User response**

Check TSM server permissions and sanity. Retry the deletion operation.

**ANS27040E: An error occurred during file analysis: *error text***  
**Explanation**

The absolute file path could not be obtained.

**System action**

The program terminates.

**User response**

Check file permissions and security settings.

**ANS27041E: An error occurred during file analysis *error text***  
**Explanation**

File attributes could not be obtained.

**System action**

The program terminates.

**User response**

Check file permissions and security settings.

**ANS27042E: An error occurred during file analysis: *error text***  
**Explanation**

The backend query for the file failed.

**System action**

The program terminates.

**User response**

Check server accessibility and permissions.

**ANS27043E: An error occurred during file analysis: *error text***  
**Explanation**

File MD5 key could not be calculated.

**System action**

The program terminates.

**User response**

Check file permissions and security settings.

**ANS27044E: An error occurred during file analysis: *error text***  
**Explanation**

File reparse data could not be read.

**System action**

The program terminates.

**User response**

Check file permissions and security settings.

**ANS27045E: An error occurred during file analysis: *error text***  
**Explanation**

File security could not be obtained or evaluated.

**System action**

The program terminates.

**User response**

Check file permissions and security settings.

**ANS27046E: A program initialization problem occurred: *error text*****Explanation**

Registry values, file or directories were missing and could not have been created.

**System action**

The program terminates.

**User response**

Check registry values and installation directory permissions, or re-install the product.

**ANS27047E: A program initialization problem occurred:** *error text*

**Explanation**

Logging could not be started.

**System action**

The program terminates.

**User response**

Check logging directory and log file locking, permissions and security.

**ANS27048E: A program initialization problem occurred:** *error text*

**Explanation**

Memory objects could not be created by the program.

**System action**

The program terminates.

**User response**

Check the memory state of the computer running the program.

**ANS27049E: Failure querying with pattern** *search pattern: error text*

**Explanation**

Multiple entries for the same file and version have been found. This error indicates inconsistent file entries in the file space.

**System action**

The operation is aborted.

**User response**

Run the reconciliation tool. Rerun the operation.

**ANS27050E: Failure querying TSM server for file entries with pattern** *search pattern: error text*

**Explanation**

Querying the TSM server for the requested files failed.

**System action**

The TSM server entry listing operation is not performed.

### **User response**

Check TSM server permissions and sanity. Retry the list operation.

### **ANS27051E: An error occurred during a file rename operation with pattern *search pattern: error text***

#### **Explanation**

Server file entry rename operation failed.

#### **System action**

The TSM server entry rename operation is not performed.

### **User response**

Check server configuration and permissions.

### **ANS27052E: Failure querying TSM server for file entries with pattern *search pattern: error text***

#### **Explanation**

Querying the TSM server for the requested files failed.

#### **System action**

The TSM server entry rename operation is not performed.

### **User response**

Check TSM server permissions and sanity. Retry the rename operation.

### **ANS27053E: Failure opening file rename transaction: *error text***

#### **Explanation**

The application could not open the transaction context for an entry rename operation on the TSM server.

#### **System action**

The file entry or the file entries are not renamed on the TSM server.

### **User response**

Check TSM server permissions and sanity. Retry the rename operation.

**ANS27054E: Failure closing file rename transaction: *error text*****Explanation**

The application could not close the transaction context for an entry rename operation on the TSM server.

**System action**

None. The operation continues with the next action.

**User response**

Check TSM server permissions and sanity. Retry the rename operation.

**ANS27055E: Failure restoring file '*file name*': *error text*****Explanation**

Multiple entries for the same file and version have been found. This error indicates inconsistent file entries in the file space.

**System action**

The operation is aborted.

**User response**

Run the reconciliation tool. Rerun the operation.

**ANS27056E: Failure querying TSM server for file entries with pattern *search pattern*: *error text*****Explanation**

Querying the TSM server for the requested files failed.

**System action**

The TSM server entry retrieve operation is not performed.

**User response**

Check TSM server permissions and sanity. Retry the retrieve operation.

**ANS27057E: Failure resetting connection to TSM server '*server name*': *error text*****Explanation**

After a file has been retrieved or recalled from a tape library the TSM server connection needs to be reset to release the tape.

**System action**

None. The application continues with the next operation.

### **User response**

Check server TCP/IP connection and the tape library.

### **ANS27058E: Failure retrieving file(s) '*file name or pattern*' from TSM server '*server name*': *error text***

#### **Explanation**

Requested file(s) could not be retrieved from the TSM server.

#### **System action**

The retrieve operation is aborted.

### **User response**

Check server address, configuration and permissions, check file space and disk space on file system.

### **ANS27059E: Failure deleting file '*file name*' from the file system: *error text***

#### **Explanation**

The file has been stored on the TSM server. Removing the file from the file system failed.

#### **System action**

The file is kept as is. File attributes and file times are recovered.

### **User response**

Check file and volume permissions. Rerun the file migration.

### **ANS27060E: Failure preparing file entry '*file name*' for migration to TSM server '*server name*': *error text***

#### **Explanation**

TSM server file entry information could not be completely computed.

#### **System action**

The file is not migrated to the TSM server.

### **User response**

Restart the file migration.

**ANS27061E: Failure loading file(s) on the TSM server 'server name': error text**

**Explanation**

During the file migration a global error occurred.

**System action**

The file migration will be aborted.

**User response**

Check server address, configuration and permissions, check file space.

**ANS27062E: Failure turning file 'file name' into a stub file: error text**

**Explanation**

The file has been stored on the TSM server. Turning the file into stub file failed.

**System action**

The file is kept as is. File attributes and file times are recovered.

**User response**

Check if your files have extended attributes which is not allowed. Rerun the file migration.

**ANS27063E: Failure sending file data of 'file name' to TSM server 'server name': error text**

**Explanation**

Some file content could not be send to the TSM server file space.

**System action**

The file content transaction is canceled. The file is not stored on the server.

**User response**

Check the TSM server for data space. Retry the file migration.

**ANS27064E: Failure opening file migration transaction: error text**

**Explanation**

The application could not open the transaction context for a file migration to the TSM server.

**System action**

The file entry or the file entries are not migrated on the TSM server.

### **User response**

Check TSM server permissions and sanity. Retry the file migration.

### **ANS27065E: Failure closing file migration transaction: *error text***

#### **Explanation**

The application could not close the transaction context for a file migration to the TSM server.

#### **System action**

None. The operation continues with the next action.

### **User response**

Check TSM server permissions and sanity. Retry the file migration.

### **ANS27066E: Failure removing protection from file '*file name*': *error text***

#### **Explanation**

To migrate a file the file protection (read-only flag) must be removed.

#### **System action**

The file is not migrated. Attributes are restored.

### **User response**

Check file permissions and user permissions.

### **ANS27067E: Failure validating migrated file '*file name*': *error text***

#### **Explanation**

A file has been migrated to the TSM server but could not be queried on that server.

#### **System action**

The file is not turned into a stub files. Files attributes are restored on the file system.

### **User response**

Retry file migration.

**ANS27068E: The file '*file name*' specified as parameter was not found**

**Explanation**

The file specified as parameter could not be found.

**System action**

The program terminates.

**User response**

Specify a path to an existing file.

**ANS27069E: The program '*program name*' was used in an incorrect way**

**Explanation**

The specified parameter syntax is not correct.

**System action**

The program terminates.

**User response**

Type the program name for usage information or refer to the documentation.

**ANS27090E: An error occurred during file analysis: *error text***

**Explanation**

The file object id could not be obtained or set.

**System action**

The program terminates.

**User response**

Check file permissions and security settings.

**ANS27353E: An unexpected error occurred when terminating the program. Errno value: *0xerrno String***

**Explanation**

An unexpected error occurred after stopping logging.

**System action**

The application continues.

### **User response**

Contact IBM Software Support for help and indicate the message text information.

### **ANS27354E: 'ALL' cannot be used as file space name.**

#### **Explanation**

The HSM reserved key word 'ALL' was used as file space name.

#### **System action**

The application aborts.

#### **User response**

Check the specified file space list.

### **ANS27355E: Unable to copy '*extension dll name*' to '%%WINDIR%%\Cluster'.**

#### **Explanation**

The application cannot copy extension dll to '%%WINDIR%%\Cluster'.

#### **System action**

The application aborts.

#### **User response**

Check the log file for error details.

### **ANS27356E: Unable to copy '*resource type dll name*' to '%%WINDIR%%\Cluster'.**

#### **Explanation**

The application cannot copy resource type dll to '%%WINDIR%%\Cluster'.

#### **System action**

The application aborts.

#### **User response**

Check the log file for error details.

**ANS27357E: Unable to register the resource type dlls. The cluster state cannot be determined.**

**Explanation**

The installation cannot determine the cluster state.

**System action**

The application aborts.

**User response**

Make sure that the node belongs to a cluster.

**ANS27358E: Unable to get windows directory of the node.**

**Explanation**

The application cannot get windows directory of the node.

**System action**

The application aborts.

**User response**

Check the log file for error details.

**ANS27359E: Could not initialize backend libraries.**

**Explanation**

Backend library initialization failed.

**System action**

Extension dialog can't be opened.

**User response**

Please verify that the backend libraries are installed and configured.

**ANS27360E: Could not initialize backend libraries or missing configuration file (dsm.opt).**

**Explanation**

Backend library initialization failed or configuration file (dsm.opt) is missing.

**System action**

The application aborts.

### **User response**

Verify whether the backend libraries are installed and configuration file (dsm.opt) is configured.

### **ANS27361E: Can't save configuration. Mount path no longer exists: '*mount path*'**

#### **Explanation**

Extension dialog tried to save a configuration for a mount path that meanwhile has disappeared.

#### **System action**

The configuration is not saved, but stays in registry, if it was already saved before. The dialog displays another mount path.

### **User response**

Select the Cleanup button to interactively remove mount paths from the registry.

### **ANS27362E: Can't save configuration of mount path: '*other mount path*' The volume is already configured through mount path: '*other mount path*'**

#### **Explanation**

Extension dialog tried to configure a volume with a mount path which is already configured through another mount path.

#### **System action**

The configuration is not saved. The mount path stays configured through the other mount path.

### **User response**

To change the configuration, select the other mount path and apply changes there.

### **ANS27363E: The specified volume could not be unconfigured.**

#### **Explanation**

Deleting the configuration of the specified volume from registry failed unexpectedly.

#### **System action**

The configuration of the specified volume may be corrupted.

### **User response**

Try to delete the configuration again. If deleting the configuration fails again, contact IBM Software Support.

## **ANS27364E: Cannot unconfigure while reconcile is running on volume.**

### **Explanation**

You tried to unconfigure a volume while reconcile is running on that volume.

### **System action**

Volume stays configured.

### **User response**

Wait until the reconciliation of this volume is done. Then the volume can be unconfigured.

## **ANS27365E: Unable to perform COM registration of resource type extension dll.**

### **Explanation**

The application cannot perform COM registration of resource type extension dll.

### **System action**

The application aborts.

### **User response**

Make sure that the resource type extension dll exists under the %%WINDIR%%\Cluster and check the log file for error details.

## **ANS27366E: Unable to perform COM unregistration of resource type extension dll.**

### **Explanation**

The application cannot perform COM unregistration of resource type extension dll.

### **System action**

The application aborts.

### **User response**

Make sure that the resource type extension dll exists under the %%WINDIR%%\Cluster and check the log file for error details.

**ANS27367E: Unable to unregister resource type dll, because there is still reconcile configuration on the cluster.**

**Explanation**

Unable to unregister resource type dll, because there is still reconcile configuration on the cluster.

**System action**

The application aborts.

**User response**

Delete all of reconcile configurations on the cluster and try the operation again.

**ANS27368I: Please create at least 1 file space before using the extension panel.**

**Explanation**

To configure volumes for reconciliation at least one file space is required.

**System action**

Extension dialog is not displayed.

**User response**

Create a file space. Then open the extension panel.

**ANS27369E: Failure creating file needed for reconciliation (expected size KB): file name**

**Explanation**

Reconcile hashtable file could not be created. The file is needed to store information during reconciliation.

**System action**

Reconcile is aborted for this volume.

**User response**

Make sure there is enough free space on the volume to create the file. Add some extra space as the file size is only an estimate and might need additional space.

**ANS27370E: Failure running the application: *error message***

**Explanation**

An application error occurred.

**System action**

The application aborts.

**User response**

Check the log file for error details.

**ANS27371E: Cannot define the current node resource.**

**Explanation**

Definition of the Microsoft cluster node failed.

**System action**

The application aborts.

**User response**

Check the log file for error details.

**ANS27372E: Cannot define owner of the resource '*resource name*'.**

**Explanation**

Define owner of Microsoft cluster resource failed.

**System action**

The application aborts.

**User response**

Check the log file for error details.

**ANS27373E: Failure deleting TSM server object. load time: '*load time*', filespace: '*filespace*', TSM server object id (hi/lo): *0xhi / 0xlo***

**Explanation**

An error occurred while reconciliation tried to delete a server object.

**System action**

Delete operation is skipped and reconciliation proceeds.

### **User response**

Check if TSM server is accurately configured and available.

### **ANS27374E: An unexpected error occurred when terminating the program.**

#### **Explanation**

An unexpected error occurred when deleting instance.

#### **System action**

The application continues.

#### **User response**

Check the log file and contact IBM Software Support for help.

### **ANS27375E: Cannot delete resource '*resource name*'.**

#### **Explanation**

Delete Microsoft cluster resource failed.

#### **System action**

The application aborts

#### **User response**

Make sure that the resource belongs to the local host. Check the log file for error details.

### **ANS27376E: The file space names in the list were not unique.**

#### **Explanation**

There were two file spaces with the same name.

#### **System action**

The application aborts.

#### **User response**

Check the specified file space list.

### **ANS27377E: Unable to enumerate the registered resource types on the node.**

#### **Explanation**

Unexpected error occurred when enumerating the registered resource types on the node.

**System action**

The application aborts.

**User response**

Check the log file for error details.

**ANS27378E: Failure validating registry key: 'registry key' Error: 'error'****Explanation**

A registry key used for reconcile configuration contains invalid data.

**System action**

Operation aborts.

**User response**

Contact IBM Software Support.

**ANS27379W: Failure while saving configuration for mount path: *mount path*****Explanation**

An error occurred while saving configuration to registry.

**System action**

System will reload saved configuration and apply a general validation check. Settings might differ from previous input.

**User response**

Check all settings of currently displayed mount path. If validation fails, contact IBM Software Support.

**ANS27380E: Unable to set loaded dll free.****Explanation**

The application cannot set loaded dll free.

**System action**

The application aborts.

**User response**

Check the log file for error details.

**ANS27381E: Unable to unload the resource type extension dll.****Explanation**

The application cannot unload the resource type extension dll.

**System action**

The application aborts.

**User response**

Make sure that the resource type extension dll exists under the %%WINDIR%%\Cluster and check the log file for error details.

**ANS27382E: Unable to get version number of 'dll name'.****Explanation**

The application cannot get version number of dll.

**System action**

The application aborts.

**User response**

Make sure that dll exists and has not been modified.

**ANS27383E: Getting file spaces failed.****Explanation**

The program was not able to get the list of file spaces.

**System action**

The conversion program aborts.

**User response**

Please check the connection to the database server.

**ANS27384E: Cannot get name of the resource 'resource ID'.****Explanation**

Get name of Microsoft cluster resource failed.

**System action**

The application aborts

**User response**

Check the log file for error details.

## **ANS27385E: Unable to get state of resource type dlls.**

### **Explanation**

Unable to get state of resource type dlls.

### **System action**

The application aborts.

### **User response**

Make sure that the resource type dlls (HSMResTypDLL.dll and HSMResTypDLLEx.dll) were registered and copied into the right directory and check the log file for error details.

## **ANS27386E: Unable to get state of registration of resource type dlls.**

### **Explanation**

The application cannot get the state of registration of resource type dlls.

### **System action**

The application aborts.

### **User response**

Check the log file for error details.

## **ANS27387E: hsmmonitor service has stopped due to an error. Error is written to Windows event log.**

### **Explanation**

Hsmmonitor service has been stopped with an error.

### **System action**

Error is written to Windows event log. Scheduled reconcile tasks will not execute.

### **User response**

Restart hsmmonitor service as soon as possible to assure that reconcile tasks will be processed.

**ANS27388W: hsmmonitor service has stopped.**

**Explanation**

Hsmmonitor service has been stopped.

**System action**

Scheduled reconcile tasks will not execute.

**User response**

Restart hsmmonitor service as soon as possible to assure that reconcile tasks will be processed.

**ANS27389W: Hsmmonitor service has stopped with a warning. Warning is written to Windows event log.**

**Explanation**

Hsmmonitor service has been stopped with a warning.

**System action**

Warning is written to Windows event log. Scheduled reconcile tasks will not execute.

**User response**

Restart hsmmonitor service as soon as possible to assure that reconcile tasks will be processed.

**ANS27390W: *service name* is not yet running. Reconcile tasks will be delayed until it is running.**

**Explanation**

The service is needed for reconcile tasks to execute.

**System action**

Scheduled reconcile tasks will be delayed until the service is running.

**User response**

If the service does not start automatically, start it manually. Otherwise simply wait until it has started.

**ANS27391E: The HSM recall service is not running.****Explanation**

If the HSM recall service is not running, stub file attributes cannot be read.

**System action**

Reconciliation canceled because of the missing HSM recall service.

**User response**

Start the HSM recall service and rerun reconciliation.

**ANS27392W: Found an inconsistent file: '*orphan file name*'.****Explanation**

Found a file without an external object ID or unequal object IDs.

**System action**

The process ignores this inconsistency and continues.

**User response**

This problem can be solved by remigrating the file.

**ANS27393E: Initialization of extension utility failed: *error message*****Explanation**

Failure when initializing an extension utility.

**System action**

The application or reconcile dialog aborts.

**User response**

Make sure application is running under an administrator account. Check the log file for error details.

**ANS27394E: Installation of resource type dlls failed.****Explanation**

The application cannot install resource type dlls.

**System action**

The application aborts.

**User response**

Check the log file for error details.

**ANS27395E: Versions of deleted files must be between *minimum versions of deleted files* and *maximum versions of deleted files*.**

**Explanation**

The specified value for versions of deleted files was not valid.

**System action**

Show the correct range for version of deleted files. The application aborts.

**User response**

Check the validity of the specified parameter value.

**ANS27396E: Versions of existing files must be between *minimum versions of existing files* and *maximum versions of existing files*.**

**Explanation**

The specified value for versions of existing files was not valid.

**System action**

Show the correct range for version of existing files. The application aborts.

**User response**

Check the validity of the specified parameter value.

**ANS27397E: The Next Reconcile Time was not valid.**

**Explanation**

The specified next reconcile time was not valid.

**System action**

Show the correct format of next reconcile time. The application aborts.

**User response**

Check the validity of the specified parameter value.

**ANS27398E: The Reconcile Interval must be between *minimum of reconcile interval* and *maximum of reconcile interval*. ( **both inclusive** )**

**Explanation**

The specified reconcile interval was not valid.

**System action**

Show the correct range of reconcile interval. The application aborts.

**User response**

Check the validity of the specified parameter value.

**ANS27399E: Please give 'yes' or 'no' to the RECONCILENOW-option.****Explanation**

The specified value for option RECONCILENOW was not valid.

**System action**

Show the correct value for option RECONCILENOW. The application aborts.

**User response**

Check the validity of the specified parameter value.

**ANS27400E: License expired.****Explanation**

License expired.

**System action**

Extension dialog can't open.

**User response**

Check license.

**ANS27401E: License expired.****Explanation**

License expired.

**System action**

The application aborts.

**User response**

Check license.

**ANS27402E: License Registration failed.**

**Explanation**

License Registration failed.

**System action**

Extension dialog can't open.

**User response**

Check license.

**ANS27403E: License Registration failed.**

**Explanation**

License Registration failed.

**System action**

The application aborts.

**User response**

Check license.

**ANS27404E: Unable to load required dll '*dll name*'.**

**Explanation**

The application cannot load required dll.

**System action**

The application aborts.

**User response**

Check the log file for error details.

**ANS27405E: Unable to load resource type extension dll.**

**Explanation**

The application cannot load the resource type extension dll.

**System action**

The application aborts.

**User response**

Make sure that the resource type extension dll exists under the  
%%WINDIR%%\Cluster.

**ANS27406E: Invalid Max Reconcile Process Number. It must be a number between *minimum number of max reconcile process* and *maximum number of max reconcile process*. ( both inclusive )**

**Explanation**

Value of max reconcile process out of range.

**System action**

Show correct range of max reconcile process. The application aborts.

**User response**

Check the input value of max reconcile process.

**ANS27407W: A file space was not in search list (file: '*orphan file name*'; file space: '*file space name*').**

**Explanation**

The file space name of this stub file was not in search list for processing.

**System action**

Less objects are processed by the operation - processing continues.

**User response**

Include this file space to search list for a complete processing.

**ANS27408E: Reconcile aborted due to a removed volume in: '*volume mount point*'.**

**Explanation**

Hsmmonitor service was stopped and aborted the running reconciliation.

**System action**

Reconciliation of the volume has not entirely completed.

**User response**

During reconciliation do not remove any volumes. Doing so can create data loss.

### **ANS27409E: The resource type dlls are missing.**

#### **Explanation**

The installation might not be completely. The resource type dlls are missing.

#### **System action**

The application aborts.

#### **User response**

Make sure that the resource type dlls (HSMResTypDLL.dll and HSMResTypDLLEx.dll) were registered and copied into the right directory and check the log file for error details.

### **ANS27410W: Mount path no longer exists: '*mount path*'**

#### **Explanation**

A mount path disappeared configuring the mount path.

#### **System action**

The configuration of the mount path stays in registry, if it was already saved before. The dialog displays another mount path.

#### **User response**

Select the Cleanup button to interactively remove mount paths from the registry.

### **ANS27411E: Not enough memory.**

#### **Explanation**

The application cannot allocate enough memory.

#### **System action**

The application aborts.

#### **User response**

Make sure that enough memory is available and check the log file for error details.

### **ANS27412E: The local host is not the owner of the reconcile configuration resource *resource name*.**

#### **Explanation**

The application accessed a resource, which is does belong to the local host.

#### **System action**

Access denied. Operation on the resource aborts.

### **User response**

Make sure that the resource belongs to the local host. Check the log file for error details.

### **ANS27413E: No access to a file or a directory: 'file name'.**

#### **Explanation**

The process has no access to a file or a directory.

#### **System action**

Without access to all files, the operation cannot complete.

#### **User response**

Please check the access permissions of the file or the directory.

### **ANS27414E: No available file space.**

#### **Explanation**

No available files space.

#### **System action**

The application aborts.

#### **User response**

You need to create at least one file space.

### **ANS27415E: Cannot take resource 'resource name' offline.**

#### **Explanation**

Takeing the Microsoft cluster resource offline failed.

#### **System action**

The application aborts

#### **User response**

Make sure that the resource belongs to the local host. Check the log file for error details.

**ANS27416W: Found an object of a pre TSM HSM 5.4.0 client: '*file name*'.**

**Explanation**

Pre TSM HSM 5.4.0 server objects are not processed by reconciliation.

**System action**

Reconciliation does not remove obsolete pre TSM HSM 5.4.0 server objects.

**User response**

Use the tool '*dsmReconConverter.exe*' to upgrade these objects.

**ANS27417E: Cannot bring resource '*resource name*' online.**

**Explanation**

Bringing the Microsoft cluster resource online failed.

**System action**

The application aborts

**User response**

Make sure that the resource belongs to the local host. Check the log file for error details.

**ANS27418E: Unable to open a enumeration handle.**

**Explanation**

The application cannot open a handle to enumeration registered resource types.

**System action**

The application aborts.

**User response**

Check the log file for error details.

**ANS27419E: Unable to load required function '*function name*' from '*dll name*'.**

**Explanation**

The application cannot load the required function from dll.

**System action**

The application aborts.

### **User response**

Make sure that the dll exists and has not been modified.

### **ANS27420E: Cannot open handle to 'resource name'.**

#### **Explanation**

Opening the handle to Microsoft cluster resource failed.

#### **System action**

The application aborts

### **User response**

Make sure that the resource belongs to the local host. Check the log file for error details.

### **ANS27421E: No data on the TSM Server found for file: 'orphan file name' (file space: 'file space name').**

#### **Explanation**

The process found an orphan file (no data on the TSM Server).

#### **System action**

The operation cannot be completed if any orphan stub file has been found.

### **User response**

Please replace the orphan stub file with the last backup to solve the problem.

### **ANS27422E: The specified Next Reconcile Time is not valid. It must be at least one interval (of the reading volume configuration setting ( *actual interval of reading volume configuration minute(s)* )) after the current time.**

#### **Explanation**

The specified Next Reconcile time is in the past past.

#### **System action**

The application aborts.

### **User response**

Enter a new Next Reconcile Time. It must be at least one interval (of the reading volume configuration setting (default 60s)) after the current time.

**ANS27423E: Failed to read command line arguments.**

**Explanation**

Cannot allocate enough memory to save command line arguments.

**System action**

The application aborts.

**User response**

Please reserve enough memory for the application.

**ANS27424E: Reading Number of Max Reconcile Process failed.**

**Explanation**

Reading max reconcile process number from registry failed.

**System action**

No max reconcile process read from registry. The application aborts.

**User response**

Check access permission of registry.

**ANS27425E: Reading volume configuration from registry failed.**

**Explanation**

Reading volume configuration from registry failed.

**System action**

The application aborts.

**User response**

Check the log file for error details.

**ANS27426E: Reconcile aborted due to shutdown of hsmmonitor service. Volume: '*reconcile volume*'.**

**Explanation**

Hsmmonitor service was stopped and aborted the running reconciliation.

**System action**

Reconciliation of the volume has not entirely completed.

### **User response**

Reconciliation of this volume will be executed again when hsmmonitor service starts. No need to schedule an additional reconciliation.

## **ANS27427E: Conversion aborts because of running reconciliation jobs.**

### **Explanation**

One or more reconciliation jobs are currently running.

### **System action**

Conversion process aborts.

### **User response**

Wait until reconciliation jobs are finished before restating conversion.

## **ANS27428E: Unable to register the resource type extension dll.**

### **Explanation**

The application cannot register the resource type extension dll.

### **System action**

The application aborts.

### **User response**

Make sure that the resource type extension dll exists under the %%WINDIR%%\Cluster and check the log file for error details.

## **ANS27429E: Unable to register the resource type dll.**

### **Explanation**

The application cannot register the resource type dll.

### **System action**

The application aborts.

### **User response**

Make sure that the resource type dll exists under the %%WINDIR%%\Cluster and check the log file for error details.

**ANS27430E: Unexpected error. Saved configuration disappeared, mount path: '*mount path*'**

**Explanation**

The extension dialog cannot find a configuration after saving it. This is probably due to a manual registry manipulation.

**System action**

The mount path is not configured.

**User response**

Try to save the configuration again. If it fails again, check the log file for details or contact IBM Software Support.

**ANS27431E: Saving volume configuration failed.**

**Explanation**

Saving volume configuration failed.

**System action**

No volume configuration will be saved into registry. The application aborts.

**User response**

Check access permission of registry and check the log file for details.

**ANS27432E: Could not restore the object ID of a file: '*orphan file name*'.**

**Explanation**

Restore of an external file object ID failed.

**System action**

The process ignores this problem and continues.

**User response**

Please check the access permissions of this file.

**ANS27433E: Setting Max Reconcile Process Number failed.**

**Explanation**

Setting max reconcile process number failed.

**System action**

No max reconcile process number will be written in registry. The application aborts.

### **User response**

Check access permission of registry.

### **ANS27434E: Cannot set the value of NumberOfServerObjects of the resource '*resource name*'.**

#### **Explanation**

Setting the NumberOfServerObjects parameter of the Microsoft cluster resource failed.

#### **System action**

The application aborts

### **User response**

Make sure that the resource belongs to the local host. Check the log file for error details.

### **ANS27435E: Cannot set value of ReconcileNow of the resource '*resource name*'.**

#### **Explanation**

Setting the ReconcileNow parameter of Microsoft cluster resource failed.

#### **System action**

The application aborts

### **User response**

Make sure that the resource belongs to the local host. Check the log file for error details.

### **ANS27436E: Cannot set the value of a parameter of the resource '*resource name*'.**

#### **Explanation**

Setting the parameter of Microsoft cluster resource failed.

#### **System action**

The application aborts

### **User response**

Make sure that the resource belongs to the local host. Check the log file for error details.

**ANS27437E: Cannot set value of ReconcileRunning of the resource '*resource name*'.**

**Explanation**

Setting the ReconcileRunning parameter of the Microsoft cluster resource failed.

**System action**

The application aborts.

**User response**

Make sure that the resource belongs to the local host. Check the log file for error details.

**ANS27438E: A program initialization problem occurred.**

**Explanation**

Cannot start cluster features.

**System action**

The application aborts.

**User response**

Check the log file and contact IBM Software Support for help.

**ANS27439E: A program initialization problem occurred.**

**Explanation**

Cannot start conversion.

**System action**

The application aborts.

**User response**

Check the log file and contact IBM Software Support for help.

**ANS27440E: A program initialization problem occurred.**

**Explanation**

Cannot start domain controller.

**System action**

The application aborts.

**User response**

Check the log file and contact IBM Software Support for help.

**ANS27441E: A program initialization problem occurred.**

**Explanation**

Cannot start storage.

**System action**

The application aborts.

**User response**

Check the log file and contact IBM Software Support for help.

**ANS27442E: An unexpected error occurred when terminating the program.**

**Explanation**

An unexpected error occurred when stopping cluster features.

**System action**

The application continues.

**User response**

Check the log file and contact IBM Software Support for help.

**ANS27443E: An unexpected error occurred when terminating the program.**

**Explanation**

An unexpected error occurred when stopping conversion.

**System action**

The application continues.

**User response**

Check the log file and contact IBM Software Support for help.

**ANS27444E: An unexpected error occurred when terminating the program.**

**Explanation**

An unexpected error occurred when stopping domain controller.

**System action**

The application continues.

**User response**

Check the log file and contact IBM Software Support for help.

**ANS27445E: An unexpected error occurred when terminating the program.****Explanation**

An unexpected error occurred when stopping driver.

**System action**

The application continues.

**User response**

Check the log file and contact IBM Software Support for help.

**ANS27446E: An unexpected error occurred when terminating the program.****Explanation**

An unexpected error occurred when stopping logging.

**System action**

The application continues.

**User response**

Check the log file and contact IBM Software Support for help.

**ANS27447E: An unexpected error occurred when terminating the program.****Explanation**

An unexpected error occurred when stopping storage.

**System action**

The application continues.

**User response**

Check the log file and contact IBM Software Support for help.

**ANS27448E: Syntax error or wrong parameter. Please check the usage.**

**Explanation**

Syntax error or wrong parameter.

**System action**

Show command usage. The application aborts.

**User response**

Check the usage.

**ANS27449E: The following specified file space(s) is(are) not available : *unavailable file space(s)***

**Explanation**

There was(were) unavailable file space(s) in the specified file space list.

**System action**

The application aborts.

**User response**

Check the specified file space list.

**ANS27450E: An unexpected error occurred: *unexpected error***

**Explanation**

An unexpected error occurred (MFC exception).

**System action**

Operation or program aborts.

**User response**

Check the log file and contact IBM Software Support for help.

**ANS27451E: An unknown unexpected error occurred.**

**Explanation**

An unknown unexpected error occurred (unknown exception).

**System action**

Operation or program aborts.

**User response**

Check the log file and contact IBM Software Support for help.

**ANS27452E: Uninstallation of resource type dlls failed.****Explanation**

The application cannot uninstall resource type dlls.

**System action**

The application aborts.

**User response**

Check the log file for error details.

**ANS27453W: Unknown file space(s) in list of selected file spaces: *file space*****Explanation**

A mount path configured by another mount path has unknown file spaces in list of selected file spaces.

**System action**

Unknown file spaces are in list together with known ones.

**User response**

Select mount path that configures this mount path and change the setting.

**ANS27454W: Unknown file space not added to selection: *file space*****Explanation**

A file space previously set in configuration now does not exist.

**System action**

File space is removed from list of selected file spaces in volume reconcile configuration.

**User response**

The change can be accepted with 'Apply' or 'Ok'. To avoid this message, a file space should be removed from all configurations before it is deleted.

## **ANS27455E: Unable to unregister the resource type extension dll.**

### **Explanation**

The application cannot unregister the resource type extension dll.

### **System action**

The application aborts.

### **User response**

Make sure that the resource type extension dll exists under the %%WINDIR%%\Cluster and check the log file for error details.

## **ANS27456E: Unable to unregister the resource type dll.**

### **Explanation**

The application cannot unregister the resource type dll.

### **System action**

The application aborts.

### **User response**

Make sure that the resource type dll exists under the %%WINDIR%%\Cluster and check the log file for error details.

## **ANS27457E: Found unresolved objects.**

### **Explanation**

Unresolved objects are found during file system scan.

### **System action**

The operation cannot complete if any unresolved objects are detected.

### **User response**

Please solve all problems with unresolved files and restart the process.

## **ANS27458E: Conversion failed of a pre TSM HSM 5.4.0 client object: '*file name*'.**

### **Explanation**

An error occurred during conversion of a pre TSM HSM 5.4.0 client object.

### **System action**

Conversion stops if any upgrade failed.

### **User response**

Check the log file and contact IBM Software Support for help.

### **ANS27459E: Failure getting volume for UNC path: '*UNC path*'** **Error description: *error message***

#### **Explanation**

The volume of an UNC path could not be determined.

#### **System action**

Reconciliation aborts.

### **User response**

Make sure network connection is activated and properly configured.

### **ANS27460E: Failure analyzing B/A client trace file for backup failures: Trace file: '*TSM B-A client trace file name*'**

#### **Explanation**

The B/A client trace file cannot be exploited to analyze backup failures.

#### **System action**

No backup will be performed before file migration.

### **User response**

Check the log file for a more detailed reason description.

### **ANS27461E: Failure running TSM B/A client executable: *originator error string***

#### **Explanation**

The B/A client executable could not be run.

#### **System action**

No backup will be performed before file migration.

### **User response**

Check the log files for more detailed information.

**ANS27462E: The TSM B/A client must not be configured to prompt interactively for a password. Option file: '%1'**

**Explanation**

Migration job files with the backup before migration option cannot be processed correctly.

**System action**

No backup will be performed before file migration.

**User response**

Configure the B/A client to maintain the password automatically (PASSWORDACCESS=GENERATE).

**ANS27463E: No password access mode found in the TSM B/A client's option file. Option file: '*option file path*'**

**Explanation**

For migration job files with the backup before migrate option, the B/A client need be configured with password access generate.

**System action**

No backup will be performed before file migration.

**User response**

Configure the B/A client to maintain the password automatically (PASSWORDACCESS=GENERATE).

**ANS27464E: The currently installed TSM B/A client API version *B-A client version string* is not supported with TSM HSM client version *HSM client version string*. You need to install at least B/A client version *required HSM client version string*.**

**Explanation**

The B/A client API version is too old to run the TSM HSM client.

**System action**

The currently installed B/A client API will not be used by the TSM HSM client.

**User response**

Install a newer B/A client version.

**ANS27465E: Failure configuring target='configuration target string', key='configuration key', value='configuration value': error string**

**Explanation**

The desired configuration changes could not be applied.

**System action**

The configuration has not been changed.

**User response**

Check if the specified target and the configuration key are valid and if the value is in range for the key.

**ANS27466E: The listing file '*listing file name*' already exists.**

**Explanation**

TSM HSM applications need to open a new listing file during startup. The listing file name is created based on the current time.

**System action**

The TSM HSM application terminates.

**User response**

Wait a moment and restart the desired operation.

**ANS27467E: Failure running migration for job file '*migration job file name*': originator message**

**Explanation**

The migration job did not run properly.

**System action**

The job was not run or canceled.

**User response**

Check the reason for the failed migration and correct the problem.

**ANS27468E: Failure opening listing file '*listing file name*'**

**Explanation**

TSM HSM applications need to open a new listing file during startup. The listing file name is created based on the current time.

**System action**

The TSM HSM application terminates.

### **User response**

Make sure that the listing file directory is accessible and permissions are sufficient to write the listing file.

### **ANS27469E: The log file '*log file name*' could not be opened.**

#### **Explanation**

TSM HSM applications need to open their log files during startup.

#### **System action**

The TSM HSM application terminates.

### **User response**

Make sure that the log file is not locked by another application, and that no other reason, like missing access rights, prevents the TSM HSM application from opening the log file.

### **ANS27470E: Failure retrieving content of stub file '*stub file path*' from TSM server '*TSM server name*', file space '*TSM server file space*': error string**

#### **Explanation**

The stub file could not be restored from the TSM server.

#### **System action**

The recall for the stub file will be canceled and the recalling user application will be released from waiting.

### **User response**

Check the log files for more detailed information. Check why the stub file could not be restored from TSM server.

### **ANS27480E: Reparse point read error of stub file: '*filename*'.**

#### **Explanation**

The process could not read the reparse point data.

#### **System action**

Without the reparse point data the operation can not be completed.

### **User response**

Please check the file access permissions and that this file is a valid IBM TSM HSM for Windows stub with correct version.

**ANS27481E: The multithreaded TSM B/A client API could not be initialized: *TSM B-A client error message***

**Explanation**

The B/A client API reports an error during initialization. The TSM functionality cannot be used.

**System action**

The TSM interface library will be unloaded.

**User response**

Check the error message of the B/A client and solve the reported issue. Retry the desired operation.

**ANS27482E: Failure analyzing B/A client audit trace file for backup failures: Audit trace file: *audit trace file name* Error message: *error text***

**Explanation**

The B/A client audit trace file cannot be exploited for backup result analysis.

**System action**

No backup will be performed before file migration, the migration will not be run without backup.

**User response**

Check log file for a more detailed reason description.

**ANS27483E: Failure while loading configuration values for the TSM B/A client: *error text***

**Explanation**

The TSM HSM for Windows B/A client configuration is not valid.

**System action**

The backup operation cannot be run.

**User response**

Check error text and log file for a more detailed reason description. Correct the configuration or re-install the product and retry the desired operation.

**ANS27485E: NTFS change journal has been truncated for volume '*volume name*'.**

**Explanation**

The NTFS change journal size was too small for all file system changes.

**System action**

Process has been aborted to avoid a possible data loss because of the truncated NTFS change journal.

**User response**

Please increase the size of the NTFS change journal.

**ANS27496E: The migration candidate file *file name* was recently modified.**

**Explanation**

A file was changed after scanning. Migration job rules may no longer apply.

**System action**

The file will be excluded from migration.

**User response**

Run the migration job once again. If the job filter criteria still apply to the file, it will be migrated then.

**ANS27497E: The migration candidate file *file name* could not be write protected: *error text***

**Explanation**

To protect against external modifications, migration candidate files are write locked before the actual migration. The lock operation failed for some reason.

**System action**

The file will be excluded from migration.

**User response**

Check the log files for the reason reported by the Windows system. Run the migration job once again.

**ANS27498E: The file *file name* could not be backed up.**

**Explanation**

Backup failed for some file.

**System action**

The file will be excluded from migration.

**User response**

Check the B/A client log file(s) for a reason. If backup failed due to a global failure, also check the log files of the program you ran for migration.

**ANS27499E: Unknown backup result for *file name*, assuming backup failure.**

**Explanation**

No backup result information could be found for a file during backup result analysis.

**System action**

A backup failure is assumed, and the file will be excluded from migration.

**User response**

Check the B/A client log file(s) for a reason. If backup failed due to a global failure, also check the log files of the program you ran for migration.

**ANS27500E: The backup result analysis failed.**

**Explanation**

The TSM HSM Client could not analyze backup results properly.

**System action**

To avoid that files that have not been backed up correctly are migrated, concerned files are not migrated.

**User response**

Check the log files of the program you ran for migration and the B/A Client log files. Ensure that the TSM B/A Client is executed with option `-filesonly`.

**ANS27501E: Failure running migration job 'migration job file name': originator message**

**Explanation**

The migration did not run properly.

**System action**

The migration was not run or canceled.

**User response**

Check the reason for the failed migration and correct the problem.

**ANS27502E: The job list file 'job file name' could not be found**

**Explanation**

A migration job list file could not be found.

**System action**

The migration job list can not be executed.

**User response**

Specify an existing job list file or create the missing job list file.

**ANS27508E: The list migration candidate file 'file name' listed in job 'job file name' at line line number could not be processed: error text**

**Explanation**

A list migration job line, which is interpreted as a file name by the TSM HSM Client, could not be processed.

**System action**

The line in the list migration job file will be skipped. The migration candidate file will be excluded from migration.

**User response**

Correct the list migration job file and run the migration job again.

**ANS27579E: The value name value must be in the range of minimum and maximum.**

**Explanation**

The specified value was not valid.

**System action**

Show the correct range and abort.

**User response**

Check the validity of the specified parameter value.

**ANS27580E: The *value name* value must be set to *yes* or *no*.****Explanation**

The specified value was not valid.

**System action**

Show the correct values.

**User response**

Check the validity of the specified parameter value.

**ANS27581E: The *value name* value must be set to *choice 1*, *choice 2* or *choice 3*.****Explanation**

The specified value was not valid.

**System action**

Show the correct values.

**User response**

Check the validity of the specified parameter value.

**ANS27582E: File space does not exist: '*file space name*'.****Explanation**

A file space with the specified name cannot be found.

**System action**

Abort command.

**User response**

Specify the name of an existing file space.

**ANS27583E: Threshold migration file space is not specified.****Explanation**

The threshold migration file space name has not been specified.

**System action**

Abort command.

### **User response**

Specify the name of an existing file space.

### **ANS27584E: Threshold migration file space is not specified.**

#### **Explanation**

To configure a mount path for threshold migration, the file space to be used must be specified, if the mount path is not configured for threshold migration yet.

#### **System action**

Abort command.

### **User response**

Specify the name of an existing file space.

### **ANS27585E: Setting Max Threshold Processes Number failed.**

#### **Explanation**

Setting max threshold processes number failed.

#### **System action**

No max threshold processes number is be written to registry. The application aborts.

### **User response**

Check access permission of registry.

### **ANS27590E: Invalid Max Threshold Processes Number. It must be a number between *minimum number of max threshold processes* and *maximum number of max threshold processes*. ( both inclusive )**

#### **Explanation**

The value of max threshold processes is out of range.

#### **System action**

Show the correct range of max threshold processes. The application aborts.

### **User response**

Check the input value of max threshold processes.

**ANS27591E: Reading Number of Max Threshold Processes failed.**

**Explanation**

Reading max threshold processes number from registry failed.

**System action**

The max threshold processes value is not read from registry. The application aborts.

**User response**

Check access permission of registry.

**ANS27627E: Volume Mount Path: '*specified volume mount path*' is not a valid configuration path.**

**Explanation**

To be valid the path must point to a local, fixed NTFS drive. Also the path must not contain recursively mounted volumes.

**System action**

Operation aborts.

**User response**

Specify a valid volume mount path.

**ANS27663E: Unknown file space detected in configuration: *file space***

**Explanation**

A mount path configured by another mount path has an unknown file space configured.

**System action**

The unknown file space is in the configuration.

**User response**

Select the mount path that configures this mount path and change the setting.

**ANS27664E: Unknown file space detected in configuration: *file space***

**Explanation**

A file space previously set in the configuration now does not exist.

**System action**

The file space is replaced by 'select file space' in the file space selection control.

**User response**

The change can be accepted with 'Apply' or 'Ok' after selecting a file space. To avoid this message, a file space should be removed from all configurations before it is deleted.

**ANS27667E: Failure validating registry key(s): '*registry key*'  
Error: '*error*'**

**Explanation**

Invalid reconcile or threshold configuration data has been detected in registry.

**System action**

Operation aborts.

**User response**

Contact IBM Software Support.

**ANS27668E: Low threshold value '*low threshold*' can not be bigger or equal high threshold value '*high threshold*'**

**Explanation**

Low threshold value is bigger or equal high threshold value.

**System action**

Operation aborts.

**User response**

Set correct low and/or high threshold value.

**ANS27669E: Running the TSM B/A client returns an error code as result code: *error number***

**Explanation**

The B/A client executable returns a global warning or error failure.

**System action**

The backup operation will be canceled.

### **User response**

Check the B/A client log file(s) for more detailed information.

### **ANS27681E: Could not open handle for candidate list file '*file path*'.**

#### **Explanation**

The specified file is supposed to contain the list of candidates for Threshold Migration of the containing volume. If the file cannot be opened (with read and write access), threshold migration cannot work properly.

#### **System action**

File handle for the candidate list could not be opened. Threshold Migration will not be able to process this volume.

#### **User response**

Check the log file (hsmmonitor.log) for details. In particular, make sure the candidate list file is not read-only or locked by another process.

### **ANS27682E: Could not create file mapping handle for file '*file path*'.**

#### **Explanation**

The specified file is supposed to contain the list of candidates for Threshold Migration of the containing volume. If this file cannot be mapped, threshold migration cannot work properly.

#### **System action**

File mapping object for the candidate list could not be created. Threshold Migration will not be able to process this volume.

#### **User response**

Check the log file (hsmmonitor.log) for details. In particular, make sure there is enough space for the candidate list file on the volume.

### **ANS27683W: Could not grow candidate list file '*file path*'.**

#### **Explanation**

The candidate list file for Threshold Migration tried to reserve more space but failed. This may have impact on the task that requested to append items.

#### **System action**

Growing the candidate list terminated with a failure. The overall process will not be affected, but Threshold Migration might function suboptimally.

### **User response**

Check the log file (hsmmonitor.log) for details. In particular, make sure there is enough space for the candidate list file on the volume.

## **ANS27684E: Unable to unregister resource type dll, because there is still hsmmonitor configuration on the cluster.**

### **Explanation**

Unable to unregister resource type dll, because there is still reconcile and/or threshold migration configuration on the cluster.

### **System action**

The application aborts.

### **User response**

Delete all reconcile and threshold migration configurations on the cluster and try the operation again.

## **ANS27685E: hsmmonitor service has stopped due to an error. Error is written to Windows event log.**

### **Explanation**

hsmmonitor service has been stopped with an error.

### **System action**

Error is written to Windows event log. Scheduled reconcile and threshold migration tasks will not execute.

### **User response**

Restart hsmmonitor service as soon as possible to assure that reconcile and threshold migration tasks will be processed.

## **ANS27686W: hsmmonitor service has stopped.**

### **Explanation**

hsmmonitor service has been stopped.

### **System action**

Scheduled reconcile and threshold migration tasks will not execute.

### **User response**

Restart hsmmonitor service as soon as possible to assure that reconcile and threshold migration tasks will be processed.

**ANS27687W: hsmmonitor service has stopped with a warning. Warning is written to Windows event log.**

**Explanation**

hsmmonitor service has been stopped with a warning.

**System action**

Warning is written to Windows event log. Scheduled reconcile and threshold migration tasks will not execute.

**User response**

Restart hsmmonitor service as soon as possible to assure that reconcile and threshold migration tasks will be processed.

**ANS27688W: *service name* is not yet running. Threshold Migration tasks will be delayed until it is running.**

**Explanation**

The service is needed for threshold migration tasks to execute.

**System action**

Threshold migration tasks will be delayed until the service is running.

**User response**

If the service does not start automatically, start it manually. Otherwise simply wait until it has started.

**ANS27689E: Initialization of extension utility failed: *error message***

**Explanation**

Failure when initializing an extension utility.

**System action**

The application or the reconcile/ threshold migration dialog aborts.

**User response**

Make sure application is running under an administrator account. Check the log file for error details.

**ANS27690E: The local host is not the owner of the hsmmonitor configuration resource *resource name*.**

**Explanation**

The application accessed a resource, which does not belong to the local host.

**System action**

Access denied. Operation on the resource aborts.

**User response**

Make sure that the resource belongs to the local host. Check the log file for error details.

---

## Appendix B. Accessibility features for Tivoli Storage Manager

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. The major accessibility features of Tivoli Storage Manager are described in this topic.

### Accessibility features

The following list includes the major accessibility features in Tivoli Storage Manager:

- Keyboard-only operation
- Interfaces that are commonly used by screen readers
- Keys that are discernible by touch but do not activate just by touching them
- Industry-standard devices for ports and connectors
- The attachment of alternative input and output devices
- User documentation provided in HTML and PDF format. Descriptive text is provided for all documentation images.

The Tivoli Storage Manager Information Center, and its related publications, are accessibility-enabled.

### Keyboard navigation

The Tivoli Storage Manager for Windows Console follows Microsoft conventions for all keyboard navigation and access. Drag and Drop support is managed using the Microsoft Windows Accessibility option known as MouseKeys. For more information about MouseKeys and other Windows accessibility options, please refer to the Windows Online Help (keyword: MouseKeys).

### Vendor software

Tivoli Storage Manager includes certain vendor software that is not covered under the IBM license agreement. IBM makes no representation about the accessibility features of these products. Contact the vendor for the accessibility information about its products.

### Related accessibility information

You can view the publications for Tivoli Storage Manager in Adobe® Portable Document Format (PDF) using the Adobe Acrobat Reader. PDFs of Tivoli Storage Manager user guides are provided on the Quick Start CD packaged with the product. Or, you can access these or any of the other documentation PDFs at the IBM Publications Center at <http://www.ibm.com/shop/publications/order/>.

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