

Tivoli Storage Manager HSM for Windows
Version 6.3

Administration Guide



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Version 6.3

Administration Guide



Note:

Before using this information and the product it supports, read the information in “Notices” on page 177.

- | This edition applies to Version 6.3 of IBM Tivoli Storage Manager HSM for Windows (product number 5608-E13),
- | and to all subsequent releases and modifications until otherwise indicated in new editions or technical newsletters.
- | This edition replaces SC23-9795-01.

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About this publication

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

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.

Publications

Publications for the IBM® Tivoli® Storage Manager family of products are available online. The IBM Tivoli Storage Manager product family includes IBM Tivoli Storage FlashCopy® Manager, IBM Tivoli Storage Manager for Space Management, IBM Tivoli Storage Manager for Databases, and several other storage management products from IBM Tivoli.

To search all publications, go to the Tivoli Storage Manager information center at <http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3>.

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/>.

Go to Tivoli Documentation Central to find information centers that contain official product documentation for current and previous versions of Tivoli products, including the Tivoli Storage Manager product family. You can find Tivoli Documentation Central at <https://www.ibm.com/developerworks/wikis/display/tivolidoccentral/Home>.

You can also order some related publications from the IBM Publications Center website. The website provides information about ordering publications from countries other than the United States. In the United States, you can order publications by calling 1-800-879-2755.

Tivoli Storage Manager publications

The following tables list the publications that make up the Tivoli Storage Manager library.

Table 1. Tivoli Storage Manager server publications

Publication title	Order number
<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

Table 1. Tivoli Storage Manager server publications (continued)

Publication title	Order number
<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 Oracle Solaris Installation Guide</i>	GC23-9784
<i>IBM Tivoli Storage Manager for Oracle Solaris Administrator's Guide</i>	SC23-9772
<i>IBM Tivoli Storage Manager for Oracle 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 Media Installation and User's Guide</i>	SC27-4018
<i>IBM Tivoli Storage Manager Upgrade and Migration Guide for V5 Servers</i>	GC27-4017
<i>IBM Tivoli Storage Manager Integration Guide for Tivoli Storage Manager FastBack®</i>	SC27-2828

Table 2. Tivoli Storage Manager storage agent publications

Publication title	Order number
<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 Oracle 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

Publication title	Order number
<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 Using the Application Programming Interface</i>	SC23-9793
<i>IBM Tivoli Storage Manager for Space Management for UNIX and Linux: User's Guide</i>	SC23-9794
<i>IBM Tivoli Storage Manager HSM for Windows Administration Guide</i>	SC23-9795

Table 4. Tivoli Storage Manager data protection publications

Publication title	Order number
<i>IBM Tivoli Storage Manager for Databases: Data Protection for Microsoft SQL Server Installation and User's Guide</i>	GC27-4010

Table 4. Tivoli Storage Manager data protection publications (continued)

Publication title	Order number
<i>IBM Tivoli Storage Manager for Databases: Data Protection for Oracle for UNIX and Linux Installation and User's Guide</i>	SC27-4019
<i>IBM Tivoli Storage Manager for Databases: Data Protection for Oracle for Windows Installation and User's Guide</i>	SC27-4020
<i>IBM Tivoli Storage Manager for Mail: Data Protection for Microsoft Exchange Server Installation and User's Guide</i>	GC27-4009
<i>IBM Tivoli Storage Manager for Mail: Data Protection for Lotus Domino® UNIX and Linux Installation and User's Guide</i>	SC27-4021
<i>IBM Tivoli Storage Manager for Mail: Data Protection for Lotus Domino for Windows Installation and User's Guide</i>	SC27-4022
<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 Virtual Environments Installation and User's Guide</i>	SC27-2898
<i>IBM Tivoli Storage Manager for Microsoft SharePoint Guide</i>	N/A

Table 5. IBM Tivoli Storage Manager troubleshooting and tuning publications

Publication title	Order number
<i>IBM Tivoli Storage Manager Problem Determination Guide</i>	GC23-9789
<i>IBM Tivoli Storage Manager Performance Tuning Guide</i>	GC23-9788
<i>IBM Tivoli Storage Manager Client Messages and Application Programming Interface Return Codes</i>	SC27-2878
<i>IBM Tivoli Storage Manager Server Messages and Error Codes</i>	SC27-2877
<i>IBM Tivoli Storage Manager for Mail: Data Protection for Microsoft Exchange Server Messages</i>	GC27-4011
<i>IBM Tivoli Storage Manager for Databases: Data Protection for Microsoft SQL Server Messages</i>	GC27-4012
<i>IBM Tivoli Storage Manager for Databases: Data Protection for Oracle Messages</i>	SC27-4014
<i>IBM Tivoli Storage Manager for Mail: Data Protection for Lotus Domino Messages</i>	SC27-4015
<i>IBM Tivoli Storage Manager for Enterprise Resource Planning: Data Protection for SAP Messages</i>	SC27-4016

Note: You can find information about IBM System Storage® Archive Manager at http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3/c_complydataretention_ovr.html.

Support information

You can find support information for IBM products from various sources.

Start at the IBM Support Portal: <http://www.ibm.com/support/entry/portal/>. You can select the products that you are interested in and search for a wide variety of relevant information.

Getting technical training

Information about Tivoli technical training courses is available online.

Go to the following websites to sign up for training, ask questions, and interact with others who use IBM storage products.

Tivoli software training and certification

Choose from instructor led, online classroom training, self-paced Web classes, Tivoli certification preparation, and other training options at <http://www.ibm.com/software/tivoli/education/>

Tivoli Support Technical Exchange

Technical experts share their knowledge and answer your questions in webcasts at http://www.ibm.com/software/sysmgmt/products/support/supp_tech_exch.html.

Storage Management community

Interact with others who use IBM storage management products at <http://www.ibm.com/developerworks/servicemanagement/sm/index.html>

Global Tivoli User Community

Share information and learn from other Tivoli users throughout the world at <http://www.tivoli-ug.org/>.

IBM Education Assistant

View short "how to" recordings designed to help you use IBM software products more effectively at <http://publib.boulder.ibm.com/infocenter/ieduasst/tivv1r0/index.jsp>

Searching knowledge bases

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

Begin by searching the Tivoli Storage Manager Information Center at <http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3>. From this website, you can search the current Tivoli Storage Manager documentation.

Searching the Internet

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

To search multiple Internet resources, go to the IBM support website at <http://www.ibm.com/support/entry/portal/>.

You can search for information without signing in. Sign in using your IBM ID and password if you want to customize the site based on your product usage and

information needs. If you do not already have an IBM ID and password, click **Sign in** at the top of the page and follow the instructions to register.

From the support website, you can search various resources including:

- IBM technotes
- IBM downloads
- IBM Redbooks® publications
- IBM Authorized Program Analysis Reports (APARs)

Select the product and click **Downloads** to search the APAR list.

If you still cannot find a solution to the problem, you can search forums and newsgroups on the Internet for the latest information that might help you find problem resolution.

An independent user discussion list, ADSM-L, is hosted by Marist College. You can subscribe by sending an email to listserv@vm.marist.edu. The body of the message must contain the following text: SUBSCRIBE ADSM-L *your_first_name your_family_name*.

To share your experiences and learn from others in the Tivoli Storage Manager and Tivoli Storage FlashCopy Manager user communities, go to the following wikis:

Tivoli Storage Manager wiki

<http://www.ibm.com/developerworks/wikis/display/tivolistoragemanager>

Tivoli Storage FlashCopy Manager wiki

[https://www.ibm.com/developerworks/mydeveloperworks/wikis/home/wiki/Tivoli Storage FlashCopy Manager](https://www.ibm.com/developerworks/mydeveloperworks/wikis/home/wiki/Tivoli%20Storage%20FlashCopy%20Manager)

Using IBM Support Assistant

IBM Support Assistant is a complimentary software product that can help you with problem determination. It is available for some Tivoli Storage Manager and Tivoli Storage FlashCopy Manager products.

To learn about which products are supported, go to the IBM Support Assistant download web page at <http://www.ibm.com/software/support/isa/download.html>.

IBM Support Assistant helps you gather support information when you must 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

You can find more information at the IBM Support Assistant website:

<http://www.ibm.com/software/support/isa/>

You can also install the stand-alone IBM Support Assistant application on any workstation. You can then enhance the application by installing product-specific plug-in modules for the IBM products that you use. Find add-ons for specific products at <http://www.ibm.com/support/docview.wss?uid=swg27012689>.

Finding product fixes

A product fix to resolve your problem might be available from the IBM software support website.

You can determine what fixes are available by checking the IBM software support website at <http://www.ibm.com/support/entry/portal/>.

- If you previously customized the site based on your product usage:
 1. Click the link for your product, or a component for which you want to find a fix.
 2. Click **Downloads**, and then click **Fixes by version**.
- If you have not customized the site based on your product usage, click **Downloads** and search for your product.

Receiving notification of product fixes

You can receive notifications about fixes, flashes, upgrades, and other news about IBM products.

To sign up to receive notifications about IBM products, follow these steps:

1. From the support page at <http://www.ibm.com/support/entry/portal/>, click **Sign in to create, manage, or view your subscriptions** in the **Notifications** pane.
2. Sign in using your IBM ID and password. If you do not have an ID and password, click **register now** and complete the registration process.
3. Click **Manage all my subscriptions** in the **Notifications** pane.
4. Click the **Subscribe** tab and then click **Tivoli**.
5. Select the products for which you want to receive notifications and click **Continue**.
6. Specify your notification preferences and click **Submit**.

Contacting IBM Software Support

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

To obtain help from IBM Software Support, complete the following steps:

1. Ensure that you have completed the following prerequisites:
 - a. Set up a subscription and support contract.
 - b. Determine the business impact of your problem.
 - c. Describe your problem and gather background information.
2. Follow the instructions in “Submitting the problem to IBM Software Support” on page xvi.

Setting up a subscription and support contract

Set up a subscription and support 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, IBM Tivoli, Lotus®, and Rational® products, as well as IBM DB2® and IBM WebSphere® products that run on Microsoft Windows or on operating systems such as AIX or Linux), enroll in IBM Passport Advantage® in one of the following ways:

- **Online:** Go to the Passport Advantage website at <http://www.ibm.com/software/lotus/passportadvantage/>, click **How to enroll**, and follow the instructions.
- **By telephone:** You can call 1-800-IBMSERV (1-800-426-7378) in the United States. For the telephone 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**.

Determining the business impact

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

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

Describing the problem and gathering 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 re-created? 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 using a workaround for this problem? If so, be prepared to explain it when you report the problem.

Submitting the problem to IBM Software Support

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

Online

Go to the IBM Software Support website at [http://www.ibm.com/support/entry/portal/Open_service_request/Software/Software_support_\(general\)](http://www.ibm.com/support/entry/portal/Open_service_request/Software/Software_support_(general)). Sign in to access IBM Service Requests and enter your information into the problem submission tool.

By telephone

For the telephone number to call in your country, go to the IBM Software Support Handbook at <http://www14.software.ibm.com/webapp/set2/sas/f/handbook/home.html> and click **Contacts**.

Conventions used in this manual

This manual uses the following typographical conventions:

Example	Description
cancel	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.

Tivoli Storage Manager HSM for Windows client updates

Several features in Tivoli Storage Manager HSM for Windows client version 6.3 are new.

The following features are new for IBM Tivoli Storage Manager HSM for Windows client in version 6.3:

You can easily maintain HSM services when you move migrated files or change file server hardware

When you rename a file server or storage device, you change the information that IBM Tivoli Storage Manager uses to identify migrated files. Use the new hardware volume mapping feature to maintain HSM services without interruption.

You can move stub files to another location with the new **dsmmove** command. Files are not recalled during the move. If the other location is managed by another Tivoli Storage Manager server, the migrated file data is automatically moved to the other Tivoli Storage Manager server.

You can share a migration job file among computers with similar directory structures

A migration job file can be shared among computers with similar configurations, and can be shared among nodes in a cluster. If some directory structure of two computers is the same, a migration job that specifies the common directory structure can be used without modification on both computers.

Before version 6.3, the host name was recorded in the job file. Before the job file could be used on another computer, the host name had to be manually modified in the job file. In version 6.3, the job file no longer contains the host name.

You can retrieve or delete specific archive versions

You can specify the version of the archive copy that you want to retrieve or delete. A new option **version** is supported on the commands **dsmc lc delete** and **dsmc lc retrieve**.

You can view a list of objects that are deleted by a reconciliation process

During reconciliation, the HSM monitor service writes to a listing file the names of obsolete objects on the Tivoli Storage Manager server. The file is located in the directory that is specified in the HSM GUI in the **Tracing Preferences** menu (**Tools > Trace Preferences > Path Configuration > Listing file directory**). The listing file name is `hsmmonitor-delete-YYYYMMDD-hhmmss.log`.

When **reconcilemode=emulation**, this file contains a list of obsolete objects, but the objects are not deleted. When **reconcilemode=normal** (the default), this file contains a list of obsolete objects that are deleted by the reconciliation process.

You can preview the objects that would be deleted during a reconciliation process.

The new option **reconcilemode** can be used with the **dsmhsmc lc** command to run reconciliation in emulation mode or normal mode. When **reconcilemode=emulation**, reconciliation processes do not delete obsolete objects, but write the obsolete objects to a listing file. You can compare the

obsolete objects in the listing file with the stub files on the file system to determine if a normal reconciliation would yield orphan stub files.

Display the quantity, size, and expiration period of migrated objects in Tivoli Storage Manager storage.

The **dsmtool** command displays the size that the migrated objects occupy on the file system. Compressed size and expired objects are not included in the occupancy calculation. If you specify the **statistic** option, the command displays the versions and expiration periods of unexpired migrated files.

The **dsmReconConverter.exe command is not included with version 6.3**

Before version 6.3, the **dsmReconConverter.exe** command was used to find potential orphan files. In version 6.3 you can do this same task with the listing file from a reconciliation process that is run in emulation mode. For the task of finding potential orphan files, the **dsmReconConverter.exe** command is no longer needed.

If you have stub files that were created with a version 5.3 HSM for Windows client, a reconciliation process might not identify all obsolete objects on the Tivoli Storage Manager server. The reconciliation process can fail to delete obsolete objects on the Tivoli Storage Manager server. To ensure that all obsolete objects are deleted, you must upgrade the stub files. Install Tivoli Storage Manager version 5.5 or version 6.1 and use the **dsmReconConverter.exe** command to upgrade the stub files. Only after upgrading the version 5.3 stub files with the **dsmReconConverter.exe** command can you upgrade to the latest version of the Tivoli Storage Manager. Run the **dsmReconConverter.exe** command once, before you run the first reconciliation with an HSM for Windows client version 6.3. The **dsmReconConverter.exe** command is available only in Tivoli Storage Manager version 5.5 and version 6.1.

Some parameters of the **dsmhsmc1c.exe command that previously required a dash must now be entered without a dash**

The following parameters of the **dsmhsmc1c.exe** command previously required a dash. These parameters must now be entered without a dash.

- configurereconcile
- configurethresholdmig
- help
- query
- unconfigurereconcile
- unconfigurethresholdmig
- ?

See the full syntax of this command for details.

You can configure the connection between the Tivoli Storage Manager and the HSM for Windows client with the **dsmc1c.exe command.**

With the register option of the **dsmc1c.exe** command you can define a new connection or set the password for an existing connection. See the full syntax of the **dsmc1c.exe** command for details.

Related concepts

"Moving migrated files" on page 58

"Migration jobs" on page 27

"Previewing files that would be deleted by a reconciliation process" on page 92

Related reference

"dsmclc.exe" on page 66

"dsmhsmclc.exe" on page 74

"dsmtool.exe" on page 88

"Managing reconciliation with **dsmhsmclc.exe**" on page 74

"Hardware and software requirements" on page 9

Chapter 1. HSM for Windows client overview

The IBM Tivoli Storage Manager HSM for Windows client provides hierarchical storage management (HSM) for Windows New Technology File System (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.
- You can move migrated data without interrupting HSM services.

You can move migrated files to accommodate the changing needs of users, applications, and hardware. If a user moves to another site, you can move the migrated data as needed. If a new or changed application requires that data is moved to another location, you can move the migrated files. If you need to replace or rename a volume or file server, the HSM client can accommodate the change. In all of these examples, the HSM client uses tape drives efficiently and no recall operations are required.

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 local, fixed NTFS file systems. This includes Microsoft Cluster Server (MSCS) cluster volumes, if they are formatted in NTFS. Windows File Allocation Table (FAT) partitions, Common Internet File System (CIFS) shared folders, network-attached storage (NAS) drives, and other file systems are not supported.

The HSM for Windows client acts as a Tivoli Storage Manager client exploiting the Tivoli Storage Manager API.

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, list migrations, and threshold migration. Migration jobs and list migrations 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 settings for management classes 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 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 17.

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

Table 6. Migration jobs compared to threshold migration. The table is a summary of differences and similarities between migration jobs and threshold migration.

Criterion	Migration job and list migration	Threshold migration
Which files are migrated?	<p>Migration job: You configure the path, type (file extension), minimum age and minimum size of files to migrate. All files that meet this criteria are migrated.</p> <p>List migration: The files are identified in a list file.</p>	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.
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?	<p>Migration job: Migration ends when all files that meet the criteria have been migrated.</p> <p>List migration: Migration ends when all files in the list have been migrated.</p>	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?	<p>HSM for Windows client can do one of three things, as you configure:</p> <ul style="list-style-type: none"> 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 dsmcl.exe command.	Using the HSM for Windows client GUI or dsmcl.exe command.

Related concepts

"Migration jobs" on page 27

"Threshold migration" on page 37

"Manually retrieving migrated or archived files" on page 42

Related reference

"Backing up files before migrating them" on page 44

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 file system. 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. The migrated file is bound to the management class that is specified by the last migration job or threshold migration.

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. The management class does not change, even if the migration job specifies a different management class.

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 temporarily retrieves the file at the next migration job or list migration. When you run the next migration job or list migration that targets 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. The migrated file is bound to the management class that is specified by the last migration job or threshold migration. If the file is targeted by a threshold migration, it is not migrated again.

Note: Files are temporarily retrieved when you run a migration job or a list migration after changing security attributes of migrated files. Ensure that you have sufficient free disk space for the largest retrieved file.

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, you recalled the file and did not change it between runs. In this case HSM for Windows client replaces the existing file with a stub pointing to the existing file copy in Tivoli Storage Manager storage. The management class does not change, even if the migration job specifies a different management class.

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. If you archive the file again, the file is bound to the management class that is specified by the last migration job or list migration.

Related tasks

“Retrieving migrated or archived files using the HSM for Windows client GUI” on page 43

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.c.exe**. An administrative user can also start reconciliation manually at any time.

Related tasks

“Configuring reconciliation with the graphical user interface” on page 56

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 6, “HSM for Windows commands,” on page 65

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.

Related information

Chapter 4, “Configuring the HSM for Windows client,” on page 15

Planning to install the HSM for Windows client

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 at <http://www.ibm.com/support/docview.wss?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.

The length of a file name that is migrated by the HSM for Windows client 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 tolerated, but not fully supported.

When a file is migrated, alternate data streams are not stored in Tivoli Storage Manager storage. The alternate data streams remain in the stub file. During a recall operation the ADS is not altered. After a recall operation the file and the ADS are as before the migration.

Retrieve operations do not restore the ADS. After a file is retrieved from Tivoli Storage Manager storage, the ADS is lost.

Backing up the stub file with ADS does not create a copy of the ADS in Tivoli Storage Manager storage. Restoring a file with the backup-archive client does not recreate the ADS.

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.

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.

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 4, "Configuring the HSM for Windows client," on page 15

Installing and configuring 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 HSM for Windows client must be installed on each cluster node on which files should be migrated and recalled. For example, assume a three node cluster. You plan to migrate data from one cluster volume. If this cluster volume is available on only *node1* and *node2*, it is sufficient to install the HSM for Windows client on only *node1* and *node2*. If the volume can fail over to *node3* and the HSM for Windows client is not installed on that node, you get access errors when trying to open a migrated file.

Each HSM for Windows client uses its own node name to authenticate with the Tivoli Storage Manager server. By default, the Tivoli Storage Manager node name for the computer is the computer host name. But you can change that name when running the initial configuration wizard. In order to access the data from the cluster volumes on all nodes, the data is stored on the Tivoli Storage Manager server under a common node name. This common node name must be the cluster name. You need to grant access for each node to the common cluster node name by using the **grant proxynode** command. The configuration wizard shows you the appropriate command to be run on the Tivoli Storage Manager server.

Each HSM for Windows client has its own set of configuration data. The configuration data and the migration jobs and log files are stored by default in subfolders of the installation directory. You can configure the folder that contains the jobs file to a common directory that is accessible by other HSM for Windows client nodes in the cluster. Do not configure a common directory for the logs and listing files (**Tools > Trace Preferences > Path Configuration**) or for the configuration file directory and temporary files directory (**Tools > Preferences > Path Configuration**).

The HSM for Windows client must be installed on each cluster node to a local drive, like the system drive. The HSM executable files must be available at any time. Do not install to a cluster drive.

If you want to use the Tivoli Storage Manager backup-archive client, it must be installed, configured, and registered appropriately for an MSCS cluster environment. If you want files to be backed up before migration, the options file must specify **clusternode=yes**. For example, assume that your cluster volume is E: and your backup-archive client scheduler is configured to run the daily backup with the option file E:\TIVOLI-TSM\dsm_cluster_E.opt. Select E:\TIVOLI-TSM\dsm_cluster_E.opt as the options file for the backup before migration.

Attention: HSM for Windows client stores the cluster name as file recall information in stub files. If you change the cluster name, the HSM for Windows client does not work. You must apply the appropriate hardware volume mappings before you continue.

If you remove a volume from a cluster and reconfigure it as a local volume on one node, HSM for Windows client expects the local host name in the stub files. Use hardware volume mappings to link the local volume to the old cluster volume name.

When you install the HSM for Windows client on a cluster system, the HSM services require the cluster services. If the cluster services are not running, the HSM services do not start. After restarting the system, the HSM services attempt to start automatically two times. If the cluster services are not running at the second automatic attempt, you must start the HSM services manually.

If you change a cluster name, only the HSM for Windows client GUI starts. The GUI presents a conversion dialog to map the new cluster name to the old cluster name. If you confirm, the HSM for Windows client creates hardware mappings from the new cluster name to the old cluster name. The mappings are replicated over the Tivoli Storage Manager server to other cluster nodes where the HSM for Windows client is installed.

Related concepts

“File location preferences” on page 22

“Stub files” on page 5

Chapter 3. Upgrading the HSM for Windows client

This topic provides the information that you need when upgrading from a previous version of the HSM for Windows client.

Upgrading version 5.3 stub files for accurate reconciliation

You can recall files that were migrated with HSM for Windows client version 5.3. But for accurate and complete reconciliation you must upgrade the stub files.

If you have stub files that were created with a version 5.3 HSM for Windows client, a reconciliation process might not identify all obsolete objects on the Tivoli Storage Manager server. The reconciliation process can fail to delete obsolete objects on the Tivoli Storage Manager server. To ensure that all obsolete objects are deleted, you must upgrade the stub files. Install Tivoli Storage Manager version 5.5 or version 6.1 and use the **dsmReconConverter.exe** command to upgrade the stub files. Only after upgrading the version 5.3 stub files with the **dsmReconConverter.exe** command can you upgrade to the latest version of the Tivoli Storage Manager. Run the **dsmReconConverter.exe** command once, before you run the first reconciliation with an HSM for Windows client version 6.3. The **dsmReconConverter.exe** command is available only in Tivoli Storage Manager version 5.5 and version 6.1.

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

The 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 19

Chapter 4. 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 27

“Threshold migration” on page 37

“Reconciliation” on page 53

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.

This topic describes configuration on a non-clustered system. For information about configuring a clustered system, see “Installing and configuring the HSM for Windows client in a cluster environment” on page 11.

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.

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 for migration. 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**.
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. If you want to clearly identify the HSM node as distinct from the backup-archive node, choose a different node name for the HSM for Windows client. Click **Next**.
4. 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**.
5. 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.
6. 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**.
7. In the TSM Server Connection window, verify the values that you configured in the previous windows. Click **Apply**.
8. 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**.

9. 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**.
10. 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**.
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**.

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 27

"Threshold migration" on page 37

"Reconciliation" on page 53

"Configuring the retention period of migration copies"

Related tasks

"Configuring a new file space" on page 21

Related reference

"Backing up files before migrating them" on page 44

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. The migration copies are stored in the storage pool that is defined by the archive copy group of the assigned management class. 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. 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 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.
- **REInit** determines when the **RETVer** attribute is applied.

If **REInit**=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 **REInit**=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 **REInit** value cannot be updated.

- **REMin** 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*.

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 6.1.3. 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 files that were migrated with HSM for Windows client versions earlier than 6.1.3. Files that were migrated with such earlier HSM for Windows client versions are bound to the default management class.

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*.

Related concepts

"HSM for Windows client earlier than version 6.1.3: Configuring the default management class" on page 13

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 changes to become effective.

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

HSM advanced parameters and preferences settings

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

Table 7 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 full path is listed in the Parameter name column.

Table 7. Advanced parameters descriptions

Parameter name	description	Default	Notes
HKLM\SYSTEM\CurrentControlSet\Services\ithsmdrv\Parameters\Timeout	The File System Filter Driver returns an error when this time elapses and a recall process has not yet started. If the recall process starts within this time, no error is returned. The start time is when the recall thread picks up the recall order. Time waiting for a device or reading data is not considered. The end time of the recall process is not considered. The time is measured in seconds.	300	The error is returned when the recall service is too busy, and the recall quota has not been reached. This can occur when many recall processes are running at the same time.
dsmclic\FileAttributesFilter	Configures the registry to prevent files with certain attributes from migration. Affects the dsmclic.exe command.	6 - hidden and system	Change this parameter only on technical advice from IBM.

Table 7. Advanced parameters descriptions (continued)

Parameter name	description	Default	Notes
dsmgui\FileAttributesFilter	Configures the registry to prevent files with certain attributes from migration. Affects the dsmgui.exe command.	6 - hidden and system	Change this parameter only on technical advice from IBM.
hsmmonitor\FileAttributesFilter	Configures the registry to prevent files with certain attributes from migration. Affects the hsmmonitor.exe command.	6 - hidden and system	Change this parameter only on technical advice from IBM.
dsmclic\DirectoryAttributesFilter	Configures folders with certain attributes that are generally not entered for selecting files for migration. Affects the dsmclic.exe command.	6 - hidden and system	Change this parameter only on technical advice from IBM.
dsmgui\DirectoryAttributesFilter	Configures folders with certain attributes that are generally not entered for selecting files for migration. Affects the dsmgui.exe command.	6 - hidden and system	Change this parameter only on technical advice from IBM.
hsmmonitor\DirectoryAttributesFilter	Configures folders with certain attributes that are generally not entered for selecting files for migration. Affects the hsmmonitor.exe command.	6 - hidden and system	Change this parameter only on technical advice from IBM.

File location preferences

Use the HSM for Windows client GUI Preferences window **Path Configuration** tab to define file locations.

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

The **Path Configuration** tab contains fields that indicate the location of the following files:

- Configuration files
- Migration job files
- Move job files
- Temporary files

Move Settings

You can configure the bandwidth that is used for moving stub files. You can also configure how many stub files are identified before a move process begins.

Use the HSM for Windows client GUI Preferences window **Move Settings** tab to configure two move settings:

Bandwidth

The **Bandwidth** value controls what percent of time the HSM for Windows client spends on move operations. For example, if you set **Bandwidth**=40% and a move operation takes 20 milliseconds, the HSM for Windows client pauses for 30 milliseconds before the next move operation starts. The total elapsed time is 50 milliseconds, the move operation is 20 milliseconds (40%) of the elapsed time.

Stub Files

The **Stub Files** value controls how many stub files are identified before a move operation begins. The HSM for Windows client moves the stub files in an optimal order to minimize the number of tape mounts and seeks. When the list of stub files is large, more files can be moved with fewer tape mounts. However, it takes more time for the HSM for Windows client to identify a large number of stub files. A larger value improves the efficiency of the move process, but delays the start of the move operation. The value can be 1 to 50,000. The default is 5,000.

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.

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 quota 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 the HSM for Windows client installation directory in \config\quota.cfg. After changing quotas, a backup of quota.cfg is saved in the backup directory \config\backup\quota.cfg.

Restriction: The HSM for Windows client can define and view quotas only for the security type Security Group - Domain Local. Quotas for the security types Security Group - Global and Security Group - Universal cannot be defined or viewed.

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.
2. To change the default quota using the System Default Quota window, select the **Change** button that is to the right of **Default Quota**.
 - 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.
3. To change a user quota click the **Change** button that is to the right of **User Quota**.
 - 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.
 - 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 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**.
 - 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.
 - 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 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.

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.

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**, **hsmtasks**, **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**. Table 8 on page 26 describes each setting.

Table 8. Tracing preferences window field definitions

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

The **Path Configuration** tab 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.

Chapter 5. 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.

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 the HSM for Windows client `dsmc1c.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 various criteria:

- File type
- File size
- File creation date
- File modification date
- File access date

Each migration job is stored in an XML structured 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 start a migration job directly from 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 recalls and remigrates the file. The security attributes of the file are 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 the recall speed. Although most file recall is not noticed by users, network bandwidth, storage repository speed, and file size all determine the file recall speed.

A migration job file can be shared among computers with similar configurations, and can be shared among nodes in a cluster. If some directory structure of two computers is the same, a migration job that specifies the common directory structure can be used without modification on both computers.

Related reference

“dsmc1c.exe” on page 66

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:

- The length of a file name that is migrated by the HSM for Windows client 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 **dsmclc.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**.
2. Name the new job icon to a name of your choice.
3. Double-click the new job icon to display the job creation window.
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.
7. Select the **Source Files** tab so that you can begin to select files to migrate by files or by directories.
8. To add a new directory, skip to step 9 on page 29. 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**.

- 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.

- 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**.
 - 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**.

- 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 select the type of include condition you want to define.

Related concepts

"Running migration jobs" on page 35

Related tasks

"Configuring a new file space" on page 21

"Creating a new file group" on page 34

"Edit a file group" on page 35

"Calculate a migration job's space savings" on page 35

Related reference

"Examples of including and excluding files" on page 30

"Backing up files before migrating them" on page 44

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 9 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 9. 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
test.dwg	100 GB

Table 10 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 10. Summary of include and exclude examples

Table	Include / exclude condition
Table 11 on page 31	include all files < 300 MB
Table 12 on page 31	exclude all files < 300 MB
Table 13 on page 31	exclude all files < 30 GB
Table 14 on page 32	include all files < 300 MB include all files with extension = pdf
Table 15 on page 32	exclude all files < 300 MB exclude all files with extension = pdf
Table 16 on page 33	exclude all files < 3 GB include all files with extension = pdf
Table 17 on page 33	include all files with extension = pdf exclude all files < 2 GB
Table 18 on page 34	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 11 shows the target set that results from the following include condition:

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

Table 11. 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 12 shows the target set that results from the following exclude condition:

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

Table 12. 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 13 shows that no file is in the target set from the following exclude condition:

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

Table 13. 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			

Table 13. Target set for exclude condition example 3 (continued)

Base file set			Target file set	
File name	File size		File name	File size
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 14 shows the target set that results from the following include conditions:

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

Table 14. 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 15 shows the target set that results from the following exclude conditions:

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

Table 15. 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 16 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 16. 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 17.

```
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 17. 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 18 on page 34 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 18. 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.
4. Enter the file extensions you want to be included in this file group, separated by spaces.
5. Click the **OK** button.

Related tasks

"Edit a file group" on page 35

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

Related tasks

“Creating a new file group” on page 34

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**. All files matching the job criteria are searched. This requires a file system traversal. For jobs spanning many directories and files this can take some time. When all files have been searched, you can see three sets of information in both files count and kilobytes:

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

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 GUI
- From the Command Prompt window using the **dsmc1c** command
- From a scheduled task

Related reference

“dsmc1c.exe” on page 66

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.

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

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 **dsmc1c.exe** command, specifying the job file as an argument when **dsmc1c.exe** is started.

You can run only one **dsmc1c.exe** process at a time. You cannot schedule two migrations at the same time, and you cannot schedule two migrations that overlap. 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.
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 dsmc1c.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 `dsmc1c.exe` command, specifying the `migrate1ist` option, and specify the name of the list file.

Related reference

“`dsmc1c.exe`” on page 66

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 `dsmhsmc1c.exe` command.

Related concepts

“Configuring the retention period of migration copies” on page 17

Related reference

“Backing up files before migrating them” on page 44

“Managing threshold migration with `dsmhsmc1c.exe`” on page 79

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**.

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 mount path. 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 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.

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 **dsmhsmc1c.exe**" on page 79

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 dsmclc.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

“dsmclc.exe” on page 66

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 **TSM server** and **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.
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). 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). 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 selected, the Retrieve options window opens.
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. After clicking **Retrieve** in the Search Results window with more than one file selected, the Retrieve options window opens.
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.

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 backup 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.

Even if you schedule regular backups, it is possible that a file will change after it is backed up and before it is migrated. If the HSM for Windows client migrates the file without backing up the file, the file will be retrieved the next time that it is backed up. To avoid such retrieve processes, use the backup-before-migrate feature and use the same backup options that are used for the scheduled backup.

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 47

Related tasks

"Creating migration jobs" on page 28

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 39

Related tasks

“Creating migration jobs” on page 28

Related reference

“dsmc.exe” on page 66

“Managing threshold migration with **dsmsmclc.exe**” on page 79

Backing up and restoring migrated files

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

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 version is in the HSM pool, created by the HSM for Windows client. And one version 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.

The **Skip migrated files** option and the **Check stub file reparse content** option regulate the backup of stub 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.

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 process resident files only. When a stub file is archived or backed up by selective backup, a retrieve process is triggered. An incremental by date backup will neither trigger a retrieval of the migrated file nor back up the stub file.
- You must not use adaptive subfile backup and HSM. You must back up only the entire migrated file. If you use adaptive subfile backup on migrated files, you might not be able to restore migrated files correctly. This is true even though the backup-archive client does not report any errors or warnings when doing adaptive subfile backup.

Related concepts

“Tivoli Storage Manager backup-archive client options for backing up migrated files” on page 47

“Tivoli Storage Manager backup-archive client options for restoring migrated files” on page 51

Related reference

“Backing up files before migrating them” on page 44

Setting backup-archive client options

Set the backup-archive client options in the backup-archive client preferences editor, or directly edit the backup-archive `dsm.opt` configuration file. You can also specify the option when invoking a backup-archive client command in a Command Prompt window.

Use the **HSM for Windows** tab in the preferences editor in the backup-archive client GUI to set the **Skip migrated files**, **Check stub reparse content**, **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 > Client 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 19 on page 47 matches the name of the check box in the preferences editor with the option name used in the `dsm.opt` file and in a backup-archive client command.

Table 19. Backup-archive client option names

Check box name in the preferences editor	Preferences editor tab	Option name for commands and the <code>dsm.opt</code> options file	Default value
Skip migrated files	HSM for Windows	<code>skipmigrated</code>	Cleared (no)
Check stub reparse content	HSM for Windows	<code>checkreparsecontent</code>	Cleared (no)
Restore as migrated file	HSM for Windows	<code>restoremigstate</code>	Set (yes)
Restore resident if not accessible	HSM for Windows	<code>restorecheckstubaccess</code>	Set (yes)
Reset modified last access date	Backup	<code>preserverlastaccessdate</code>	Cleared (no)
Staging directory	General	<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

Several options control how the Tivoli Storage Manager backup-archive client backs up and restores migrated files.

skipmigrated

When the **skipmigrated** option is set to yes, the backup-archive client does not back up or archive any stub files.

If the **skipmigrated** option is set to no, the backup-archive client can back up stub files during an incremental backup. The default value of the **skipmigrated** option is no.

checkreparsecontent

The value of **checkreparsecontent** is applied only when **skipmigrated=no**. If **checkreparsecontent=yes**, the backup-archive client compares reparse point content of the local stub file with the content in Tivoli Storage Manager storage. If the content is the same, it is not necessary to back up the stub file again. If the local reparse point content is different from the backed-up content, the local stub file is backed up.

If **checkreparsecontent=no**, the backup-archive client does not compare the reparse point content of the local stub file with the content in Tivoli Storage Manager storage. Differences in the reparse point content are not detected, and no backup is created as a result of the reparse point comparison. If a valid stub file does not exist on the Tivoli Storage Manager, you cannot restore a file as a stub file. In this case, you can restore a complete file instead of a stub file.

The **checkreparsecontent** option is one condition that can result in a file backup. Other conditions such as changes in file size or security settings are evaluated independently and can also result in a backup.

The reparse point of stub files that were backed up with the HSM for Windows client version 6.1 and earlier does not contain the same information as stub files that were backed up with the HSM for Windows client version 6.3. As a result, all version 6.1 and earlier reparse points appear changed to a version 6.3 and later backup-archive client. If you set **checkreparsecontent=yes** and **skipmigrated=no**, the first incremental backup with a version 6.3 backup-archive client will create new backup copies of all version 6.1 and earlier stub files. The new backups in Tivoli Storage Manager storage contain the version 6.3 reparse point information. Subsequent incremental backups will create new backup copies of stub files only if the reparse point indicates that the file has been changed.

Setting this option requires checking the reparse point content of the local stub file, and increases the time for a backup operation. Set this option the first time you do an incremental backup after either of the following events:

- You move migrated files with the **dsmove.exe** command.
- You change the file space that is used for migration.

Clear this option on subsequent backups.

Table 20. skipmigrated and checkreparsecontent interaction during incremental backup

	skipmigrated=yes	skipmigrated=no
checkreparsecontent=no	A stub file is not backed up.	A stub file is not backed up due to differences in reparse point content. A stub file can be backed up if other changes occurred.
checkreparsecontent=yes	A stub file is not backed up.	Reparse point content of the local stub file is compared with content in Tivoli Storage Manager storage. A local stub file is backed up if the content does not match. Also, a stub file can be backed up if other changes occurred.

stagingdirectory

The backup-archive client ensures that whenever a stub is backed up, there is a copy of the complete file in the backup pool. If a complete file was not backed up before migration, the complete file is temporarily retrieved and is backed up. In this way, Tivoli Storage Manager associates the backup copy of the complete 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 complete backup copy of the migrated file, the backup-archive client does not back up the stub file. This is the case if the stub is an orphan with no migrated copy in Tivoli Storage Manager storage.

When Tivoli Storage Manager maintains a backup copy of both the complete file and the stub, the backup copy of the complete file does not expire until the backup copy of the stub expires. Either the complete 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.

Related concepts

“Tivoli Storage Manager backup-archive client options for restoring migrated files” on page 51

“Impacts of changing file encryption” on page 50

Related tasks

“Limiting retrieves during backup” on page 50

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 version 6.1 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 45

“Tivoli Storage Manager backup-archive client options for backing up migrated files” on page 47

Related tasks

“Limiting retrieves during backup”

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, many 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 the following situations: 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).
- Version 5.4 or earlier stub files were backed up. You upgrade to version 6.1 or later and back up the stubs.

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 21

Table 21. Results of using restoremigstate and restorecheckstubaccess options.. This table shows the results of using restoremigstate and restorecheckstubaccess options.

restorecheckstubaccess value	restoremigstate=no	restoremigstate=yes (the default)
restorecheckstubaccess=no	Restore the resident file; do not restore the stub	Restore the stub. Do not check if a migration copy exists.
restorecheckstubaccess=yes (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. If you run reconciliation in emulation mode, the HSM for Windows client creates a list of orphan stubs, but does not delete any files from Tivoli Storage Manager storage.

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 45

Related reference

“Managing reconciliation with **dsmhsmc1c.exe**” on page 74

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 **dsmhsmc1c.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 file system. Reconciliation is not intended for file spaces or volumes with migration jobs that have the action **Keep the original file** or **Delete the file**.

If you have stub files that were created with a version 5.3 HSM for Windows client, a reconciliation process might not identify all obsolete objects on the Tivoli Storage Manager server. The reconciliation process can fail to delete obsolete objects on the Tivoli Storage Manager server. To ensure that all obsolete objects are deleted, you must upgrade the stub files. Install Tivoli Storage Manager version 5.5 or version 6.1 and use the **dsmReconConverter.exe** command to upgrade the stub files. Only after upgrading the version 5.3 stub files with the **dsmReconConverter.exe** command can you upgrade to the latest version of the Tivoli Storage Manager. Run the **dsmReconConverter.exe** command once, before you run the first reconciliation with an HSM for Windows client version 6.3. The **dsmReconConverter.exe** command is available only in Tivoli Storage Manager version 5.5 and version 6.1.

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.

During reconciliation, the HSM monitor service writes to a listing file the names of obsolete objects the Tivoli Storage Manager server. The file is located in the directory that is specified in the HSM GUI in the **Tracing Preferences** menu (**Tools > Trace Preferences > Path Configuration > Listing file directory**). The file name is `hsmmonitor-delete-YYYYMMDD-hhmmss.log`, where `YYYYMMDD` indicates the date and `hhmmss` indicates the time when the HSM monitor service was started.

If the reconciliation process is run in emulation mode (**reconcilemode=emulation**), the listing file contains the name of the obsolete objects, but the objects are not deleted. You can look up the obsolete objects in the listing file to determine which objects are deleted by a normal reconciliation.

If the reconciliation process is run in normal mode (**reconcilemode=normal**), the listing file contains the name of the obsolete objects, and the objects are deleted by the reconciliation process. Normal mode is the default.

Tip:

- To improve reconciliation performance and avoid having to use the backup-archive client to restore files, use separate file spaces for each file system. 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 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, you must create a hardware volume mapping.

If you do not create a hardware volume mapping, the reconciliation process can erroneously assume that the files have been deleted from the file server, and the reconciliation process 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.

Related concepts

“Maintaining HSM when a volume or file server is renamed” on page 61

“Tivoli Storage Manager backup-archive client options for backing up migrated files” on page 47

Related tasks

“Creating migration jobs” on page 28

Related reference

“dsmhsmcl.exe” on page 74

Changing volume mount paths

If you change a volume mount point or drive letter or change the file server name, reconciliation can be affected. You can mitigate many problems by creating hardware volume mappings, and prevent some problems by using unique file space names.

If you change a volume drive letter, mount point, or file server name, you can maintain HSM services by creating a hardware volume mapping. If you do not create a hardware volume mapping, reconciliation can delete migration copies in Tivoli Storage Manager storage. If the drive letter, mount point, or file server name does not match the information on the Tivoli Storage Manager server, a reconciliation process marks a migration copy as obsolete. The obsolete object is deleted from Tivoli Storage Manager storage, subject to retention policy. A hardware volume mapping matches the old drive letter, mount point, or file server name with the new drive letter, mount point, or file server name. With a hardware volume mapping, a reconciliation process does not delete migration copies merely because the drive letter, mount point, or file server name has changed.

A hardware mapping maintains HSM services for some changes to nested volumes. If you change only the drive letter or file server name, a hardware

mapping maintains HSM services. If you move a nested volume to another volume, a hardware mapping does not maintain HSM services.

For example, assume that `\\MYNODE\E$\nested` is mounted into `\\MYNODE\E$`. Files are migrated from both volumes and reconciliation is configured for both volumes.

In the first case, assume that you change the drive E: to F:. `\\MYNODE\E$` is renamed to `\\MYNODE\F$` and `\\MYNODE\E$\nested` is renamed to `\\MYNODE\F$\nested`. In this case, a hardware volume mapping maintains HSM services, including accurate reconciliation.

In the second case, assume that you do not change drive letter E:, but you move the nested volume into `\\MYNODE\G$`. The nested volume becomes `\\MYNODE\G$\nested`. In this case, a hardware volume mapping cannot maintain HSM services.

The second case can be mitigated with some planning. 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 only this file space. 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.

Tip:

- You can manage which file spaces are used during reconciliation with the **FILESPECelist** option of the **dsmhsmc1c** command or by using the Reconcile settings window of the HSM for Windows client GUI.

If a reconciliation process deletes objects from Tivoli Storage Manager storage, you can restore the files from backup copies that were created by the backup-archive client. 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 51

“Maintaining HSM when a volume or file server is renamed” on page 61

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 > Reconciliation**.

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 mount path. 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.

Remote TSM Server Connections used for reconcile

Specify which remote Tivoli Storage Manager server connections are used for reconciliation. By default, no remote Tivoli Storage Manager server is included in reconciliation. If you select a remote Tivoli Storage Manager server, all file spaces of the remote Tivoli Storage Manager server connection are included in the reconciliation process.

If a file is recalled when in *moving* state, the migrated object is not automatically deleted on the remote Tivoli Storage Manager server. The migrated object remains on the remote Tivoli Storage Manager server until the remote Tivoli Storage Manager server is added to reconciliation, and the reconciliation process has been run.

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.

Moving migrated files

You can move migrated files to another volume on the same computer or to a volume on another file server. You can rename a volume or file server and maintain HSM.

You can move migrated files to accommodate the changing needs of users, applications, and hardware. If a user moves to another site, you can move the migrated data as needed. If a new or changed application requires that data is moved to another location, you can move the migrated files. If you need to replace or rename a volume or file server, the HSM client can accommodate the change. In all of these examples, the HSM client uses tape drives efficiently and no recall operations are required.

If you do not plan the movement of migrated files, you can encounter several problems:

- Stub files can become inaccessible
- Many migrated files can be recalled, resulting in out-of-space conditions
- Tapes can be mounted several times

There are two cases where the HSM for Windows client detects that migrated files have moved.

You move stub files to another location.

In this case, the stub file is copied to another location. If the new location is managed by a different Tivoli Storage Manager server, the migrated file data must be moved to the new Tivoli Storage Manager server.

You rename a file server or volume on which stub files reside.

In this case, although the files do not move to another physical location, the name of the location changes. Tivoli Storage Manager identifies a file by the UNC path, which includes the file server name and drive letter. If you change the name of the file server or the volume, Tivoli Storage Manager cannot identify a stub file. To continue HSM services, the old file location must be mapped to the new file location.

In both of these cases, to maintain HSM services you must use HSM for Windows client utilities.

Move stub files to another location

You can move stub files to another location. If the other location is managed by another HSM for Windows client or another Tivoli Storage Manager server, the migrated file data is moved appropriately.

The location to which you move the stub files must be managed by a Tivoli Storage Manager server. The Tivoli Storage Manager server must provide HSM services for the location. Because HSM is supported only on NTFS file systems, you can move the stub files only to an NTFS file system.

The location from which you move the stub files must be managed by a Tivoli Storage Manager server. This Tivoli Storage Manager server is required until the move is complete.

All HSM for Windows clients involved in the move must be at version 6.3 or later.

You can move stub files to another location on the same file server and volume. You can move stub files to another volume on the same file server or on a different file server.

The computer from which stub files are moved away is called the *remote* file server. The stub files on the remote file server are remote stub files. The Tivoli Storage Manager server that manages the remote stub files is the remote Tivoli Storage Manager server.

The computer to which the stub files are moved is called the *local* file server. The stub files on the local file server are local stub files. The Tivoli Storage Manager server that manages the local stub files is the local Tivoli Storage Manager server.

To move the stub files do the following steps:

1. Define the connection parameters for the remote Tivoli Storage Manager server. Do this with the HSM for Windows client that is running on the local file server.

If stub files are moved to a clustered system, a connection must be configured on each node of the cluster. Defining a connection for each node ensures that stubs which are in *moving* state can be accessed after failover. The stub moving tool stores the information about the files that are in *moving* state in a local directory. This data is not replicated to the other node in the cluster. In a failover the move job is stopped. However, files are accessible on the other node. If the volume fails back, the **hsmtasks** service completes the move of the files that are in *moving* state.

- a. In the HSM for Windows client GUI, click **Menu > Tools > Remote TSM Servers.....** The Remote TSM Servers Connections window opens.
- b. Click **Create**. The remote connections wizard opens.
- c. Enter the connection information in the wizard panels. In the **TSM Authentication** panel, enter the Tivoli Storage Manager node name in the **Remote Node Name:** field.

The remote node must be granted proxy access and identified by the **asnodename** option on the remote HSM node.

If stubs are moved from a clustered system, enter the cluster name. The cluster name must be granted proxy access and identified by the **asnodename** option on the remote HSM nodes.

The final panel of the remote connection wizard tests the connection. If the connection is successful, the HSM for Windows client creates a new options file in the \config\ subdirectory of the HSM for Windows client installation directory. The file name is constructed from the unique connection pair of server and node, and is file type .opt. An example configuration file name is \config\server1-node1.opt.

2. Move the stub files with the **dsmove** command. Run the **dsmove** command on the local file server.

The **dsmove** command does the following tasks:

- Move the stub file to the new location. The remote stub file is deleted. The reparse content is updated for the new location.
- Rename the migrated object on the remote Tivoli Storage Manager server with the new location of the stub file.

If the local file system is managed by a different Tivoli Storage Manager server, the migrated file data must be moved. The migrated file data must be moved from the remote Tivoli Storage Manager server to the local Tivoli Storage Manager server. Until the migrated file data is moved to the local Tivoli Storage Manager server, the stubs are in *moving* state. The *moving* state is indicated by a flag in the reparse content of the local stub file.

The **dsmove** command provides a list of files for the **hsmtasks** service. The **hsmtasks** service is a Windows background service that runs on the local file server. The **hsmtasks** service moves the migrated data of those stub files that have been moved by the **dsmove** command. The **hsmtasks** service does the following tasks:

- Move the migrated data from the remote Tivoli Storage Manager server to the local Tivoli Storage Manager server. Only the version of migrated data that corresponds to the moved stub file is moved. The data is copied directly from one Tivoli Storage Manager server to the other. No data is recalled to the file system.
- Remove the migrated data from the remote Tivoli Storage Manager server, subject to the constraints of the retention policy. Only the version of migrated data that corresponds to the moved stub file is removed. Other versions of migrated data are left on the remote Tivoli Storage Manager server. Other versions might belong to other stub files on the remote file server.
- Change the reparse content of the local stub file to point to the local Tivoli Storage Manager server.
- Remove the *moving* state flag from the reparse content of the local stub file.
- Write a listing file to the *installation path*\listings directory. The file documents the movement of the migrated data between Tivoli Storage Manager servers.

The HSM for Windows client GUI indicates the status of the **hsmtasks** service.

When a migrated file is in *moving* status, you can search, retrieve, or delete it on the remote Tivoli Storage Manager server. You can include a remote Tivoli Storage Manager server for a reconciliation process.

A stub can not be moved again while it is in the *moving* state, even if the move was on the same file server.

A stub in state *moving* depends on the current settings of the corresponding connection, which is stored in the *dsm.opt* options file in the HSM client installation directory. If you change any of the options in the *dsm.opt* options file, the stub in state *moving* can no longer be accessed.

Related reference

“dsmclc.exe” on page 66

“Managing reconciliation with **dsmhsmc1c.exe**” on page 74

“dsmmove.exe” on page 85

Maintaining HSM when a volume or file server is renamed

You can replace or rename the file server host and storage volumes. To maintain HSM, map the new volumes to the old volumes.

The HSM for Windows client has dependencies on the file server host name and drive letters. This information is stored in the reparse point of a migrated file and is used to identify the migrated object on the Tivoli Storage Manager server during recall. If you change the drive letter of a volume with migrated files, Tivoli Storage Manager cannot retrieve files. If you change the file-server host name or cluster name, Tivoli Storage Manager cannot recall or retrieve files. If you change drive letter, host name, or cluster name, a reconciliation process can mark the migrated objects on the Tivoli Storage Manager as obsolete.

If you change the host name, or cluster name, a version 6.3 or later HSM for Windows client prompts you to create a hardware mapping. HSM services are suspended until you confirm the hardware mapping. If you map the new host name or cluster name to the old, you can maintain all HSM services and reconcile accurately.

You must map the new volume to the old volume in two situations:

- You change the volume drive letter or mount point on a file server
- You replace the file server hardware or change the file server host name or cluster name

Changing a volume drive letter or mount point

It is common to change a volume access point. For example, you can rename volume E: to F:. In this case, to maintain HSM services, you must map the new volume name (\\SERVERNAME\F\$\) to the old volume name (\\SERVERNAME\E\$\). When you map a drive letter, any UNC path beneath the mapped drive letter is automatically mapped. Nested volumes are also mapped.

If you change the mount point of a nested volume, you cannot create a mapping for this individual mount point. You must create a mapping for the underlying drive letter. A mapping of the new drive letter to the old drive letter maintains HSM services for some moves of nested volumes, but not for all moves. If you move a nested volume to another volume, a hardware mapping does not maintain HSM services.

For example, assume that \\MYNODE\E\$\nested is mounted into \\MYNODE\E\$. Files are migrated from both volumes and reconciliation is configured for both volumes.

In the first case, assume that you change the drive E: to F:. \\MYNODE\E\$ is renamed to \\MYNODE\F\$ and \\MYNODE\E\$\nested is renamed to \\MYNODE\F\$\nested. In this case, a hardware volume mapping maintains HSM services, including accurate reconciliation.

In the second case, assume that you do not change drive letter E:, but you move the nested volume into \\MYNODE\G\$. The nested volume becomes

\\MYNODE\G\$\nested. In this case, a hardware volume mapping cannot maintain HSM services.

Replacing the file server hardware or changing the file server host name

Replacing file server hardware is a common situation. Consider the following example. A file server was set up some years ago. At that time it was powerful enough to service the needs of the users. But the amount of data and users increased, and more applications were installed. The old file server must be replaced by a new, more powerful one. The replacement can be accomplished by disconnecting the disk drives from the old file server and connecting them to the new file server. The old file server might be retired, or it might be kept and used for some other task. The new file server might have a different name, IP address, Tivoli Storage Manager node name, and drive letters for the disk drives.

The same considerations might be valid after a disaster. The file server hardware might be lost, but the data might be saved. The disks that were previously attached to the file server might still contain the original data or the data might have been replicated to another site. In this case you must map the volume on the recovery system with the volume on the original file server.

A version 6.3 or later HSM for Windows client can detect host name and cluster name changes. The HSM for Windows client must be at version 6.3 or later before the name is changed. After the name is changed, the HSM for Windows client GUI indicates that the environment has changed. The HSM for Windows client GUI prompts the user to automatically create mappings.

Hardware volume mappings are stored in a private file space

Hardware volume mappings are stored on the Tivoli Storage Manager server in a private file space. The private file space requires a management class that does not expire objects. Changes to the Tivoli Storage Manager server can affect the hardware volume mappings:

- When a Tivoli Storage Manager server database is restored, the mappings revert to the level of the restored database.
- If the Tivoli Storage Manager server is changed, you must export and import the data in the private file space.

If a management class with suitable retention policy is not available, the hardware volume mapping cannot be saved on the Tivoli Storage Manager server. This has the following consequences:

- Hardware volume mappings cannot be created.
- Hardware volume mappings cannot be changed.
- The hardware volume mappings cannot be automatically replicated to HSM for Windows clients on all nodes of a cluster.
- The hardware volume mapping is not applied when you search for files at a remote Tivoli Storage Manager server connection.

Mapping volumes

To maintain HSM services when a volume or file server is renamed, you must create a hardware volume mapping.

Create a hardware volume mapping with the following steps:

1. In the HSM for Windows client GUI, select **Tools > Volume Mappings...** The Hardware Volume Mappings window opens. The window lists all local volumes that are assigned a drive letter and all MSCS cluster volumes that are online.
If remote Tivoli Storage Manager server connections exist, you can see the hardware volume mappings that are defined on the remote HSM for Windows client. You can view the remote hardware volume mappings but not change them.
2. In the Hardware Volume Mappings window, select a volume and click **Create**. The Hardware Volume Mapping Definition window opens.
3. Type the old host and volume information and click **OK**. The new mapping is displayed in the Hardware Volume Mapping Definition window. The mapping applies to all nested volumes on the selected drive.
4. After defining all hardware volume mappings, click **Close**. A Reconfirmation window opens. The Reconfirmation window displays all new mappings.
5. Optional: Test the mappings by clicking **Scan for Problems**. This test checks for files on the Tivoli Storage Manager server that is defined with the old mapping. The scan reveals if there are any migrated files at the old mapping. Once the new mapping is applied, the migrated files at the old mapping are not accessible.
6. Click **Yes** to apply the changes. All HSM services receive notifications and apply the new mappings. HSM commands apply the new mappings the next time the commands are started.

Chapter 6. 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 22 summarizes the HSM commands.

Table 22. 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.

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

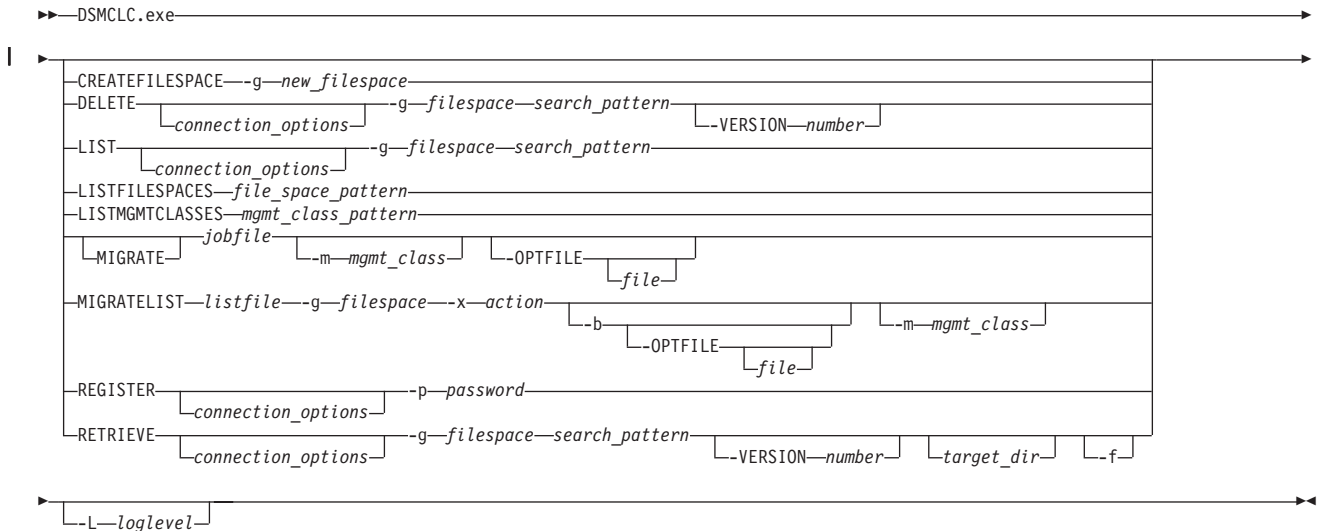
Do not enter a command when an instance of that command is running, or you will get the following error message:

Could not open log file.
Exiting.

dsmc1c.exe

With the **dsmc1c.exe** command you can run a migration job or a list migration. You can list files, file spaces, and management classes. You can configure a connection to a Tivoli Storage Manager server.

Syntax



Options

CREATEFILESPACE

Use this option to create a 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.

DELETE

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

connection_options

If the operation involves a remote file server, you must specify a Tivoli Storage Manager connection. You can specify a connection with a shortcut name or by specifying the two parts of a connection pair:

- A Tivoli Storage Manager server
- A Tivoli Storage Manager node

The shortcut is a short name for a connection pair. The Tivoli Storage Manager server and node information is a longer format to identify the same connection pair.

-c *shortcut*

This option specifies a connection shortcut. A connection shortcut is a short name for a connection pair. The shortcut is generated by the HSM for Windows client. The shortcut is one or two characters, and is similar to these examples:

- *l* (local)
- *r1* (remote connection 1)

- *r2* (remote connection 2)

Tip: Run any HSM for Windows client command with no parameters or with the **Help** parameter to display connection shortcuts.

-h *TSM_host_name*

This option specifies the Tivoli Storage Manager server part of a connection pair. The value of *TSM_host_name* is not case-sensitive. Specify *TSM_host_name* with the value of the **TCPSERVERADDRESS** option and the value of the **TCPPORT** option, separated with a colon. For example:
9.155.52.183:1500

-u *node_name*

This option specifies the Tivoli Storage Manager node part of a connection pair. Use the same value as was used to define the Tivoli Storage Manager server connection. If the connection to the Tivoli Storage Manager server was configured using the **asnodename** option, specify the value of the **asnodename** option. If the connection was configured without the **asnodename** option, specify the value of the **nodename** option. The value of *node_name* is not case-sensitive.

-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. If there is no hardware mapping, you can use wildcard characters * and ?.

volume_pattern

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

If there is a hardware mapping for the volume, you must specify the file server host name and drive letter without wildcard characters.

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

-VERSION *number*

Specify the archive version to process. The archive versions of a file are indicated by the **dsmc lc list** command.

When used with the **retrieve** parameter, this option specifies the version to retrieve from Tivoli Storage Manager storage. If you do not specify the **version** option, the HSM for Windows client retrieves the most recent archive version.

When used with the **delete** parameter, this option specifies the version to delete from Tivoli Storage Manager storage. If you do not specify the **version** option, the HSM for Windows client deletes all archive versions.

LIST

Use this option to list files that were migrated to Tivoli Storage Manager storage. The list displays the file size, archive version number, and file path.

LISTFILESPPACES

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

The occupancy data that is displayed by the command **dsmclic listfilesppaces** is calculated from the migrations and deletions that are done by the HSM for Windows client. Compression on the Tivoli Storage Manager server is not reflected in the statistics from the **dsmclic listfilesppaces** command. Decreased occupancy from expired objects is not reflected in the statistics from the **dsmclic listfilesppaces** command until you run the **dsmtool** command.

Expirations due to copy group settings are explained in the technical document "TSM HSM for Windows migrated files may expire after 365 days" at <http://www.ibm.com/support/docview.wss?uid=swg21330160>.

file_space_pattern

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

MIGRATE

Use this option to start a migration job. You can omit this option when you want to start a migration job, but you must specify *jobfile*.

jobfile

Specify the path of a migration job file.

-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 the **migratelist** option, the **optfile** option is valid only if you also specify the **b** option.

If *file* is not specified, the backup-archive client uses its default options file. This file value overrides the value configured in a migration job file.

MIGRATELIST

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

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.

-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.

-b

Use this option to back up files before migration.

REGISTER

Use this option to create a Tivoli Storage Manager server connection or to set the password of an existing connection.

Before running the **dsmc lc register** command to create a new connection, you must create a new options file for the connection. To create a connection to the default Tivoli Storage Manager server, create the options file in the HSM for Windows client installation directory. The name of this option file must be dsm.opt. To create a remote connection, create the options file in the \config\ subdirectory of the HSM for Windows client installation directory. The options file must be file type .opt. The options file must contain the following options:

- **tcpserveraddress** *address*
- **tcpport** *port*
- **commethod** tcpip
- **passwordaccess** generate or **passwordaccess** prompt
- **nodename** *name*. The node must be registered with the Tivoli Storage Manager server.

An optional entry in the options file is **asnodename** *name*. This node must be granted proxy authority.

Tip: To display the connections that are defined in the options files, enter the **dsmc lc** command with no parameters.

-p

Specify the password for the node.

RETRIEVE

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

target_dir

Specify a directory for the retrieved file. If you do not specify this option, the file is retrieved to the original path.

-f

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

-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. 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 List all .doc archives in the \projects\2011\ directory of a remote Tivoli Storage Manager server. The remote Tivoli Storage Manager is identified by connection shortcut r2. The archive copies are in file space def-hsm01.

Command: dsmc1c list -g def-hsm01 -c r2 \\remote_file_server\projects\2011*.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 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

Task Create a new connection to a Tivoli Storage Manager server. You created an options file with the following values:

- **tcpserveraddress** HAMBURG_TSM
- **tcpport** 1500
- **commethod** tcpip
- **passwordaccess** generate
- **nodename** TSMNODE

Command: dsmc1c register -h HAMBURG_TSM:1500 -u TSMNODE -p password

Related concepts

“Configuring the retention period of migration copies” on page 17

“Migration jobs” on page 27

“Migrating a list of files” on page 37

“Manually retrieving migrated or archived files” on page 42

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 23. 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

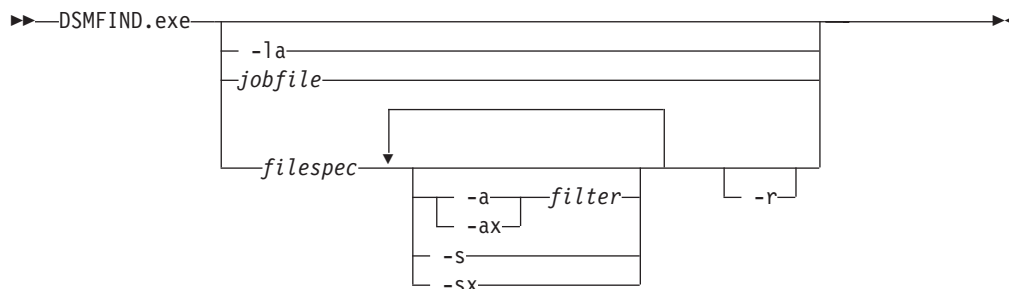
Task Display help for **dsmfileinfo.exe** command.

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

dsmhsmc1c.exe

Use the dsmhsmc1c.exe command to set and query the configuration of reconciliation and threshold migration. The settings will be used the next time a reconciliation process or a threshold migration process starts.

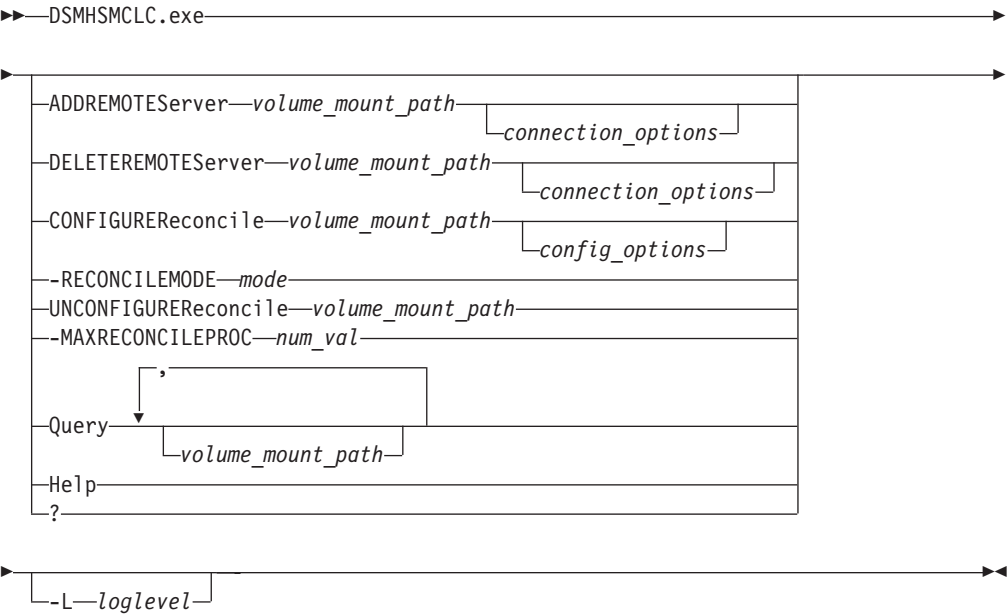
Managing reconciliation with dsmhsmc1c.exe

Use the **dsmhsmc1c.exe** command to configure reconciliation on the Command Prompt window.

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

You can configure the reconciliation process to delete obsolete objects or not delete them.

Syntax



Options

ADDREMOTEServer
Use this option to add a remote Tivoli Storage Manager server to a reconciliation task. Before you can add a remote server, the volume must be configured for reconciliation.

If a file is recalled when in *moving* state, the migrated object is not automatically deleted on the remote Tivoli Storage Manager server. The migrated object remains on the remote Tivoli Storage Manager server until the remote Tivoli Storage Manager server is added to reconciliation, and the reconciliation process has been run.

DELETEREMOTEserver

Use this option to delete a remote Tivoli Storage Manager server connection from a reconciliation task.

CONFIGUREREconcile

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

-RECONCILEMODE mode

Use this option to configure the reconciliation process to delete obsolete objects or not delete them. If you do not specify *mode*, the command displays the current value of *mode*. After changing the value of *mode*, you must restart the HSM monitor service. If you specify *mode*, it must be one of the following values:

NORMal

The reconciliation process deletes obsolete objects from the Tivoli Storage Manager server. The deleted objects are recorded in a listing file. The listing file name is `hsmmonitor-delete-YYYYMMDD-hhmmss.log`, where *YYYYMMDD* indicates the date and *hhmmss* indicates the time when the HSM monitor service was started.

EMULation

The reconciliation process runs in emulation mode. The reconciliation process does not delete obsolete objects from the Tivoli Storage Manager server. The obsolete objects are recorded in the `hsmmonitor-delete-YYYYMMDD-hhmmss.log` listing file.

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

volume_mount_path

Specify the volume mount path. 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.

connection_options

If the operation involves a remote file server, you must specify a Tivoli Storage Manager connection. You can specify a connection with a shortcut name or by specifying the two parts of a connection pair:

-Connection *shortcut*

This option specifies a connection shortcut. A connection shortcut is a short name for a connection pair. The shortcut is generated by the HSM for Windows client. The shortcut is one or two characters, and is similar to these examples:

- *l* (local)
- *r1* (remote connection 1)
- *r2* (remote connection 2)

Tip: Run any HSM for Windows client command with no parameters or with the **Help** parameter to display connection shortcuts.

-Server *TSM_host_name*

This option specifies the Tivoli Storage Manager server part of a connection pair. The value of *TSM_host_name* is not case-sensitive. Specify *TSM_host_name* with the value of the **TCPSERVERADDRESS** option and the value of the **TCPPORT** option, separated with a colon. For example:
9.155.52.183:1500

-User *node_name*

This option specifies the Tivoli Storage Manager node part of a connection pair. Use the same value as was used to define the Tivoli Storage Manager server connection. If the connection to the Tivoli Storage Manager server was configured using the **asnodename** option, specify the value of the **asnodename** option. If the connection was configured without the **asnodename** option, specify the value of the **nodename** option. The value of *node_name* is not case-sensitive.

config_options

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.

-RECONCILEIN*Terval* *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.

-FILESPEC 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 file 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: dsmhsmc1c configurer e:\

Task Configure the next reconciliation to start at midnight on the 1 December 2019 using file spaces `fileSpaceA` and `fileSpaceC`, with an interval of one year (8760 hours) until the next reconciliation.

```

|
| Command: dsmhsmc1c configurer e:\ -nextrec 2011-12-01-00-00
| -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: dsmhsmc1c configurer f:\ -reconcileinterval 1000
|
| Task Volume g:\ is already configured for reconciliation. Change only the
| reconcileinterval value for this volume.
|
| Command: dsmhsmc1c configurer g:\ -reconcileint 800
|
| Task Limit reconciliation among all volumes to one reconciliation process at a
| time.
|
| Command: dsmhsmc1c -maxreconcileproc 1
|
| Task Deactivate automatic reconciliation but do not erase reconciliation
| configuration of volume e:\.
|
| Command: dsmhsmc1c configurer e:\ -reconcileint 0
|
| Task Deactivate reconciliation and erase reconciliation configuration for volume
| e:\.
|
| Command: dsmhsmc1c unconfigurer e:\
|
| Task Add a remote server for reconciliation of volume e:\. The remote Tivoli
| Storage Manager connection shortcut is r1.
|
| Command: dsmhsmc1c addremotes e:\ -co r1
|
| Task
|
| All stub files on volume e:\ have been processed by the hsmtasks service
| and all obsolete objects have been removed from the remote Tivoli Storage
| Manager server at HAMBURG_TSM. You want to remove the remote
| server from reconciliation of volume e:\. You cannot merely delete the
| connection file (HAMBURG_TSM-TSMNODE.opt) from the configuration
| directory because you still require the connection for reconciliation of other
| volumes.
|
| Delete the remote server for reconciliation of volume e:\.
|
| Command: dsmhsmc1c delremotes e:\ -se HAMBURG_TSM:1500 -us TSMNODE
|
| 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

```

“Managing threshold migration with `dsmhsmc1c.exe`”

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

volume_mount_path

Specify the volume mount path. 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.

config_options

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.

-MGMT*class 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.

-HIGH*threshold 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.

-LOW*threshold 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.

-MON*itorinterval 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 25

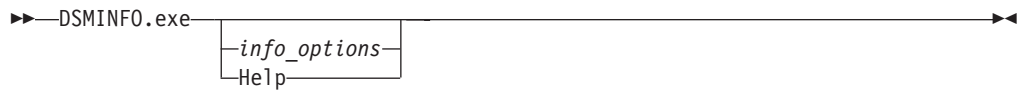
“Threshold migration” on page 37

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 24. 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 dsmc1c.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 dsmgui.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
loggroups	Display the computer local groups
locusers	Lists the computer local users
locusergr	Lists the computer local users, list the groups of each user.

Table 24. Options for *dsminfo.exe* (continued)

Option	Description
locusers	Lists the computer local users
mappings	Lists the hardware volume mappings
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 and the version of the binary files.

Command: `dsminfo version stamp`

Task Display the logging level of the following commands: **hsmervice.exe**, **dsmgui.exe**, **dsmclc.exe**.

Command: `dsminfo servicelog guilog clclog`

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

Command: `dsminfo help`

Command: `dsminfo`

dsmmove.exe

Run the **dsmmove.exe** command to move stub files to another location. If the other location is managed by a different Tivoli Storage Manager server, the migrated file data is moved to the new Tivoli Storage Manager server.

Run the **dsmmove.exe** command from a Command Prompt window on the local file server.

Syntax

```

>>—DSMMOVE.exe—┐options┘┐Help┘—source_file_pattern—target_directory—>>

```

Parameters

options

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

-d If option **-d** is specified, stub files in the retention state are moved. The retention will not be restarted on the local Tivoli Storage Manager server. By default, stub files in the retention state are not moved. These files are considered as already deleted by the user, but kept in the retention state by the Tivoli Storage Manager server.

-f If option **-f** is specified, a moved stub file replaces an existing file of the same name. The user is not prompted. By default, files are not replaced on the local file system and the user is not prompted, but a warning is logged.

-g *file_space*

Option **-g** specifies the file space in which the content of the stub files will be stored on the local Tivoli Storage Manager server. Option **-g** is required if files are moved to another file server.

Do not specify this option if stub files are moved within a volume or to another volume on the same file server. For such moves, the migrated content of stub files on the local file server remains in the same file space.

-m *management_class*

Option **-m** specifies a Tivoli Storage Manager server management class. If you do not specify this option, the moved stub files are bound to the default management class.

Do not specify this option if stub files are moved within a volume or to another volume on the same file server. For such moves, no new object is created on the Tivoli Storage Manager server.

-r If option **-r** is specified, the **dsmove.exe** command traverses subdirectories on the remote file server when scanning for stub files to move. When reaching the volume boundary, the **dsmove.exe** command stops. The command does not traverse into nested volumes.

-s If option **-s** is specified, the **dsmove.exe** command applies the security access control list (ACL) of the remote stub file to the local stub file.

This option does not affect the ACLs of local directory objects. The ACLs of the remote directory objects are not applied to the local directory objects.

connection_options

If the operation involves a remote file server, you must specify a Tivoli Storage Manager connection. You can specify a connection with a shortcut name or by specifying the two parts of a connection pair:

- A Tivoli Storage Manager server
- A Tivoli Storage Manager node

The shortcut is a short name for a connection pair. The Tivoli Storage Manager server and node information is a longer format to identify the same connection pair.

-c *shortcut*

This option specifies a connection shortcut. A connection shortcut is a short name for a connection pair. The shortcut is generated by the HSM for Windows client. The shortcut is one or two characters, and is similar to these examples:

- *l* (local)

- *r1* (remote connection 1)
- *r2* (remote connection 2)

Tip: Run any HSM for Windows client command with no parameters or with the **Help** parameter to display connection shortcuts.

-h *TSM_host_name*

This option specifies the Tivoli Storage Manager server part of a connection pair. The value of *TSM_host_name* is not case-sensitive. Specify *TSM_host_name* with the value of the **TCPSERVERADDRESS** option and the value of the **TCPPORT** option, separated with a colon. For example: 9.155.52.183:1500

-u *node_name*

This option specifies the Tivoli Storage Manager node part of a connection pair. Use the same value as was used to define the Tivoli Storage Manager server connection. If the connection to the Tivoli Storage Manager server was configured using the **asnodename** option, specify the value of the **asnodename** option. If the connection was configured without the **asnodename** option, specify the value of the **nodename** option. The value of *node_name* is not case-sensitive.

Help

Use this option to display help for the command. Entering the command with no options also displays help for the command. The help displays the command syntax and previously defined connection shortcuts.

source_file_pattern

Specify the location of the stub files. You can use wildcard characters. If stub files are moved to another file server, you must use a UNC path name.

You cannot move stub files with the **dsmmove.exe** command if the hostname of the remote file server is the same as the hostname of the local file server. If the hostname is the same, you can move a migrated file by recalling the file, moving the file, and then migrating the file again.

The **dsmmove.exe** command does not traverse into nested volumes, even if option **-r** is specified. To move data from nested volumes, run the **dsmmove.exe** command for each nested volume.

target_directory

Specify where to move the stub files. If the local directory does not exist, the stub moving tool creates the directory with default security settings.

Examples

Task: Move migrated files from remote directory \\REMOTE_HOST\dir\ and all subdirectories to local directory E:\new_dir. Indicate the connection with the **-h (*host_name*) and **-u** (*node_name*) parameters. Accept the default management class.** Command:

```
dsmmove -h 123.456.789.1:1505 -u TSMNODE -g tmspace -r
\\REMOTE_HOST\dir\* E:\new_dir
```

Task: Move migrated PDF files (*.pdf) from remote directory \\REMOTE_HOST\proj1\ to local directory F:\proj1\PDFs. Indicate the connection with the **-c (*shortcut*) parameter. The connection is assigned shortcut value **r2**.**

Command:

```
dsmmove -c r2 -g projects -m DEFAULT \\REMOTE_HOST\proj1\* F:\proj1\new_PDFs
```

Task: Move migrated files from local directory G:\proj3\ and all subdirectories to local directory F:\proj3\. Directory G:\proj3\ and directory F:\proj3\ are on the same file server.

Command:

```
dsmove -r G:\proj3\* F:\proj1
```

dsmtool.exe

Run the **dsmtool.exe** command to display the quantity, size, and expiration period of migrated objects in Tivoli Storage Manager storage.

You can display the occupancy data of migrated files in three ways:

- The administrative command **query occupancy**
- The HSM for Windows client command **dsmc lc listfilespace**s
- The HSM for Windows client command **dsmtool**

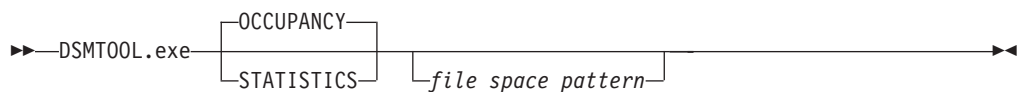
The administrative command **query occupancy** determines the amount of storage that a client is using on the Tivoli Storage Manager server. The command displays the space that is used in a Tivoli Storage Manager storage pool. The query can be refined by specifying a node name, file space name and type of data. You must have administrative access to the Tivoli Storage Manager server to use this command.

The occupancy data that is displayed by the command **dsmc lc listfilespace**s is calculated from the migrations and deletions that are done by the HSM for Windows client. Compression on the Tivoli Storage Manager server is not reflected in the statistics from the **dsmc lc listfilespace**s command. Decreased occupancy from expired objects is not reflected in the statistics from the **dsmc lc listfilespace**s command until you run the **dsmtool** command.

Expirations due to copy group settings are explained in the technical document "TSM HSM for Windows migrated files may expire after 365 days" at <http://www.ibm.com/support/docview.wss?uid=swg21330160>.

The **dsmtool** command displays the size that the migrated objects occupy on the file system. Compressed size and expired objects are not included in the occupancy calculation. Only uncompressed, unexpired objects sizes are calculated.

Syntax



Parameters

OCCUPANCY

If you specify the **occupancy** option, the command displays the number of migrated files and their total size. The size is calculated as the size of the file on the file system.

Because the compressed size is not calculated, the size can be different from the administrative command **query occupancy**.

Because expired objects are not included in the calculation, the size can be different from the **dsmc lc listfilespace**s command.

STATISTIC

If you specify the **statistic** option, the command displays the number of migrated files and their total size, and the versions and expiration periods of unexpired migrated files.

file_space_pattern

You can specify a file space. The specification can contain the wildcard character (*). If you do not specify a file space, the command displays information for all file spaces.

Example

Task Display occupancy of all file spaces for the HSM for Windows client node.

Command: `dsmtool occupancy`

Task Display the versions and expiration periods of migrated files on all file spaces that begin with *hsm*.

Command: `dsmtool statistic hsm*`

Chapter 7. 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

A technical note provides steps for generating and collecting information that can help the IBM support team assist you. See *Collecting Data for IBM Tivoli Storage Manager HSM for Windows* at <https://www.ibm.com/support/docview.wss?uid=swg21456651>.

Related concepts

"Tracing preferences" on page 25

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**.

Previewing files that would be deleted by a reconciliation process

You can create a list of files that would be deleted by a reconciliation process. When running reconciliation in the emulation mode, the files are not deleted.

The **reconcilemode** option can be used with the **dsmhsmc1c** command to create a listing file of obsolete objects on the Tivoli Storage Manager server. When **reconcilemode=emulation**, the reconciliation process does not delete obsolete objects, but writes the file names to the listing file `hsmmonitor-delete-YYYYMMDD-hhmmss.log`.

Tivoli Storage Manager version 6.3.

Related reference

"dsmhsmc1c.exe" on page 74

Offline stub files are recalled when they are first synchronized

Offline sub files are recalled the first time that Windows synchronizes the offline files.

With the Windows operating system you can select a network file or folder to make available offline. Windows synchronizes your offline file with the network copy of the file when you reconnect to the network folder. The HSM for Windows client can migrate your offline file to Tivoli Storage Manager storage. The first time that Windows synchronizes the offline file, the HSM for Windows client recalls the migrated copy. The migrated copy is recalled even if you did not update your local copy after it was migrated to Tivoli Storage Manager storage.

After Windows does the initial synchronization, subsequent synchronizations do not cause a recall of the migrated copy.

Appendix A. HSM for Windows client messages reference

This section contains messages issued by the HSM for Windows client.

Messages with prefix **ANS** and in the range 27000 - 28999 are issued by the HSM for Windows client.

This section contains Diagnosis, Modification, or Tuning Information. Some of the messages include information about the Tivoli Storage Manager error log that you can use when working with your service representative.

HSM for Windows version 6.3.0 messages changes

The following HSM for Windows messages are new or changed for version 6.3.0. The changes occurred since version 6.1.3.

- ANS27373E
- ANS27407W
- ANS27421E
- ANS27449E
- ANS27485E
- ANS28154E
- ANS28157E
- ANS28165E
- ANS28267W
- ANS28268E
- ANS28269E
- ANS28275W
- ANS28279E
- ANS28286E
- ANS28289E
- ANS28291E
- ANS28292E
- ANS28293E
- ANS28315E
- ANS28316E
- ANS28317E
- ANS28318W
- ANS28319E
- ANS28325E
- ANS28326E
- ANS28327E
- ANS28328E
- ANS28330W
- ANS28331E
- ANS28332E

- ANS28339E
- ANS28340E
- ANS28343E
- ANS28344E
- ANS28345W
- ANS28346E
- ANS28349E
- ANS28350E

HSM for Windows version 6.3.0 messages (ANS27000-ANS28999)

This section contains a listing of all HSM for Windows 6.3.0 messages. The messages are listed in ascending numeric order. The complete message is documented, including message ID, message text, explanation, system action, and user response.

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

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

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**

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 Tivoli Storage Manager server object. load time: '*load time*', server: '*server*', user: '*user*', filespace: '*filespace*', Tivoli Storage Manager server object ID (hi/lo): 0x*hi* / 0x*lo*

Explanation

An error occurred while reconciliation tried to delete a server object.

System action

Delete operation is skipped and reconciliation proceeds.

User response

Verify that the Tivoli Storage Manager 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 the search list (file: '*orphan file name*'; file space: '*file space name*'; server: '*server name*'; user: '*user name*';).

Explanation

The file space name of this stub file was not in the search list for processing.

System action

Reconcile is not able to identify and delete obsolete objects in the missing file space.

User response

If reconcile should also delete obsolete objects from this file space, add the file space for 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: There is no data on the Tivoli Storage Manager Server '*server name*' under user '*user name*' for file: '*orphan file name*' (file space: '*file space name*').

Explanation

The process found an orphan file (no data on the Tivoli Storage Manager Server).

System action

The operation cannot be completed if any orphan stub file has been found.

User response

Replace the orphan stub file with the last backup version 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: File space *file space name* is not available on the Tivoli Storage Manager server :*server name* under user name *node name*

Explanation

One or more entries of the file space list do not exist on the Tivoli Storage Manager server.

System action

Processing stops.

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 Tivoli Storage Manager backup-archive client API version *backup-archive client API installed version* is not supported with HSM client version *HSM client installed version*. You need to install at least backup-archive client version *minimum backup-archive client API version*, but lower than version *maximum backup-archive client API version*.

Explanation

The backup-archive client API version is too old or too new for the installed version of the HSM client.

System action

The currently installed backup-archive client API can not be used by the HSM client.

User response

Install an appropriate version of the backup-archive client API.

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*' while reconcile is running.

Explanation

The NTFS change journal size was too small for all file system changes.

System action

Process has been stopped to avoid a possible data loss because of the truncated NTFS change journal.

User response

Increase the size of the NTFS change journal or choose a time with low user activity on the volume.

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.

ANS27697E: An error occurred during file analysis: *error text*

Explanation

File streams could not be obtained or evaluated.

System action

The program terminates.

User response

Check file permissions and security settings.

**ANS27701E: Failure recalling content of stub file '*stub file path*'
version=back end version number, requesting user: '*user name*':
*error string***

Explanation

The offline file could not be recalled to the file system.

System action

The recall for the stub file is canceled and the recalling user application is released from waiting.

User response

Check the log files for more detailed information. Look for reasons why the stub file could not be restored from Tivoli Storage Manager server.

ANS27702E: The Tivoli Storage Manager options file 'optionsfile path' is not valid, as it does not specify all of the following required options: *missing options string*

Explanation

The option file does not work without the missing options.

System action

Actions that rely on the options file are cancelled.

User response

Specify a valid Tivoli Storage Manager options file or correct the errors in the current Tivoli Storage Manager options file.

ANS27709E: An error occurred during file analysis: *error text*

Explanation

File extended attributes operation failed (read, write, or delete).

System action

The program terminates.

User response

Check file permissions and security settings.

ANS27740E: Failure writing to listing file '*file name*'

Explanation

The offline file could not be recalled to the file system.

System action

The HSM application terminates.

User response

Make sure that the listing file directory is accessible and permissions are sufficient to write the listing file.

ANS27744E: Failure opening deletion-hold transaction: *error text*

Explanation

The application could not open the transaction context for a deletion-hold operation on the Tivoli Storage Manager server.

System action

The file entry or the file entries are not protected against expiration on the Tivoli Storage Manager server. In case of a migration no stub files will be created.

User response

Check the log files for a reason code. Check Tivoli Storage Manager server permissions. Retry the operation.

ANS27745E: Failure sending deletion-hold events to Tivoli Storage Manager server '*Tivoli Storage Manager server name*': *error text*

Explanation

A file could not be protected or unprotected by a deletion-hold event on the Tivoli Storage Manager server.

System action

Operations that rely on the event are cancelled: Migration candidate files are not converted to stub files, back end entries are not deleted.

User response

Check the log files for a reason code. Check Tivoli Storage Manager server licenses and permissions. Retry the operation.

ANS27746E: Failure closing deletion-hold transaction: *error text*

Explanation

The application could not close the transaction context for a deletion-hold operation on the Tivoli Storage Manager server.

System action

The file entry or the file entries are not accessible on the Tivoli Storage Manager server. In case of a deletion files cannot be deleted.

User response

Check the log files for a reason code. Check Tivoli Storage Manager server permissions. Retry the operation.

**ANS27786E: Failure deleting Tivoli Storage Manager server file
object: *error text***

Explanation

The application could not delete a file on the Tivoli Storage Manager server.

System action

None. The operation continues with the next action.

User response

Check Tivoli Storage Manager server permissions. Retry the deletion operation.

**ANS27791E: Failure turning executable file '*file name*' into a
stub file: *error text***

Explanation

The executable file has been stored on the Tivoli Storage Manager server. Turning the file into stub file failed as the Windows operating system has cached the image section of the file.

System action

The file is kept as is. File attributes and file times are recovered.

User response

The Windows operating system releases the cached file after an unpredictable time. If you need to migrate the file, unmount and mount the volume or reboot. Then run the file migration again.

**ANS27811E: Failure sending retention-activate events to Tivoli
Storage Manager server '*Tivoli Storage Manager server name*':
*error text***

Explanation

The retention period of a file could not be initiated by a retention-activate event on the Tivoli Storage Manager server.

System action

The retention period of the object is not activated. The object remains on the Tivoli Storage Manager server.

User response

Check the log files for a reason code. Check Tivoli Storage Manager server licenses and permissions. Retry the operation.

ANS27813E: Failure starting the service '*service name*': error text

Explanation

The service could not be initiated.

System action

The service is not available.

User response

Make sure that you have administrative rights. Check the log files for more information.

ANS27814E: Failure stopping the service '*service name*': error text

Explanation

The service could not be shut down due to some problem.

System action

The service does not shut down.

User response

Make sure that you have administrative rights. Check the log files for more information.

ANS27879E: Failure turning executable file '*file name*' into a stub file: error text

Explanation

The file has been stored on the Tivoli Storage Manager server. Turning the file into stub file failed as the Windows operating system keeps the file opened.

System action

The file is kept as is. File attributes and file times are recovered.

User response

The Windows operating system closes the cached file after an unpredictable time. If you need to migrate the file unmount the volume or reboot. Then run the file migration again.

ANS27882E: The modified stub file '*file name*' could not be located on the Tivoli Storage Manager server '*Tivoli Storage Manager server name*'.

Explanation

The stub file could not be found on the Tivoli Storage Manager server. The HSM migration task cannot update the stub file on the Tivoli Storage Manager server.

System action

The modified stub file was not updated on the Tivoli Storage Manager server.

User response

Restore the file from a backup copy, or delete the stub file.

ANS27883E: The backup configuration file '*config file name*' could not be found or is not a file.

Explanation

The backup-archive client options file could not be found or is not a valid file.

System action

The backup-before-migrate operations will not be performed and the files will not be migrated to the Tivoli Storage Manager.

User response

Create a new backup-archive options file or correct the path to the options file you want to specify.

ANS27888E: Options file is not valid:*backup options file*. Please, select a valid backup option file.

Explanation

The specified file is not a valid options file for the backup-archive client.

System action

Processing stops.

User response

Select a valid options file.

ANS27889E: Management class is not valid :*management class*. Select a valid management class.

Explanation

The HSM client was not able to find the specified management class in the list of the available management classes of this node.

System action

Processing stops.

User response

Select a valid management class.

ANS27890E: *management class* management class selected for volume *volume* does not belong to the domain of your node.

Explanation

The management class that is selected for the volume does not belong to domain of your node.

System action

Processing stops.

User response

Select another management class for the volume. Select a management class for the domain of your node. To see available management classes for your node, run 'dsmc listmgmtclasses'.

ANS27897E: A backup options file is specified, but you did not choose to back up files before migration.

Explanation

You can only specify an options file if you also choose to back up files before migration.

System action

Processing stops.

User response

Select the option to back up files before migration.

ANS27898W: Low threshold for volume *volume* could not be reached. Current disk usage *disk usagepercent*.

Explanation

Threshold migration was not able to migrate enough files to reach low threshold. There might be resident files available for migration, but these files do not match the criteria for migration such as file age or file size.

System action

Monitor continues work.

User response

Check the minimum file age and size that you configured for threshold migration candidates.

ANS27899W: Backup before migrate has been deactivated. The backup option file remains selected, but is not used during migration.

Explanation

Option file is ignored.

System action

Operation has finished successfully.

User response

None

ANS27900W: Management class *management class name* has finite retention period of *number days*.

Explanation

A management class with finite retention is selected. Objects are automatically removed from the Tivoli Storage Manager Server after *number* days.

System action

N/A

User response

If you want to ensure that data is not automatically removed from the Tivoli Storage Manager server, select a management class with an unlimited retention period or with an event-based retention period.

ANS27901W: Management class *class name* does not exist on domain. Default management class has been used.

Explanation

The configured management class does not exist on domain. Default management class has been used.

System action

Operation has finished successfully.

User response

None

ANS27902W: Option file *file name* does not exist. Default option file has been used.

Explanation

The configured option file does not exist. Default option file has been used.

System action

Operation has finished successfully.

User response

None

ANS27914E: The configured management class for threshold migration of volume *volume name* is not valid.

Explanation

The configured management class is not available for the HSM client node. Thus this management class cannot be used for threshold migration.

System action

Operation aborts.

User response

Select a valid management class or unconfigure threshold migration for this volume.

ANS27915E: The configured option file for back up before migration for threshold migration of volume *volume name* is not valid.

Explanation

The configured option file for back up before migration does not exist. Thus this option file cannot be used for threshold migration.

System action

Operation aborts.

User response

Select a valid option file for back up before migration or unconfigure threshold migration for this volume.

ANS28154E: Failure validating job file '*job file name*': *specific error text*

Explanation

The job file could not be validated.

System action

The migration job is not performed.

User response

Check the log file to find the specific problems or re-create the job from scratch.

ANS28157E: Deletion of objects on remote TSM server being matched by string or pattern '*string or pattern*' is not permitted.

Explanation

The HSM client does not delete objects that belong to remote file servers.

System action

The addressed objects on the Tivoli Storage Manager server are not deleted.

User response

Delete the desired objects using the HSM client on the file server from which the objects were migrated.

ANS28165E: No configuration was found for Tivoli Storage Manager server '*server name*', node '*node name*'.

Explanation

The Tivoli Storage Manager HSM client could not find the configuration required to connect to a Tivoli Storage Manager server.

System action

Actions that rely on the configuration are not performed.

User response

Define a valid configuration for the Tivoli Storage Manager server, then retry the operation.

ANS28267W: The existing file '*file name*' was not overwritten.

Explanation

The IBM Tivoli Storage Manager HSM Client did not overwrite an existing file on the file system.

System action

The file, that was not overwritten, is being skipped and the current operation continues.

User response

Remove the file and retry the operations, or specify option -f to force overwrite.

ANS28268E: The file or directory '*file or directory name*' could not be accessed.

Explanation

The Tivoli Storage Manager HSM Client could not access a file or directory on the file system.

System action

The operation is not executed.

User response

Make sure that the file or directory exists. Grant the required permissions to the file or directory, or switch to a user who owns the rights.

ANS28269E: The reparse data of the stub file '*stub file name*' could not be accessed.

Explanation

The Tivoli Storage Manager HSM client could not access reparse data of the stub file on the file system.

System action

The file not moved. A message is logged to the administrative log file.

User response

Grant the required permissions to the file or directory, or switch to a user account that has the required permissions.

ANS28275W: The stub file '*file name*' was not moved.

Explanation

The object on the Tivoli Storage Manager server is in retention state. Stub files that point to objects in retention state are not moved unless you specify the -d option with the dsmmove command.

System action

The stub file not moved. A message is logged to the administrative log file.

User response

If you want to move stub files in retention state, specify the -d option with the dsmmove command.

ANS28279E: Failure initializing cluster and hardware mapping features: *error text*

Explanation

The cluster and hardware mapping feature are needed to convert file path names between the local disk and the Tivoli Storage Manager server.

System action

The program will terminate or run with limited functionality.

User response

Correct the problem. Use the trace file for problem analysis. Hardware mappings can be adjusted using the GUI application, dsmsgui.exe.

ANS28286E: HSM fails because the host or cluster name has changed.

Explanation

The host and cluster names are an integral component of the HSM client's naming conventions. Changing these names might break the client. Use hardware volume mappings to adapt to this change.

System action

The operation fails and the application stops.

User response

Use the HSM for Windows GUI to correct the volume mapping. Retry the operation.

ANS28289E: Failure registering the HSM client node at the Tivoli Storage Manager server.

Explanation

HSM for Windows cannot register at a Tivoli Storage Manager server without valid configuration information.

System action

The registration operation fails.

User response

Create a Tivoli Storage Manager options file for the HSM node you want to register. Refer to the documentation for the correct syntax. Retry the registration operation.

ANS28291E: The stub file '*file name*' is already in state moving.

Explanation

The stub file has already been moved by the user, and its content data is still located on the remote Tivoli Storage Manager server.

System action

The file is not moved. A message is logged to the administrative log file.

User response

Wait until the HSM tasks service has finished moving the content data of the stub file. Retry the move operation.

ANS28292E: The source stub file '*file name*' could not be opened.

Explanation

The IBM Tivoli Storage Manager HSM Client could not open the source stub file for moving.

System action

The file is not moved. A message is logged to the administrative log file.

User response

Grant the required permissions to the stub file, directory, or file share or switch to a user account that has the required permissions.

ANS28293E: Remote SSAM Tivoli Storage Manager servers are not supported.

Explanation

The Tivoli Storage Manager HSM client does not support SSAM remote servers. The HSM client cannot delete objects on SSAM servers.

System action

The remote Tivoli Storage Manager server connection is denied. A message is logged to the administrative log file.

User response

Do not move stub files from Tivoli Storage Manager SSAM servers.

ANS28315W: The content data of the moved stub file '*stub file name*' could not be deleted from the remote Tivoli Storage Manager server '*TSM server name*': '*error text*'.

Explanation

The stub file and its content data have been successfully moved to the target location, but the HSM client could not delete the stub content data on the remote server.

System action

The stub content data is left on the remote Tivoli Storage Manager server.

User response

Run the reconciliation service on the remote file server to delete remaining stub file data.

ANS28316E: Moving the content of stub file '*stub file name*' failed: '*error text*'.

Explanation

The prerequisites required to move the content could not be processed.

System action

The content of the stub file is not moved. The stub file can still be recalled from the remote Tivoli Storage Manager server.

User response

Check the log file for possible causes. Retry the operation after the problem is fixed.

ANS28317E: Moving the content of stub file '*stub file name*' failed: '*error text*'.

Explanation

Moving the content data of the stub file from the remote Tivoli Storage Manager server to the local Tivoli Storage Manager server failed.

System action

The content of the stub file is not moved. The stub file can still be recalled from the remote Tivoli Storage Manager server.

User response

Check the log file for possible causes. Retry the operation after the problem is fixed.

ANS28318W: The stub file '*file name*' was not moved.

Explanation

The migrated object that corresponds to the stub file was not found on the Tivoli Storage Manager server.

System action

The stub file not moved. A message is logged to the administrative log file.

User response

Check the log file for possible causes. If the file content does not exist on the Tivoli Storage Manager server use the reconciliation service to process orphaned stub files.

ANS28319E: The stub file '*file name*' was not moved due to the following reason: *error string*

Explanation

An error occurred when the HSM client tried to move the stub file. The reason for the error is identified.

System action

The stub file not moved. A message is logged to the administrative log file.

User response

Check the log file for possible causes. Correct the problem and retry the operation.

ANS28325E: Failure writing file name container for reconciliation: *file name*. The current file size is (*file size* KB).

Explanation

Reconcile file name container could not be written. The file is used to store information during reconciliation.

System action

Reconcile is canceled for this volume.

User response

Make sure that there is enough free space on the volume to create the file. The free space should be at least twice the current file size.

ANS28326E: Failure reading file name container for reconciliation: *file name*

Explanation

Reconcile file name container could not be read. The file is used to store information during reconciliation.

System action

Reconcile is canceled for this volume.

User response

Check the log files for detailed information.

ANS28327E: Infinite loop is determined during reconciliation of volume *volume name* while deleting objects on Tivoli Storage Manager server.

Explanation

An error occurred while reconciliation tried to delete a server object.

System action

Processing stops.

User response

Try to run reconciliation again. If the problem persists, contact IBM Software Support.

ANS28328E: Remote Tivoli Storage Manager server connection *connection pair* is already configured for reconcile of volume *volume name*.

Explanation

You attempted to configure the same remote Tivoli Storage Manager server connection a second time.

System action

The configuration is canceled.

User response

Check command input and retry the operation.

ANS28330W: The remote server connection pairs in the list for volume *volume name* are not unique.

Explanation

There are two remote servers with the same connection pair.

System action

The duplicated name was deleted. Operation continues.

User response

No user response is necessary.

ANS28331E: The connection pair *connection pair* cannot be added.

Explanation

The connection cannot be added to the configuration because no dsm.opt file for this pair exists.

System action

The configuration is canceled.

User response

Check the specified connection pair.

ANS28332E: Cannot remove the connection pair *connection pair*.

Explanation

The connection pair was not configured for reconcile. It cannot be removed.

System action

Processing stops.

User response

Check the specified connection pair.

ANS28339E: Remote Tivoli Storage Manager server configurations are not available.

Explanation

No available remote Tivoli Storage Manager servers are found.

System action

Processing stops.

User response

Check for other error messages. Check the connections in the Remote Tivoli Storage Manager Server Connections window.

ANS28340E: Cannot create cluster resource '*resource name*'.

Explanation

Create Microsoft cluster resource failed.

System action

Processing stops.

User response

Make sure that the resource belongs to the local host. Check the log file for error details.

ANS28343E: Failed to import configuration of volumes *volume names* using import file *import file name*.

Explanation

It was not possible to import the configuration for volumes *volume names* during installation. The volumes were not accessible. The import file *import file name* was used for the operation.

System action

The installation continues.

User response

Ensure that the volumes are accessible and configure the volume manually by either using the GUI or the command line tool dsmhsmclic.

ANS28344E: Volume *volume name* is not configured for reconcile and you cannot add a remote Tivoli Storage Manager servers.

Explanation

It is not possible to add or delete a remote Tivoli Storage Manager server if the volume is not configured for reconciliation.

System action

The operation is stopped.

User response

If you want to add a remote Tivoli Storage Manager server, you must configure the volume for reconciliation.

ANS28345W: The remote Tivoli Storage Manager server (server: '*remote Tivoli Storage Manager server name*', user: '*user name*') is not in the search list. File '*stub file name*' is not processed.

Explanation

The remote Tivoli Storage Manager server is not part of the reconciliation configuration. Stub files in state moving that are migrated to this Tivoli Storage Manager server are skipped during processing.

System action

Fewer objects are processed by the operation. Processing continues.

User response

If objects on the remote Tivoli Storage Manager server should be reconciled, add the remote Tivoli Storage Manager server to the reconciliation settings for the volume.

ANS28346E: No data on the Tivoli Storage Manager Server found for file: '*orphan file name*' (file space: '*file space name*', server: '*server name*', user: '*user name*').

Explanation

The process found an orphan file (no data on the Tivoli Storage Manager 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.

ANS28349E: No suitable management class for private HSM for Windows objects was found.

Explanation

The Tivoli Storage Manager HSM client stores and maintains private data on the Tivoli Storage Manager. For this purpose a management class, that does not expire data, is required.

System action

The data is not stored on the Tivoli Storage Manager server. The current operation is canceled.

User response

Create and activate a management class on the Tivoli Storage Manager server. Use a time based management class with infinite retention period (preferred), or a

event based management class. Retry the operation.

ANS28350E: Reconciliation on volume *volume name* was stopped as the volume mapping has been changed.

Explanation

The hardware volume mapping has been changed during running reconciliation. Reconciliation has been stopped.

System action

Reconciliation was stopped for this volume. Reconciliation will be started again at the next scheduled time.

User response

None

Appendix B. Accessibility features for the Tivoli Storage Manager product family

Accessibility features help users who have a disability, such as restricted mobility or limited vision, to use information technology products successfully.

Accessibility features

The following list includes the major accessibility features in the Tivoli Storage Manager family of products:

- 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

The Tivoli Storage Manager Information Center, and its related publications, are accessibility-enabled. The accessibility features of the information center are described at http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3/topic/com.ibm.help.ic.doc/iehs36_accessibility.html.

Keyboard navigation

On Windows, the Tivoli Storage Manager product family 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).

On other operating systems, these products follow the operating-system conventions for keyboard navigation and access.

Vendor software

The Tivoli Storage Manager product family 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.

IBM and accessibility

See the IBM Human Ability and Accessibility Center for more information about the commitment that IBM has to accessibility.

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Glossary

This glossary includes terms and definitions for IBM Tivoli Storage Manager and IBM Tivoli Storage FlashCopy Manager products.

To view glossaries for other IBM products, go to <http://www.ibm.com/software/globalization/terminology/>.

The following cross-references are used in this glossary:

- *See* refers the reader from a term to a preferred synonym, or from an acronym or abbreviation to the defined full form.
- *See also* refers the reader to a related or contrasting term.

A

absolute mode

In storage management, a backup copy-group mode that specifies that a file is considered for incremental backup even if the file has not changed since the last backup. See also *modified mode*.

access control list (ACL)

In computer security, a list associated with an object that identifies all the subjects that can access the object and their access rights. For example, an access control list is associated with a file that identifies the users who can access that file and their access rights.

access mode

An attribute of a storage pool or a storage volume that specifies whether the server can write to or read from the storage pool or storage volume. The access mode can be read/write, read-only, or unavailable. Volumes in primary storage pools can also have an access mode of destroyed. Volumes in copy storage pools can also have an access mode of offsite.

acknowledgment

The transmission of acknowledgment characters as a positive response to a data transmission.

ACL See *access control list*.

activate

To validate the contents of a policy set and then make it the active policy set.

active-data pool

A named set of storage pool volumes that contain only active versions of client backup data.

active file system

A file system to which space management has been added. With space management, tasks for an active file system include automatic migration, reconciliation, selective migration, and recall. Contrast with *inactive file system*.

active policy set

The activated policy set that contains the policy rules in use by all client nodes that are assigned to the policy domain. See also *policy domain* and *policy set*.

active version

The most recent backup copy of a file stored. The active version of a file cannot be deleted until a backup process detects that the user has either replaced the file with a newer version or has deleted the file from the file server or workstation. Contrast with *inactive version*.

activity log

A log that records normal activity messages that are generated by the server. These messages include information about server and client operations, such as the start time of sessions or device I/O errors.

adaptive subfile backup

A type of backup that sends only changed portions of a file to the server, instead of sending the entire file. Adaptive subfile backup reduces network traffic and increases the speed of the backup.

administrative client

A program that runs on a file server, workstation, or mainframe that administrators use to control and monitor the Tivoli Storage Manager server. Contrast with *backup-archive client*.

administrative command schedule

A database record that describes the

planned processing of an administrative command during a specific time period. See also *client schedule*.

administrative privilege class

See *privilege class*.

administrative session

A period of time during which an administrator user ID communicates with a server to perform administrative tasks. Contrast with *client node session*.

administrator

A user who is registered to the server as an administrator, and who is authorized to perform tasks and issue commands through the assignment of an administrative privilege class.

Advanced Program-to-Program Communication (APPC)

An implementation of the SNA LU 6.2 protocol that allows interconnected systems to communicate and share the processing of programs.

agent node

A client node that has been granted proxy authority to perform operations on behalf of another client node, which is the target node.

aggregate

An object, stored in one or more storage pools, consisting of a group of logical files that are packaged together. See also *logical file* and *physical file*.

aggregate data transfer rate

A performance statistic that indicates the average number of bytes that were transferred per second while processing a given operation.

APPC See *Advanced Program-to-Program Communication*.

application client

A program that is installed on a system to protect an application. The Tivoli Storage Manager server provides backup services to an application client.

archive

To copy programs, data, or files to other storage media, usually for long-term storage or security. Contrast with *retrieve*.

archive copy

A file or group of files that was archived to server storage.

archive copy group

A policy object containing attributes that control the generation, destination, and expiration of archived files.

archive-retention grace period

The number of days that the storage manager retains an archived file when the server is unable to rebind the file to an appropriate management class. See also *bind*.

association

(1) The defined relationship between a client node and a client schedule. An association identifies the name of a schedule, the name of the policy domain to which the schedule belongs, and the name of a client node that performs scheduled operations.

(2) On a configuration manager, the defined relationship between a profile and an object such as a policy domain. Profile associations define the configuration information that is distributed to a managed server when it subscribes to the profile.

audit

To check for logical inconsistencies between information that the server has and the actual condition of the system. The storage manager can audit information about items such as volumes, libraries, and licenses. For example, when a storage manager audits a volume, the server checks for inconsistencies between information about backed-up or archived files that are stored in the database and the actual data that are associated with each backup version or archive copy in server storage.

authentication

The process of checking a user's password before permitting user access to the Tivoli Storage Manager server. Authentication can be turned on or off by an administrator with system privilege.

authentication rule

A specification that another user can use to either restore or retrieve files from storage.

authority

The right to access objects, resources, or functions. See also *privilege class*.

authorization rule

A specification that permits another user to either restore or retrieve a user's files from storage.

authorized user

A user who has administrative authority for the Tivoli Storage Manager client on a workstation. This user changes passwords, performs open registrations, and deletes file spaces.

AutoFS

See *automounted file system*.

automatic detection

A feature that detects, reports, and updates the serial number of a drive or library in the database when the path from the local server is defined.

automatic migration

The process that is used to automatically move files from a local file system to storage, based on options and settings that are chosen by a root user on a workstation. See also *threshold migration* and *demand migration*.

automatic reconciliation

The process that is used to reconcile file systems at regular intervals. The intervals are set by a user with root user authority. See also *reconciliation*.

automounted file system (AutoFS)

A file system that is managed by an automounter daemon. The automounter daemon monitors a specified directory path, and automatically mounts the file system to access data.

B**backup-archive client**

A program that runs on a workstation or file server and provides a means for users to back up, archive, restore, and retrieve files. Contrast with *administrative client*.

backup copy group

A policy object containing attributes that control the generation, destination, and expiration of backup versions of files. A backup copy group belongs to a management class.

backup-retention grace period

The number of days the storage manager retains a backup version after the server is unable to rebind the file to an appropriate management class.

backup set

A portable, consolidated group of active versions of backup files that are generated for a backup-archive client.

backup set collection

A group of backup sets that are created at the same time and which have the same backup set name, volume names, description, and device classes. The server identifies each backup set in the collection by its node name, backup set name, and file type.

backup version

A file or directory that a client node backed up to server storage. More than one backup version can exist in server storage, but only one backup version is the active version. See also *active version* and *inactive version*.

bind To associate all versions of a file with a management class name. See *rebind*.

bindery

A database that consists of three system files for a NetWare server. The files contain user IDs and user restrictions.

C

cache To place a duplicate copy of a file on random access media when the server migrates a file to another storage pool in the hierarchy.

cache file

A snapshot of a logical volume created by Logical Volume Snapshot Agent. Blocks are saved immediately before they are modified during the image backup and their logical extents are saved in the cache files.

CAD See *client acceptor*.

central scheduler

A function that permits an administrator to schedule client operations and administrative commands. The operations can be scheduled to occur periodically or on a specific date. See *client schedule* and *administrative command schedule*.

client A software program or computer that requests services from a server.

client acceptor

An HTTP service that serves the applet for the web client to web browsers. On Windows systems, the client acceptor is installed and run as a service. On AIX®, UNIX, and Linux systems, the client acceptor is run as a daemon, and is also called the *client acceptor daemon* (CAD).

client acceptor daemon (CAD)

See *client acceptor*.

client domain

The set of drives, file systems, or volumes that the user selects to back up or archive data, using the backup-archive client.

client node

A file server or workstation on which the backup-archive client program has been installed, and which has been registered to the server.

client node session

A session in which a client node communicates with a server to perform backup, restore, archive, retrieve, migrate, or recall requests. Contrast with *administrative session*.

client options file

An editable file that identifies the server and communication method, and provides the configuration for backup, archive, hierarchical storage management, and scheduling.

client option set

A group of options that are defined on the server and used on client nodes in conjunction with client options files.

client-polling scheduling mode

A method of operation in which the client queries the server for work. Contrast with *server-prompted scheduling mode*.

client schedule

A database record that describes the planned processing of a client operation during a specific time period. The client operation can be a backup, archive, restore, or retrieve operation, a client operating system command, or a macro. See also *administrative command schedule*.

client/server

Pertaining to the model of interaction in

distributed data processing in which a program on one computer sends a request to a program on another computer and awaits a response. The requesting program is called a client; the answering program is called a server.

client system-options file

A file, used on AIX, UNIX, or Linux system clients, containing a set of processing options that identify the servers to be contacted for services. This file also specifies communication methods and options for backup, archive, hierarchical storage management, and scheduling. This file is also called the *dsm.sys* file. See also *client user-options file*.

client user-options file

A file that contains the set of processing options that the clients on the system use. The set can include options that determine the server that the client contacts, and options that affect backup operations, archive operations, hierarchical storage management operations, and scheduled operations. This file is also called the *dsm.opt* file. For AIX, UNIX, or Linux systems, see also *client system-options file*.

closed registration

A registration process in which only an administrator can register workstations as client nodes with the server. Contrast with *open registration*.

collocation

The process of keeping all data belonging to a single-client file space, a single client node, or a group of client nodes on a minimal number of sequential-access volumes within a storage pool. Collocation can reduce the number of volumes that must be accessed when a large amount of data must be restored.

collocation group

A user-defined group of client nodes whose data is stored on a minimal number of volumes through the process of collocation.

commit point

A point in time when data is considered consistent.

Common Programming Interface for Communications (CPI-C)

A call-level interface that provides a consistent application programming interface (API) for applications that use program-to-program communications. CPI-C uses LU 6.2 architecture to create a set of interprogram services that can establish and end a conversation, send and receive data, exchange control information, and notify a partner program of errors.

communication method

The method by which a client and server exchange information. See also *Transmission Control Protocol/Internet Protocol*.

communication protocol

A set of defined interfaces that permit computers to communicate with each other.

compression

A function that removes repetitive characters, spaces, or strings of characters from the data being processed and replaces the repetitive characters with control characters. Compression reduces the amount of storage space that is required for the data.

configuration manager

A server that distributes configuration information, such as policies and schedules, to managed servers according to their profiles. Configuration information can include policy and schedules. See also *managed server* and *profile*.

conversation

A connection between two programs over a session that allows them to communicate with each other while processing a transaction.

copy backup

A full backup in which the transaction log files are not deleted so that backup procedures that use incremental or differential backups are not disrupted

copy group

A policy object containing attributes that control how backup versions or archive copies are generated, where backup versions or archive copies are initially

located, and when backup versions or archive copies expire. A copy group belongs to a management class. See also *archive copy group*, *backup copy group*, *backup version*, and *management class*.

copy storage pool

A named set of volumes that contain copies of files that reside in primary storage pools. Copy storage pools are used only to back up the data that is stored in primary storage pools. A copy storage pool cannot be a destination for a backup copy group, an archive copy group, or a management class (for space-managed files). See also *primary storage pool* and *destination*.

CPI-C See *Common Programming Interface for Communications*.

D**daemon**

A program that runs unattended to perform continuous or periodic functions, such as network control.

damaged file

A physical file in which Tivoli Storage Manager has detected read errors.

data access control mode

A mode that controls whether a command can access a migrated file, see a migrated file as zero-length, or receive an input/output error if it attempts to access a migrated file. See also *execution mode*.

database backup series

One full backup of the database, plus up to 32 incremental backups made since that full backup. Each full backup that is run starts a new database backup series. A number identifies each backup series.

database snapshot

A complete backup of the entire database to media that can be taken off-site. When a database snapshot is created, the current database backup series is not interrupted. A database snapshot cannot have incremental database backups associated with it. See also *database backup series*. Contrast with *full backup*.

data deduplication

A method of reducing storage needs by eliminating redundant data. Only one instance of the data is retained on storage

media. Other instances of the same data are replaced with a pointer to the retained instance.

data manager server

A server that collects metadata information for client inventory and manages transactions for the storage agent over the local area network. The data manager server informs the storage agent with applicable library attributes and the target volume identifier.

data mover

A device that moves data on behalf of the server. A network-attached storage (NAS) file server is a data mover.

data storage-management application-programming interface (DSMAPI)

A set of functions and semantics that can monitor events on files, and manage and maintain the data in a file. In an HSM environment, a DSMAPI uses events to notify data management applications about operations on files, stores arbitrary attribute information with a file, supports managed regions in a file, and uses DSMAPI access rights to control access to a file object.

default management class

A management class that is assigned to a policy set. This class is used to govern backed up or archived files when a file is not explicitly associated with a specific management class through the include-exclude list.

deduplication

See *data deduplication*.

demand migration

The process that is used to respond to an out-of-space condition on a file system for which hierarchical storage management (HSM) is active. Files are migrated to server storage until space usage drops to the low threshold that was set for the file system. If the high threshold and low threshold are the same, one file is migrated.

desktop client

The group of backup-archive clients that includes clients on Microsoft Windows, Apple, and Novell NetWare operating systems.

destination

A copy group or management class attribute that specifies the primary storage pool to which a client file will be backed up, archived, or migrated.

device class

A named set of characteristics that are applied to a group of storage devices. Each device class has a unique name and represents a device type of disk, file, optical disk, or tape.

device configuration file

(1) For a server, a file that contains information about defined device classes, and, on some servers, defined libraries and drives. The information is a copy of the device configuration information in the database.

(2) For a storage agent, a file that contains the name and password of the storage agent, and information about the server that is managing the SAN-attached libraries and drives that the storage agent uses.

device driver

A program that provides an interface between a specific device and the application program that uses the device.

disaster recovery manager (DRM)

A function that assists in preparing and using a disaster recovery plan file for the server.

disaster recovery plan

A file that is created by the disaster recovery manager (DRM) that contains information about how to recover computer systems if a disaster occurs and scripts that can be run to perform some recovery tasks. The file includes information about the software and hardware that is used by the server, and the location of recovery media.

domain

A grouping of client nodes with one or more policy sets, which manage data or storage resources for the client nodes. See *policy domain* or *client domain*.

DRM See *disaster recovery manager*.

DSMAPI

See *data storage-management application-programming interface*.

dynamic serialization

A type of copy serialization in which a file or folder is backed up or archived on the first attempt regardless of whether it changes during a backup or archive.

E

EA See *extended attribute*.

EB See *exabyte*.

EFS See *Encrypted File System*.

Encrypted File System (EFS)

A file system that uses file system-level encryption.

enterprise configuration

A method of setting up servers so that the administrator can distribute the configuration of one of the servers to the other servers, using server-to-server communication. See also *configuration manager*, *managed server*, *profile*, and *subscription*.

enterprise logging

The process of sending events from a Tivoli Storage Manager server to a designated event server. The event server routes the events to designated receivers, such as to a user exit. See also *event*.

error log

A data set or file that is used to record error information about a product or system.

estimated capacity

The available space, in megabytes, of a storage pool.

- event** (1) An administrative command or a client operation that is scheduled to be run using Tivoli Storage Manager scheduling.
- (2) A message that an Tivoli Storage Manager server or client issues. Messages can be logged using Tivoli Storage Manager event logging.

event record

A database record that describes actual status and results for events.

event server

A server to which other servers can send events for logging. The event server routes the events to any receivers that are enabled for the sending server's events.

exabyte (EB)

For processor storage, real and virtual storage, and channel volume, 1 152 921 504 606 846 976 bytes. For disk storage capacity and communications volume, 1 000 000 000 000 000 000 bytes.

exclude

The process of identifying files in an include-exclude list. This process prevents the files from being backed up or migrated whenever a user or schedule enters an incremental or selective backup operation. A file can be excluded from backup and space management, backup only, or space management only.

exclude-include list

See *include-exclude list*.

execution mode

A mode that controls the space-management related behavior of commands that run under the **dsmmode** command.

expiration

The process by which files, data sets, or objects are identified for deletion because their expiration date or retention period has passed.

expiring file

A migrated or premigrated file that has been marked for expiration and removal from storage. If a stub file or an original copy of a premigrated file is deleted from a local file system, or if the original copy of a premigrated file is updated, the corresponding migrated or premigrated file is marked for expiration the next time reconciliation is run.

extend

To increase the portion of available space that can be used to store database or recovery log information.

extended attribute (EA)

Names or value pairs that are associated with files or directories. There are three classes of extended attributes: user attributes, system attributes, and trusted attributes.

extent The part of a file that is created during the data-deduplication process. Extents are compared with other file extents to identify duplicates.

external library

A type of library that is provided by Tivoli Storage Manager that permits LAN-free data movement for StorageTek libraries that are managed by Automated Cartridge System Library Software (ACSL). To activate this function, the Tivoli Storage Manager library type must be EXTERNAL.

F**file access time**

On AIX, UNIX, or Linux systems, the time when the file was last accessed.

file age

For migration prioritization purposes, the number of days since a file was last accessed.

file device type

A device type that specifies the use of sequential access files on disk storage as volumes.

file server

A dedicated computer and its peripheral storage devices that are connected to a local area network that stores programs and files that are shared by users on the network.

file space

A logical space in server storage that contains a group of files that have been backed up or archived by a client node, from a single logical partition, file system, or virtual mount point. Client nodes can restore, retrieve, or delete their file spaces from server storage. In server storage, files belonging to a single file space are not necessarily stored together.

file space ID (FSID)

A unique numeric identifier that the server assigns to a file space when it is stored in server storage.

file state

The space management mode of a file that resides in a file system to which space management has been added. A file can be in one of three states: resident, premigrated, or migrated. See also *resident file*, *premigrated file*, and *migrated file*.

file system migrator (FSM)

A kernel extension that intercepts all file system operations and provides any space

management support that is required. If no space management support is required, the operation is passed to the operating system, which performs its normal functions. The file system migrator is mounted over a file system when space management is added to the file system.

file system state

The storage management mode of a file system that resides on a workstation on which the hierarchical storage management (HSM) client is installed. A file system can be in one of these states: native, active, inactive, or global inactive.

frequency

A copy group attribute that specifies the minimum interval, in days, between incremental backups.

FSID See *file space ID*.

FSM See *file system migrator*.

full backup

The process of backing up the entire server database. A full backup begins a new database backup series. See also *database backup series* and *incremental backup*. Contrast with *database snapshot*.

fuzzy backup

A backup version of a file that might not accurately reflect what is currently in the file because the file was backed up at the same time as it was being modified.

fuzzy copy

A backup version or archive copy of a file that might not accurately reflect the original contents of the file because it was backed up or archived the file while the file was being modified. See also *backup version* and *archive copy*.

G**General Parallel File System**

A high-performance shared-disk file system that can provide data access from nodes in a cluster environment.

gigabyte (GB)

In decimal notation, 1 073 741 824 when referring to memory capacity; in all other cases, it is defined as 1 000 000 000.

global inactive state

The state of all file systems to which

space management has been added when space management is globally deactivated for a client node. When space management is globally deactivated, hierarchical storage management (HSM) cannot perform migration, recall, or reconciliation. However, a root user can update space management settings and add space management to additional file systems. Users can access resident and premigrated files.

Globally Unique Identifier (GUID)

An algorithmically determined number that uniquely identifies an entity within a system.

GPFS™

See *General Parallel File System*.

GPFS node set

A mounted, defined group of GPFS file systems.

group backup

The backup of a group containing a list of files from one or more file space origins.

GUID See *Globally Unique Identifier*.

H

hierarchical storage management (HSM)

A function that automatically distributes and manages data on disk, tape, or both by regarding devices of these types and potentially others as levels in a storage hierarchy that range from fast, expensive devices to slower, cheaper, and possibly removable devices. The objectives are to minimize access time to data and maximize available media capacity.

hierarchical storage management (HSM) client

A client program that works with the Tivoli Storage Manager server to provide hierarchical storage management (HSM) for a system. See also *hierarchical storage management* and *space manager client*.

HSM See *hierarchical storage management*.

HSM client

See *hierarchical storage management client*.

I

ILM See *information lifecycle management*.

image A file system or raw logical volume that is backed up as a single object.

image backup

A backup of a full file system or raw logical volume as a single object.

inactive file system

A file system for which space management has been deactivated. Contrast with *active file system*.

inactive version

A backup version of a file that is either not the most recent backup version, or that is a backup version of a file that no longer exists on the client system. Inactive backup versions are eligible for expiration processing according to the management class assigned to the file. Contrast with *active version*.

include-exclude file

A file containing statements to determine the files to back up and the associated management classes to use for backup or archive. See also *include-exclude list*.

include-exclude list

A list of options that include or exclude selected files for backup. An exclude option identifies files that should not be backed up. An include option identifies files that are exempt from the exclusion rules or assigns a management class to a file or a group of files for backup or archive services.

incremental backup

(1) A copy of all database data that has changed since the most recent successful full backup operation. An incremental backup is also known as a *cumulative backup image* because each incremental backup includes the contents of the previous incremental backup.

(2) The process of backing up information in the database that is new or changed since the last full backup. Contrast with *full backup*. See also *database backup series*.

(3) For Data Protection for Microsoft Exchange Server, a backup in which the transaction logs are backed up and then cleared.

individual mailbox restore

See *mailbox restore*.

information lifecycle management (ILM)

GPFS policy-based file management for storage pools and file sets.

inode The internal structure that describes the individual files on AIX, UNIX, or Linux systems. An inode contains the node, type, owner, and location of a file.

inode number
A number specifying a particular inode file in the file system.

IP address
A unique address for a device or logical unit on a network that uses the IP standard.

J

job file
A generated file that contains configuration information for a migration job. The file is XML format and can be created and edited in the hierarchical storage management (HSM) client for Windows client graphical user interface.

journal-based backup
A method for backing up Windows clients and AIX clients that exploits the change notification mechanism in a file to improve incremental backup performance by reducing the need to fully scan the file system.

journal daemon
On AIX, UNIX, or Linux systems, a program that tracks change activity for files residing in file systems.

journal service
In Microsoft Windows, a program that tracks change activity for files residing in file systems.

K

kilobyte (KB)
For processor storage, real and virtual storage, and channel volume, 210 or 1 024 bytes. For disk storage capacity and communications volume, 1 000 bytes.

L

LAN See *local area network*.

LAN-free data movement
The movement of client data between a client system and a storage device on a storage area network (SAN), bypassing the local area network. This process is also referred to as *LAN-free data transfer*.

LAN-free data transfer

See *LAN-free data movement*.

leader data

Bytes of data, from the beginning of a migrated file, that are stored in the file's corresponding stub file on the local file system. The amount of leader data that is stored in a stub file depends on the stub size that is specified.

library

(1) A repository for demountable recorded media, such as magnetic disks and magnetic tapes.

(2) A collection of one or more drives, and possibly robotic devices (depending on the library type), which can be used to access storage volumes.

library client

A server that uses server-to-server communication to access a library that is managed by another storage management server. See also *library manager*.

library manager

A server that controls device operations when multiple storage management servers share a storage device. See also *library client*.

local (1) Pertaining to a device, file, or system that is accessed directly from a user system, without the use of a communication line.

(2) For HSM products, pertaining to the destination of migrated files that are being moved.

local area network (LAN)

A network that connects several devices in a limited area (such as a single building or campus) and that can be connected to a larger network.

local shadow volumes

Data that is stored on shadow volumes localized to a disk storage subsystem.

LOFS See *loopback virtual file system*.

logical file

A file that is stored in one or more server storage pools, either by itself or as part of an aggregate. See also *aggregate* and *physical file*.

logical occupancy

The space that is used by logical files in a

storage pool. This space does not include the unused space created when logical files are deleted from aggregate files, so it might be less than the physical occupancy.

logical unit (LU)

An access point through which a user or application program accesses the Systems Network Architecture (SNA) network to communicate with another user or application program.

logical unit number (LUN)

In the Small Computer System Interface (SCSI) standard, a unique identifier that is used to differentiate devices, each of which is a logical unit (LU).

logical volume

A portion of a physical volume that contains a file system.

logical volume backup

A backup of a file system or logical volume as a single object.

Logical Volume Snapshot Agent (LVSA)

Software that can act as the snapshot provider for creating a snapshot of a logical volume during an online image backup.

loopback virtual file system (LOFS)

A file system that is created by mounting a directory over another local directory, also known as mount-over-mount. A LOFS can also be generated using an automounter.

LU See *logical unit*.

LUN See *logical unit number*.

LVSA See *Logical Volume Snapshot Agent*.

M

macro file

A file that contains one or more storage manager administrative commands, which can be run only from an administrative client using the MACRO command. Contrast with *Tivoli Storage Manager command script*.

mailbox restore

A function that restores Microsoft Exchange Server data (from IBM Data Protection for Microsoft Exchange backups) at the mailbox level or mailbox-item level.

managed object

In Tivoli Storage Manager, a definition in the database of a managed server that was distributed to the managed server by a configuration manager. When a managed server subscribes to a profile, all objects that are associated with that profile become managed objects in the database of the managed server. In general, a managed object cannot be modified locally on the managed server. Objects can include policy, schedules, client option sets, server scripts, administrator registrations, server definitions, and server group definitions.

managed server

A Tivoli Storage Manager server that receives configuration information from a configuration manager using a subscription to one or more profiles. Configuration information can include definitions of objects such as policy and schedules. See also *configuration manager*, *subscription*, and *profile*.

management class

A policy object that users can bind to each file to specify how the server manages the file. The management class can contain a backup copy group, an archive copy group, and space management attributes. See also *copy group*, *space manager client*, *bind*, and *rebind*.

maximum transmission unit

The largest possible unit of data that can be sent on a given physical medium in a single frame. For example, the maximum transmission unit for Ethernet is 1500 bytes.

MB See *megabyte*.

media server

In a z/OS® environment, a program that provides access to z/OS disk and tape storage for Tivoli Storage Manager servers that run on operating systems other than z/OS.

megabyte (MB)

(1) 1 048 576 bytes (2 to the 20th power) when used in this publication.

(2) For processor storage, real and virtual storage, and channel volume, 2 to the power of 20 or 1 048 576 bits. For disk

storage capacity and communications volume, 1 000 000 bits.

metadata

Data that describes the characteristics of data; descriptive data.

migrate

To move data from one storage location to another. In Tivoli Storage Manager products, migrating can mean moving data from a client node to server storage, or moving data from one storage pool to the next storage pool defined in the server storage hierarchy. In both cases the movement is controlled by policy, such as thresholds that are set. See also *migration threshold*.

migrated file

A file that has been copied from a local file system to Tivoli Storage Manager storage. For HSM clients on UNIX or Linux systems, the file is replaced with a stub file on the local file system. On Windows systems, creation of the stub file is optional. See also *stub file* and *resident file*. For HSM clients on UNIX or Linux systems, contrast with *premigrated file*.

migrate-on-close recall mode

A mode that causes a migrated file to be recalled back to its originating file system temporarily. Contrast with *normal recall mode* and *read-without-recall recall mode*.

migration job

A specification of files to migrate, and actions to perform on the original files after migration. See also *job file*.

migration threshold

High and low capacities for storage pools or file systems, expressed as percentages, at which migration is set to start and stop.

mirroring

The process of writing the same data to multiple locations at the same time. Mirroring data protects against data loss within the recovery log.

mode

A copy group attribute that specifies whether to back up a file that has not been modified since the last time the file was backed up. See *modified mode* and *absolute mode*.

modified mode

In storage management, a backup copy-group mode that specifies that a file is considered for incremental backup only if it has changed since the last backup. A file is considered a changed file if the date, size, owner, or permissions of the file have changed. See also *absolute mode*.

mount limit

The maximum number of volumes that can be simultaneously accessed from the same device class. The mount limit determines the maximum number of mount points. See also *mount point*.

mount point

On the Tivoli Storage Manager server, a logical drive through which volumes in a sequential access device class are accessed. For removable-media device types, such as tape, a mount point is a logical drive that is associated with a physical drive. For the file device type, a mount point is a logical drive that is associated with an I/O stream. The number of mount points for a device class is defined by the value of the mount limit attribute for that device class. See also *mount limit*.

mount retention period

The maximum number of minutes that the server retains a mounted sequential-access media volume that is not being used before it dismounts the sequential-access media volume.

mount wait period

The maximum number of minutes that the server waits for a sequential-access volume mount request to be satisfied before canceling the request.

MTU See *maximum transmission unit*.

N**Nagle algorithm**

An algorithm that reduces congestion of TCP/IP networks by combining smaller packets and sending them together.

named pipe

A type of interprocess communication that permits message data streams to pass between peer processes, such as between a client and a server.

NAS See *network-attached storage*.

NAS node

A client node that is a network-attached storage (NAS) file server. Data for the NAS node is transferred by a NAS file server that is controlled by the network data management protocol (NDMP). A NAS node is also called a NAS file server node.

native file system

A file system that is locally added to the file server and is not added for space management. The hierarchical storage manager (HSM) client does not provide space management services to the file system.

native format

A format of data that is written to a storage pool directly by the Tivoli Storage Manager server. Contrast with *non-native data format*.

NDMP

See *Network Data Management Protocol*.

NetBIOS

See *Network Basic Input/Output System*.

network-attached storage (NAS) file server

A dedicated storage device with an operating system that is optimized for file-serving functions. A NAS file server can have the characteristics of both a node and a data mover.

Network Basic Input/Output System (NetBIOS)

A standard interface to networks and personal computers that is used on local area networks to provide message, print-server, and file-server functions. Application programs that use NetBIOS do not have to handle the details of LAN data link control (DLC) protocols.

Network Data Management Protocol (NDMP)

A protocol that allows a network storage-management application to control the backup and recovery of an NDMP-compliant file server, without installing vendor-acquired software on that file server.

network data-transfer rate

A rate that is calculated by dividing the total number of bytes that are transferred by the data transfer time. For example, this rate can be the time that is spent transferring data over a network.

node A file server or workstation on which the backup-archive client program has been installed, and which has been registered to the server.

node name

A unique name that is used to identify a workstation, file server, or PC to the server.

node privilege class

A privilege class that gives an administrator the authority to remotely access backup-archive clients for a specific client node or for all clients in a policy domain. See also *privilege class*.

non-native data format

A format of data that is written to a storage pool that differs from the format that the server uses for operations.

normal recall mode

A mode that causes a migrated file to be copied back to its originating file system when it is accessed.

O**offline volume backup**

A backup in which the volume is locked so that no other system applications can access it during the backup operation.

online volume backup

A backup in which the volume is available to other system applications during the backup operation.

open registration

A registration process in which users can register their workstations as client nodes with the server. Contrast with *closed registration*.

operator privilege class

A privilege class that gives an administrator the authority to disable or halt the server, enable the server, cancel server processes, and manage removable media. See also *privilege class*.

options file

A file that contains processing options. On Windows and NetWare systems, the file is called dsm.opt. On AIX, UNIX, Linux, and Mac OS X systems, the file is called dsm.sys.

originating file system

The file system from which a file was

migrated. When a file is recalled using normal or migrate-on-close recall mode, it is always returned to its originating file system.

orphaned stub file

A file for which no migrated file can be found on the Tivoli Storage Manager server that the client node is contacting for space management services. For example, a stub file can be orphaned when the client system-options file is modified to contact a server that is different than the one to which the file was migrated.

out-of-space protection mode

A mode that controls whether the program intercepts out-of-space conditions. See also *execution mode*.

P

pacing

In SNA, a technique by which the receiving system controls the rate of transmission of the sending system to prevent overrun.

packet In data communication, a sequence of binary digits, including data and control signals, that is transmitted and switched as a composite whole.

page A defined unit of space on a storage medium or within a database volume.

partial-file recall mode

A recall mode that causes the hierarchical storage management (HSM) function to read just a portion of a migrated file from storage, as requested by the application accessing the file.

password generation

A process that creates and stores a new password in an encrypted password file when the old password expires. Automatic generation of a password prevents password prompting. Password generation can be set in the options file (passwordaccess option). See also *options file*.

path An object that defines a one-to-one relationship between a source and a destination. Using the path, the source accesses the destination. Data can flow from the source to the destination, and back. An example of a source is a data

mover (such as a network-attached storage [NAS] file server), and an example of a destination is a tape drive.

pattern-matching character

See *wildcard character*.

physical file

A file that is stored in one or more storage pools, consisting of either a single logical file, or a group of logical files that are packaged together as an aggregate. See also *aggregate* and *logical file*.

physical occupancy

The amount of space that is used by physical files in a storage pool. This space includes the unused space that is created when logical files are deleted from aggregates. See also *physical file*, *logical file*, and *logical occupancy*.

plug-in

A self-contained software component that modifies (adds, or changes) the function in a particular system. When a plug-in is added to a system, the foundation of the original system remains intact.

policy domain

A grouping of policy users with one or more policy sets, which manage data or storage resources for the users. The users are client nodes that are associated with the policy domain.

policy privilege class

A privilege class that gives an administrator the authority to manage policy objects, register client nodes, and schedule client operations for client nodes. Authority can be restricted to certain policy domains. See also *privilege class*.

policy set

A group of rules in a policy domain. The rules specify how data or storage resources are automatically managed for client nodes in the policy domain. Rules can be contained in management classes. See also *active policy set* and *management class*.

premigrated file

A file that has been copied to Tivoli Storage Manager storage, but has not been replaced with a stub file on the local file system. An identical copy of the file resides both on the local file system and

in Tivoli Storage Manager storage. Premigrated files occur on UNIX and Linux file systems to which space management has been added. Contrast with *migrated file* and *resident file*.

premigrated files database

A database that contains information about each file that has been premigrated to Tivoli Storage Manager storage. The database is stored in a hidden directory named `.SpaceMan` in each file system to which space management has been added.

premigration

The process of copying files that are eligible for migration to Tivoli Storage Manager storage, but leaving the original file intact on the local file system.

premigration percentage

A space management setting that controls whether the next eligible candidates in a file system are premigrated following threshold or demand migration.

primary storage pool

A named set of volumes that the server uses to store backup versions of files, archive copies of files, and files migrated from client nodes. See also *destination* and *copy storage pool*.

privilege class

A level of authority that is granted to an administrator. The privilege class determines which administrative tasks the administrator can perform. See also *node privilege class*, *operator privilege class*, *policy privilege class*, *storage privilege class*, and *system privilege class*.

profile

A named group of configuration information that can be distributed from a configuration manager when a managed server subscribes. Configuration information can include registered administrator IDs, policies, client schedules, client option sets, administrative schedules, storage manager command scripts, server definitions, and server group definitions. See also *configuration manager* and *managed server*.

Q

quota (1) For HSM on AIX, UNIX, or Linux systems, the limit (in megabytes) on the

amount of data that can be migrated and premigrated from a file system to server storage.

(2) For HSM on Windows systems, a user-defined limit to the space that is occupied by recalled files.

R

randomization

The process of distributing schedule start times for different clients within a specified percentage of the schedule's startup window.

raw logical volume

A portion of a physical volume that is comprised of unallocated blocks and has no journaled file system (JFS) definition. A logical volume is read/write accessible only through low-level I/O functions.

read-without-recall recall mode

A mode that causes hierarchical storage management (HSM) to read a migrated file from storage without storing it back on the local file system. The last piece of information read from the file is stored in a buffer in memory on the local file system. Contrast with *normal recall mode* and *migrate-on-close recall mode*.

rebind

To associate all backed-up versions of a file with a new management class name. For example, a file that has an active backup version is rebound when a later version of the file is backed up with a different management class association. See also *bind*.

recall In Tivoli Storage Manager, to copy a migrated file from server storage back to its originating file system using the space management client. See also *transparent recall*, *selective recall*, and *recall mode*.

recall mode

A mode that is assigned to a migrated file with the `dsmatrr` command that determines how the file is processed when it is recalled. It determines whether the file is stored on the local file system, is migrated back to Tivoli Storage Manager storage when it is closed, or is read from Tivoli Storage Manager storage without storing it on the local file system.

receiver

A server repository that contains a log of server and client messages as events. For example, a receiver can be a file exit, a user exit, or the Tivoli Storage Manager server console and activity log. See also *event*.

reclamation

The process of consolidating the remaining data from many sequential-access volumes onto fewer, new sequential-access volumes.

reclamation threshold

The percentage of space that a sequential-access media volume must have before the server can reclaim the volume. Space becomes reclaimable when files are expired or are deleted.

reconciliation

The process of synchronizing a file system with the Tivoli Storage Manager server, and then removing old and obsolete objects from the Tivoli Storage Manager server.

recovery log

A log of updates that are about to be written to the database. The log can be used to recover from system and media failures. The recovery log consists of the active log (including the log mirror) and archive logs.

register

To define a client node or administrator ID that can access the server.

registry

A repository that contains access and configuration information for users, systems, and software.

| remote

- | (1) Pertaining to a system, program, or device that is accessed through a communication line.
- |
- | (2) For HSM products, pertaining to the origin of migrated files that are being moved.
- |

resident file

On a Windows system, a complete file on a local file system that might also be a migrated file because a migrated copy can exist in Tivoli Storage Manager storage. On a UNIX or Linux system, a complete

file on a local file system that has not been migrated or premigrated, or that has been recalled from Tivoli Storage Manager storage and modified. Contrast with *stub file* and *premigrated file*. See *migrated file*.

restore

To copy information from its backup location to the active storage location for use. For example, to copy information from server storage to a client workstation.

retention

The amount of time, in days, that inactive backed-up or archived files are kept in the storage pool before they are deleted. Copy group attributes and default retention grace periods for the domain define retention.

retrieve

To copy archived information from the storage pool to the workstation for use. The retrieve operation does not affect the archive version in the storage pool.

roll back

To remove changes that were made to database files since the last commit point.

root user

A system user who operates without restrictions. A root user has the special rights and privileges needed to perform administrative tasks.

S

SAN See *storage area network*.

schedule

A database record that describes client operations or administrative commands to be processed. See *administrative command schedule* and *client schedule*.

scheduling mode

The type of scheduling operation for the server and client node that supports two scheduling modes: client-polling and server-prompted.

scratch volume

A labeled volume that is either blank or contains no valid data, that is not defined, and that is available for use.

script

A series of commands, combined in a file, that carry out a particular function when the file is run. Scripts are interpreted as

they are run. Contrast with *Tivoli Storage Manager command script*.

Secure Sockets Layer (SSL)

A security protocol that provides communication privacy. With SSL, client/server applications can communicate in a way that is designed to prevent eavesdropping, tampering, and message forgery.

selective backup

The process of backing up certain files or directories from a client domain. The files that are backed up are those that are not excluded in the include-exclude list. The files must meet the requirement for serialization in the backup copy group of the management class that is assigned to each file. Contrast with *incremental backup*.

selective migration

The process of copying user-selected files from a local file system to Tivoli Storage Manager storage and replacing the files with stub files on the local file system. Contrast with *threshold migration* and *demand migration*.

selective recall

The process of copying user-selected files from Tivoli Storage Manager storage to a local file system. Contrast with *transparent recall*.

serialization

The process of handling files that are modified during backup or archive processing. See *dynamic serialization*, *static serialization*, *shared static serialization*, and *shared dynamic serialization*.

server A software program or a computer that provides services to other software programs or other computers.

server options file

A file that contains settings that control various server operations. These settings affect such things as communications, devices, and performance.

server-prompted scheduling mode

A client/server communication technique where the server contacts the client node when tasks must be done. Contrast with *client-polling scheduling mode*.

server storage

The primary, copy, and active-data storage

pools that are used by the server to store user files such as backup versions, archive copies, and files migrated from space manager client nodes (space-managed files). See also *active-data pool*, *primary storage pool*, *copy storage pool*, *storage pool volume*, and *volume*.

session

A logical or virtual connection between two stations, software programs, or devices on a network that allows the two elements to communicate and exchange data.

session resource usage

The amount of wait time, processor time, and space that is used or retrieved during a client session.

shared dynamic serialization

A value for serialization that specifies that a file must not be backed up or archived if it is being modified during the operation. Tivoli Storage Manager retries the backup or archive operation a number of times; if the file is being modified during each attempt, Tivoli Storage Manager will back up or archive the file on its last try. See also *serialization*. Contrast with *dynamic serialization*, *shared static serialization*, and *static serialization*.

shared library

A library device that is used by multiple storage manager servers.

shared static serialization

A copy-group serialization value that specifies that a file must not be modified during a backup or archive operation. Tivoli Storage Manager attempts to retry the operation a number of times. If the file is in use during each attempt, the file is not backed up or archived. See also *serialization*. Contrast with *dynamic serialization*, *shared dynamic serialization*, and *static serialization*.

snapshot

An image backup type that consists of a point-in-time view of a volume.

space-managed file

A file that is migrated from a client node by the space manager client. The space manager client recalls the file to the client node on demand.

space management

The process of keeping sufficient free storage space available on a local file system for new data by migrating files to server storage. Synonymous with *hierarchical storage management*.

space manager client

A program that runs on a UNIX or Linux system to manage free space on the local file system by migrating files to server storage. The program can recall the files either automatically or selectively. Also called *hierarchical storage management (HSM) client*.

space monitor daemon

A daemon that checks space usage on all file systems for which space management is active, and automatically starts threshold migration when space usage on a file system equals or exceeds its high threshold.

sparse file

A file that is created with a length greater than the data it contains, leaving empty spaces for the future addition of data.

special file

On AIX, UNIX, or Linux systems, a file that defines devices for the system, or temporary files that are created by processes. There are three basic types of special files: first-in, first-out (FIFO); block; and character.

SSL See *Secure Sockets Layer*.

stabilized file space

A file space that exists on the server but not on the client.

stanza A group of lines in a file that together have a common function or define a part of the system. Each stanza is identified by a name that occurs in the first line of the stanza. Depending on the type of file, a stanza is ended by the next occurrence of a stanza name in the file, or by an explicit end-of-stanza marker. A stanza can also be ended by the end of the file.

startup window

A time period during which a schedule must be initiated.

static serialization

A copy-group serialization value that specifies that a file must not be modified

during a backup or archive operation. If the file is in use during the first attempt, the storage manager cannot back up or archive the file. See also *serialization*. Contrast with *dynamic serialization*, *shared dynamic serialization*, and *shared static serialization*.

storage agent

A program that enables the backup and restoration of client data directly to and from storage attached to a storage area network (SAN).

storage area network (SAN)

A dedicated storage network that is tailored to a specific environment, combining servers, systems, storage products, networking products, software, and services.

storage hierarchy

(1) A logical order of primary storage pools, as defined by an administrator. The order is typically based on the speed and capacity of the devices that the storage pools use. The storage hierarchy is defined by identifying the next storage pool in a storage pool definition. See also *storage pool*.

(2) An arrangement of storage devices with different speeds and capacities. The levels of the storage hierarchy include: main storage, such as memory and direct-access storage device (DASD) cache; primary storage (DASD containing user-accessible data); migration level 1 (DASD containing data in a space-saving format); and migration level 2 (tape cartridges containing data in a space-saving format).

storage pool

A named set of storage volumes that are the destination that is used to store client data. A storage pool contains backup versions, archive copies, and files that are migrated from space manager client nodes. A primary storage pool is backed up to a copy storage pool. See also *primary storage pool*, *copy storage pool*, and *active-data pool*.

storage pool volume

A volume that has been assigned to a storage pool. See also *volume*, *active-data pool*, *copy storage pool*, and *primary storage pool*.

storage privilege class

A privilege class that gives an administrator the authority to control how storage resources for the server are allocated and used, such as monitoring the database, the recovery log, and server storage. See also *privilege class*.

stub

A shortcut on the Windows file system that is generated by the hierarchical storage management (HSM) client for a migrated file that allows transparent user access. A stub is the sparse file representation of a migrated file, with a reparse point attached.

stub file

A file that replaces the original file on a local file system when the file is migrated to storage. A stub file contains the information that is necessary to recall a migrated file from Tivoli Storage Manager storage. It also contains additional information that can be used to eliminate the need to recall a migrated file.

stub file size

The size of a file that replaces the original file on a local file system when the file is migrated to Tivoli Storage Manager storage. The size that is specified for stub files determines how much leader data can be stored in the stub file. The default for stub file size is the block size defined for a file system minus 1 byte.

subscription

In a Tivoli environment, the process of identifying the subscribers that the profiles are distributed to. For Tivoli Storage Manager, a subscription is the process by which a managed server receives configuration information associated with a particular profile on a configuration manager. See also *managed server*, *configuration manager*, and *profile*.

system privilege class

A privilege class that gives an administrator the authority to issue all server commands. See also *privilege class*.

Systems Network Architecture (SNA)

The description of the logical structure, formats, protocols, and operational sequences for transmitting information through and controlling the configuration and operation of networks.

T**tape library**

A set of equipment and facilities that support an installation's tape environment. The tape library can include tape storage racks, mechanisms for automatic tape mounting, a set of tape drives, and a set of related tape volumes mounted on those drives.

tape volume prefix

The high-level-qualifier of the file name or the data set name in the standard tape label.

target node

A client node for which other client nodes (called agent nodes) have been granted proxy authority. The proxy authority allows the agent nodes to perform operations such as backup and restore on behalf of the target node, which owns the data.

TCA See *trusted communications agent*.

TCP/IP

See *Transmission Control Protocol/Internet Protocol*.

threshold migration

The process of moving files from a local file system to Tivoli Storage Manager storage based on the high and low thresholds that are defined for the file system. Contrast with *demand migration*, *selective migration*, and *migration job*.

throughput

In storage management, the total bytes in the workload, excluding overhead, that are backed up or restored, divided by elapsed time.

timeout

A time interval that is allotted for an event to occur or complete before operation is interrupted.

timestamp control mode

A mode that determines whether commands preserve the access time for a file or set it to the current time.

Tivoli Storage Manager command script

A sequence of Tivoli Storage Manager administrative commands that are stored in the database of the Tivoli Storage Manager server. The script can run from any interface to the server. The script can

include substitution for command parameters and conditional logic.

tombstone object

A small subset of attributes of a deleted object. The tombstone object is retained for a specified period, and at the end of the specified period, the tombstone object is permanently deleted.

Transmission Control Protocol/Internet Protocol (TCP/IP)

An industry-standard, nonproprietary set of communication protocols that provides reliable end-to-end connections between applications over interconnected networks of different types.

transparent recall

The process that is used to automatically recall a file to a workstation or file server when the file is accessed. See also *recall mode*. Contrast with *selective recall*.

trusted communications agent (TCA)

A program that handles the sign-on password protocol when clients use password generation.

U

UCS-2 A 2-byte (16-bit) encoding scheme based on ISO/IEC specification 10646-1. UCS-2 defines three levels of implementation: Level 1-No combining of encoded elements allowed; Level 2-Combining of encoded elements is allowed only for Thai, Indic, Hebrew, and Arabic; Level 3-Any combination of encoded elements are allowed.

UNC See *Universal Naming Convention name*.

Unicode

A character encoding standard that supports the interchange, processing, and display of text that is written in the common languages around the world, plus some classical and historical texts. The Unicode standard has a 16-bit character set defined by ISO 10646.

Unicode-enabled file space

Unicode file space names provide support for multilingual workstations without regard for the current locale.

Unicode transformation format 8

Unicode Transformation Format (UTF), 8-bit encoding form, which is designed for ease of use with existing ASCII-based

systems. The CCSID value for data in UTF-8 format is 1208.

Universal Naming Convention (UNC) name

A name that is used to access a drive or directory containing files shared across a network. The UNC name includes the system name and a SharePoint name that represents the shared drive or directory.

Universally Unique Identifier (UUID)

The 128-bit numeric identifier that is used to ensure that two components do not have the same identifier.

UTF-8 See *Unicode transformation format 8*.

UUID See *Universally Unique Identifier*.

V

validate

To check a policy set for conditions that can cause problems if that policy set becomes the active policy set. For example, the validation process checks whether the policy set contains a default management class.

version

A backup copy of a file stored in server storage. The most recent backup copy of a file is the active version. Earlier copies of the same file are inactive versions. The number of versions retained by the server is determined by the copy group attributes in the management class.

virtual file space

A representation of a directory on a network-attached storage (NAS) file system as a path to that directory.

virtual volume

An archive file on a target server that represents a sequential media volume to a source server.

volume

A discrete unit of storage on disk, tape or other data recording medium that supports some form of identifier and parameter list, such as a volume label or input/output control. See also *scratch volume*, and *storage pool volume*.

volume history file

A file that contains information about volumes that have been used by the server for database backups and for export of administrator, node, policy, or

server data. The file also has information about sequential-access storage pool volumes that have been added, reused, or deleted. The information is a copy of volume information that is recorded in the server database.

Volume Shadow Copy Service

A set of Microsoft application-programming interfaces (APIs) that you can use to create shadow copy backups of volumes, exact copies of files, including all open files, and so on.

VSS See *Volume Shadow Copy Service*.

VSS Backup

A backup operation that uses Microsoft Volume Shadow Copy Service (VSS) technology. The backup operation produces an online snapshot (point-in-time consistent copy) of Microsoft Exchange data. This copy can be stored on local shadow volumes or on Tivoli Storage Manager server storage.

VSS Fast Restore

A function that uses a Microsoft Volume Shadow Copy Service (VSS) software provider to restore VSS Backups (IBM Data Protection for Microsoft Exchange database files and log files) that reside on local shadow volumes.

VSS Instant Restore

A volume-level hardware-assisted Microsoft Volume Shadow Copy Service (VSS) function where target volumes that contain the snapshot are copied back to the original source volumes.

VSS offloaded backup

A backup operation that uses a Microsoft Volume Shadow Copy Service (VSS) hardware provider (installed on an alternate system) to move IBM Data Protection for Microsoft Exchange data to the Tivoli Storage Manager server. This type of backup operation shifts the backup load from the production system to another system.

VSS Restore

A function that uses a Microsoft Volume Shadow Copy Service (VSS) software provider to restore VSS Backups (IBM Data Protection for Microsoft Exchange database files and log files) that reside on

Tivoli Storage Manager server storage to their original location.

W**wildcard character**

A special character such as an asterisk (*) or a question mark (?) that can be used to represent one or more characters. Any character or set of characters can replace the wildcard character.

workstation

A terminal or personal computer at which a user can run applications and that is usually connected to a mainframe or a network.

worldwide name

A 64-bit, unsigned name identifier that is unique.

workload partition (WPAR)

A partition within a single operating system instance.

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Product Number: 5608-E13

Printed in USA

SC23-9795-02

