Tivoli Storage Manager for Macintosh

Version 5.3

Backup-Archive Clients Installation and User's Guide

GC32-0787-05

Tivoli® Storage Manager for Macintosh

IBM

Version 5.3

Backup-Archive Clients Installation and User's Guide

GC32-0787-05

Note

Before using this information and the product it supports, read the general information under "Notices" on page 325.

Sixth Edition (October 2005)

This edition applies to Version 5.3 of IBM Tivoli Storage Manager (5608-ISM), IBM Tivoli Storage Manager Extended Edition (5608-ISX), IBM Tivoli Storage Manager for Storage Area Networks (5608-SAN), and to all subsequent releases and modifications until otherwise indicated in new editions or technical newsletters.

Order publications through your IBM® representative or the IBM branch office serving your locality.

Your feedback is important in helping to provide the most accurate and high-quality information. If you have comments about this manual or any other IBM Tivoli Storage Manager documentation, see "Contacting customer support" on page xiii.

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About this book

IBM Tivoli Storage Manager is a client-server licensed product that provides storage management services in a multi-platform computer environment. The backup-archive client program permits users to back up and archive files from their workstations or file servers to storage, and restore and retrieve backup versions and archived copies of files to their local workstations.

In addition to the backup-archive client, Tivoli Storage Manager includes the following components available on a variety of platforms:

- A *server program* that permits systems to perform as a backup and archive server for distributed workstations and file servers. See "Related publications" on page xii for available server publications.
- An *administrative client program* that you can access from a Web browser or the command line. The program permits a Tivoli Storage Manager administrator to control and monitor server activities, define storage management policies for backup, archive and space management services, and set up schedules to perform those services at regular intervals. For more information about the Administrative client, see "Related publications" on page xii for available Tivoli Storage Manager Administrator's Reference publications.

Who should read this manual

This manual provides instructions for an end-user to install, configure, and use the Tivoli Storage Manager client. For installation information and supported operating system levels, see Chapter 1, "Installing Tivoli Storage Manager," on page 1. For configuration information, see Chapter 2, "Configuring Tivoli Storage Manager," on page 11.

This manual assumes that you are familiar with your workstation, your operating system, and your basic system administration.

See "Root user, Authorized User, and non-Authorized user tasks" on page 11 for more information about **authorized user** and **root user** tasks.

IBM Tivoli Storage Manager Web site

Technical support information and publications are available at the following address:

`http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html`

By accessing the Tivoli Storage Manager home page, you can access subjects that interest you. You can also access current Tivoli Storage Manager product information.

The Tivoli Storage Manager home page **Self help** section provides customers with a knowledge base of articles and information on issues with Tivoli Storage Manager that you might be experiencing.

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Conventions used in this book

This book uses the following typographical conventions:

Table 1. Typographical conventions

Example	Description
`dsmc.nlm`	A series of lowercase letters with an extension indicates Tivoli Storage Manager program file names.
archive	Boldface type indicates a command that you type at a workstation, such as a command you type on a command line.
dateformat	Boldface italic type indicates a Tivoli Storage Manager option. The bold type is used to introduce the option, or used in an example. Occasionally, file names are entered in boldface italic for emphasis.
filespec	Italicized type indicates either the name of a parameter, a new term, or a placeholder for information that you provide. Italics are also used for emphasis in the text.
`maxcmdretries`	Monospaced type represents fragments of a program or information as it would display on a screen.
plus sign (+)	A plus sign between two keys indicates you should press both keys at the same time.

Reading syntax diagrams

This section describes how to read the syntax diagrams used in this manual. To read a syntax diagram, follow the path of the line. Read from left to right, and top to bottom.

- The ►►── symbol indicates the beginning of a syntax diagram.
- The ──► symbol at the end of a line indicates the syntax diagram continues on the next line.
- The ►── symbol at the beginning of a line indicates a syntax diagram continues from the previous line.
- The ──►◄ symbol indicates the end of a syntax diagram.

Syntax items, such as a keyword or variable, can be:
- On the line (required element)
- Above the line (default element)
- Below the line (optional element).

Syntax diagram description	Example
Abbreviations: Uppercase letters denote the shortest acceptable truncation. If an item appears entirely in uppercase letters, it cannot be truncated. You can type the item in any combination of uppercase or lowercase letters. In this example, you can enter KEYWO, KEYWORD, or KEYWOrd.	►►─KEYWOrd──────────────────────────►◄
Symbols: Enter these symbols exactly as they appear in the syntax diagram.	* Asterisk { } Braces : Colon , Comma = Equal Sign - Hyphen () Parentheses . Period Space
Variables: Italicized lowercase items (*var_name*) denote variables. In this example, you can specify a *var_name* when you enter the KEYWORD command.	►►─KEYWOrd─*var_name*──────────────────►◄
Repetition: An arrow returning to the left means you can repeat the item. A character or space within the arrow means you must separate repeated items with that character or space. A footnote by the arrow references the number of times you can repeat the item.	►►─┬─*repeat*─┬──────────────────►◄ └◄──┘ ►►─┬─,─*repeat*─┬──────────────────►◄ └◄──┘ ►►─┬─(1)─*repeat*─┬──────────────────►◄ └◄──┘ **Notes:** 1 Specify *repeat* as many as 5 times.
Required choices: When two or more items are in a stack and one of them is on the line, you *must* specify one item. In this example, you *must* choose A, B, or C.	►►─┬─A─┬──────────────────►◄ ├─B─┤ └─C─┘

Syntax diagram description	Example
Optional choice: When an item is below the line, that item is optional. In the first example, you can choose A or nothing at all. When two or more items are in a stack below the line, all of them are optional. In the second example, you can choose A, B, C, or nothing at all.	
Defaults: Defaults are above the line. The default is selected unless you override it. You can override the default by including an option from the stack below the line. In this example, A is the default. You can override A by choosing B or C. You can also specify the default explicitly.	
Repeatable choices: A stack of items followed by an arrow returning to the left means you can select more than one item or, in some cases, repeat a single item. In this example, you can choose any combination of A, B, or C.	
Syntax fragments: Some diagrams, because of their length, must fragment the syntax. The fragment name appears between vertical bars in the diagram. The expanded fragment appears between vertical bars in the diagram after a heading with the same fragment name.	 **The fragment name:**

Related publications

Table 2 lists the IBM Tivoli Storage Manager client and server publications that are referred to in this manual.

Table 2. IBM Tivoli Storage Manager client and server publications

Publication title	Order number
Client publications	
IBM Tivoli Storage Manager Messages	GC32-0767
IBM Tivoli Storage Manager for Windows Backup-Archive Clients Installation and User's Guide	GC32-0788
IBM Tivoli Storage Manager for NetWare Backup-Archive Clients Installation and User's Guide	GC32-0786
IBM Tivoli Storage Manager for UNIX and Linux Backup-Archive Clients Installation and User's Guide User's Guide	GC32-0789
Server publications	

Table 2. IBM Tivoli Storage Manager client and server publications (continued)

Publication title	Order number
IBM Tivoli Storage Manager for AIX Quick Start	GC32-0770
IBM Tivoli Storage Manager for HP-UX Quick Start	GC32-0774
IBM Tivoli Storage Manager for Linux Quick Start	GC23-4692
IBM Tivoli Storage Manager for z/OS Quick Start	GC32-0777
IBM Tivoli Storage Manager for OS/400 PASE Quick Start	GC23-4696
IBM Tivoli Storage Manager for Sun Solaris Quick Start	GC32-0780
IBM Tivoli Storage Manager for Windows Quick Start	GC32-0784

Downloading or ordering publications

All Tivoli publications are available for electronic download or order from the IBM Publications Center: http://www.ibm.com/shop/publications/order/.

The Tivoli Storage Manager publications are available on the following CD-ROM:

Tivoli Storage Manager Publications Version 5.3, SK3T-8176

The format of the publications is PDF and HTML.

If you have questions or comments regarding Tivoli publications and product documentation, please visit http://www.ibm.com/software/tivoli/contact.html to send an e-mail.

The International Technical Support Center (ITSC) publishes Redbooks, which are books on specialized topics such as using Tivoli Storage Manager to back up databases. You can order publications through your IBM representative or the IBM branch office serving your locality. You can also search for and order books of interest to you at the IBM Redbooks Web site at this address:

`http://www.ibm.com/redbooks/`

Tivoli Field Guides are designed to address specific technical scenarios or concepts that are often complex to implement or difficult to understand. All completed field guides are available free to registered customers and internal IBM employees at the following Web site:

`http://www.ibm.com/software/sysmgmt/products/support/Field_Guides.html`

Accessibility

Accessibility features help users with a physical disability, such as restricted mobility or limited vision, to use software products successfully. With this product, you can use assistive technologies to hear and navigate the interface. You can also use the keyboard instead of the mouse to operate all features of the graphical user interface.

Contacting customer support

For support for this or any Tivoli product, you can contact Tivoli Customer Support in one of the following ways:

- Visit the Tivoli Storage Manager technical support Web site at:
  `http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html`

- Submit a problem management record (PMR) electronically at **IBMSERV/IBMLINK**. You can access the IBMLINK from the IBM Web site at:
  `http://www.ibm.com/ibmlink/`
- Submit a problem management record (PMR) electronically from the IBM Web site at:
  `http://www.ibm.com/software/support/probsub.html.`

Customers in the United States can also call 1-800-IBM-SERV (1-800-426-7378).

International customers should consult the Web site for customer support telephone numbers.

You can also review the *IBM Software Support Guide*, which is available on our Web site at http://techsupport.services.ibm.com/guides/handbook.html.

When you contact IBM Software Support, be prepared to provide identification information for your company so that support personnel can readily assist you. Company identification information is needed to register for online support available on the Web site.

The support Web site offers extensive information, including a guide to support services (IBM Software Support Guide); frequently asked questions (FAQs); and documentation for all IBM Software products, including Release Notes, Redbooks, and white papers, defects (APARs), and solutions. The documentation for some product releases is available in both PDF and HTML formats. Translated documents are also available for some product releases.

Go to the following Web site for the Tivoli Storage Manager home page:
http://www.ibm.com/software/tivoli/products/storage-mgr/

We are very interested in hearing about your experience with Tivoli products and documentation. We also welcome your suggestions for improvements. If you have comments or suggestions about our documentation, please complete our customer feedback survey at:

`http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html`

by selecting the Feedback link in the left navigation bar.

Reporting a problem

Please have the following information ready when you report a problem:

- The Tivoli Storage Manager server version, release, modification, and service level number. You can get this information by entering the **query status** command at the Tivoli Storage Manager command line.
- It is recommended that you use the Tivoli Storage Manager client **query systeminfo** command with the ***filename*** option to gather Tivoli Storage Manager system information and output this information to a file. This information is intended primarily as an aid for IBM support to assist in diagnosing problems.
- The Tivoli Storage Manager client version, release, modification, and service level number. You can get this information by entering `dsmc` at the command line.
- The communication protocol (for example, TCP/IP), version, and release number you are using.

- The activity you were doing when the problem occurred, listing the steps you followed before the problem occurred.
- The exact text of any error messages.

Internet

To search multiple Internet resources for your product, go to the support web site for the product

http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html

and look for the section to search the support knowledge base. From this section, you can search a variety of resources including:

- IBM technotes
- IBM downloads
- IBM Redbooks
- Forums and newsgroups

A newsgroup, *listserv@marist.edu*, is implemented by a third party. IBM supports this newsgroup on a best-effort basis only. See "Online forum" on page 40 for more information.

Summary of changes for Tivoli Storage Manager

This section summarizes changes made to the Tivoli Storage Manager product and this publication. Technical changes to the text are indicated by vertical lines to the left of the change.

Technical changes for Version 5.3 - October 2005

The following changes have been made to the product for this edition:

Changing HFS paths to UNIX paths
The Tivoli Storage Manager Macintosh Client now uses UNIX file paths for options, schedules, and file system names on the Tivoli Storage Manager server. By default, the UNIX mount point will be used to create file spaces on the server. See "Configuring the client scheduler" on page 19, "Migrating from earlier versions" on page 1, Chapter 9, "Using processing options," on page 105, and "Using the Tivoli Storage Manager central scheduler," on page 313 for more information about changing file paths from HFS to UNIX.

Note: There are required migration steps that must be completed before using Tivoli Storage Manager Version 5.3. This applies to all users migrating from any previous version of Tivoli Storage Manager. If these steps are not completed, Tivoli Storage Manager Schedules and Include/Exclude processing might not work as expected. See "Migrating from earlier versions" on page 1 for more information.

Access Control List (ACL) data support
The Tivoli Storage Manager Macintosh Client can back up and restore ACL data. The ACL information is automatically backed up with each object that has ACL data. See "Supported file systems" on page 48 for more information.

Extended Attribute support
The Tivoli Storage Manager Macintosh client can back up and restore Extended Attribute data. The Extended Attribute data is automatically backed up with each object that has Extended Attributes. See "Supported file systems" on page 48 for more information.

Event-based policy retention protection
In addition to traditional backup archive processing to a Tivoli Storage Manager server, the Tivoli Storage Manager Backup-Archive Clients can now archive data to an IBM System Storage Archive Manager server by using the ***enablearchiveretentionprotection*** option. When connected to any Tivoli Storage Manager server Version 5.2.2 and above, the Tivoli Storage Manager Backup-Archive Clients can take advantage of event-based archive management policies. With the new **set event** command the client can also signal events and request deletion hold and deletion release for specific files. This feature is intended to help customers meet regulatory requirements. See "Using event-based policy retention protection" on page 102, "Enablearchiveretentionprotection" on page 147 and "Set Event" on page 309 for more information.

New options, Skipacl and Skipaclupdatecheck
Skipacl and ***Skipaclupdatecheck*** are new options for controlling the

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processing of access control lists (ACL) by Tivoli Storage Manager. ***Skipacl***=*yes* skips ACL processing completely on backup. ***Skipaclupdatecheck***=*yes* prevents the Tivoli Storage Manager client from performing checksum and size comparisons before and after backup, and during incremental processing. See "Skipacl" on page 228 and "Skipaclupdatecheck" on page 229 for more information.

New links from the backup-archive client GUI to the Tivoli Storage Manager and Tivoli Home Pages

From the backup-archive client GUI, you can now directly access the IBM Tivoli Storage Manager web site, the IBM Tivoli web site, the IBM Tivoli Storage Manager Support web site, and the Tivoli Storage Manager Publications web site.

From the backup-archive command line interface help menu screen, the web site address is displayed. You can enter the web site address in a browser to access the IBM Tivoli Storage Manager Support web site for technical support on Tivoli Storage Manager.

New options, Errorlogmax and Schedlogmax, and DSM_LOG environment variable changes

Errorlogmax and ***Schedlogmax*** are new options for controlling log size. ***Errorlogmax*** specifies the maximum size for the error log, in megabytes. ***Schedlogmax*** specifies the maximum size for the scheduler log, in megabytes. See Chapter 9, "Using processing options," on page 105 for more information.

DSM_LOG environment variable changes have been made to prevent a security or data integrity problem. Logs will no longer be created in the installation directory. In addition, if the client is unable to open a required log for writing, the client process will terminate. The Tivoli Storage Manager client must have a writeable dsmerror.log in order to run. See Chapter 2, "Configuring Tivoli Storage Manager," on page 11, Chapter 9, "Using processing options," on page 105, and Chapter 10, "Using commands," on page 253 for more information.

Enhanced encryption

Tivoli Storage Manager now supports AES (Advanced Encryption Standard) 128-bit data encryption to encrypt data during backup and archive operations using the ***include.encryption*** option.

Include-exclude enhancements

A preview function allows you to view the objects that would be backed up or archived according to the include-exclude list. This enhancement is useful for validating the include-exclude list.

The Tivoli Storage Manager Client GUI directory tree shows detailed information of included and excluded objects.

The Client Configuration Wizard and the directory tree in the Tivoli Storage Manager Client GUI allow you to select files and directories to include or exclude.

See Chapter 2, "Configuring Tivoli Storage Manager," on page 11, Chapter 4, "Backing up your data," on page 43, Chapter 6, "Archiving and retrieving data," on page 75, and Chapter 10, "Using commands," on page 253 for more information.

Enhancements to query schedule command

To more accurately determine the status of scheduled events, the **query schedule** command on a Tivoli Storage Manager Version 5.3 and above client reports new parameters. See Chapter 7, "Automating tasks," on page 83 and Chapter 10, "Using commands," on page 253 for more information about these enhancements. Also see the Administrator's Guide and Administrator's Reference for your operating system.

Dynamic client tracing

A new command line utility, **dsmtrace**, is available to enable tracing, disable tracing, or change trace flags while the client is running. See the Problem Determination Guide for information about using this utility.

Note: Tracing is an advanced diagnostic feature intended for use only at the recommendation of IBM support and development, or as outlined in the Problem Determination Guide.

Client node proxy support

Backup time can be reduced and clustered configurations can store data with client node proxy support. Tivoli Storage Manager nodes, when authorized as agent nodes, can be directed to back up or restore data on behalf of another node (the target node). This enables concurrent operations from multiple nodes to store data to the same target node and file space in parallel. The concurrent operations can reduce backup and restore times in environments such as Apple's Xsan. Client nodes can also be configured with proxy node authority to support many of the systems that can be configured to support clustering failover. The ***asnodename*** option also allows data to be restored from a different system than the one which performed the backup. See "Asnodename" on page 123 for more information.

Support for deleting individual backups from a server file space

If your administrator has given you authority, you can delete individual backup copies from the Tivoli Storage Manager server without deleting the entire file space. This can be useful in the following situations:

- You need to delete sensitive files which were mistakenly backed up.
- You need to delete a subset of backup files which were inadvertently backed up.
- You need to delete files that are found to contain viruses.

See "Deleting backup data" on page 61 for more information.

Optimized option default values

Table 3. Optimized option default values

Option	Change	Page
diskbuffsize	Allows you to specify I/O buffer size (in kilobytes) that the client can use to optimize backup, archive, or HSM client performance. **Recommendation:** Use the default value instead of specifying the ***diskbuffsize*** option.	143

Table 3. Optimized option default values (continued)

Option	Change	Page
largecommbuffers	This option has been replaced by the ***diskbuffsize*** option. At this time, ***largecommbuffers*** will continue to be accepted by the Tivoli Storage Manager client in order to ease the transition to the new option. However, the value specified by ***largecommbuffers*** will be ignored in favor of the ***diskbuffsize*** setting. **Recommendation:** Discontinue the use of ***largecommbuffers*** because future releases of Tivoli Storage Manager might not accept this option.	143
tcpadminport	Specifies a separate TCP/IP port number on which the server is waiting for requests for administrative client sessions, allowing secure administrative sessions within a private network. If this option is not specified, the default value is the value of the ***tcpport*** option.	234
tcpbuffsize	The default value was changed from 16 kilobytes to 32 kilobytes.	235
tcpnodelay	The default value was changed from *no* to *yes*. ***tcpnodelay*** *yes* disables the TCP/IP Nagle algortihm. This algorithm is used to reduce the number of small segments sent across the network, but in some environments this might negatively impact Tivoli Storage Manager performance. **Recommendation:** Use the default of *yes*, unless you fully understand the effects of the TCP Nagle algorithm on network transmissions and how its use affects the performance of Tivoli Storage Manager in your environment.	238

Table 3. Optimized option default values (continued)

Option	Change	Page
tcpwindowsize	The default value was changed from 32 kilobytes to 63 kilobytes.	241
txnbytelimit	The default value was changed from 2048 kilobytes to 25600 kilobytes.	245

Technical changes for Version 5.2.2 - December 2003

The following changes have been made to the product for this edition:

Support for a Tivoli Storage Manager command line interface

Beginning with Tivoli Storage Manager Version 5.2.2, the Macintosh client provides a command line interface. As with the traditional Macintosh client graphical user interface, you can perform all backup, archive, restore, and retrieve tasks locally or remotely through the native client command line interface.

- To back up your data using the command line interface, see "Backing up data using the command line" on page 53 for more information.
- To restore backup versions of your data using the command line interface, see "Restoring data using the command line" on page 67 for more information.
- To archive your data using the command line interface, see "Archiving data using the command line" on page 76 for more information.
- To retrieve archived versions of your data using the command line interface, see "Retrieving data using the command line" on page 81 for more information.

Support for Tivoli Storage Manager as a background scheduler

The Tivoli Storage Manager Macintosh client can now be configured as a startup item to handle scheduled events without requiring a user to be logged in. See "Using the command line client to handle scheduled events" on page 83 for more information.

Support for non-administrators to use Tivoli Storage Manager to manage their own data

The system administrator is responsible for enabling non-administrators to use Tivoli Storage Manager to manage their own data. See "Enabling non-administrators to manage their own data (required system administrator task)" on page 8 for more information.

See "Root user, Authorized User, and non-Authorized user tasks" on page 11 for information about tasks that non-administrators can perform.

Support for a Tivoli Storage Manager administrative client

Beginning with Tivoli Storage Manager Version 5.2.2, the Macintosh client supports an administrative command line interface. The administrative command line interface permits a Tivoli Storage Manager administrator to control and monitor server activities, define storage management policies for backup, archive and space management services, and set up schedules to perform those services at regular intervals. For more information about the Administrative client, see "Related publications" on page xii for available Tivoli Storage Manager Administrator's Reference publications.

Support for controlling symbolic link and alias processing

Tivoli Storage Manager treats symbolic links and aliases as actual files and backs them up. However, the file referenced by the symbolic link is not backed up. In some cases symbolic links and aliases can be easily recreated and need not be backed up. In addition, backing up these symbolic links or aliases can increase backup processing time and occupy a substantial amount of space on the Tivoli Storage Manager server. You can use the ***exclude.attribute.symlink*** option to exclude a file or a group of files that are symbolic links or aliases from backup processing. If necessary, you can use the ***include.attribute.symlink*** option to include symbolic links or aliases within a broad group of excluded files for backup processing. For additional information, see :

- "Using include-exclude options" on page 27
- "Exclude options" on page 156
- "Include options" on page 173

Removal of operand limits for backup and archive operations

Use the ***removeoperandlimit*** option to specify that Tivoli Storage Manager removes the 20-operand limit for the Macintosh OS X platform. If you specify the ***removeoperandlimit*** option with the **incremental**, **selective**, or **archive** commands, the 20-operand limit is not enforced and is restricted only by available resources or other operating system limits. See "Removeoperandlimit" on page 209

Multi-session backup session enhancements

Use the ***collocatebyfilespec*** option to specify whether the Tivoli Storage Manager client uses only one server session to send objects generated from one file specification. Setting the ***collocatebyfilespec*** option to *yes* eliminates interspersing of files from different file specifications, by limiting the client to one server session per file specification. Therefore, if you store the data to tape, files for each file specification are stored together on one tape (unless another tape is required for more capacity). See "Collocatebyfilespec" on page 128 for more information.

Enhanced firewall security

Security for back up and restore operations and Tivoli Storage Manager administrative functions is enhanced to allow the Tivoli Storage Manager server to control whether the server or client initiates sessions through a firewall. See "Sessioninitiation" on page 226 for more information.

See "Configuring Tivoli Storage Manager client/server communication across a firewall" on page 85 for detailed information about Tivoli Storage Manager firewall support.

Support for encrypting data during backup or archive operation

Tivoli Storage Manager supports the encryption of data that are sent to the server during a backup or archive operation using standard 56-bit encryption. See "Encrypting data during backup or archive operations" on page 47 for more information.

Support for displaying options and their settings via the command line

Use the **query options** command to display all or part of your options and their current settings. This command accepts an argument to specify a subset of options. The default is to display all options. See "Query Options" on page 288 for more information.

Support for gathering Tivoli Storage Manager system information

Use the **query systeminfo** command to gather information on one or more of the following items and output this information to a file name that you specify:

- DSMOPTFILE - The contents of dsm.opt file.
- ENV - Environment variables.
- ERRORLOG - The Tivoli Storage Manager error log file.
- FILE - Attributes for the file name that you specify.
- INCLEXCL - Compiles a list of include-exclude in the order in which they are processed during backup and archive operations.
- OPTIONS - Compiled options.
- OSINFO - Name and version of the client operating system
- POLICY - Policy set dump.
- DSMSYSFILE - The contents of the dsm.sys file.

See "Query Systeminfo" on page 292 for more information.

Enhanced query backup and query archive commands

If you use the ***detail*** option with the **query archive** or **query backup** commands, the client displays the following additional information:

- Last modification date

See "Query Archive" on page 279 and "Query Backup" on page 281 for more information.

Technical changes for Version 5.2 - April 2003

The following changes have been made to the product for this edition:

Enhancements for the query filespace command

The **query filespace** command is enhanced to allow you to query a single file space on the Tivoli Storage Manager server. See "Query Filespace" on page 284 for more information.

Technical changes for Version 5.1.5 - September 2002

The following changes have been made to the product for this edition:

Enhanced domain processing

Domain processing is enhanced to allow you to include and exclude items from the domain. Previous versions of Storage Manager only allowed you to include items in the domain. See "Domain" on page 144 for more information.

Technical changes for Version 5.1 - April 2002

The following changes have been made to the product for this edition:

Support for Cyclical Redundancy Checking (CRC)

Tivoli Storage Manager supports cyclical redundancy checking (CRC) to verify that data is not being corrupted in transfer during a backup or restore session.

Multiple session no query restore

The backup-archive clients can now utilize multiple restore sessions for no query restore operations, increasing the speed of restores. This is similar to the multiple backup session support. It exploits the mount point available

on the server. If data is backed up on multiple tapes, and if the server has multiple mount points available, then the restore starts a session for each tape, up to the number your administrator configures. See "Resourceutilization" on page 212 for more information.

Consistent client return codes

Reliable, consistent, and documented return codes have been added to the command line client and the scheduler. This facilitates automation of client operations via user-written scripts. By using the **QUERY EVENT** command with the ***FORMAT***=*DETAILED* option, administrators can now distinguish between scheduled backups that completed successfully with no skipped files and scheduled backups that completed successfully with one or more skipped files. Also if you use the processing option **preschedulecmd** to run a command, and that command returns a non-zero return code, the scheduled event will not run. This ensures that scheduled events will not run if prerequisite commands do not complete successfully. See "Return codes from the command line interface" on page 87, "Preschedulecmd/Prenschedulecmd" on page 202, and "Postschedulecmd/Postnschedulecmd" on page 200 for more information.

Chapter 1. Installing Tivoli Storage Manager

The Tivoli Storage Manager backup-archive client helps you protect information on your workstation. Using Tivoli Storage Manager, you can maintain backup versions of your workstation files that you can restore if the original files are damaged or lost. You can also archive workstation files that you do not currently need, or preserve them in their current state, and retrieve them when necessary.

Attention: *You must be a system administrator to install Tivoli Storage Manager.*

You can access Tivoli Storage Manager backup and archive features:
- Locally through the native Graphical User Interface. The main window displays buttons labeled: **Backup**, **Restore**, **Archive**, and **Retrieve**. To initiate a task, click on the appropriate button.
- Locally or remotely through the client command line interface.

This chapter provides migration, environment, and installation information for the Tivoli Storage Manager client. After installation, see Chapter 2, "Configuring Tivoli Storage Manager," on page 11 for required configuration tasks to perform before using Tivoli Storage Manager.

Migrating from earlier versions

Upgrade path for clients and servers

As part of a migration plan from Tivoli Storage Manager Version 5.2 to Tivoli Storage Manager Version 5.3, Tivoli Storage Manager clients and servers can be upgraded at different times. To help prevent disruption to your backup and archive activities during the migration, note the following:

- A Tivoli Storage Manager Version 5.3 client can perform backup, restore, archive, and retrieve functions to a Tivoli Storage Manager Version 5.3 server.
- A Tivoli Storage Manager Version 5.3 client can perform backup, restore, archive, retrieve, and query functions to a Tivoli Storage Manager Version 5.2 server, including Version 3.1 level functions to a Tivoli Storage Manager Version 3.1 server on VM.
- If you back up or archive data from a Tivoli Storage Manager Version 5.1 or Version 5.2 client to any Tivoli Storage Manager server, you can restore or retrieve that data using a Tivoli Storage Manager Version 5.3 client.
- If you back up or archive data with a Tivoli Storage Manager 5.3 client to any Tivoli Storage Manager server and the data has Access Control Lists or Extended Attributes, the data cannot be restored by the Tivoli Storage Manager 5.2 client.
- All command line administrative clients can administer Tivoli Storage Manager Version 5.2 and Version 5.3 servers, and the Version 3.1 VM server.

Migrating to the Tivoli Storage Manager Version 5.3 Macintosh client

This release of the Tivoli Storage Manager Macintosh client has several changes that must be managed as part of the migration from previous Tivoli Storage Manager versions.

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- The Tivoli Storage Manager client now uses the UNIX path names internally. This reduces the amount of path translation that must be done. However, this affects how paths are stored in the Tivoli Storage Manager option files and Tivoli Storage Manager Schedule definitions.

  One set of options that take a path are the include and exclude options. For example, consider the option to exclude the files in the 'Documents' folder for 'User1' on the startup volume 'Macintosh HD'.

  With the Tivoli Storage Manager Version 4.2.4 and earlier clients, this entry would be in the TSM System Preferences file:

  ```
  exclude "Macintosh HD:Users:User1:Documents:*"
  ```

  For the Version 5.3 client, to exclude the same files, the entry in the TSM System Preferences would be:

  ```
  exclude /Users/User1/Documents/*
  ```

  See "Using include-exclude options" on page 27 for more examples of how the include/exclude options must now be set.

  All of the options listed in Table 4 have a path for a parameter. If any of these options are set in your current option files, they will need to be converted to UNIX paths before the Tivoli Storage Manager Version 5.3 client will work as expected:

Table 4. Option paths to convert to UNIX

DOMain	POSTSchedulecmd
ERRORLOGName	POSTNschedulecmd
INCLExcl	PRESchedulecmd
MAILprog	PRENSchedulecmd
PASSWORDDIR	SCHEDLOGName
All exclude and include options	

  The simplest migration path is to rename your existing TSM System Preferences and TSM User Preferences files. The renamed files should then be opened in a text editor so you can view your current option settings. The default location for the option files is: /Library/Preferences/Tivoli Storage Manager.

  Next, start the TSM Backup for Administrators application. The setup assistant will start automatically. Using your old option files as a reference, fill in the fields presented by the Setup Assistant. Mark each option in the old option files to keep track of the options that have been set.

  After the Setup Assistant has finished, open the preference editor and set any options that were not available in the Setup Assistant. Again, mark each option in the old option files to keep track of the options that have been set. Then quit the client so the options can take affect.

  Review the marks in the old option files to see if any option has not been set with either the Setup Wizard or Preference Editor. These options can be added to the option files with a text editor.

- The other change that must be managed is that the scheduler now takes the UNIX path for the 'object' option.

  Any schedule that specifies a path must be changed to use the UNIX path. For example, this schedule has an object that must be updated:

  ```
  Policy Domain Name: STANDARD
  Schedule Name: INCR_MAC_HD
  Description: INCR_MAC_HD
  ```

```
Action: Incremental
Options:
Objects: "Machintosh HD"
Priority: 5
Start Date/Time: 05/14/2005 15:21:32
Duration: 1 Hour(s)
Period: 1 Day(s)
Day of Week: Any
Expiration:
Last Update by (administrator): ADMIN
Last Update Date/Time: 05/14/2005 15:22:37
Managing profile:
```

This is the same schedule, with a new name, and an updated object:

```
Policy Domain Name: STANDARD
Schedule Name: INCR_UNIX_MAC_HD
Description: INCR_UNIX_MAC_HD
Action: Incremental
Options:
Objects: /
Priority: 5
Start Date/Time: 05/14/2005 15:21:32
Duration: 1 Hour(s)
Period: 1 Day(s)
Day of Week: Any
Expiration:
Last Update by (administrator): ADMIN
Last Update Date/Time: 05/14/2005 15:24:04
Managing profile:
```

You will need to contact your Tivoli Storage Manager System Administrator and have them update any schedules that specify a path to use the UNIX versions of those paths.

Migrating to the Unicode-enabled client

Unicode is a universal character encoding standard that supports the interchange, processing, and display of text that is written in any of the languages of the modern world. Unicode-enabled file spaces provide support for multi-lingual workstations without regard for the current locale. Beginning with Tivoli Storage Manager Version 5.2, the Macintosh client is Unicode enabled. The Unicode-enabled client supports Unicode for file, directory, and file space names.

Benefits of using the Unicode-enabled client

- If you back up or archive objects with a Unicode-enabled client, you can restore or retrieve these objects with a Unicode-enabled client in any other supported language environment. For example, a Japanese Unicode-enabled client can restore files backed up by German Unicode-enabled client.
- The Unicode-enabled client is cross language, meaning that it works with files using different code pages. The Unicode-enabled client can handle a mixture of files from different code pages or locales in the same file space.
- Without the support for storing Unicode-enabled file spaces, some earlier Macintosh clients have experienced backup failures. This occurs when file spaces contain names of directories or files in multiple languages or have names that cannot be converted to the client's current code page.

How to migrate to the Unicode-enabled client

To migrate to the Unicode-enabled client, the server must be at Version 4.2.0 or later level. New clients storing data on the server for the first time require no special set up. In this case, the server automatically stores data in Unicode-enabled file spaces. However, if your client already stores data on the server, you need to plan for the migration of your file spaces to Unicode-enabled file spaces. The

migration involves renaming your file spaces on the server and creating new Unicode-enabled file spaces on the server using the ***autofsrename*** option.

The Tivoli Storage Manager administrator can specify three possible values using the server ***autofsrename*** option: `yes`, `no`, or `client`. Note that the server setting for this option overrides the setting on the client.

- If the server specifies `no`, the existing file spaces for your node are not renamed or Unicode enabled, even if you have a Unicode-enabled client installed.
- If the server specifies `yes`, and the client performs an incremental backup with ***domain***=*all-local*, all file spaces specified in the current operation that are not Unicode enabled are renamed. The Unicode-enabled client then creates new Unicode-enabled file spaces.

  If the client performs a selective backup, only the file spaces you specify in the current operation are renamed and Unicode enabled.
- If the server specifies `client`, the client can set the ***autofsrename*** option in the TSM System Preferences file to `prompt`, `yes`, or `no`. If the client sets the option to `no`, the file spaces that are not Unicode enabled are not renamed and are not Unicode enabled. If the client specifies *prompt*, the client prompts you whether to rename file spaces. The client prompts you only once to rename a particular file space.

Optionally, your Tivoli Storage Manager administrator can rename the file spaces on the server that are not Unicode enabled.

For options and results when using the ***autofsrename*** option, see the table below.

Server option	Client option	Result
Yes	Prompt, Yes, No	Renamed
No	Prompt, Yes, No	Not Renamed
Client	No	Not Renamed
Client	Yes	Renamed
Client	Prompt	Based on User Response

For detailed information about the ***autofsrename*** option, see "Autofsrename" on page 125. For additional information about working with the Macintosh clients, see:
- "Considerations for Unicode-enabled clients" on page 171
- "Inclexcl" on page 171

Considerations for migrating to the Unicode-enabled client

When migrating to the Tivoli Storage Manager Macintosh Unicode-enabled client, please consider the following:

1. To support Unicode functionality, the Macintosh OS X Unicode-enabled client must connect to a Version 4.2.0 or higher server.
2. Ensure that you install the fonts for the languages you want to display. If you do not have the necessary fonts installed, the file names and archive descriptions might not display properly. However, the Unicode-enabled clients can still back up, restore, archive, and retrieve the files and directories.
3. The name of the Unicode-enabled file space might be unreadable if the server cannot display the Unicode name. In this case, use the file space identifier

(fsID) of the file space to identify these file spaces on the server. On the GUI main window, select the **File details** option from the **View** menu to display the fsID of a file space.

4. After installing a Unicode-enabled client, we recommend that you perform a full incremental backup to rename all existing file spaces that are not Unicode enabled and back up the files and directories within them under the new Unicode-enabled file spaces.
5. Renamed file spaces remain on the server and managed as stabilized file spaces. *These file spaces contain all the original data, which can still be restored until the file spaces are deleted.*
6. When an existing file space is renamed during Unicode conversion, any access rules defined for the file space remain applicable to the original file space. New access rules must be defined to apply to the new Unicode file space, if necessary.
7. Once a Tivoli Storage Manager Unicode-enabled client connects to a Tivoli Storage Manager Version 4.2.0 or 4.2.1 server with a given node name, that node name can no longer be used by a version of the client that does not support Unicode. For example, when a node name used with Tivoli Storage Manager Version 5.1.5 is subsequently used with the Version 5.2.0 Mac OS X Unicode-enabled client, the Version 5.1.5 client will be unable to access that node's data from the Tivoli Storage Manager server and the following error message will display:

   ```
   ANS1357S Session rejected: Downlevel client code version
   ```

   If the Tivoli Storage Manager server version is 4.2.0 or 4.2.1, you *cannot* use any client version prior to 5.2.0 after the 5.2.0 client has connected to the server. If the Tivoli Storage Manager server is at Version 4.2.2 or higher, a client that is not Unicode enabled can still subsequently connect to the server using the same node name if no Unicode-enabled file spaces exist for that node.
8. When backing up files to a file space that is not Unicode enabled, the Unicode-enabled client skips the files and directories with names containing characters from a code page other than the current locale.
9. If files and directories with names containing characters from a code page other than the current locale were previously *backed up with a client that was not Unicode enabled*, Tivoli Storage Manager will *expire* them in the file space that is not Unicode enabled. However, the Unicode-enabled client can back up or archive these files to a Unicode-enabled file space.
10. When migrating from a client that is not Unicode enabled to a Unicode client, file names with double-byte characters mixed with single-byte characters might be restored in mixed single-byte character set (SBCS) format. This is only a display issue.
11. When a client performs a selective backup of an object and the original file space is renamed, the new Unicode-enabled file space contains only that object. Tivoli Storage Manager will back up all other directories and file spaces during the next full incremental backup.
12. The Unicode-enabled client has a file and directory name size limitation of 504 bytes. Depending on the Unicode characters (2-byte, 3-byte, 4-byte) used, this translates to a maximum of 126 to 252 characters.
13. **Attention:** If you do not follow the migration instructions properly, you might have two file spaces, such as Unicode and non-Unicode, with different file space identifiers (fsID) for the same client volume. In this case, the Tivoli

Storage Manager client uses the non-Unicode file space as the default file space for backup and restore operations.

Macintosh client environment requirements

This section contains client environment information, Tivoli Storage Manager client components, and hardware and software requirements for the Macintosh client.

Attention: For current information concerning the client environment prerequisites for all Tivoli Storage Manager supported client platforms, refer to the `README` file that is shipped on the product installation media or go to the Web site at:

`http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html`

Client components

- Backup-archive GUI client
- Backup-archive command line client
- Administrative client (command-line)

For more information about the Administrative client, see "Related publications" on page xii for available Tivoli Storage Manager Administrator's Reference publications.

Hardware requirements

- Any PowerBook or Power Macintosh personal computer (G3 or higher)
- Disk space: see the README file that is shipped on the product installation media.
- Memory: 128 MB
- A minimum screen resolution of 800 by 600 pixels is required to display the Tivoli Storage Manager Backup-Archive Client GUI.

Software requirements

- Macintosh OS X 10.3.9 or higher

Communications method

To use this communication method:	Install this software:	To connect to these Tivoli Storage Manager servers:
TCP/IP	Sockets for Mac X, which comes standard with the OS.	AIX, HP-UX, Linux, OS/390, OS/400 PASE, Solaris, VM, Windows, z/OS

Installing the Macintosh client program (required system administrator task)

Attention: *You must be a system administrator to install Tivoli Storage Manager.*

The Tivoli Storage Manager Macintosh client is included on the desktop client installation CD-ROM in the `tsmcli:mac` directory structure.

You can display online startup information, product manuals, and README files. On a Web browser:

1. Click **File** and then click **Open File**.
2. Select the CD-ROM drive.
3. Select the **START.HTM** file.

Preparing for installation from the client CD-ROM

To prepare for installation from the client CD-ROM, follow these steps:

1. Insert the CD-ROM into the CD-ROM drive.
2. Double-click on the CD-ROM icon.
3. Go to the clients:mac folder.
4. Double-click on the file TSMInstaller.dmg. After the **TSMInstaller** disk image is mounted, continue with the steps below.

Installing the program

To install the program, follow these steps:

1. Double-click on the **TSM Installer** program icon.
2. When the Tivoli Storage Manager installation window appears, click on the **Continue** button.
3. When the README file appears, read through the file to learn about recent updates and product changes. You can print this file for later reference by clicking on the **Print** button. When you have finished reading this file, click on the **Continue** button.
4. The **TSM Backup Standard Install** window displays:
   a. Select **Install** to install the standard installation package which includes the Tivoli Storage Manager Backup Program.
   b. Select **Custom** if you want to customize the standard installation package.
5. Select the installation folder. The Tivoli Storage Manager folder and files will be placed in this location. Click on the **install** button to begin the installation process.

   Note: In addition to the folder that you have chosen for installation, files are also stored in the default installation directory `/Library/Application Support/tivoli/tsm/client/ba/bin/`.
6. After installation, see Chapter 2, “Configuring Tivoli Storage Manager,” on page 11 for required configuration tasks to perform before using Tivoli Storage Manager.

Notes:

1. During the installation TSM Backup Help is added to the Mac Help Center.
2. See Chapter 7, “Automating tasks,” on page 83 for instructions on how to start the scheduler daemon automatically at system startup.
3. The first time you run Tivoli Storage Manager, the preference folder is placed in the following path:

   ```
   <Startup Disk>:Library:Preferences:Tivoli Storage Manager
   ```

   where <Startup Disk> is the name of the current startup disk. The permissions on this folder are set to 775. To edit the files in this folder, you might need to change the folder permissions in a terminal window using the following command:

   ```
   cd "/Library/Preferences"
   sudo chmod 775 "Tivoli Storage Manager"
   ```

Updating a previously installed version of Tivoli Storage Manager

To update a previously installed version of Tivoli Storage Manager, navigate to the folder that contains the Tivoli Storage Manager folder. The installer installs the new files into the existing Tivoli Storage Manger folder and overwrites the old files. Existing preference files are not removed.

Note: The previous installation folder must be named Tivoli Storage Manager to replace the old installation. Click on the **Install** button to begin the installation process.

The installer installs the updated files into this folder and overwrites the old Tivoli Storage Manager files, but does not replace any existing preferences files. Click on the Install button to begin the automatic installation update process.

Note: There is no automated process to assist with importing options files from a Tivoli Storage Manager version prior to Tivoli Storage Manager version 5.3. It might be easier to open the old option files in a text editor, then use the Configuration Assistant and the Preferences editor to set the options to the values in the old preference file.

Enabling non-administrators to manage their own data (required system administrator task)

To enable non-administrators to use Tivoli Storage Manager to manage their own data, the system administrator must do the following in addition to the normal configuration steps:

- Set the ***passwordaccess*** option to *generate* in the TSM System Preferences file.
- The system administrator must generate the initial password by using Tivoli Storage Manager one time.
- Use either of the following methods to change the ownership of the dsmtca application to root and set the execution permission bit to **s**:

  Method 1 (recommended)

  Use **TSM Backup for Administators** to start Tivoli Storage Manager GUI, select **Utilities** → **Setup Assistant**. If the execution permission bit of the dsmtca application is not set to **s**, you are prompted to set the execution permission bit.

  Method 2

  In a terminal window, enter the following commands:

  ```
  cd "/Library/Application Support/tivoli/tsm/client/ba/bin"
  sudo chown 0:80 dsmtca
  sudo chmod 4755 dsmtca
  ```

- To verify the dsmtca setup, enter the following commands in a terminal window:

  ```
  cd "/Library/Application Support/tivoli/tsm/client/ba/bin"
  ls -l dsmtca

  -rwsr-xr-x  1 root  admin  262492 Nov  6 16:14 dsmtca
  ```

See “Root user, Authorized User, and non-Authorized user tasks” on page 11 for information about administrator and non-administrator tasks.

Tivoli Storage Manager server installation and configuration

The Tivoli Storage Manager clients work in conjunction with the Tivoli Storage Manager server. Contact your Tivoli Storage Manager administrator to obtain client access to the Tivoli Storage Manager server, or refer to the following publications to install and configure a Tivoli Storage Manager server:

Table 5. Tivoli Storage Manager server Quick Start publications

Publication title	Order number
IBM Tivoli Storage Manager for AIX Quick Start	GC32-0770
IBM Tivoli Storage Manager for HP-UX Quick Start	GC32-0774
IBM Tivoli Storage Manager for Linux Quick Start	GC23-4692
IBM Tivoli Storage Manager for OS/390 and z/OS Quick Start	GC32-0777
IBM Tivoli Storage Manager for OS/400 PASE Quick Start	GC23-4696
IBM Tivoli Storage Manager for Sun Solaris Quick Start	GC32-0780
IBM Tivoli Storage Manager for Windows Quick Start	GC32-0784

Chapter 2. Configuring Tivoli Storage Manager

Attention
For current configuration information for the Tivoli Storage Manager program product, refer to the `README` file that is shipped on the product installation media.

After installation, *required* configuration tasks include the following:

Task	Page
Creating and modifying the system preferences file (required root user or authorized user task)	13
Creating a default client user options file (optional root user or authorized user task)	15
Registering your workstation with a server (required root user or authorized user task)	23

Optional configuration tasks include the following:

Task	Page
Setting processing environment variables (optional)	18
Creating an include-exclude list (optional root user or authorized user task)	25
Creating multiple user preferences files (optional)	16

Root user, Authorized User, and non-Authorized user tasks

Throughout this publication, the phrases **Root User** and **Authorized User** identify Tivoli Storage Manager tasks that either a system administrator, non-administrator, or both can perform. Tivoli Storage Manager commands and options that you can use to perform these tasks are also identified in this way.

When a task requires additional authority to complete, you must use the authorization application to start Tivoli Storage Manager. This allows Tivoli Storage Manager to run with sufficient system privileges to complete the task. Table 6 lists the authorization tools to use.

Table 6. Macintosh OS X authorization tools and associated Tivoli Storage Manager applications

Macintosh OS X authorization tool	Associated Tivoli Storage Manager application
TSM Backup for Administrators	TSM Backup
sudo	dsmc

A system administrator is any user that is allowed to administer the system. You can check your account type using the System Preferences **Accounts** tool. System Administrators will have an account type of **Admin**.

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An Authorized User is any user running with a real user ID of 0 (root) or a user who owns the Tivoli Storage Manager executable and whose owner execution permission bit is set to s. In the following example, the user tivoli is an Authorized User while running dsmc since the dsmc owner execution permission bit is set to s:

```
-rwsr-xr-x 1 tivoli dsmdev 2880479 Nov 5 13:42 dsmc*
```

Non-administrators (or non-Authorized Users) meet the following criteria:

- They do not have a user id of 0. They are not the root user.
- Have a user account that has not been configured as a system administrator.

The system administrator is responsible for configuring Tivoli Storage Manager so non-administrators can manage their own data. See "Enabling non-administrators to manage their own data (required system administrator task)" on page 8 for more information.

Table 7 shows the tasks that can be performed by the root user, Authorized User, and the non-Authorized User.

Table 7. Root user, Authorized User, and non-Authorized user tasks

Task	Root User	Authorized User	Non-Authorized User
Registering new nodes with Tivoli Storage Manager server.	Yes.	Yes.	No, even when the registration is set to *open* on the server.
Set or recreate the Tivoli Storage Manager password for client workstations.	Yes, if the password file has been deleted.	Yes, if the password file has been deleted and you have write permission to the file.	No, not if the password file has been deleted.
Create and modify a TSM System Preferences file.	Yes.	Yes, if you have write permission to the file.	No.
Create and modify a TSM User Preferences file.	Yes.	Yes, if you have write permission to the file.	Yes, if you own the file.
Create and modify an include-exclude list.	Yes.	Yes.	No.
Backup	Yes.	Yes, if you have read permission, regardless of ownership.	Yes, if you own the file.
Restore	Yes. When restoring to a new location or the same location, file permission and ownership are preserved.	Yes. However, the operating system will prevent writing to the same location if the file has read only permission. Ownership of all restored objects will be changed to Authorized User.	Yes, if you own the file or you are granted access. The ownership of the restored file will change to the non-Authorized user.
Archive	Yes.	Yes, if you have read permission, regardless of ownership.	Yes, if you have read permission, regardless of ownership.
Retrieve	Yes. When retrieving to a new location or to the same location, file permissions and ownership are preserved.	Yes. However, the operating system will prevent writing to the same location if the file has read only permission. Ownership of all retrieved objects will be changed to Authorized User.	Yes, if you archived the file. Ownership of all retrieved objects will be changed to the non-Authorized user.

Table 7. Root user, Authorized User, and non-Authorized user tasks (continued)

Task	Root User	Authorized User	Non-Authorized User
Grant user access to files on the Tivoli Storage Manager server.	Yes.	Yes.	Yes, for files that you own on the Tivoli Storage Manager server.
Delete Tivoli Storage Manager server file spaces.	Yes, if you are granted backup or archive delete authority by a Tivoli Storage Manager server administrator.	Yes, if you are granted backup or archive delete authority by a Tivoli Storage Manager server administrator.	No.

Creating and modifying the system preferences file (required root user or authorized user task)

During installation, Tivoli Storage Manager provides a sample System Preferences file called TSM System Preferences-Sample. This file has examples of how to specify one or more servers to contact for services, and the communications options for each server. This file can also include authorization options, backup and archive processing options, and scheduling options.

By default, Tivoli Storage Manager places the TSM System Preferences-Sample file in the TSM Application folder (the location where the Tivoli Storage Manager client was installed). You can copy and rename the TSM System Preferences-Sample file to TSM System Preferences-Sample and leave this file in the TSM Application folder.

If you use the Tivoli Storage Manager Setup Assistant to create the TSM System Preferences-Sample file (the preferred method), the file can be located with the finder on the startup volume in the `Library:Preferences:Tivoli Storage Manager` folder. In a terminal window, the file is located in: `/Library/Preferences/Tivoli Storage Manager`.

If the TSM System Preferences-Sample file exists in both the TSM Application folder and the path created by the Tivoli Storage Manager Setup Assistant, the TSM System Preferences-Sample file created by the Setup Assistant takes precedence. The Preference folder created by the Setup Assistant is owned by root and the permissions are set to 775. This allows system administrators to modify the files.

Use the TSM System Preferences-Sample file to specify one or more servers to contact for services, and communications options for each server. This file can also include authorization options, backup and archive processing options, and scheduling options.

Edit the TSM System Preferences-Sample file to include the server or servers to which you want to connect. The following is an example of a client system options file stanza which contains the required options for a server you want users to contact. You can specify options for more than one server:

If you are a system administrator, you can modify the required options in your TSM System Preferences-Sample file according to your needs. The following options are required to establish communication with a Tivoli Storage Manager server:

```
SErvername     server1
  COMMMethod                  TCPip
  TCPPort                     1500
  TCPServeraddress            node.domain.company.com
```

As the default, your client node contacts the first server identified in the TSM System Preferences-Sample file. You can specify a different server to contact by entering the ***servername*** option in your own client user options file, TSM User Preferences, or by entering that option, on the initial command line, with a command.

You can also specify a default server and a migration server (if you have the HSM client installed on your workstation) in your TSM System Preferences file. For more information, see "Defaultserver" on page 137.

The TSM System Preferences file can also contain the following option categories:
- Communication options
- Backup and archive processing options
- Restore and retrieve processing options
- Scheduling options
- Authorization options
- Error processing options
- Transaction processing option

See Chapter 9, "Using processing options," on page 105 for more information about these options.

Use one of the following methods to modify the TSM System Preferences file:
- Click **Utilities** → **Setup Assistant** from the Tivoli Storage Manager client GUI.

  Note: It is recommended that you use the Tivoli Storage Manager Setup Assistant because it can detect and correct some installation and configuration issues that a user would not normally consider, such as ensuring that the TCA and CAD file permissions are correct.
- Click **Preferences** from the application menu.
- Use your favorite text editor. Ensure that you save the file as plain text. See "Setting options in a preferences file" on page 17 for information on how to set options in the TSM System Preferences file.

  Notes:
  1. If you want to edit the TSM System Preferences file in a text editor, you might need to change the file permissions. In a terminal window, enter the following commands:

     ```
     cd "/Library/Preferences/Tivoli Storage Manager"
     sudo chmod 774 "TSM System Preferences"
     ```
  2. The TSM System Preferences file must be a plain text file. By default, TextEdit does not save files as plain text. Select **Format** → **Make PlainText** to save the TSM System Preferences file as a plain text file. When saving, do not add the .txt extension.

If you update the TSM System Preferences file during a session, you must restart the client to pick up the changes.

See "Setting options in a preferences file" on page 17 for information on how to set options in the TSM System Preferences file.

Creating a default client user options file (optional root user or authorized user task)

During installation, Tivoli Storage Manager provides a sample User Preferences file named TSM User Preferences-Sample. By default, Tivoli Storage Manager places the TSM User Preferences-Sample file in the TSM Application folder (the location where the Tivoli Storage Manager client was installed). You can copy and rename the TSM User Preferences-Sample file to TSM User Preferences and leave this file in the TSM Application folder.

If you use the TSM Setup Assistant to create the TSM User Preferences file (the preferred method), this file can be located with the finder on the startup volume in the `Library:Preferences:Tivoli Storage Manager` folder. In a terminal window, the file is located in: `/Library/Preferences/Tivoli Storage Manager`.

If the TSM User Preferences file exists in both the TSM Application folder and the path created by the Tivoli Storage Manager Setup Assistant, the TSM User Preferences file created by the Setup Assistant takes precedence.

You can modify the TSM User Preferences file according to your needs. This file can contain the following options:
- Backup and archive processing options
- Restore and retrieve processing options
- Scheduling options
- Format and language options
- Error processing options
- Transaction processing option

See Chapter 9, “Using processing options,” on page 105 for more information about these options.

Use one of the following methods to modify the TSM User Preferences file:
- Click **Utilities** → **Setup Assistant** from the Tivoli Storage Manager client GUI.
- Click **Edit** → **Preferences** from the Tivoli Storage Manager client GUI.
- Use your favorite text editor. Ensure that you save the file as plain text. See “Setting options in a preferences file” on page 17 for information on how to set options in the TSM User Preferences file.

  Notes:
  1. If you want to edit the TSM User Preferences file in a text editor, you might need to change the file permissions. In a terminal window, enter the following commands:

     ```
     cd "/Library/Preferences/Tivoli Storage Manager"
     sudo chmod 774 "TSM User Preferences"
     ```
  2. The TSM User Preferences file must be a plain text file. By default, TextEdit does not save files as plain text. Select **Format** → **Make PlainText** to save the TSM User Preferences file as a plain text file. Do not add the `.txt` extension.

If you update the TSM User Preferences file during a session, you must restart the client to enable the changes.

Considerations:
- The TSM User Preference file has type and creator codes which allow Tivoli Storage Manager to be launched by dragging and dropping the file on the TSM Backup application.

- Double clicking on the TSM User preference file will start the TSM Backup application.
- It is not possible to start **TSM Backup for Administrators** by double-clicking or drag-n-drop of an option file.
- To maintain the *drag-n-drop* functionality, the TSM User Preference creator code must be retained. Using TextEdit to modify the TSM User Preference file will cause the creator code to be removed. You can use SimpleText to successfully edit the file and retain the creator code. SimpleText is a Classic application. Most commercially available editors will also preserve the creator code.
- TSM User Preference files that you create using the Setup Assistant have the creator code. If the creator code is ever removed from your preference file, rename your existing file, use the setup assistant to create a new one, then use a text editor to replace the contents of the new file with your original preferences.
- From a terminal window, you can use vi or pico to edit the preference files. These editors might display the line endings as ^m characters. You can replace the ^m character by deleting the character and making a new line. However, this will cause the line endings to show up as odd characters in SimpleText. Tivoli Storage Manager will handle preference files edited with vi or pico line endings.

See "Setting options in a preferences file" on page 17 for information on how to set options in the TSM User Preferences file.

Creating multiple user preferences files (optional)

Some tasks require changes to the User Preferences file. For example, suppose that you want to back up your files to one server and archive them to another. Or, suppose you want to retrieve files to a different workstation. Instead of editing your User Preferences file each time you want to connect to a different server or use a different workstation, you can create multiple User Preferences files. Depending on what you want to do, you can launch Tivoli Storage Manager with a different User Preferences file that suits your needs.

Suppose you want to be able set the REPLACE option to ALL for some, but not all, of your restores. Simply create two user preference files that are named, for example, **Prefs Replace All** and **Prefs Replace Prompt**. When you want to do a restore with replace all set, drop **Prefs Replace All** on to the Tivoli Storage Manager. Or double click on the **Prefs Replace All** file. Tivoli Storage Manager starts and uses the options from the **Prefs Replace All** option file. You can also specify the option to use with the command line client. For example:

```
dsmc -optfile="/Users/user1/Documents/Prefs Replace All"
```

Notes:

1. The TSM Backup for Administrator tool does not support drag-n-drop.
2. Remember to make duplicates of your original User Preferences file and modify the duplicates. Always keep the original Tivoli Storage Manager Backup Preferences Sample intact.
3. When you create user preferences files, you can double-click them or drop them onto the Tivoli Storage Manager icon.
4. You can have multiple User Preference files but only one System Preferences file. If you use more than one server, you must have multiple server stanzas in the TSM System Preferences file. Then use the ***servername*** option in the user option file to select which server stanza to use.

Setting options in a preferences file

This section describes how to set options in your TSM System Preferences file or TSM User Preferences file.

Notes:

1. If you want to edit the TSM System Preferences file in a text editor, you might need to change the file permissions. In a terminal window, enter the following commands:

   ```
   cd "/Library/Preferences/Tivoli Storage Manager"
   sudo chmod 774 "TSM System Preferences"
   ```

2. The TSM System Preferences file must be a plain text file. By default, TextEdit does not save files as plain text. Select **Format** → **Make PlainText** to save the TSM System Preferences file as a plain text file. When saving, do not add the `.txt` extension.

To set an option in this file, enter the option name and one or more blank spaces, followed by the option value. For example:

```
compression  yes
nodename     client_a
```

Some options consist of only the option name, such as ***verbose*** and ***quiet***. You can enter the entire option name or its abbreviation. For example, you can specify the ***verbose*** option as either of the following:

```
verbose
ve
```

Follow these additional rules when entering options in your Preferences file:

- Begin each comment with an asterisk (*) as the first character in a line.
- Do not enter comments on the same line as an option.
- Indent options with spaces or tabs.
- Enter each option on a separate line and enter all parameters for an option on the same line. For example, to specify two different volumes as your default client domain, you could enter the following:

  ```
  domain / "/Volumes/Macintosh HD"
  ```

- Do not enclose an option value with single or double quotes unless the value is a file specification that contains spaces or wildcard characters. For example, the following option is not valid:

  ```
  passwordaccess  "generate"
  ```

- Enter one or more blank spaces between parameters.
- The maximum number of characters in a file name is 255. The maximum combined length of the file name and path name is 1024 characters. The maximum length of a file name is limited to 504 bytes (not characters). Because the Unicode representation of a character can occupy several bytes, the maximum number of characters that a file name might contain can vary.

If you update the Preferences file while a session is active, you must restart the session to pick up the changes

You can use the **query options** command to display all or part of your options and their current settings. This command accepts an argument to specify a subset of options. The default is to display all options. See “Query Options” on page 288 for more information.

Setting processing environment variables (optional)

Generally, setting the environment variables is an optional task. Setting them will make it more convenient for you to use the command line. However, you must set the environment variables if you need to run in either of the following environments:

1. You want to invoke Tivoli Storage Manager from a directory other than the directory where Tivoli Storage Manager is installed.
2. You want to specify a different options file for the backup-archive client, the administrative client, or both.

Note: You can also specify an alternate client options file for the command line client (not the administrative client) using the ***optfile*** option. See "Optfile" on page 192 for more information.

There are three environment variables you can set which affect Tivoli Storage Manager processing:

DSM_DIR
Points to the command line tools and resource files. You cannot specify the root directory for DSM_DIR. If DSM_DIR is not set, the files are expected in the default installation directory. The default installation directory is: /Library/Application Support/tivoli/tsm/client/ba/bin.

DSM_CONFIG
Contains the fully-qualified path and file name of the TSM User Preferences file for users who create their own personalized options file. If DSM_CONFIG is *not* set, the TSM User Preferences file is expected to satisfy both of these requirements:

1. The options file should be named `TSM User Preferences` file.
2. The file is expected in one of the following locations and order:
   - ~/Library/Preferences/Tivoli Storage Manager
   - /Library/Preferences/Tivoli Storage Manager
   - The default installation directory

DSM_LOG
Points to the directory where you want the TSM error log and TSM schedule log files to reside. The error log file contains information about any errors that occur during processing. The client creates the error log to help the Tivoli Storage Manager technical support team diagnose severe errors.

If you define DSM_LOG, Tivoli Storage Manager writes messages to the TSM error log and TSM schedule log files in the directory you specify.

If you do not define DSM_LOG, Tivoli Storage Manager writes messages to the TSM error log and TSM schedule log to one of the following locations:
~/Library/Logs/tivoli/tsm
/Library/Logs/tivoli/tsm

Notes:

1. If you use the ***errorlogname*** option to specify the fully qualified path where you want to store the dsmerror.log file, this value overrides the definition in the DSM_LOG environment variable. The dsmsched.log file is created in the same directory as the dsmerror.log file.
2. The dsmerror.log file cannot be a symbolic link. If there is a preexisting dsmerror.log symbolic link, Tivoli Storage Manager will delete the link

overwriting protected data. The dsmerror.log file is created in a subsequent operation. This behavior also applies to the dsmsched.log file.

3. You cannot specify the root directory for DSM_LOG.

Attention: Set the DSM_LOG environment variable to name a directory where read-write permissions allow the required write access for the user to create and write to the log file. This will prevent log write failures and process termination. Use the ***chmod*** command to give the files permissions that allow all expected client user IDs to read and write them. If the log names are the default names, just set the DSM_LOG environment variable to point to the directory where they reside. If you have chosen different names for the log files, you must use the ***errorlogname*** option to specify the path and file name.

Setting T and C shell variables

For the tcsh shell, enter the environment variables in the .tcshrc file for T shell and .cshrc for C shell in your user's $HOME directory. For example:

```
setenv DSM_DIR "/Users/user1/Tivoli Storage Manager"
setenv DSM_CONFIG "/Users/user1/TSM User Preferences"
setenv DSM_LOG /Users/user1/logs
```

Where:

- The "/Users/user1/Tivoli Storage Manager" directory is where the executable file and resource files reside.
- "/Users/user1/TSM User Preferences" is the path and file name for your TSM User Preferences file.
- The /Users/user1/logs directory is where the dsmerror.log and dsmsched.log files reside.

Setting Bash and Bourne shell variables

For the Bourne shell, add the DSM_CONFIG, DSM_LOG and DSM_DIR variables to the .profile file in your user's $HOME directory. For example:

```
export DSM_DIR="/Users/user1/Tivoli Storage Manager"
export DSM_CONFIG="/Users/user1/TSM User Preferences"
export DSM_LOG="/Users/user1/logs"
```

Where:

- The "/Users/user1/Tivoli Storage Manager" directory is where the executable file and resource files reside.
- "/Users/user1/TSM User Preferences" is the path and file name for your TSM User Preferences file.
- The "/Users/user1/logs" directory is where the dsmerror.log and dsmsched.log files reside.

Configuring the client scheduler

Your Tivoli Storage Manager administrator can schedule Tivoli Storage Manager to perform tasks automatically. For example, you can automatically back up files at the end of each day or archive some of your files every Friday. This procedure, known as *central scheduling*, is a cooperative effort between the server and your client node. Your administrator associates clients with one or more schedules that are part of the policy domain maintained in the server database. The Tivoli Storage

Manager administrator defines central scheduling on the server and you start the client scheduler on your workstation. Once you start the client scheduler, further intervention is not necessary.

Note: Client nodes migrating from a previous version of Tivoli Storage Manager need to review the schedules set up for their node. Beginning with Tivoli Storage Manager Version 5.3, the schedule ″object″ must be specified with the UNIX path. If the schedule is not updated, the schedules will fail because it will not be able to find the objects specified. See "Using the Tivoli Storage Manager central scheduler," on page 313 for more information on how to define schedules.

With client scheduling, you can also:
- Display information about available schedules.
- Display information about work that the schedule has completed.
- Modify scheduling options in the TSM System Preferences file. See "Scheduling options" on page 112 for more information.

See Chapter 7, "Automating tasks," on page 83 for more information. See "Using the Tivoli Storage Manager central scheduler," on page 313 for supplemental information about the Tivoli Storage Manager central scheduler.

The Tivoli Storage Manager Client Acceptor daemon (CAD) can manage the scheduler. In this case, the CAD serves as an external timer for the scheduler. When the scheduler is started, it queries the server for the next scheduled event. The event is either executed immediately or the scheduler exits. The CAD restarts the scheduler when it is time to execute the scheduled event. This reduces the number of background processes on your workstation and resolves memory retention problems that can occur when running the scheduler service without CAD management. It is recommended that you use the Client Acceptor daemon to manage the client scheduler.

Use the ***managedservices*** option in your TSM System Preferences file to specify whether the CAD manages the scheduler. See "Managedservices" on page 183 for more information.

A system administrator can use either of the following methods to enable the Tivoli Storage Manager Client Acceptor daemon (CAD) to launch the command line client in schedule mode to handle scheduled events during system startup.

Method 1 (recommended)

1. From the Tivoli Storage Manager main GUI window, select **Utilities** → **Setup Assistant**. The Client Configuration Assistant appears.
2. Select the **Help me configure the TSM Client Acceptor Daemon and TSM Client Scheduler** and click the **OK** button. The Scheduler Wizard panel appears.
3. Select the task you want to perform. You can install a new client scheduler, update the settings for a scheduler, or remove a scheduler.
4. Complete each panel and click the right arrow to continue. To go back to a previous panel, click the left arrow.

Method 2

1. The shell script install_cad.sh has been provided to assist with installing the CAD from a terminal window. This file is in the `/Library/Application Support/tivoli/tsm/client/ba/bin/Resources` folder. See the script for more details.

2. In addition to the install_cad.sh script, you must complete the following steps before the CAD will work. You must complete these steps before running the install_cad.sh script.
   a. Set the ***managedservices*** option to *schedule* in the TSM System Preferences file. See "Managedservices" on page 183 for more information.
   b. Set the ***passwordaccess*** option to *generate* in the TSM System Preferences file. See "Passwordaccess" on page 194 for more information.
   c. The system administrator *must* generate a password so that Tivoli Storage Manager can store the password in the TSM.PWD file.

Considerations:

- The Tivoli Storage Manager command line tools must be installed before you can use the CAD to run the client scheduler. If you performed an Easy Install of the Tivoli Storage Manager client, the command line tools are automatically installed. If you performed a Custom Install, you must install the command line tools by selecting TSM Command Line Tools from the Installer window.
- The ***passwordaccess*** option is automatically set to *generate* option when you install the client scheduler by using the setup assistant.
- If you include files for encryption, ensure that *ENCRYPTKEY SAVE* is set in the TSM System Preferences file. This option is set by selecting **Save Encryption Key Password Locally** on the Authorization panel in the preference editor. Setting this option enables unattended scheduled services. If the encryption key has not been previously saved, you must perform an attended backup of at least one file so that the encryption prompt will be given and the key can be saved.
- To start the CAD manually, Enter the following command in a terminal window:

  ```
  sudo /sbin/SystemStarter start /usr/bin/dsmcad
  ```

- To check if the CAD is running, enter the following command:

  ```
  ps -ax | grep dsmcad
  ```

  If the CAD is running, one of the processes listed will have the path /usr/bin/dsmcad.

Configuring Tivoli Storage Manager client/server communication across a firewall

In most cases, the Tivoli Storage Manager server and clients can work across a firewall. Because every firewall is different, the firewall administrator might need to consult the instructions for the firewall software or hardware in use.

There are two methods for enabling client and server operations through a firewall:

Method 1:

To allow clients to communicate with a server across a firewall, the following ports must be opened in the firewall by the firewall administrator:

TCP/IP port

To enable the backup-archive client, command line admin client, and the scheduler to run outside a firewall, the port specified by the server option ***tcpport*** (default 1500) must be opened by the firewall administrator. This port is set on the client and the server using the ***tcpport*** option. The setting must be the same on the

client and server. See "Tcpport" on page 239 for more information. This will allow Tivoli Storage Manager scheduler communications in both *polling* and *prompted* mode, CAD-managed schedulers, and regular backup-archive client operations.

Note: The client might not use the port specified by the ***tcpadminport*** option (on the server) for client session. That port can be used for administrative sessions only.

TCP/IP ports for the remote workstation
The two TCP/IP ports for the remote workstation client must be opened. Use the ***webports*** option in the remote workstation client options file to specify these ports. If you do not specify the values for the ***webports*** option, the default zero (0) causes TCP/IP to randomly assign two free port numbers. See "Webports" on page 251 for more information about the ***webports*** option.

TCP/IP port for administrative sessions
Specifies a separate TCP/IP port number on which the server is waiting for requests for administrative client sessions, allowing secure administrative sessions within a private network. See "Tcpadminport" on page 234 for more information.

Method 2:
For the client scheduler in prompted mode, it is unnecessary to open *any* ports on the firewall. If you set the ***sessioninitiation*** option to *serveronly*, the client will not attempt to contact the server. *All sessions will be initiated by server prompted scheduling* on the port defined on the client with the ***tcpclientport*** option. The ***sessioninitiation*** option only affects the behavior of the client scheduler running in the prompted mode.

The Tivoli Storage Manager server must set the SESSIONINITiation parameter on the REGISTER NODE and UPDATE NODE commands for each node. If the server specifies SESSIONINITiation=*clientorserver*, the default, the client can decide which method to use. If the server specifies SESSIONINITiation=*serveronly*, all sessions are initiated by the server.

Notes:

1. Using the ***sessioninitiation*** option requires a Tivoli Storage Manager Version 5.2 or higher server and client.
2. If you set the ***sessioninitiation*** option to *serveronly*, with the exception of CAD-managed schedulers, the command line client and GUI client will still attempt to initiate sessions, but are blocked by the Tivoli Storage Manager server for nodes which have the ***sessioninitiation*** option set to *serveronly*.
3. When installing Tivoli Storage Manager scheduler using the setup wizard, and the Tivoli Storage Manager server is behind a firewall, the node password will not get stored on the client machine. As a result, the scheduler service be unable to authenticate to the server when the server contacts the client to execute a schedule. In this case, you can run the scheduler from the command line (dsmc schedule), wait until a scheduled operation starts, and enter the password for your node when prompted.

   A similar problem can occur if an encryption key is required for backup operations. In this case, you can run the scheduler from the command line (dsmc schedule), wait until a scheduled backup starts, and enter the encryption key when prompted. After the password and encryption key are updated, you must restart the scheduler.

If you set the ***sessioninitiation*** option to *client*, the client will initiate sessions with the server (Method 1) by communicating on the TCP/IP port defined with the *server* option ***tcpport***. This is the default. Server prompted scheduling be used to prompt the client to connect to the server.

See "Sessioninitiation" on page 226 for more information about the ***sessioninitiation*** option.

When using Tivoli Storage Manager across a firewall, please consider the following:

- In *prompted* mode the Tivoli Storage Manager server needs to contact the client. In order to do this, some software need to be installed on the Tivoli Storage Manager server to route the request through the firewall. This software routes the server request through a socks port on the firewall. This is typically called *socksifying* a system. Proxies are not supported, because they only route a few types of communication protocols (HTTP, FTP, GOPHER). Tivoli Storage Manager communications are not routed by proxies. It is important to note that the client creates a new connection to the Tivoli Storage Manager server when prompted. This means that the firewall configuration discussed above must be in place.
- The server cannot log events to a Tivoli Enterprise Console server across a firewall.

In an enterprise environment, we strongly recommend that you use the Tivoli Storage Manager Secure Web Administrator Proxy for Web administration of the Tivoli Storage Manager server. Install the proxy on a Web server that sits on the firewall so that the Web server can access resources on both sides of the firewall (this is sometimes called the *demilitarized zone*). When you set up the proxy, you can use it to administer any Tivoli Storage Manager server at Version 3.7 or higher. For more information on how to install and use the proxy, see the appendix about the Web proxy in the Tivoli Storage Manager Quick Start manuals listed in Table 8.

Table 8. Tivoli Storage Manager Quick Start publications

Publication title	Order number
IBM Tivoli Storage Manager for AIX Quick Start	GC32-0770
IBM Tivoli Storage Manager for HP-UX Quick Start	GC32-0774
IBM Tivoli Storage Manager for Linux Quick Start	GC23-4692
IBM Tivoli Storage Manager for z/OS Quick Start	GC32-0777
IBM Tivoli Storage Manager for OS/400 PASE Quick Start	GC23-4696
IBM Tivoli Storage Manager for Sun Solaris Quick Start	GC32-0780
IBM Tivoli Storage Manager for Windows Quick Start	GC32-0784

Registering your workstation with a server (required root user or authorized user task)

Root user or Authorized User

Before you can use Tivoli Storage Manager, your node must be registered with the server. The process of setting up a node name and password is called *registration*. There are two types of registration: *open* and *closed*. Your Tivoli Storage Manager administrator chooses the type of registration for your site.

Using closed registration

With closed registration, a Tivoli Storage Manager administrator must register your workstation as a client node with the server. If your enterprise uses closed registration, you must provide the following information to your Tivoli Storage Manager administrator:

- Your node name (the name of your workstation or the node name you specified with the ***nodename*** option). If you do not specify a node name with the ***nodename*** option, the default login ID is the name that the **hostname** command returns.
- The initial password you want to use, if required.
- Contact information, such as your name, user ID, and phone number.

In addition to possibly defining certain options in your Preferences file, your Tivoli Storage Manager administrator defines the following for you:

- The policy domain to which your client node belongs. A policy domain contains policy sets and management classes, defined by your Tivoli Storage Manager administrator, that control how Tivoli Storage Manager manages the files you back up and archive.
- Whether you can compress files before sending them to the server.
- Whether you can delete backup and archive data from server storage.

Using open registration

With open registration, a system administrator can register your workstation as a client node with the server.

The first time you start a session, Tivoli Storage Manager prompts you for information necessary to register your workstation with the server identified in your TSM User Preferences file. You need to supply your node name, a password, and contact information.

When you use open registration:

- Your client node is assigned to a policy domain named **standard**.
- You can delete archived copies of files from server storage, but not backup versions of files.

If necessary, your Tivoli Storage Manager administrator can change these defaults later.

Associating your client node with a host system (optional)

The globally unique identifiers (GUID) help to uniquely identify a particular machine (for reporting purposes), regardless of the following:

- How many node names are used on the machine
- Which network adapter is used to connect to the Tivoli Storage Manager server
- Which nodes are connected to the Tivoli Storage Manager servers

For example, if you use nodes GORDON, DONNA, and DAGORDON to connect to a Tivoli Storage Manager server from your desktop machine, all three nodes will have the same GUID. Similarly, if nodes GORDON, DONNA, and DAGORDON connect to multiple Tivoli Storage Manager servers, each server will show the same GUID for these nodes.

The first time TSM Backup for Administrators is used, a GUID is automatically created. It is stored in the /Library/Application Support/tivoli/guid directory. The GUID for a client node on the server can change if the host system machine is

corrupted, if the file entry is lost, or if a user uses the same node name from different host systems. You can perform the following functions from the command line:

- Create a new GUID
- View the current GUID
- Write a specific value
- Create another GUID even if one exists.

Table 9 describes the GUID functions and the associated commands.

Table 9. GUID commands

Function	Enter on the command line:
Create and store a new GUID on the host if one does not exist. If a GUID already exists, the current value is displayed.	`tivguid -Create`
Display help for the tivguid commands.	`tivguid -Help`
Return the value of the current GUID.	`tivguid -Show`
Write the GUID that is specified in the -GUID option to the file. For example, `-Write GUID = 'string'` uses the value in 'string' rather than creating a new GUID. The string must be a valid Tivoli GUID (32 hexadecimal values). This function is useful in the following cases: • If the Tivoli GUID is corrupted you can use the administrative client to query the server for the value using the q node nodename f=d command, and set that value on the current machine. • If you want to set up multiple physical machines with the same guid (for example on cluster).	`tivguid -Write -guid=38.70.92.a1.9a.93 .11.d6.a2.f9.00.04.ac.dd.76.38`
Create a new GUID even if one exists.	`tivguid -Write -New`

Creating an include-exclude list (optional root user or authorized user task)

System Administrator

This is an optional task but an important one. If you do not create an include-exclude list, Tivoli Storage Manager considers all files for backup services and uses the default management class for backup and archive services. For information on management classes and policy domains, see Chapter 8, "Understanding storage management policies," on page 93.

You can create an include-exclude list to exclude a specific file or groups of files from backup services, and to assign specific management classes to files. Tivoli Storage Manager backs up any file that is not explicitly excluded. You should exclude Tivoli Storage Manager client folders from backup services. You can use the **query inclexcl** command to display a list of include and exclude statements in the order they are examined when determining whether an object is to be included.

Attention: There are some system files that you should exclude. See "Excluding system files" on page 28 for more information.

Specify your include-exclude list in your TSM System Preferences file. If you define more than one server in your TSM System Preferences file, each server must have its own include-exclude list. The include-exclude list can also go into a separate file, which is referred to by the ***inclexcl*** option.

The TSM System Preferences file must be in a non-Unicode format. However, if you are using a separate include-exclude file, it can be in Unicode or non-Unicode format. See "Inclexcl" on page 171 for instructions on creating a Unicode include-exclude file.

When the client processes include-exclude statements, the include-exclude statements within the include-exclude file are placed at the position occupied by the ***inclexcl*** option in TSM System Preferences file, in the same order, and processed accordingly.

See "Inclexcl" on page 171 for important detailed information about specifying an include-exclude file using the ***inclexcl*** option.

You can use the following methods from the client GUI to create an include-exclude list or specify an include-exclude file:

1. You can add include-exclude statements in the Tivoli Storage Manager directory tree. The online help provides detailed instructions.
2. Open the **Edit** menu and select **Preferences**. In the Preferences dialog, click the **Include/Exclude** section.

   Note: You can specify a Unicode file as an include-exclude file using the Preferences editor. However, you cannot create the Unicode file using the Preferences editor. See "Considerations for Unicode-enabled clients" on page 171 for instructions on creating a Unicode include-exclude file.

You can also create an include-exclude list manually by performing the following steps:

1. Determine your include and exclude requirements.
2. Open your TSM System Preferences file with SimpleText or another Macintosh text editor.
3. Locate the server stanza in your TSM System Preferences file.
4. Enter your ***include*** and ***exclude*** statements using the appropriate include-exclude options as described in "Using include-exclude options" on page 27. Tivoli Storage Manager evaluates all ***exclude.dir*** statements *first* (regardless of their position within the include-exclude list), and removes the excluded directories and files from the list of objects available for processing. All other include-exclude statements are processed from the bottom of the list up. Therefore, it is important to enter all your include-exclude statements in the proper order. For example, in the following include-exclude list the `includefile.cpp` file *is not* backed up:

   ```
   include /Users/user01/Documents/includefile.cpp
   exclude /Users/user01/Documents/.../*
   ```

   However, in the following include-exclude list the `includefile.cpp` file *is* backed up:

```
exclude /Users/user01/Documents/.../*
include /Users/user01/Documents/includefile.cp
```

5. Save the file and close it. Ensure that you save the file as plain text. Do not add the `.txt` extension.
6. Restart your Tivoli Storage Manager client to enable your include-exclude list.

Using include-exclude options

This section provides the following information:

- Brief descriptions of the ***include*** and ***exclude*** options that you can specify in your TSM System Preferences file. See table references for more information about each option.
- A minimum include-exclude list that excludes system files.
- A list of supported wildcard characters.
- Examples of how you might use wildcard characters with ***include*** and ***exclude*** patterns.

Excluding directories

Use ***exclude.dir*** statements to exclude all files and sub-directories in the specified directory from processing. Tivoli Storage Manager evaluates all ***exclude.dir*** statements *first* (regardless of their position within the include-exclude list), and removes the excluded directories and files from the list of objects available for processing. The ***exclude.dir*** statements override all include statements that match the pattern.

Table 10. Option for excluding directories

Option	Description	Page
exclude.dir	Excludes a directory, its files, and all its subdirectories and their files from backup processing. For example, the statement exclude.dir /test/dan/data1 excludes the /test/dan/data1 directory, its files, and all its subdirectories and their files. Using the ***exclude.dir*** option is preferable over the standard ***exclude*** option to exclude large directories containing many files that you do not want to back up. You cannot use ***include*** options to override an ***exclude.dir*** statement. Only use ***exclude.dir*** when excluding an entire directory branch.	156

Controlling symbolic link and alias processing

After Tivoli Storage Manager evaluates all ***exclude.dir*** statements and removes the excluded directories, Tivoli Storage Manager evaluates any include-exclude statements for controlling symbolic link and alias processing (***exclude.attribute.symlink*** and ***include.attribute.symlink***) against the remaining list of objects available for processing. Table 11 defines options for controlling symbolic link and alias processing.

Table 11. Options for controlling symbolic link and alias processing

Option	Description	Page
exclude.attribute.symlink	Excludes a file or a group of files that are symbolic links or aliases from backup processing only.	156
include.attribute.symlink	Includes a file or a group of files that are symbolic links or aliases within broad group of excluded files for backup processing only.	173

Controlling backup and archive processing

After Tivoli Storage Manager evaluates all statements, the following options are evaluated against the remaining list of objects available for processing.

Table 12. Options for controlling backup and archive processing

Option	Description	Page
	Backup processing	
exclude ***exclude.backup*** ***exclude.file*** ***exclude.file.backup***	*These options are equivalent*. Use these options to exclude a file or group of files from backup services.	156
include ***include.backup*** ***include.file***	*These options are equivalent*. Use these options to include files or assign management classes for backup processing.	173
	Archive processing	
exclude.archive	Excludes a file or group of files from archive services.	156
include ***include.archive***	*These options are equivalent*. Use these options to include files or assign management classes for archive processing.	173

Controlling compression and encryption processing

After Tivoli Storage Manager evaluates ***exclude.dir*** and any other include-exclude options controlling symbolic links, backup, and archive processing, it uses the following options to determine which files undergo compression and encryption processing.

Table 13. Options for controlling compression and encryption processing

Option	Description	Page
	Compression processing	
exclude.compression	Excludes files from compression processing if ***compression***=*yes* is specified. This option applies to backups and archives.	156
include.compression	Includes files for compression processing if ***compression***=*yes* is specified. This option applies to backups and archives.	173
	Encryption processing	
exclude.encrypt	Excludes files from encryption processing.	156
include.encrypt	Includes files for encryption processing. The data that you include is stored in encrypted form, and encryption does not affect the amount of data sent or received. **Attention:** The ***include.encrypt*** option is the only way to enable encryption on the Backup-Archive client. If no ***include.encrypt*** statements are used encryption will not occur.	173

Excluding system files

The Tivoli Storage Manager client will add the following exclude statements to the include-exclude list from your TSM System Preferences file:

```
EXCLUDE.ARCHIVE "/.../Desktop DB"
EXCLUDE.BACKUP "/.../Desktop DB"
EXCLUDE.ARCHIVE "/.../Desktop DF"
EXCLUDE.BACKUP "/.../Desktop DF"
EXCLUDE.ARCHIVE /.vol
EXCLUDE.BACKUP /.vol
EXCLUDE.ARCHIVE /automount
EXCLUDE.BACKUP /automount
EXCLUDE.ARCHIVE /Network
EXCLUDE.BACKUP /Network
EXCLUDE.ARCHIVE /dev
EXCLUDE.BACKUP /dev
EXCLUDE.BACKUP /.vol/.../*
EXCLUDE.ARCHIVE /.vol/.../*
EXCLUDE.BACKUP /automount/.../*
EXCLUDE.ARCHIVE /automount/.../*
EXCLUDE.BACKUP /Network/.../*
EXCLUDE.ARCHIVE /Network/.../*
EXCLUDE.BACKUP /dev/.../*
EXCLUDE.ARCHIVE /dev/.../*
EXCLUDE.DIR /.vol
EXCLUDE.DIR /automount
EXCLUDE.DIR /Network
EXCLUDE.DIR /dev
```

Notes:

1. Volumes with **...** in their name are not supported. Tivoli Storage Manager uses the **...** sequence as part of include-exclude processing. Tivoli Storage Manager reports an invalid include-exclude statement if a volume has **...** in the name. The volume *must* be renamed.
2. Objects that have a type of *rhap* and a creator of *lcmt* will be excluded from processing. Generally, these are special file system objects, but can also be created with the **mknod** command or are Unix mount points. An entry will be made in the error log indicating which objects have been skipped.

Recommendation: You should have the following minimum include-exclude list in your TSM System Preferences file:

```
EXCLUDE  "/.../Norton FileSaver Data"
EXCLUDE  "/.../Norton VolumeSaver Data"
EXCLUDE  "/.../Norton VolumeSaver Index"
EXCLUDE  "/.../TSM Sched*"
EXCLUDE  "/.../TSM Error*"
EXCLUDE  /.../.hotfiles.bTree

EXCLUDE.DIR  /private/tmp
EXCLUDE.DIR  /private/var/vm
EXCLUDE.DIR  /private/var/tmp

EXCLUDE.DIR  /.../.Trashes
EXCLUDE.DIR  /.../.Trash
EXCLUDE.DIR  /.../.Spotlight-*
EXCLUDE.DIR  /.../.TemporaryItems
EXCLUDE.DIR  /.../Library/Caches
EXCLUDE.DIR  /Trash
EXCLUDE.DIR  /TheVolumeSettingsFolder
EXCLUDE.DIR  "/Temporary Items"
EXCLUDE.DIR  /Users/.../Library/Caches

EXCLUDE.DIR  "/System Folder/Preferences/netscape A/Cache"
EXCLUDE.DIR  "/System Folder/Preferences/Explorer/Temporary Files"
EXCLUDE.DIR  "/System Folder/Preferences/cache-cache"
EXCLUDE.DIR  "/System Folder/Preferences/netscape users/.../Cache"
```

These are system files that cannot be recovered without possibly corrupting the operating system, or temporary files with data that you can easily recreate.

Including and excluding groups of files

To specify groups of files that you want to include or exclude, use the wildcard characters listed in Table 14. This table applies to ***include*** and ***exclude*** statements *only*. For information about using wildcard characters in Tivoli Storage Manager commands, see "Using wildcard characters" on page 258.

Note: A very large include-exclude list decrease backup performance. Use wildcards and eliminate unnecessary include statements to keep the list as short as possible.

Table 14. Wildcard and other special characters

Character	Function
?	The match one character matches any single character *except* the directory separator; it does not match the end of the string. For example: • The **pattern** ab?, **matches** abc, but **does not match** ab, abab, or abzzz. • The **pattern** ab?rs, **matches** abfrs, but **does not match** abrs, or abllrs. • The **pattern** ab?ef?rs, **matches** abdefjrs, but **does not match** abefrs, abdefrs, or abefjrs. • The **pattern** ab??rs, **matches** abcdrs, abzzrs, but **does not match** abrs, abjrs, or abkkkrs.
*	The match-all character. For example: • The **pattern** ab*, **matches** ab, abb, abxxx, but **does not match** a, b, aa, bb. • The **pattern** ab*rs, **matches** abrs, abtrs, abrsrs, but **does not match** ars, or aabrs, abrss. • The **pattern** ab*ef*rs, **matches** abefrs, abefghrs, but **does not match** abefr, abers. • The **pattern** abcd.*, **matches** abcd.c, abcd.txt, but **does not match** abcd, abcdc, or abcdtxt.
/...	The match-*n* character matches zero or more directories.
[	The open character-class character begins the enumeration of a character class. For example: `xxx[abc] matches xxxa, xxxb, or xxxc.`
–	The character-class range includes characters from the first character to the last character specified. For example: `xxx[a-z] matches xxxa, xxxb, xxxc, ... xxxz.`
\	The literal escape character. When used within a character class, it treats the next character literally. When used outside of a character class, it is not treated in this way. For example, if you want to include the ']' in a character class, enter [...\]...]. The escape character removes the usual meaning of ']' as the close character-class character.
]	The close character-class character ends the enumeration of a character class.

Examples using wildcards with include and exclude patterns

Table 15 on page 31 contains examples of ways you might use wildcard characters with ***include*** and ***exclude*** patterns.

Table 15. Using wildcard characters with include and exclude patterns

Task	Pattern
Exclude all files that end with `.doc`, except those found on volume `La Pomme` in the `Documents` folder.	`EXCLUDE /.../*.doc` `EXCLUDE "/Volumes/La Pomme/Documents/*.doc"`
Exclude all files and folders under any `Documents` folder that might exist, *except* for the `Current` file in the `Documents` folder on the `La Pomme` volume. Include this file. Assume that `La Pomme` is not the startup disk.	`EXCLUDE /.../Documents/.../*` `INCLUDE "/Volumes/La Pomme/Documents/Current"`
Exclude any .cpp file in any folder on the `Vol1`, `Vol2`, `Vol3`, and `Vol4` volumes.	`EXCLUDE /Volumes/Vol[1-4]/.../*.cpp`
Exclude the .cpp files found in the root folder of the `Vol2` volume.	`EXCLUDE /Volumes/Vol2/*.cpp`
Exclude all symbolic links or aliases from backup processing, except for the `Docs` folder for user1. Assume that `Jaguar` is the startup disk.	`EXCLUDE.ATTRIBUTE.SYMLINK /.../*` `INCLUDE.ATTRIBUTE.SYMLINK /Users/user1/Docs/*`

Testing an include-exclude list with the Preview command

Once modifications have been made to the Include-Exclude list, you can use the **preview** command to see what will be sent to the server. The **preview** command simulates a backup or archive command without sending data to the server. The **preview** command generates a tab delineated text file that can be imported into a spreadsheet program. The preview contains information such as whether the file is excluded or included. If the file is excluded, the pattern, or reason, the file is excluded will be listed, along with the source for the pattern.

The **preview** command is on the Utilities menu of the Native GUI Client.

Processing include and exclude options

The Tivoli Storage Manager server can define include-exclude options using the ***inclexcl*** parameter in a client option set. The include-exclude statements specified by the server are evaluated along with those in the TSM System Preferences file. The server include-exclude statements are always enforced and placed at the bottom of the include-exclude list and evaluated before the client include-exclude statements.

When performing an incremental backup, Tivoli Storage Manager evaluates all ***exclude.dir*** statements *first*, and removes the excluded directories and files from the list of objects available for processing. See "Excluding directories" on page 27 and "Exclude options" on page 156 for more information about the ***exclude.dir*** option.

After evaluating all ***exclude.dir*** statements, Tivoli Storage Manager evaluates the include-exclude statements for controlling symbolic link or alias processing (***exclude.attribute.symlink*** and ***include.attribute.symlink***) from the bottom up and stops if it finds an include or exclude statement that matches the file it is processing. After the include-exclude statements for controlling symbolic link or alias processing are processed, Tivoli Storage Manager evaluates the remaining include-exclude list from the bottom up and stops when it finds an include or exclude statement that matches the file it is processing. The order in which the include and exclude options are entered therefore affects which files are included and excluded. See Chapter 9, "Using processing options," on page 105 for more information about the order in which all options are processed.

To display a list of all include-exclude statements in effect on your client workstation in the actual order they are processed, use the **query inclexcl** command. See "Query Inclexcl" on page 285 for more information.

The client program processes the list of include-exclude statements according to the following rules:

1. Folders *are not* checked; files are checked. Therefore, if you have a volume (such as `"/Volumes/La Pomme"`) defined using the ***domain*** option, all folders of that volume are backed up *regardless* of what you defined for your ***include*** and ***exclude*** options. This is the case *even if* the files in those folders are not backed up.
2. **File names are compared to the patterns in the include-exclude list from the bottom up.** When a match is found, the processing stops and checks whether the option is ***include*** or ***exclude***. If the option is ***include***, the file is backed up. If the option is ***exclude***, the file *is not* backed up.

   Note: A very large include-exclude list decrease backup performance. Use wildcards and eliminate unnecessary include statements to keep the list as short as possible.
3. If a match *is not* found, files are implicitly included and backed up.
4. When a file is backed up, it is bound to the default management class unless it matched an ***include*** statement that specified a different management class name, in which case the file is bound to that management class.

The following examples demonstrate *bottom up* processing.

Example 1

Assume that `La Pomme` is not the startup disk.

```
EXCLUDE /.../*.cpp
INCLUDE "/Volumes/La Pomme/Foo/.../*.cpp"
EXCLUDE "/Volumes/La Pomme/Foo/Junk/*.cpp"
```

The current file being processed is `/Volumes/La Pomme/Foo/Dev/test.cpp`. The processing follows these steps:

1. Rule 3 (the last ***include*** or ***exclude*** statement defined) is checked first because of *bottom up* processing. The pattern `/Volumes/La Pomme/Foo/Junk/*.cpp` does not match the current file name being processed.
2. Processing moves to Rule 2 and checks. This time, pattern `/Volumes/La Pomme/Foo/.../*.cpp` matches the current file name being processed. Processing stops, the option is checked, and it is ***include***.
3. File `/Volumes/La Pomme/Foo/Dev/test.cpp` is backed up.

Example 2

Assume that `La Pomme` is not the startup disk.

```
EXCLUDE /.../*.cpp
INCLUDE "/Volumes/La Pomme/Foo/.../*.cpp"
EXCLUDE "/Volumes/La Pomme/Foo/Junk/*.cpp"
```

The current file being processed is `/Volumes/La Pomme/Widget/Sample File`. The processing follows these steps:

1. Rule 3 is checked and finds no match.
2. Rule 2 is checked and finds no match.
3. Rule 1 is checked and finds no match.
4. Because a match is not found, file `Volumes/La Pomme/Widget/Sample File` is implicitly included and is backed up.

Example 3

Assume that `La Pomme` is not the startup disk.

```
EXCLUDE /.../*.cpp
INCLUDE "/Volumes/La Pomme/Foo/.../*.cpp"
EXCLUDE "/Volumes/La Pomme/Foo/Junk/*.cpp"
```

The current file being processed is `/La Pomme/Lib/Src/Module1.cpp`. The processing follows these steps:

1. Rule 3 is checked and finds no match.
2. Rule 2 is checked and finds no match.
3. Rule 1 is checked and a match is found.
4. Processing stops, the option is checked, and it is ***exclude***.
5. File `/La Pomme/Lib/Src/Module1.cpp` is not backed up.

Example 4

Assume that `La Pomme` is not the startup disk.

```
EXCLUDE /.../*.cpp
INCLUDE "/Volumes/La Pomme/Foo/.../*.cpp"
EXCLUDE "/Volumes/La Pomme/Foo/Junk/*.cpp"
```

The current file being processed is: /Users/user1/documents/printf.cpp. Processing follows these steps:

1. The ***exclude.attribute.symlink*** statement is checked first. If the printf.cpp file is a symbolic link or alias it will be excluded, otherwise proceed to the next step. Note that the ***exclude.attribute.symlink*** statements are always processed before the other include-exclude statements, regardless of their position in the include-exclude list.
2. Rule 3 is checked and finds no match.
3. Rule 2 is checked and finds no match.
4. Rule 1 is checked and a match is found.
5. Processing stops, the option is checked, and it is ***exclude***.
6. File /Users/user1/documents/printf.cpp is not backed up.

Example 5 ″ The current file being processed is The processing follows these steps: 1. 2. 3.

Example 5

Assume that `La Pomme` is the startup disk, is defined as the domain, and that you defined the following statements for the include and exclude options.

```
EXCLUDE /.../*.cpp
INCLUDE /Foo/.../*.cpp
EXCLUDE /Foo/Junk/*.cpp
```

The current file being processed is: `/Foo/Dev/test.cpp`. Processing follows these steps:

1. Rule 3 (the last include or exclude statement defined) is checked first because of bottom up processing. The pattern `/Foo/Dev/test.cpp` does not match the current file name being processed.
2. Processing moves to Rule 2 and checks. This time, pattern `/Foo/.../*.cpp` matches the current file name being processed. Processing stops, the option is checked, and it is included.
3. File `/Foo/Dev/test.cpp` is backed up.

Chapter 3. Getting started

This chapter includes instructions for the following tasks:

Task	Page
Starting a GUI session	36
Starting a command line session	36
Starting the client scheduler automatically	38
Changing your password	38
Working with your files using the Tivoli Storage Manager GUI	39
Displaying online help	39
Ending a session	40

Tivoli Storage Manager client authentication

When using the backup-archive GUI you can log on using a node name and password *or* administrative user ID and password. Tivoli Storage Manager prompts for your user ID and compares it to the configured node name. If they match, Tivoli Storage Manager attempts to authenticate the user ID as a node name. If the authentication fails or if the user ID does not match the configured node name, the client attempts to authenticate the user ID as an administrative user ID.

To use an administrative user ID with any of the backup-archive clients, the user ID must have one of the following authorities:

System privilege
: Authority over the entire system. An administrator with system privilege can perform any administrative task.

Policy privilege
: Authority over the node policy domain. Allows an administrator to manage policy objects, register client nodes, and schedule client operations for client nodes.

Client owner
: Authority over the registered Tivoli Storage Manager client node. You can access the client through the backup-archive client. You own the data and have a right to physically gain access to the data remotely. You can back up and restore files on the same or different machine, and you can delete file spaces or archive data.

Client access
: Client access authority only allows Tivoli Storage Manager administrators to back up and restore files on remote machines. They do not have physical access to the data. That is, they cannot restore the data belonging to the remote machine to their own machines. To restore data belonging to a remote machine to your own machine, you must possess at least client owner authority.

To determine what authority you have, you can use either of the following methods:

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- From the main Tivoli Storage Manager GUI window, select **File → Connection Information**.
- Use the Tivoli Storage Manager server QUERY ADMIN command from the administrative command line client. See the appropriate *Tivoli Storage Manager Administrator's Reference* for more information about the QUERY ADMIN command.

Starting a GUI session

Start a GUI session using one of the following methods:

- For Macintosh users:
  - Double-click the **TSM Backup** icon.
  - Double-click the TSM User Preferences file.
  - Drag and drop a TSM User Preferences file onto the **TSM Backup** icon
- For Macintosh system administrators:
  - Double-click the **TSM Backup for Administrators** icon. You will be prompted for a system administrator ID and password

Tivoli Storage Manager locates the TSM User Preferences file and starts with the preferences specified in that file. See "Creating a default client user options file (optional root user or authorized user task)" on page 15 for more information about the TSM User Preferences file.

Using your Tivoli Storage Manager password

Your Tivoli Storage Manager administrator can require you to use a password to connect to the server. Tivoli Storage Manager prompts you for the password if one is required. Contact your Tivoli Storage Manager administrator if you do not know your password. For information about changing your password, see "Changing your password" on page 38.

Setup Assistant

When the GUI client starts, it checks to see whether a TSM System Preferences file exists. If the TSM System Preferences file does not exist (which usually happens after you have installed the client for the first time on your machine), the setup assistant will automatically start and guide you through the configuration process. You can launch the assistant at any time to modify your client configuration files.

Starting a command line session

You can start a command line session using one of the following methods:

- System Administrators can use the sudo command to gain additional authority so Tivoli Storage Manager can access files for all users on the system.
- On the command line enter **dsmc** followed by the command, if you want to run a single command (*batch mode*). If the symbolic link /usr/bin/dsmc exists, you can enter the **dsmc** command from any directory. Otherwise you can enter the fully qualified name.
- On the command line enter **dsmc**. This places you in *interactive mode*, permitting you to run several commands without preceding each with **dsmc**.

Your Tivoli Storage Manager administrator can require you to use a password to connect to the server.

You can start a client command session in either batch or interactive mode.

Using batch mode

Use *batch* mode to enter a single client command. When you use batch mode, you must precede the command with **dsmc**.

For example, to archive the file /Users/user1/Documents/file1.txt, enter the command:

```
dsmc archive /Users/user1/Documents/file1.txt
```

To issue the **incremental** command, enter the following at the prompt:

```
dsmc incremental
```

Depending upon the current setting of your ***passwordaccess*** option, Tivoli Storage Manager prompt you for your password before the command is processed in a batch mode session. See "Passwordaccess" on page 194 for more information.

When you type your password and press Return, the password is not displayed on your screen.

Using interactive mode

Use *interactive* mode when you want to issue a series of commands. Because Tivoli Storage Manager establishes the connection to the server only once for interactive mode, you can process a series of commands more quickly in interactive mode than in batch mode.

To start a client command session in interactive mode, enter either of the following commands:

- `dsmc`
- `dsmc loop`

When you press **Return**, this prompt is displayed on your screen:

```
tsm>
```

When you are in interactive mode, do not precede commands with **dsmc**. For example, instead of typing **dsmc archive** to archive a file, type only **archive**.

For example, to archive a file named /Users/user1/file1.txt, enter the command:

```
archive /Users/user1/file1.txt
```

Depending upon the current setting of your ***passwordaccess*** option, Tivoli Storage Manager prompt you for your password before you are allowed to enter a command in an interactive session.

When you type your password and press Return, the password is not displayed on your screen.

See "Options handling in interactive mode" on page 256 for a discussion of how options are handled in interactive mode.

See Chapter 10, "Using commands," on page 253 for more information on how to start and use the command line client.

Starting: Additional considerations

You can include options as arguments to **dsmc** commands. For example, you can use options to modify the format that displays dates, times, and numbers, or to include your password so that Tivoli Storage Manager does not prompt for it.

In addition, if you have more than one server defined in TSM System Preferences and you want to contact a different server for backup-archive services (other than the one specified in your client user options file TSM User Preferences), specify the server with the ***servername*** option. For example:

```
dsm -servername=server_b
```

Starting the client scheduler automatically

You can start the client scheduler automatically when you start your workstation. If the Tivoli Storage Manager administrator has defined schedules for your node, starting the client scheduler permits you to automatically back up your workstation (or perform other scheduled actions). See Chapter 7, "Automating tasks," on page 83 for more information about the client scheduler.

You can also use the Tivoli Storage Manager Client Acceptor daemon to manage the scheduler. See "Configuring the client scheduler" on page 19 for more information.

Changing your password

Your Tivoli Storage Manager administrator can require you to use a password to connect to the server. Tivoli Storage Manager prompts you for the password if one is required. Contact your Tivoli Storage Manager administrator if you do not know your password.

To change your password from the GUI:

1. From the main window, open the **Utilities** menu and select **Change password**.
2. Enter your current and new passwords, and enter your new password again in the **Verify password** field.
3. Click **Change**.

To change your password from the command line client, enter:

```
sudo dsmc set password
```

Then, enter your old and new passwords when prompted.

A Tivoli Storage Manager password can be up to 63 characters. Valid characters are:

Character	Description
A–Z	Any letter; A through Z, upper or lower case
0–9	Any number; 0 through 9
+	Plus
.	Period
_	Underscore
-	Hyphen
&	Ampersand

A password is not case sensitive. See “Password” on page 193 for additional password information.

The following are additional password information sources:
- “Starting the client scheduler automatically” on page 38
- “Password” on page 193
- “Set Password” on page 311

Working with your files using the Tivoli Storage Manager GUI

When you select the **View** menu in the menu bar, options are displayed for sorting files by name, directory, date, size, modified date, creation date, backup date, or archive date.

Only one of these options can be in effect at one time. For example, if you select the **Sort by Name** item, a bullet displays at its left. If you select another item, the bullet moves to that item.

Note: When you are viewing a list of files, you can also click the headings above the listing to sort by that particular attribute.

Select the **Edit** menu → **Select Items** or **Deselect Items** options to select or deselect several files simultaneously during a backup or archive operation.

In the Restore window, the **Display active/inactive files** menu option controls whether to display both active and inactive backup versions of files. An *active* file is the most recent backup version of a file that existed on your workstation when you ran your last backup. All other backup versions of that file are *inactive*. Only active backup versions of files are displayed, unless you select the **Display active/inactive files** menu option. If you delete the file from your workstation, the active version becomes inactive the next time you run an incremental backup.

On the command line client, you can use the ***inactive*** and ***pick*** options with query and restore commands to display both active and inactive objects. See “Inactive” on page 170 and “Pick” on page 197 for more information.

Displaying online help

You can display online help in any of the following ways:
- **From the Tivoli Storage Manager GUI:** You can click the GUI question mark (**?**) icon, which displays online information about the current operation.
- **From the dsmc command line:** Enter the **help** command. A menu of topics is displayed for which help is available. See “Help” on page 270 for more information about the **Help** command.

The help pages contain HTML style hyper-links to other topics related to the current operation you are performing. You can select a topic of interest in the **Ask** field and search the online help for matches. Search results will be sorted by relevance. Use the left and right arrow keys in the lower right-hand corner to navigate between help pages.

Ending a session

You can end a Tivoli Storage Manager client session in any one of the following ways:

- **From the Tivoli Storage Manager backup-archive GUI:**
  - Open the **File** menu and select **Quit**.
  - Press Command+Q.
- **From the DSMC command line:** In batch mode, each **dsmc** command you enter is a complete session. Tivoli Storage Manager ends the session when it finishes processing the command. To end an interactive session, enter **quit** at the `tsm>` prompt.

Online forum

To participate in user discussions of Tivoli Storage Manager you can subscribe to the ADSM-L list server. This is a user forum maintained by Marist College. While not officially supported by IBM, Tivoli Storage Manager developers and other IBM support staff also participate on an informal, best-effort basis. Because this is not an official IBM support channel, you should contact IBM Technical Support if you require a response specifically from IBM. Otherwise there is no guarantee that IBM will respond to your question on the list server.

You can subscribe by sending a note to the following e-mail address:

```
listserv@vm.marist.edu
```

The body of the message must contain the following:

```
SUBSCRIBE ADSM-L yourfirstname yourlastname
```

The list server will send you a response asking you to confirm the subscription request. Once you confirm your subscription request, the list server will send you further instructions. You will then be able to post messages to the list server by sending e-mail to:

```
ADSM-L@vm.marist.edu
```

If at a later time you want to unsubscribe from ADSM-L, you can send a note to the following e-mail address:

```
listserv@vm.marist.edu
```

The body of the message must contain the following:

```
SIGNOFF ADSM-L
```

You can also read and search the ADSM-L archives, join discussion forums, and access other resources at the following URL:

```
http://www.adsm.org
```

Other sources of online help

An anonymous FTP server (ftp.software.ibm.com/storage) is available where you can find maintenance and other Tivoli Storage Manager-related materials. Three other anonymous servers are unofficially maintained by non-IBM volunteers. These servers are:

```
ftp.rz.uni-karlsruhe.de (mirror - Germany)
ftp.wu-wien.ac.at (mirror - Austria)
ftp.cac.psu.edu (mirror - Pennsylvania)
```

You can get maintenance information from the Tivoli Storage Manager support page at:

```
http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html
```

Also see "Contacting customer support" on page xiii for product support information.

Chapter 4. Backing up your data

Use Tivoli Storage Manager to store copies of your workstation files on a Tivoli Storage Manager server. These copies are called backup versions or backups. You can restore these backup versions from the server to your workstation if the original workstation files are lost or damaged. See Chapter 5, "Restoring your data," on page 63 for more information.

As a quick reference, this chapter includes instructions for the following tasks.

Table 16. Backup: Primary tasks

Task	Page
Planning your backups	43
Pre-backup considerations	44
Performing an incremental, selective, or incremental-by-date backup	50
Backing up data using the GUI	53
Backing up data using the command line	53
Deleting backup data	61

Planning your backups

If you are a first-time user, or if you only back up files occasionally, you wish to use Table 17 as a checklist of preliminary steps to consider before performing a backup.

Table 17. Planning your backups

___	Decide whether you want to back up files or archive them. See "When to back up and when to archive files" for more information.
___	See "Pre-backup considerations" on page 44 for important considerations before you back up your files and directories.
___	Do you need to exclude files from backup services? See "Using the include-exclude list to control processing" on page 46 for more information.
___	Decide what type of backup you want according to your needs. See the following sections for more information: • "Performing an incremental, selective, or incremental-by-date backup" on page 50 • "Backup with client node proxy support" on page 56
___	For further backup considerations, see "Backup: Additional considerations" on page 59.

When to back up and when to archive files

When the backup-archive client backs up or archives a file, it sends a copy of the file and its associated attributes to the server; however, backups and archives have different goals.

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Use backups to protect against unforeseen damage to your files, and use archives for maintaining more permanent versions of your files.

Backup data is managed by version, using predetermined policy based rules. Using these rules, the Tivoli Storage Manager administrator can control the following:

- The number of versions
- The number of days each additional backup copy is kept
- What happens to backup data versions when the file is deleted on the client machine

Each copy of the file stored on the server is considered to be a separate and unique version of the file.

Archive is a powerful and extremely flexible mechanism for storing long term data. Archive data is kept for a specified number of days. Archive has no concept or support for versions. The user or Tivoli Storage Manager administrator is responsible for determining what files get added to an archive.

Recommendation: If archive is run multiple times against a file using the same archive description, a new copy of the file will be added to the archive each time that archive is run. To simplify retrieve, store only one copy of a file in each archive.

Backups protect against file damage or loss that could occur through accidental deletion, corruption, disk crashes, and so forth. The server maintains one or more backup versions for each file that you back up. Older versions are deleted as newer versions are made. The number of backup versions the server maintains is set by your administrator.

Note: If you frequently create archives for the same data, consider using instant archives (backup sets) instead. Frequent archive operations can create a large amount of metadata in the server database increasing database growth and decreasing performance for operations such as expiration. See "Restoring data from a backupset" on page 70 for more information on how backup sets can be generated and restored.

Archive copies are saved for long-term storage. Your administrator can limit how long archive copies are kept. The server can store an unlimited number of archive versions of a file. Archives are useful if you need to go back to a particular version of your files, or you want to delete a file from your workstation and retrieve it at a later time, if necessary. For example, you might need to save spreadsheets for tax purposes, but because you are not using them, you do not want to leave them on your workstation. See Chapter 6, "Archiving and retrieving data," on page 75 for more information about archiving and retrieving files.

Pre-backup considerations

This section discusses important processing and performance considerations before you back up your data.

How Tivoli Storage Manager maintains volume names

Tivoli Storage Manager backs up volumes based on their UNIX mount point name. Tivoli Storage Manager maintains each volume name as a separate restore or retrieve volume. These volume names become the names of file spaces on the server.

If you change the name of a volume you have already backed up, Tivoli Storage Manager sees it as a new volume and does not relate it to the previous one. Any backup of the volume backs up the files under the new name. A mismatch might occur if you rename your volumes, or if you access Tivoli Storage Manager from a different workstation than the one from which you backed up the files.

Volume naming precautions

Beginning with Version 5.3, Tivoli Storage Manager creates all new Tivoli Storage Manager file spaces on the server with the UNIX mount point of the volume. If there are two volumes with the names such as `"La Pomme"` and `"la pomme"`, two unique UNIX mount points are created. For example:

```
/Volumes/La Pomme
/Volumes/la pomme
```

Notes:

1. The Tivoli Storage Manager client continues to use the existing file space names on the Tivoli Storage Manager Server. Only new file spaces use the UNIX mount point for the name.
2. Volumes with `...` in their name are not supported.
3. Tivoli Storage Manager uses the `...` sequence as part of include-exclude processing.
4. Tivoli Storage Manager reports an invalid include-exclude statement if a volume has `...` in the name. The volume *must* be renamed.

If duplicate volumes exist on your desktop, it is possible for the UNIX mount points to be different than the last time Tivoli Storage Manager did a backup. Tivoli Storage Manager might not back up the data to the correct file system on the Tivoli Storage Manager server.

The file system to which Tivoli Storage Manager will back up the data can be checked. In the TSM Backup window, select a file system. Then choose **File → Show Info**. The UNIX mount point, and the file system that Tivoli Storage Manager uses, is at the top of the Information dialog.

The best way to avoid any potential naming problems is to ensure that the volume names are unique.

Volume naming precautions on dual boot systems

If you have more than one version of Mac OS X that you switch between, it is critical that you understand how Tivoli Storage Manager uses the UNIX mount paths for file space names on the Tivoli Storage Manager server.

For example, consider a dual-boot system that has two volumes, `Panther` and `Tiger`. The finder and the Tivoli Storage Manager GUI displays these as `Panther` and `Tiger`. However, the UNIX mount points will depend upon which version of Mac OS is running. If Panther is the startup disk, the UNIX paths are:

```
/
/Volumes/Tiger
```

If Tiger is the startup disk, the UNIX paths are:

```
/
/Volumes/Panther
```

This means that when Tivoli Storage Manager does a backup or archive, the file space names will also depend upon which version of Mac OS X is running.

The real issue is that both versions of Mac OS X will backup to the / file system on the Tivoli Storage Manager server. If this happens, the system files will be intermixed.

Attention: To avoid any potential problems on dual-boot systems, you must do ONE of the following:

1. Select one version of Mac OS X on which to install and run Tivoli Storage Manager. This will ensure that the UNIX mount points are the same each time Tivoli Storage Manager does a backup. This is the recommended approach.
2. Configure each version of Mac OS X with a unique TSM node name. Then exclude the other version of Mac OS X from backup processing with a '-domain' statement in the TSM System Preferences file. For example, if Tiger is the startup disk, add this option to the TSM System Preferences file:

   ```
   DOMAIN -/Volumes/Panther
   ```

   If Panther is the startup disk, add this option to the TSM System Preferences file:

   ```
   DOMAIN -/Volumes/Tiger
   ```

Unicode considerations

The Macintosh OS X client is Unicode enabled. New clients storing data on the server for the first time require no special set up. The server automatically stores files and directories as Unicode enabled. However, if you are upgrading to the Unicode-enabled client, you need to plan the migration of existing file spaces so they can support Unicode. For migration information, see "Migrating to the Unicode-enabled client" on page 3.

Any file spaces that are already on the server must be renamed so Unicode-enabled file spaces can be created. Use the ***autofsrename*** option rename existing file spaces. For detailed information about this option, see "Autofsrename" on page 125.

Configure memory-constrained workstations to run incremental backups

Incremental backup performance suffers if the workstation has a low amount of memory available before starting the backup. If your workstation is memory constrained, specify the ***memoryefficientbackup*** *Yes* option in your TSM User Preferences file. Specifying *Yes* reduces memory consumption but increases backup time. When you specify *Yes*, Tivoli Storage Manager analyzes only one directory at a time for backup consideration. If performance remains poor, check your communication buffer settings and the communication link between your workstation and the server. If your workstation is not memory constrained, setting the ***memoryefficientbackup*** option to *Yes* will degrade your backup performance.

Using the include-exclude list to control processing

Usually, there are files that you do not want to back up. These files can be operating system or application files that can be easily recovered by reinstalling the program, or any other file that you could easily rebuild.

Use the ***include*** and ***exclude*** options in the TSM System Preferences file to define which files to include or exclude from incremental or selective backup processing.

A file is eligible for backup unless excluded by an ***exclude*** option. It is not necessary to use an ***include*** option to include specific files for backup unless those files are in a directory or file system to which you have an exclude statement.

Tivoli Storage Manager uses *management classes* to determine how to manage your backups on the server. Every time you back up a file, the file is assigned a management class. The management class is either a default chosen for you, or one you assign to the file using the ***include*** option in the include-exclude list. If you assign a management class, it must contain a backup copy group for the file to be backed up. See Chapter 7, "Automating tasks," on page 83 for more information on management classes and how to assign them to files.

For more information about creating an include-exclude list in your TSM System Preferences file, see "Creating an include-exclude list (optional root user or authorized user task)" on page 25.

Encrypting data during backup or archive operations

Tivoli Storage Manager Version 5.3 and higher supports 128-bit Advanced Encryption Standard (AES) data encryption, using the ***encryptiontype*** option, for the strongest possible encryption. The data that you include is stored in encrypted form, and encryption does not affect the amount of data sent or received. See "Encryptiontype" on page 149 for more information.

Attention: The ***include.encrypt*** option is the only way to enable encryption on the Backup-Archive client. If no ***include.encrypt*** statements are used encryption will not occur.

For more information about the ***include.encrypt*** option, see "Include options" on page 173. For more information about the ***exclude.encrypt*** option, see "Exclude options" on page 156.

Use the ***include.encrypt*** and ***exclude.encrypt*** options to select files for encryption processing. By default, files are not encrypted unless they are explicitly included using the ***include.encrypt*** option. For more information about the ***exclude.encrypt*** option, see "Exclude options" on page 156. For more information about the ***include.encrypt*** option, see "Include options" on page 173.

To encrypt file data, you must select an encryption key password, which Tivoli Storage Manager uses to generate the encryption key for encrypting and decrypting the file data. Store the encryption key password for later use. You can specify whether to save the encryption key password in a file named TSM.PWD by using the ***encryptkey*** option.

Tivoli Storage Manager client encryption allows you to enter a value of up to 63 characters in length. This encryption password needs to be confirmed when encrypting the file for backup, and also needs to be entered when performing restores of encrypted files.

While restoring the encrypted file, Tivoli Storage Manager will prompt you for the key password to decrypt the file in the following cases:

- If the ***encryptkey*** option is set to `Prompt`.
- If the key supplied by the user in the above case does not match.
- If the ***encryptkey*** option is set to `Save` and the locally saved key password does not match the encrypted file.

For more information about this option, see "Encryptkey" on page 150.

Supported file systems

Tivoli Storage Manager supports HFS, HFS+, HFSX, UFS, UDF, and ISO 9600 file systems, as defined in Table 18.

Table 18. Supported file systems

File system	Tivoli Storage Manager support
Mac OS Standard (HFS)	• Case-insensitive, but case preserving • Supports creation and modification dates as meta data • Supports Aliases • 32 character limit for folder and file names
MAC OS Extended (HFS+)	• Case-insensitive, but case preserving • Supports creation and modification dates as meta data • Supports Aliases • 255 Character limit for folder and file names • On Mac OS X 10.4, supports Access Control Lists and Extended Attributes
MAC OS Extended, Case-sensitive (HFSX)	• Case-sensitive • Supports creation and modification dates as meta data • Supports Aliases • 255 Character limit for folder and file names • On Mac OS X 10.4, supports Access Control Lists and Extended Attributes
Mac OS Xsan (XSAN)	• Case-sensitive • Supports modification dates as meta data • Supports Aliases and symbolic links • 255 Character limit for folder and file names
UNIX File System (UFS)	• Case-sensitive • Supports modification dates as metadata • Supports aliases and symbolic links • 255 character limit for folders and file names
Universal Disk Format (UDF)	The Universal Disk Format for DVD volumes. Recognized as removable media.
ISO 9660	The standard format for CD-ROM volumes. Recognized as removable media.

The UFS and HFSX file systems are sensitive to case whereas the HFS+ file system is case-insensitive but is case-preserving. Files that you back up from a UFS or HFSX file system (case-sensitive) not be restored properly to an HFS+ file system (case-insensitive) file system. For example, on a UFS file system, files `Afile` and `afile` are seen as different files. However, on a HFS+ file system the two files are seen as identical.

Aliases and symbolic links are backed up. However, Tivoli Storage Manager does not back up the data the symbolic links point to.

Attention: If Case-sensitive HFS+ file systems are used, it is very important that the data from the HFSX file system is not backed up to a HFS+ file system. Either a new name must be used on the system or the existing file space on the Tivoli Storage Manager server must to be renamed. For example, consider a system that has a file system named Macintosh HD and this system is repartitioned with a Case-Sensitive HFS+ file system. Either the Machintosh HD file sytem on the Tivoli Storage Manager server needs to be renamed or a new name must be used on the local system. If this is not done, Tivoli Storage Manager will mix the HFSX case-sensitive data with the HFS+ case-insensitive data that is already stored on the Tivoli Storage Manager server.

Maximum file size for backup and restore

Table 19 specifies the maximum file sizes for backup and restore operations.

Table 19. Maximum file size for backup and restore

Platform	Max file size (in bytes)
Macintosh OS X	HFS - 2,147,485,648 (2GB) HFS+, HFSX, and UFS - 9,223,372,036,854,775,808 (8EB)

How Tivoli Storage Manager handles long user and group names

Tivoli Storage Manager can handle user and group names that are up to 64 characters without any issues. However, names longer than 64 characters require special handling by Tivoli Storage Manager.

Recommendation: Do not exceed the 64 character limit for user and group names. If you do, Tivoli Storage Manager will shorten the name to fall within this limit by using the following transformation: Take the first 53 characters, append a /, and then the numeric id as a character string.

An error message will be logged containing both the long name and the resulting shortened string. For most functions, you do not need to be aware of the shortened name. The exceptions are:

- The **set access** command
- The ***fromowner*** option
- The ***users*** and ***groups*** (authorization) options

In each of these cases, when you need to enter a name, you will either have to find the error message containing the transformation, or construct the name using the above outlined rule.

How Tivoli Storage Manager handles Filevault home directories

The FileVault feature compresses a user's home directory into a single file. Tivoli Storage Manager cannot access any user files inside a FileVault home directory.

Tivoli Storage Manager can backup the user's home directory as a single file. Due to how FileVault home directories are managed by Mac OS X, it is recommended that any FileVault home directories be backed up when the user is not logged in.

When a user is logged in, the home directory is mounted in a temporary folder in /Users/.<username>, and as a result of this, the sparse file will be backed up again under this temporary folder.

Tivoli Storage Manager can restore a user's home directory if the user is not logged in. This means that a user cannot restore their own home directory. User home directories can be restored by the system administator.

A second system administrator account must be created so that the primary system administrator account can be restored.

Performing an incremental, selective, or incremental-by-date backup

Your administrator might have set up schedules to back up files on your workstation automatically. See Chapter 7, "Automating tasks," on page 83 for information on checking and running the schedules available to you. The following sections discuss how to back up files without using a schedule.

Full and partial incremental backup

If you select entire file systems, you are performing a full incremental backup. If you select a directory tree or individual files, you are performing a partial incremental backup.

The first time you run a full incremental backup, Tivoli Storage Manager backs up all the files and folders on the volumes you specify. This process can take a long time if there are a large number of files, or one or more very large files. Subsequent full incremental backups will only back up new and changed files. This allows the backup server to maintain current versions of your files, without having to waste time or space by backing up files that already exist in server storage.

Depending on your storage management policies, the server keep more than one version of your files in storage. The most recently backed up files are active backup versions. Older copies of your backed up files are inactive versions. However, if you delete a file from your workstation, the next full incremental backup will cause the active backup version of the file to become inactive. If you need to restore a file you have deleted, and if a full incremental backup has been run since you deleted the file, then you will need to restore an inactive version of the file (assuming that a version still exists on the server). The number of inactive versions maintained by the server and how long they are retained is governed by the management policies defined by your server administrator. The purpose of the active versions is to represent which files existed on your file system at the time of the backup. See Chapter 8, "Understanding storage management policies," on page 93 for more information about storage management policies.

To perform a full incremental backup see "Backing up data using the GUI" on page 53 or "Backing up data using the command line" on page 53.

During an incremental backup, the client queries the server to determine the exact state of your files since the last incremental backup. The client uses this information to:

- Back up new files
- Back up files whose contents changed since the last backup. Changes include *any* of the following:
  - File size

- Date or time of last modification
- Extended Attributes, on Mac OS X 10.4
- Access Control List, on Mac OS X 10.4
- If *only* the following items change, they are updated without causing the entire file to be backed up to the server:
  - Locked attribute
  - File permissions
  - File owner
  - Group ID
  - Icon location
  - Type or creator

- Expire backup versions of files on the server that do not have corresponding files on the workstation. The result is that files which no longer exist on your workstation will not have active backup versions on the server. However, inactive versions will be retained according to rules defined by the Tivoli Storage Manager administrator.
- Rebind backup versions to management classes if you change management class assignments, even if you do not back up the file

Attention: Each directory is also backed up if it has not yet been backed up, if its permissions, Access Control List, Extended Attributes, or time stamp have changed since the last time it was backed up.

Folders are counted in the number of objects backed up. To exclude directories and their contents from backup, use the ***exclude.dir*** option. For more about ***exclude.dir***, see "Exclude options" on page 156.

Understanding which files are backed up

When you request a backup, Tivoli Storage Manager backs up a file if all of the following requirements are met:

- The selected management class contains a backup copy group. See Chapter 8, "Understanding storage management policies," on page 93 for more information on management classes and backup copy groups.
- The file meets the serialization requirements defined in the backup copy group. If serialization is *static* or *shared static*, and the file changes during backup, the file will not be backed up. See "Using management classes and copy groups" on page 93 for more information.
- The file meets the mode requirements defined in the backup copy group. If the mode is *modified*, the file must have changed since the last backup. If the mode is *absolute*, the file can be backed up even if it does not change. See "Using management classes and copy groups" on page 93 for more information.
- The file meets the frequency requirements defined in the backup copy group. The specified minimum number of days since the last backup must elapse before a file is backed up. See "Using management classes and copy groups" on page 93 for more information.

Incremental-by-date backup

For a file system to be eligible for incremental-by-date backups, you must have performed at least one full incremental backup of that file system. Running an incremental backup of only a directory branch or individual file will not make the file system eligible for incremental-by-date backups.

To perform an incremental-by-date backup, see “Backing up data using the GUI” on page 53 or “Backing up data using the command line” on page 53.

The client backs up only those files whose modification date and time is later than the date and time of the last incremental backup of the file system on which the file resides. Files added by the client after the last incremental backup, but with a modification date earlier than the last incremental backup, are not backed up.

Files that were renamed after the last incremental backup, but otherwise remain unchanged, will not be backed up. Renaming a file does not change the modification date and time of the file. However, renaming a file does change the modification date of the directory in which it is located. In this case, the directory is backed up, but not the files it contains.

If you run an incremental-by-date backup of the whole file system, the server updates the date and time of the last incremental backup. If you perform an incremental-by-date backup on only part of a volume, the server does not update the date of the last full incremental backup. In this case, the next incremental-by-date backup will back up these files again.

Comparing full incremental, partial incremental, and incremental-by-date backups

Full incremental, partial incremental, and incremental-by-date all back up new and changed files. An incremental-by-date backup takes less time to process than a full incremental backup and requires less memory. An incremental-by-date backup might not place exactly the same backup files into server storage because the incremental-by-date backup:

- Does not expire backup versions of files that you delete from the workstation.
- Does not rebind backup versions to a new management class if you change the management class.
- Does not back up files with attributes that change, unless the modification dates and times also change.
- Ignores the copy group frequency attribute of management classes.

Selective backup

Use a selective backup when you want to back up specific files or folders regardless of whether a current copy of those files exists on the server. Incremental backups are generally part of an automated system to back up entire file systems. In contrast, selective backups allow you to manually select a set of files to back up regardless of whether they have changed since your last incremental backup.

To perform a selective backup using the Tivoli Storage Manager GUI, see “Backing up data using the GUI” on page 53. To perform a selective backup using the Tivoli Storage Manager command line, see “Backing up data using the command line” on page 53.

Unlike incremental backups, a selective backup:

- Does not cause the server to update the date and time of the last incremental.
- Backs up directory and file entries even if their size, modification timestamp, or permissions have not changed.

Backing up data using the GUI

When you start Tivoli Storage Manager, it sets your default domain to the volumes you set with the ***domain*** option in the TSM System Preferences file (see "Domain" on page 144). If you do not have the domain option set, the default domain is all local volumes. Selecting **Backup Domain** from the **Actions** menu incrementally backs up all volumes in the domain.

You also exclude volumes in your default domain from backup processing using the Preferences editor.

Estimating backup processing time

The first time you perform an incremental backup, Tivoli Storage Manager needs to back up all of your files, which can take a long time. Subsequent backups usually do not take as long. The *Estimate* function is provided on the **Backup** and **Restore** windows to estimate the amount of time it takes to process your files and folders. The estimated transfer is a rough calculation of the time it takes to transfer your data, based on previous transfers of data between your workstation and the current Tivoli Storage Manager server. To calculate how fast data is transferred, the Estimate function requires at least one successful backup.

The actual transfer time could be longer or shorter than the estimate due to factors like network traffic, system load on your workstation, or system load on the server. The Estimate function also does not take into account whether or not files are excluded from backup. The assumption made by the estimation algorithm is that all the files selected will be sent to the server.

To run a backup, perform the following steps:

1. Click on the **Backup** button from the GUI main window. The Backup window appears.
2. Expand the folder tree. Select the objects you want to backup. To search or filter files, click on the **Edit** menu→ **Find** item.
3. Select the Type of Backup pull-down menu:
   - To run an incremental backup, click on **Incremental (complete)**
   - To run an incremental backup by date, click on **Incremental (date only)**
   - To run a selective backup, click on **Always backup**
4. To modify specific backup options click the **Options** button. The options you select are effective during the current session *only*.
5. Click on **Backup**. The Task List window displays the backup processing status. The Backup Report window displays processing statistics.

Backing up data using the command line

You can use the **incremental** or **selective** commands to perform backups. Table 20 shows examples of using these commands to perform different tasks. See "Incremental" on page 271 and "Selective" on page 305 for more information about these commands.

Table 20 shows examples of using commands to perform different tasks.

Table 20. Command line backup examples

Task	Command	Considerations
	Incremental backups	

Table 20. Command line backup examples (continued)

Task	Command	Considerations
Perform an incremental backup of your client domain.	dsmc incremental	See "Incremental" on page 271 for more information about the **incremental** command. See "Full and partial incremental backup" on page 50 for detailed information about incremental backups.
Back up the /Volumes/fs1 and /Volumes/fs2 file systems in addition to the volumes defined in your client domain.	dsmc incremental -domain="/Volumes/fs1 /Volumes/fs2"	See "Domain" on page 144 for more information about the ***domain*** option.
Back up all local file systems defined in your client domain *except* for the jaguar file system.	dsmc incremental -domain="all-local -/Volumes/jaguar"	You cannot use the (-) operator in front of the domain keyword all-local. See "Domain" on page 144 for more information.
Back up *only* the /Volumes/fs1 and /Volumes/fs2 file systems.	dsmc incremental /Volumes/fs1 /Volumes/fs2	None
Back up all files in the /Users directory and all its subdirectories.	dsmc incremental /Users/ -subdir=yes	See "Subdir" on page 230 for more information about the ***subdir*** option.
Incremental-by-date backup		
Perform an incremental-by-date backup of your default client domain.	dsmc incremental -incrbydate	Use the ***incrbydate*** option with the **incremental** command to back up new and changed files with a modification date later than the last incremental backup stored at the server. See "Incrbydate" on page 176 for more information about the ***incrbydate*** option.
Selective backups		
Back up all files in the /Users/van/Documents directory.	dsmc selective /Users/van/Documents/	Use the **selective** command to back up specific files or directories regardless of whether they have changed since your last incremental backup. You can use wildcards to back up multiple files at once. See "Selective" on page 305 for more information about the **selective** command.
Back up all files in the /Users/van/Documents directory and all its subdirectories.	dsmc selective /Users/van/Documents/ -subdir=yes	If you specify ***-subdir***=*yes* when backing up a specific path and file, Tivoli Storage Manager recursively backs up *all* subdirectories under that path, and any instances of the specified file that exist under *any* of those subdirectories. If a subdirectory is a mounted file system, Tivoli Storage Manager does not back up the files in that subdirectory when you use the ***subdir***=*yes* option. See "Subdir" on page 230 for more information about the ***subdir*** option.

Table 20. Command line backup examples (continued)

Task	Command	Considerations
Back up the /Users/ann/Documents/h1.doc and /Users/ann/Documents/test.doc files.	dsmc selective /Users/ann/Documents/h1.doc /Users/ann/Documents/test.doc	If you specify the ***removeoperandlimit*** option with the **incremental** or **selective** commands, the 20-operand limit is not enforced and is restricted only by available resources or other operating system limits. This allows you to specify more than 20 files on a single command. See "Removeoperandlimit" on page 209 for more information about this option.
Back up all files listed in the /Users/filelist.txt file.	selective -filelist=/Users/filelist.txt	Use the ***filelist*** option to process a list of files. See "Filelist" on page 159 for more information.

Displaying backup processing status

During a backup, by default Tivoli Storage Manager displays the status of each file it attempts to back up. Tivoli Storage Manager reports the file's size, path, file name, total number of bytes transferred, and whether the backup attempt was successful. These are also recorded in the **TSM Schedule Log** file for scheduled commands.

The backup-archive client GUI provides a **Task List** window that displays information about files during processing. When a task completes, a **Backup Report** window displays processing details.

On the backup-archive command line the name of each file is displayed after it is sent to the server. The progress indicator shows overall progress. Informational messages display as follows:

Table 21. Client command line informational messages

Informational message	Meaning
`Directory-->`	Indicates the directory that you back up.
`Updating-->`	Indicates that only the file meta data is sent, not the data itself.
`Expiring-->`	Indicates an object (file or directory) on the server that no longer exists on the client is expired and made inactive on the server.
`Total number of objects inspected:`	As indicated.
`Total number of objects backed up:`	As indicated.
`Total number of objects updated:`	These are files whose attributes, such as file owner or file permissions, have changed.
`Total number of objects rebound:`	See "Binding and rebinding management classes to files" on page 101 for more information.
`Total number of objects deleted:`	This is a count of the objects deleted from the client workstation after being successfully archived on the server. The count is zero for all backup commands.
`Total number of objects expired:`	See "Full and partial incremental backup" on page 50 for more information.
`Total number of objects failed:`	Objects can fail for several reasons. Check the `dsmerror.log` for details.

Table 21. Client command line informational messages (continued)

Informational message	Meaning
`Data transfer time:`	The total time to transfer data across the network. Transfer statistics not match the file statistics if the operation was retried due to a communications failure or session loss. The transfer statistics display the bytes attempted to be transferred across all command attempts.
`Network data transfer rate:`	The average rate at which the network transfers data between the client and the server. This is calculated by dividing the total number of bytes transferred by the time to transfer the data over the network. The time it takes to process objects is not included in the network transfer rate. Therefore, the network transfer rate is higher than the aggregate transfer rate.
`Aggregate data transfer rate:`	The average rate at which Tivoli Storage Manager and the network transfer data between the client and the server. This is calculated by dividing the total number of bytes transferred by the time that elapses from the beginning to the end of the process. Both Tivoli Storage Manager processing and network time are included in the aggregate transfer rate. Therefore, the aggregate transfer rate is lower than the network transfer rate. **Note:** On occasion, the aggregate data transfer rate be higher than the network data transfer rate. This is because the backup-archive client can have multiple simultaneous sessions with the backup server. If you set the ***resourceutilization*** option, Tivoli Storage Manager attempts to improve performance and load balancing by using multiple sessions when it backs up a or other set of files. When multiple sessions are open during backup, the data transfer time represents the sum of the times reported by all sessions. In this case, aggregate data transfer time is incorrectly reported as higher. However, when running with a single session, the aggregate data transfer rate should always be reported as lower than the network data transfer rate.
`Objects compressed by:`	Specifies the percentage of data sent over the network divided by the original size of the file on disk. For example, if the net data-bytes are 10K and the file is 100K, then Objects compressed by: == (1 - (10240/102400)) x 100 == 90%.
`Elapsed processing time:`	The active processing time to complete a command. This is calculated by subtracting the starting time of a command process from the ending time of the completed command process.
`Total number of bytes transferred:`	As indicated.

Backup with client node proxy support

Backups of multiple nodes which share storage can be consolidated to a common target nodename on the Tivoli Storage Manager server. This is useful when the machine responsible for performing the backup can change over time, such as with an Xsan or cluster. The ***asnodename*** option also allows data to be restored from a different system than the one which performed the backup.

An agent node is a client node which has been granted authority to perform client operations on behalf of a target node.

A target node is a client node which grants authority to one or more agent nodes to perform client operations on its behalf.

Use the ***asnodename*** option with the appropriate command to back up, archive, restore, and retrieve data under the target node name on the Tivoli Storage Manager server. This support is only available with a Tivoli Storage Manager Version 5.3 and higher server and client. To enable this option, follow these steps:

- Install the backup-archive client on all nodes in the shared data environment.
- Register each node with the Tivoli Storage Manager server, if it does not exist. Register the common target nodename to be shared by each of the agent nodes used in your shared data environment.
- Register each of the nodes in the shared data environment with the Tivoli Storage Manager server. This is the agent nodename which is used for authentication purposes. Data will not be stored using the nodename when the ***asnodename*** option is used.
- The Tivoli Storage Manager administrator must grant proxy authority to all nodes in the shared environment to access the target node name on the Tivoli Storage Manager server, using the **grant proxynode** command.
- Use the **query proxynode** administrative client command to display the authorized user's client nodes, granted by the **grant proxynode** command.

Recommendation: Do not use the ***asnodename*** option when a node is backing up or restoring local file systems. Only use this option when backing up or restoring to Xsan or cluster filesystems. If this recommendation is not followed, it is possible for the local file system data of each client node to become mixed on the Tivoli Storage Manager Server. This will happen for all client nodes have the same local file system names.

Follow these steps to enable multiple node operation from the GUI:

1. Verify that the client node has proxy authority to a target node (or authorized to act as the target node) using the **query proxynode** administrative client command.
2. Select **Edit** → **Preferences** to open the preferences window.
3. Select the **General** tab and fill in the **As Node Name** field with the name of the target node.
4. Click **Apply** and then **OK** to close the preferences window.
5. Quit and restart the Tivoli Storage Manager client so that the new options can take effect.

Follow these steps to verify that your client node is now accessing the server as the target node:

1. Open the tree window and check that the target node name specified by the **As Node Name** field appears as the node name in the tree view, or
2. Verify the target node name in the **Accessing As Node** field in the **Connection Information** window.

To return to single node operation, delete the **As Node Name** from the **Accessing As Node** field in the **General** → **Preferences** tab.

Suggestion:

- All agent nodes in the multiple node environment should be of the same platform type.

Restrictions enforced within a proxied session:

- You cannot access another node (either from the GUI drop down or use of the Fromnode option).

Follow these steps to set up encryption with the *encryptkey=save* option:

1. Specify *encryptkey=save* in the options file.
2. Add an include.encrypt statement in the TSM System Preferences file for the files that need to be encrypted.
3. Back up at least one file with *asnode=ProxyNodeName* to create a local encryption key on each agent node in the multiple node environment.

Follow these steps to set up encryption with the *encryptkey=prompt* option:

1. Specify *encryptkey=prompt* in the options file.
2. Ensure that users of the agent nodes in the multiple node environment are using the same encryption key.

- If you change the encryption key, you must repeat the previous steps on all participating agent node systems to ensure that the encryption key is the same.
- Use the same encryption key for all files backed up in the shared node environment.

See "Asnodename" on page 123 for more information.

Scheduling with client node proxy support

Multiple nodes can be used to perform backup operations using the scheduler. By granting proxy authority to the agent nodes, they will perform scheduled backup operations on behalf of the target node. Each agent node must use the ***asnodename*** option within their schedule to perform multiple node backup for the agent node.

The following examples show the administrative client server commands using the scheduler on multiple nodes.

1. The administrator registers all of the nodes to be used:

```
register node NODE-A
register node NODE-B
register node NODE-C
register node NODE-Z
```

2. The administrator grants proxy authority to each agent node:

```
grant proxynode target=NODE-Z agent=NODE-A
grant proxynode target=NODE-Z agent=NODE-B
grant proxynode target=NODE-Z agent=NODE-C
```

3. The administrator defines the schedules:

```
define schedule standard proxy1 description="NODE-A proxy schedule"
  action=incremental options="-asnode=NODE-Z" objects=/Volumes/Xsan1
  startdate=05/21/2005 starttime=01:00
define schedule standard proxy2 description="NODE-B proxy schedule"
  action=incremental options="-asnode=NODE-Z" objects=/Volumes/Xsan2
  startdate=05/21/2005 starttime=01:00
define schedule standard proxy3 description="NODE-C proxy schedule"
  action=incremental options="-asnode=NODE-Z" objects=/Volumes/Xsan3
  startdate=05/21/2005 starttime=01:00
```

Note: Place the ***asnode*** option in the schedule definition only. Do not place it in the client options file, on the command line, or in any other location.

For more information about the server scheduler commands, see *IBM Tivoli Storage Manager Administrator Command Reference*.

Start the schedules using the following client command:

```
dsmc sched
```

You can also use the client acceptor daemon (dsmcad), with managedservices set to schedule in the TSM System Preferences file.

Notes:

1. Each schedule can be started from a different machine.
2. After running the schedules, any proxied client will be able to query and restore all of the backed up data.

The following steps must be taken to enable scheduling of multiple nodes:

- All agent nodes must have proxy authority over common target node
- All agent nodes must have a schedule defined on the server

  ```
  def sched domain_name sched_name options='-asnode=target'
  ```

- Each agent node must have its schedule associated with node

  ```
  def association domain_name schedule_name <agentnodename>
  ```

Backup: Additional considerations

This section discusses some advanced considerations for using backup. You do not need to understand this information to use Tivoli Storage Manager for basic work.

Understanding how files are managed

Tivoli Storage Manager uses management classes to determine how to manage your backups on the server. Every time you back up a file, the file is assigned a management class. The management class used is either a default selected for you, or one assigned to the file by an Authorized User with an ***include*** option in the include-exclude options list. The selected management class must contain a backup copy group in order for the file to be backed up.

Select **Utilities → View Policy Information** in the client GUI to view the backup policies defined by the Tivoli Storage Manager server for your client node. See Chapter 8, "Understanding storage management policies," on page 93 for more information on management classes, how an Authorized User assigns management classes to files, and storage management policies.

Understanding how hard links are handled

When you back up files that are hard-linked, Tivoli Storage Manager backs up each instance of the linked file. For example, if you back up two files that are hard-linked, Tivoli Storage Manager will back up the file data twice.

When you restore hard-linked files, Tivoli Storage Manager attempts to reestablish the links. For example, if you had a hard-linked pair of files, and only one of the hard-linked files is on your workstation, when you restore both files, they will be hard-linked. The one exception to this procedure occurs if you back up two files that are hard-linked and then break the connection between them on your workstation. If you restore the two files from the server, Tivoli Storage Manager will respect the current file system and not restore the hard link.

If you do not back up and restore all files that are hard-linked at the same time, problems will occur. To ensure that hard-linked files remain synchronized, back up all hard links at the same time and restore those same files together.

Understanding how NFS hard and soft mounts are handled

When Tivoli Storage Manager connects a backup-archive client to an NFS file system, you can use either a hard mount or a soft mount. Tivoli Storage Manager uses the ***nfstimeout*** option setting to determine how long to wait for an NFS system call to respond before timing out; this applies to hard and soft mounts. The default is 0 seconds. This means that Tivoli Storage Manager uses the default behavior of NFS system calls.

You should be aware of the consequences of hard and soft mounts if the mount becomes stale (for example, if the server for the file system is not available).

Hard mount
— If the NFS file system is hard mounted, the NFS daemons will try repeatedly to contact the server. The NFS daemon retries will not time out, will affect system performance, and you cannot interrupt them, but control will return to Tivoli Storage Manager when the ***nfstimeout*** value is reached.

Soft mount
— If the NFS file system is soft mounted, NFS will try repeatedly to contact the server until either:
- A connection is established
- The NFS retry threshold is met
- The ***nfstimeout*** value is reached

When one of these events occurs, control returns to the calling program.

Backing up open files

Some files on your system be in use, or open, when you try backing them up. Because an open file change during a backup, the backup not accurately reflect the contents of the file. If this is the case, you need to consider the following options:

- If the file is unimportant, or can be easily rebuilt (for example, a temporary file), you might not care that the file is not backed up.
- If the file is important:
  - If the backup is not scheduled, close the file and the application before you start the backup.

    If the backup is scheduled, use the ***preschedulecmd*** option to issue a command that closes the file before the backup occurs. For example, if the open file is a database, use the database's quiesce command to shut down the database. You can use the ***postschedulecmd*** option to restart the application that uses the file after the backup completes.
  - You can back up the file even if it is open and changes during the backup, by assigning the file a management class with the serialization **dynamic** or **shared dynamic**. This is only useful if the file is usable even if it changes during the backup. See "Selecting a management class for files" on page 98 for information on assigning management classes, and "Displaying information about management classes and copy groups" on page 95 for information on determining which management classes are available to you.

Using wildcard characters

You can use the operating system's wildcard characters in file specifications with Tivoli Storage Manager. These characters let you select groups of files that have similar names.

In a command, wildcard characters can only be used in the file name or extension. They cannot be used to specify destination files, file systems, or directories. When using wildcard characters in non-loop mode, as in

```
dsmc sel "/Users/user1/Documents/Ledger.*"
```

enclose the parameter containing the asterisk in quotes to ensure the system does not interpret the wildcard character and produce unexpected results. Wildcard character information is covered in the following table.

* *(Asterisk)*	**Zero or more characters that match all files:**
***.cpp**	With a cpp extension
hm*.*	Starting with hm, regardless of extension, but must have the '.' character
hm*	Starting with hm, whether an extension exists or not
h*.	With an h somewhere in the file name, regardless of extension, but must have **.**

? *(Question mark)*	**One character that matches all files with:**
?.cpp	The extension cpp with one, and only one, character in the file name
hm?.cpp	Three-character names beginning with hm and that have the cpp extension

* **?** *(Asterisk and question mark)*	**Asterisk and question mark combinations matching:**
??hm.*	All four-character file names ending in hm., no matter what extension they have

In a path name for a file specification, you cannot specify a directory whose name contains an asterisk (*) or a question mark (?). Tivoli Storage Manager will recognize those characters only as wildcard characters.

Deleting backup data

If your Tivoli Storage Manager administrator has given you authority, you can delete individual backup copies from the Tivoli Storage Manager server without deleting the entire file space. To determine if you have this authority, select **File** → **Connection Information** from the Tivoli Storage Manager GUI main menu. From the command line, use the **query session** command. Your authority status is provided in the **Delete Backup Files** field.

To delete backup copies using the Tivoli Storage Manager GUI:

1. Select **Delete Backup Data** from the **Utilities** menu. The Backup Delete window appears.
2. Expand the Directory tree by clicking the disclosure triangle next to the object you want to expand.
3. Click the selection boxes next to objects that you want to delete. If you want to estimate the amount of time it takes to process your files and directories, click the **Estimate** button.

4. Click the **Delete** button. Tivoli Storage Manager prompts you for confirmation before deleting backup selections. The Backup Delete Task List window displays the progress of the delete.

To delete backup copies using the Tivoli Storage Manager command line client, use the **delete backup** command. See "Delete Backup" on page 266 for more information.

Deleting file spaces

Authorized User

If your Tivoli Storage Manager administrator gives you authority, you can delete entire file spaces from the server. When you delete a file space, you delete all the files and images, both backup versions and archive copies, that are contained within the file space. For example, if you delete the file space for your **Macintosh HD** file system, you are deleting every backup for every file in that file system and every file you archived from that file system. Carefully consider whether you want to delete a file space.

You can delete individual backup versions by using the delete backup command. See "Delete Backup" on page 266 for more information.

You can delete file spaces using the Tivoli Storage Manager GUI or command line clients.

To delete a file space using the GUI, perform the following steps:

1. Select **Utilities→ Delete Filespaces** from the main window.
2. Click the selection boxes next to the file spaces you want to delete.
3. Click the **Delete** button. Tivoli Storage Manager prompts you for confirmation before deleting the file space.

You can also delete a file space using the **delete filespace** command. See "Delete Filespace" on page 268 for more information.

Chapter 5. Restoring your data

You can use Tivoli Storage Manager to restore the following:
- Backup versions of specific files
- A group of files with similar names
- Entire folders
- Backupsets

For more information on restoring backupsets, see "Restoring data from a backupset" on page 70.

This chapter includes instructions for the following tasks.

Table 22. Restore: Primary tasks

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Restoring an active or inactive backup

Your administrator determines how many backup versions Tivoli Storage Manager maintains for each file on your workstation. Having multiple versions of a file permits you to restore older versions if the most recent backup is damaged. The most recent backup version is the *active* version. Any other backup version is an *inactive* version. Every time Tivoli Storage Manager backs up your files, it marks the new backup version as the active backup, and the last active backup becomes an inactive backup. When the maximum number of inactive versions is reached, Tivoli Storage Manager deletes the oldest inactive version.

To restore a backup version that is inactive, you must display both active and inactive versions by clicking on the **View** menu→ **Display active/inactive files** item. To display only the active versions (the default), click on the **View** menu → **Display active files only** item. If you try to restore more than one version at a time, only the active version is restored.

On the Tivoli Storage Manager command line, use the ***inactive*** option to display both active and inactive objects. See "Inactive" on page 170 for more information.

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Performing large restore operations

If you need to restore a large number of files, you can get faster performance by using the **restore** command instead of the GUI. In addition, you can improve performance by entering multiple **restore** commands at one time.

For example, to restore all the files in your `/home` file system, enter:

```
dsmc restore /home/ -subdir=yes -replace=all -tapeprompt=no
```

However, if you enter multiple commands for the directories in the `/home` file space, you can restore the files faster.

For example, you could enter each of these commands in their own terminal window:

```
dsmc restore /Users/user11/ -subdir=yes -replace=all -tapeprompt=no
dsmc restore /Users/user21/ -subdir=yes -replace=all -tapeprompt=no
dsmc restore /Users/user31/ -subdir=yes -replace=all -tapeprompt=no
```

You can also use the ***quiet*** option with the **restore** commands to save processing time. However, you will not receive informational messages for individual files.

Note: If you already have the appropriate values set for the ***subdir***, ***replace***, ***tapeprompt***, and ***quiet*** options in your client user options file, you do not need to include those options in the commands.

When you enter multiple commands to restore your files, you must specify a unique part of the file space in each **restore** command. Be sure you do not use any overlapping file specifications in the commands.

To display a list of the directories in a file space, use the **query backup** command. For example:

```
dsmc query backup -dirsonly -subdir=no /Users/
```

As a general rule, you can enter from two to four **restore** commands at one time. The maximum number you can run at one time without degrading performance depends on factors such as how much memory you have and network utilization.

The speed at which you can restore the files also depends on how many tape drives are available on the server, and whether your administrator is using collocation to keep file spaces assigned to as few volumes as possible.

For example, if `/Users/user1` and `/Users/user2` are on the same tape, the restore for `/Users/user2` must wait until the restore for `/Users/user1` is complete. However, if `/Users/user3` is on a different tape, and there are at least two tape drives available, the restore for `/Users/user3` can begin at the same time as the restore for `/Users/user1`.

If your administrator is using collocation, the number of sequential access media mounts required for restore operations is also reduced.

No query restore

The no query restore process is outlined below.

When you enter an unrestricted wildcard source file specification on the **restore** command and do not specify any of the options: ***inactive***, ***latest***, ***pick***, ***fromdate***, or ***todate***, the client uses a ***no query restore*** method for restoring files and directories from the server. This method is called *no query restore* because instead of querying the server for each object to be restored, a single restore request is sent to the server. In this case, the server returns the files and directories to the client without further action by the client. The client merely accepts the data coming from the server and restores it to the destination named on the **restore** command.

Using the Tivoli Storage Manager GUI client, an example of an unrestricted wildcard command would be to select a folder from the restore tree window. An example of a restricted wildcard command would be to select individual files from a folder.

Using the command line client, an example of an unrestricted wildcard command would be:

```
"/Users/user1/Documents/2004/*"
```

An example of a restricted wildcard file specification would be:

```
/Users/user1/Documents/2004/sales.*
```

Standard restore process

The standard restore process (also known as classic restore) is outlined below.

1. The client queries the server for a list of files backed up for the client file space you want to restore.
2. The server sends a list of backed up files that match the restore criteria. If you want to restore both active and inactive files, the server sends information about all backed up files to the client.
3. The list of files returned from the server is sorted in client memory to determine the file restore order and to minimize tape mounts required to perform the restore.
4. The client tells the server to restore file data and directory objects.
5. The directories and files you want to restore are sent from the server to the client.

No query restore process

1. The client tells the server that a no query restore is going to be performed and provides the server with details about file spaces, directories, and files.
2. The server sorts the data using an internal sort table which minimizes tape mounts.
3. The data to be restored is sent to the client. File and directory objects stored on disk are sent immediately since sorting for such data is not required before restoring it.
4. You can use multiple sessions to restore the data. If the data resides on multiple tapes, there are multiple mount points available at the server. The combination of using the ***resourceutilization*** option and MAXNUMMP allows multiple sessions. See “Resourceutilization” on page 212 for more information.

If the restore process stops because of a power outage or network failure, the server records the point at which this occurred. This record is known to the client as a *restartable restore*. It is possible to have more than one restartable restore

session. Use the **query restore** command or choose **restartable restores** from the Actions menu to find out if your client has any restartable restore sessions in the server database.

You must complete a restartable restore before attempting further backups of the file system. If you attempt to repeat the restore that was interrupted or try to back up the destination file space, the attempt will fail because you did not complete the original restore. You can restart the restore at the point of interruption by entering the **restart restore** command, or you can delete the restartable restore using the **cancel restore** command. From Tivoli Storage Manager GUI **Restartable restores** dialog box you can select the interrupted restore and delete it, or you can choose to restart the restore. If you restart the interrupted restore, it will restart with the first transaction, which consist of one or more files, not completely restored when the interruption occurred. Because of this, you receive some replace prompts for files from the interrupted transaction which were already restored.

For more information on using the command line to begin restartable restores, see "Restore" on page 295. To perform restartable restores using the GUI, follow these steps:

1. Select **Actions->Restartable restores** from the main panel.
2. Select the restartable restore session you wish to complete
3. Click the **Restart** button at the bottom of the panel.

Do you want to restore an active or inactive backup?

Your administrator determines how many backup versions Tivoli Storage Manager maintains for each file on your workstation. Frequently, the administrator allows more than one version of each file. Having multiple versions of a file allows you to restore older versions in case the most recent backup is damaged, or you need a previous version of the file.

Tivoli Storage Manager considers the most recent backup version to be the *active* version. Any other backup version is considered an *inactive* version.

Every time you back up your files, the new backup version becomes the active version, and the previous active backup version becomes an inactive version. When the maximum number of inactive versions is reached, Tivoli Storage Manager deletes the oldest inactive version from Tivoli Storage Manager server storage.

If you want to restore an inactive backup version, you need to display both active and inactive versions, by clicking on the **View** menu→ **Show active/inactive files** item. To display only the active versions (the default), click on the **View** menu→ **Show active/inactive files** item again.

On the Tivoli Storage Manager command line, use the ***inactive*** option to display both active and inactive objects. See "Inactive" on page 170 for more information.

Restoring files and directories

You can restore specific files, a group of files with similar names, or directories.

You can locate the files you want to restore by searching and filtering. Filtering displays only the files that match the filter criteria for your restore operation. Files that do not match the filter criteria do not display. The filter process searches files in the specified directory but does not include subdirectories.

Note: When restoring a directory its modification date and time is set to the date and time of the restore, not to the date and time the directory had when it was backed up. This is because Tivoli Storage Manager restores the directories first, then adds the files to the directories.

Restoring data using the GUI

To run a restore, perform the following steps:

1. Click on **Restore** from the GUI main window. The Restore window appears.
2. Expand the folder tree. Click on the object that you want to restore. To search or filter files, click on the **Edit** menu→ **Find** item. To perform a point-in-time restore that restores files to the state that existed at a specific date and time, click the **Point-in-Time** button.
3. To modify specific restore options click the **Options** button. The options you select are effective during the current session *only*.
4. Click on **Restore**. The Restore Destination window appears. Enter the appropriate information.
5. Click on **Restore**. The Task List window displays the restore processing status. The Restore Report window displays processing statistics.

Considerations:

- When **TSM Backup for Administrators** is used to start the client, the client is running with a UID of zero. This means that if you create a folder to restore your files to, that folder is owned by root. To access the files you must change the permissions of the folder. You can change the folder owner from a terminal window using the **sudo chown** command. Please see your operating system documentation for more information on how to accomplish this.
- When restoring files with the ***replace*** option set to *no*, existing files will not be overwritten, but existing directories will. To leave existing directories intact during a restore operation, select the **Options** button → **All selected files and directories** dropdown menu → **Files only** option.
- When folders are restored from a UFS or HFSX file system to a HFS file system and they differ only in case, the client will restore the contents of both folders to one folder.

Restoring data using the command line

Use the **restore** command to restore files. See "Restore" on page 295 for more information about the **restore** command. Table 23 shows examples of using the **restore** command to restore objects from Tivoli Storage Manager server storage. See "Restore" on page 295 for additional examples.

Table 23. Command line restore examples

Task	Command	Considerations
Restore the most recent backup version of the /Users/monnett/Documents/h1.doc file, even if the backup is inactive.	dsmc restore /Users/monnett/Documents/h1.doc -latest	If the file you are restoring no longer resides on your workstation, and you have run an incremental backup since deleting the file, there is no active backup of the file on the server. In this case, use the ***latest*** option to restore the most recent backup version. Tivoli Storage Manager restores the latest backup version, whether it is active or inactive. See "Latest" on page 179 for more information.

Table 23. Command line restore examples (continued)

Task	Command	Considerations
Display a list of active and inactive backup versions of files from which you can select versions to restore.	dsmc restore ″/Users/monnett/Documents/*″-pick -inactive	If you try to restore both an active and inactive version of a file at the same time, only the active version is restored. See “Pick” on page 197 and “Inactive” on page 170 for more information.
Restore the /Users/monnett/Documents/h1.doc file to its original directory.	dsmc restore /Users/monnett/Documents/h1.doc	If you do not specify a destination, the files are restored to their original location.
Restore the /Users/monnett/Documents/h1.doc file under a new name and directory.	dsmc restore /Users/monnett/Documents/h1.doc /Users/gordon/Documents/h2.doc	None
Restore the files in the /Users directory and all of its subdirectories.	dsmc restore /Users/ -subdir=yes	When restoring a specific path and file, Tivoli Storage Manager recursively restores *all* subdirectories under that path, and any instances of the specified file that exist under *any* of those subdirectories. See “Subdir” on page 230 for more information about the ***subdir*** option.
Restore all files in the /Users/gordon/Documents directory to their state as of 1:00 PM on August 17, 2003.	dsmc restore -pitd=8/17/2003 -pitt=13:00:00 /Users/gordon/Documents/	See “Pitdate” on page 198 and “Pittime” on page 199 for more information about the ***pitdate*** and ***pittime*** options.
Restore all files from the /Users/mike/Documents directory that end with .bak to the /Users/mike/projectn/ directory.	dsmc restore ″/Users/mike/Documents/*.bak″ /Users/mike/projectn/	If the destination is a directory, specify the delimiter (/) as the last character of the destination. If you omit the delimiter and your specified source is a directory or a file spec with a wildcard, you will receive an error. If the projectn directory does not exist, it is created.
Restore files specified in the restorelist.txt file to a different location.	dsmc restore -filelist=/Users/user2/Documents/restorelist.txt /Users/NewRestoreLocation/	See “Filelist” on page 159 for more information about restoring a list of files.

Performing point-in-time restores

Use a *point-in-time* restore to restore files to the state that existed at a specific date and time. A point-in-time restore can eliminate the effect of data corruption by restoring data from a time prior to known corruption, or recover a basic configuration to a prior condition.

You can perform a point-in-time restore of a file space, directory, or file.

Perform incremental backups to support a point-in-time restore. During an incremental backup, the client notifies the server when files are deleted from a client file space or directory. Selective and incremental-by-date backups do not notify the server about deleted files. Run incremental backups at a frequency consistent with possible restore requirements.

If you request a point-in-time restore with a date and time that is prior to the oldest version maintained by the Tivoli Storage Manager server, the object is not restored to your system. Files which were deleted from you workstation prior to the point-in-time specified will not be restored.

Notes:

1. Your administrator must define copy group settings that maintain enough inactive versions of a file to guarantee that you can restore that file to a specific date and time. If enough versions are not maintained, Tivoli Storage Manager not be able to restore all objects to the point-in-time you specify.
2. If you delete a file or directory, the next time you run an incremental backup, the active backup version becomes inactive and the oldest versions that exceed the number specified by the *versions data deleted* attribute of the management class are deleted. See Chapter 8, "Understanding storage management policies," on page 93 for more information about the *versions data deleted* attribute.

When performing a point-in-time restore, consider the following:

- Tivoli Storage Manager restores file versions from the most recent backup before the specified point-in-time date. Ensure the point-in-time that you specify is not the same as the date and time this backup was performed.
- If the date and time you specify for the object you are trying to restore is earlier than the oldest version that exists on the server, Tivoli Storage Manager cannot restore that object.
- Point-in-time restore will restore files deleted from the client workstation after the point-in-time date but not files deleted before this date.
- Tivoli Storage Manager cannot restore a file created after the point-in-time date and time. When a point-in-time restore runs, files that were created on the client after the point-in-time date are not deleted.

To perform a point-in-time restore using the client GUI, use the following steps:

1. Click the **Restore** button in the main window. The Restore window appears.
2. Click the **Point-in-Time** button from the Restore window. The Point in Time Restore window appears.
3. Select the **Use a Point-in-Time Date** selection box. Select the date and time and click **OK**. The point in time that you specified appears in the Point in Time display field in the Restore window.
4. Display the objects you want to restore. You can search for an object by name, filter the directory tree, or work with the directories in the directory tree.
5. Click the selection boxes next to the objects you want to restore.
6. Click the **Restore** button. The Restore Destination window is displayed. Enter the appropriate information.
7. Click the **Restore** button to start the restore. The Restore Task List window displays the restore processing status.

Note: If there are no backup versions of a directory for the point-in-time you specify, files within that directory are not restoreable from the GUI. However, you can restore these files from the command line.

You can start point-in-time restore from the command line client using the ***pitdate*** and ***pittime*** options with the **query backup** and **restore** commands. For example, when you use the ***pitdate*** and ***pittime*** options with the **query backup** command, you establish the point-in-time for which file information is returned. When you use ***pitdate*** and ***pittime*** with the **restore** command, the date and time values you

specify establish the point-in-time for which files are returned. If you specify ***pitdate*** without a ***pittime*** value, pittime defaults to 23:59:59. If you specify ***pittime*** without a ***pitdate*** value, it is ignored.

Restoring data from a backupset

Your Tivoli Storage Manager administrator can generate a backupset (a collection of your active files that reside on the server) onto portable media created on a device using a format that is compatible with the client device.

It is possible to generate a backupset as a number of special files if the device class the Tivoli Storage Manager administrator specifies when creating it is *file*. These files can be stored locally (on the client) to provide more restore flexibility.

Portable media can be used on devices such as a CD-ROM, DVD, and Iomega JAZ or ZIP drives. Current device support information is available at the following Web site:

`http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html`

You can restore backupsets from the following locations:
- From portable media on a device attached to your client workstation
- From a backupset file on the your client workstation
- Directly from the server

Backupsets can provide you with instant archive and rapid recovery capability as described below:

Instant archive
This capability allows an administrator to create an archive collection from backup versions already stored on the server.

Rapid recovery
When you are away from your office without a network connection and you lose data, you can restore the data from the backupset.

Note: If you would like to restore a backupset from portable media on a device attached to your client workstation, check with your Tivoli Storage Manager administrator to ensure that the portable media was created on a device using a format that is compatible with your client device.

Restoring an entire or partial backupset

Tivoli Storage Manager considers a backupset as one object containing the whole file structure. You can restore the entire backupset or just select portions. The backupset media is self-describing and contains all the information required to perform a successful restore.

Use the GUI to restore an entire backupset *only*. The command line can be used to restore an entire backupset or individual files within a backupset. See "Restore Backupset" on page 298 for information on how to use the **restore backupset** command.

Restoring backupsets using the GUI

Attention: Before you begin a restore, be aware that backupsets can contain data for multiple file spaces. If you specify a destination other than the original location, data from *all* file spaces are restored to the location you specify.

To restore a backupset, perform the following steps:

- Click **Restore** from the GUI main window. The Restore window appears.
- Locate the **Backup Sets** directory tree object and expand it by clicking the disclosure triangle (+) beside it.
  - To restore the backupset from a local device, expand the **Local** object and the Specify backupset location dialog is displayed. On the dialog, select **File name:** from the dropdown list and then enter the file name location. You can also click the **Browse** button to open a file selection window and select a backupset.
  - To restore an entire backupset from the server, expand the **Server** object.

  Your backupsets appear in the tree and are grouped by backupset description. Expand a backupset description to see the backupsets with that description.
- Click the selection box next to the backupset that you want to restore.
- Click **Restore**. The Restore Destination window appears. Enter the appropriate information.
- Click on **Restore**. The Task List window displays the restore processing status.

Notes:

1. If the object you want to restore is part of a backupset generated on a node, and the node name is changed on the server, any backupset objects that were generated prior to the name change will not match the new node name. Ensure that the node name is the same as the node for which the backupset was generated.
2. If the backupset is on the server, normal Tivoli Storage Manager security applies, and you can only restore your own files and files to which you have been granted access. However, normal Tivoli Storage Manager security does not apply to backupset data when restored locally because the physical media can be explored by the person who has access to it.
3. To enable the GUI client to restore a backupset on an attached device on a Macintosh standalone workstation, without requiring a server connection, use the ***localbackupset*** option. See "Localbackupset" on page 180 for more information. The **restore backupset** command supports restore of local backupsets from local media without using the ***localbackupset*** option. Also, certain local devices require device drivers to be set up prior to performing a restore. See the device manual for assistance with this task. You will also need to know the device address in order to perform the restore.

Restoring backupsets using the command line client

The **restore backupset** command restores a backupset from the Tivoli Storage Manager server or a local file. See "Restore Backupset" on page 298 for more information

Use the ***location*** option with the **restore backupset** and **query backupset** commands to specify where Tivoli Storage Manager searches for a backupset during a query or restore operation. You can use this option to locate backupsets on the server or local files. See "Location" on page 181 for more information.

Use the **query backupset** command to query a backupset from a local file or the Tivoli Storage Manager server. The **query backupset** command displays the backupset name, generation date, retention, and description. See "Query Backupset" on page 283 for more information.

Related tasks and considerations

This section discusses some advanced considerations for restoring files. You do not need to understand this information to perform basic Tivoli Storage Manager tasks.

Authorizing another user to restore or retrieve your files

You can authorize a user on another node to restore your backup versions or retrieve your archive copies. This allows you to share files with other people or with other workstations that you use with a different Tivoli Storage Manager node name.

To authorize another node to restore or retrieve your files:

1. From the Tivoli Storage Manager main window select the **Utilities** menu → **Node Access List** item. The Node Access List window displays.
2. Click the **Add** button. The Add Access Rule window appears.
3. In the Add Access Rule window, select an item in the **Permit Access to** field to specify the type of data that the other user can access. You can select Backed up Objects or Archived Objects.
4. Type the node name of the user in the **Grant Access to Node** field.
5. Type the name of the user on the node who can access your data in the **User Name** field. This field can contain the name of any user on the node, or an asterisk (*) to grant access to all users logged in under the specified node name.
6. In the **Filespace Name** field, select the file space and the directory that the user can access. You can select one file space and one directory at a time. If you want to give the user access to another file space or directory, you must create another access rule.
7. If you want to limit the user to specific files in the directory, type the name or pattern of the files on the server that the other user can access in the **Filename** field. You can make only one entry in the **Filename** field. The entry can be a single file name or a pattern which matches one or more files. You can use a wildcard character as part of the pattern. Your entry must match files that have been stored on the server.
8. If you want to give access to all files that match the file name specification within the selected directory including its subdirectories, click **Include subdirectories**.
9. Click the **OK** button to save the access rule and close the Add Access Rule window.
10. The new access rule appears in the list box in the Node Access List window. When you finish working with the Node Access List window, click the **OK** button. If you do not want to save your changes, click **Cancel** or close the window.

On the command line client, use the **set access** command to authorize another node to restore or retrieve your files. You can also use the **query access** command to see your current list, and **delete access** to delete nodes from the list. For more information about these commands, see:

- "Set Access" on page 307
- "Query Access" on page 278
- "Delete Access" on page 263

Restoring or retrieving files from another client node

After users grant you access to their files on the server, you can restore or retrieve those files to your local system. You can display another user's file spaces on the Tivoli Storage Manager server, restore the other user's backup versions, or retrieve the other user's archive copies to your local drives.

1. From the Tivoli Storage Manager main window select the **Utilities** menu→ **Access Another Node** item. The Access Another User window displays.
2. Enter the user's node name in the **Node Name** field.
3. Enter the user name of the user who owns the files in the **User Name** field.
4. Click on the **Set** button.

If you are using commands, use the ***fromnode*** and ***fromowner*** options to indicate the node name and the name of the user who owns the files.

For example, to restore files from the /Users/devel/proja directory belonging to *usermike* on system ***puma***, and place the restored files in a directory you own named /Users/id/proja, enter:

```
dsmc restore -fromowner=usermike -fromnode=puma /Users/devel/proja/
/Users/id/proja/
```

You must specify a destination, or Tivoli Storage Manager attempts to restore the files to the node from which the files were backed up. See "Fromnode" on page 164 for more information about the ***fromnode*** option. See "Restore" on page 295 for more information about using the ***fromnode*** and ***fromowner*** options with the **restore** command.

You can also use the ***fromnode*** and ***fromowner*** options with the ***retrieve*** command, see "Retrieve" on page 300 for more information.

Use the **query filespace** command to display a list of file spaces. For example, to get a list of file spaces owned by `ann` on `node1`, enter:

```
dsmc query filespace -fromn=node1 -fromo=ann
```

See "Query Filespace" on page 284 for more information.

See Table 42 on page 117 for a list of other commands for which you can use the ***fromnode*** and ***fromowner*** options.

Restoring or retrieving your files to another workstation

Tivoli Storage Manager lets you restore or retrieve files you back up from your own workstation, when you are using a different workstation. You just need to specify your node name, because your backups and archives are stored according to your node, not your specific machine. Your Tivoli Storage Manager password protects your data.

To restore or retrieve files to another workstation, either change the ***nodename*** option in your TSM System Preferences file to match the current workstation, or type it in when prompted for the nodename and password. To do this, select **File** → **Login** from the Tivoli Storage Manager GUI and enter the node name, userid, and password. You can then restore or retrieve files as if you were working on your original workstation.

If you do not want to restore or retrieve the files to the same folder name on the alternate workstation, use a different destination.

Restoring a disk in case of disk loss

Tivoli Storage Manager can only recover your files if you can run the client. If the disk that contains the client is lost (from theft or hardware failure, for example), you must reinstall the client before you can recover your files. If you also lose the disk that contains the operating system and communication software, you must recover them before you can connect to the Tivoli Storage Manager server.

To protect yourself against these kinds of losses, perform the following steps:

1. Record the IP address, subnet mask, default router, and name servers in the TCP/IP Control Panel. You can use this information to reconfigure TCP/IP when you re-install MacOS.
2. Record your nodename, TCP Server address, and TCP Port number from the **Communications** panel of the Preferences editor. The nodename information comes from the **General** panel in the Preferences editor. You will need this information to configure Tivoli Storage Manager so you can restore your data.
3. Re-install the MacOS from your Macintosh installation CD to access the network.
4. Install the Tivoli Storage Manager for Macintosh installation program. You can get this from the following Web site:

   `http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html`

Overlapping icons

Tivoli Storage Manager remembers a file's position on your desktop when it backs up the file and tries to restore it back to its original position. If a file is in the top, left corner of your desktop when you back it up, Tivoli Storage Manager tries to put it there when you restore it.

But if something else is in that same position when you restore, it is possible that folders and icons can overlap. If this occurs, in the Finder, select the **View** menu→ **View Options** item → **by Name** item, to list objects alphabetically, with no overlapping.

Chapter 6. Archiving and retrieving data

Archiving and retrieving files is similar to backing up and restoring them; many of the windows and concepts are the same. See Chapter 4, "Backing up your data," on page 43 for more information. See "When to back up and when to archive files" on page 43 for a discussion of the differences between backups and archives.

As a quick reference, this chapter includes instructions for the following tasks:

Table 24. Archive and retrieve: Primary tasks

Task	Page
Archiving data using the GUI	76
Archiving data using the command line	76
Deleting archive data	79
Retrieving archives	80
Retrieving data using the command line	81

Archiving your data

Your administrator might have set up schedules to automatically archive certain files on your workstation. See Chapter 7, "Automating tasks," on page 83 for information on checking and running the schedules available to you. The following sections discuss how to archive files without using a schedule.

Maximum file size for archive and retrieve operations

Table 25 specifies the maximum file sizes for archive and retrieve operations.

Table 25. Maximum file size for archive and retrieve

Platform	Max file size (in bytes)
Macintosh OS X	HFS - 2,147,485,648 (2GB) HFS+, HFSX, UFS - 9,223,372,036,854,775,808 (8EB)

Understanding how hard links are handled

When you archive files that are hard-linked, Tivoli Storage Manager archives each instance of the linked file. For example, if you archive two files that are hard-linked, Tivoli Storage Manager will archive the file data twice.

When you retrieve hard-linked files, Tivoli Storage Manager attempts to reestablish the links. For example, if you had a hard-linked pair of files, and only one of the hard-linked files is on your workstation, when you retrieve both files, they will be hard-linked. The one exception to this procedure occurs if you back up two files that are hard-linked and then break the connection between them on your workstation. If you retrieve the two files from the server, Tivoli Storage Manager will respect the current file system and not retrieve the hard link.

If you do not archive and retrieve all files that are hard-linked at the same time, problems will occur. To ensure that hard-linked files remain synchronized, archive all hard links at the same time and retrieve those same files together.

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Understanding how your archives are managed

As with backing up files, Tivoli Storage Manager checks the ***include*** options in your include-exclude list to determine which management class to assign to your archived files. If you do not specifically assign a management class to a file with an ***include*** option, Tivoli Storage Manager assigns the file the default management class.

Tivoli Storage Manager can only archive a file if the selected management class contains an archive copy group.

For information on the various management class attributes used to manage your archives, see "Displaying information about management classes and copy groups" on page 95. For information on assigning management classes, see "Assigning a management class to files" on page 99.

Estimating archive processing time

An **Estimate** function is provided on the **Archive** and **Retrieve** windows. Use this function if you want to estimate the amount of time it takes to process your files and folders. The estimated transfer is a rough calculation of the time it takes to transfer your data. It is based on previous transfers of data between your workstation and the current Tivoli Storage Manager server. The actual transfer time can differ from the estimate due to network traffic, system load on your workstation, or system load on the server. To calculate how fast data is transferred, the Estimate function requires at least one successful archive.

Archiving data using the GUI

You can use Tivoli Storage Manager to archive specific files, a group of files with similar names, or entire folders. You can locate the files you want to archive by searching or filtering. Filtering displays only the files that match the filter criteria for your archive operation.

To perform an archive, do the following:

1. Click on **Archive** from the GUI main window. The **Archive** window appears.
2. Expand the folder tree. Click on the object you want to archive. To search or filter files, click on the **Edit** menu→ **Find** item.
3. In the Description field, do one of the following:
   - Enter a description. The maximum length of a description is 254 characters.
   - Accept the default description
   - Select an existing description from the drop-down list.
4. To modify specific archive options click the **Options** button. The options you select are effective during the current session *only*.
5. Click on **Archive**. The Task List window displays the archive processing status. The Archive Report window displays processing statistics.

Archiving data using the command line

You request archive services when you want to preserve copies of files in their current state, either for later use or for historical or legal purposes. You can archive a single file, a group of files, or all the files in a directory or subdirectory. After you archive a file, you can choose to delete the original file from your workstation. Use the **archive** command to archive files. See "Archive" on page 260 for more information about the **archive** command.

Table 26 shows examples of using the **archive** command to archive objects. See "Archive" on page 260 additional examples.

Table 26. Command line archive examples

Task	Command	Considerations
Archive all files in the /Users/ann/Documents directory with a file extension of .txt.	dsmc archive "/Users/ann/Documents/*.txt"	Use wildcards to archive more than one file at a time.
Archive all files in the /Users/jones/Documents directory and delete the files on your workstation.	dsmc archive /Users/jones/Documents/ -deletefiles	Retrieve the archived files to your workstation whenever you need them again. See "Deletefiles" on page 138 for more information about the ***deletefiles*** option.
Archive the /Users/jones/Documents/h1.doc and /Users/jones/Documents/test.doc files.	dsmc archive /Users/jones/Documents/h1.doc /Users/jones/Documents/test.doc	If you specify the ***removeoperandlimit*** option with the **archive** command, the 20-operand limit is not enforced and is restricted only by available resources or other operating system limits. This allows you to specify more than 20 files on a single command. See "Removeoperandlimit" on page 209 for more information about this option.
Archive a list of files in the /Users/avi/Docs/filelist.txt file.	dsmc archive -filelist=/Users/avi/Docs/filelist.txt	Use the ***filelist*** option to process a list of files. See "Filelist" on page 159 for more information.
Archive the /Users/jones/Documents/ch1.doc file and assign a description to the archive.	dsmc archive /Users/jones/Documents/ch1.doc -description="Chapter 1, first version"	If you do not specify a description with the **archive** command, the default is `Archive Date:x`, where `x` is the current system date. See "Description" on page 139 for more information about the ***description*** option.
Archive all of the files in the /Users/jones/Documents directory and its subdirectories.	dsmc archive /Users/jones/Documents/ -subdir=yes	See "Subdir" on page 230 for more information about the ***subdir*** option.
Use the ***v2archive*** option with the **archive** command to archive only files in the /Users/ann/Documents directory.	dsmc archive "/Users/ann/Documents/*" -v2archive	Tivoli Storage Manager archives only files in the /Users/ann/dir1 directory. Directories that exist in the path are not processed. See "V2archive" on page 248 for more information about the ***v2archive*** option.
Use the ***archmc*** option with the **archive** command to specify the available management class for your policy domain to which you want to bind your archived files.	dsmc archive –archmc=ret2yrs /Users/ann/Documents/budget.jan	See "Archmc" on page 122 for more information about the ***archmc*** option. See Chapter 8, "Understanding storage management policies," on page 93 for more information about management classes.

Archiving data with client node proxy

Archives of multiple nodes which share storage can be consolidated to a common target nodename on the Tivoli Storage Manager server. This is useful when the machine responsible for performing the archive can change over time, such as with a Xsan or cluster.

An agent node is a client node which has been granted authority to perform client operations on behalf of a target node.

A target node is a client node which grants authority to one or more agent nodes to perform client operations on its behalf.

Use the ***asnodename*** option with the appropriate command to back up, archive, restore, and retrieve data under the target node name on the Tivoli Storage Manager server. This support is only available with a Tivoli Storage Manager Version 5.3 and higher server and client. To enable this option, follow these steps:

- Install the backup-archive client on all nodes in the shared data environment.
- Register each node with the Tivoli Storage Manager server, if it does not exist. Register the common target nodename to be shared by each of the agent nodes used in your shared data environment.
- Register each of the nodes in the shared data environment with the Tivoli Storage Manager server. This is the agent nodename which is used for authentication purposes. Data will not be stored using the nodename when the ***asnodename*** option is used.
- The Tivoli Storage Manager administrator must grant proxy authority to all nodes in the shared environment to access the target node name on the Tivoli Storage Manager server, using the **grant proxynode** administrative client command.
- Use the **query proxynode** administrative client command to display the authorized user's client nodes, granted by the **grant proxynode** administrative client command.

Follow these steps to set up encryption with the *encryptkey=save* option:

1. Specify *encryptkey=save* in the options file.
2. Back up at least one file with *asnode=ProxyNodeName* to create a local encryption key on each agent node in the multiple node environment.
3. **Ensure that users of the agent nodes in the multiple node environment are using the same encryption key**.

Follow these steps to set up encryption with the *encryptkey=prompt* option:

1. Specify *encryptkey=prompt* in the options file.
2. **Ensure that users of the agent nodes in the multiple node environment are using the same encryption key**.

- If you change the encryption key, you must repeat the previous steps.
- Use the same encryption key for all files backed up in the shared node environment.

Follow these steps to enable multiple node operation from the GUI:

1. Verify that the client node has proxy authority to a target node using the **query proxynode** administrative client command.
2. Select **Edit** → **Preferences** to open the preferences window.
3. Select the **General** tab and fill in the **As Node Name** field with the name of the proxy authorized target node.
4. Click **Apply** and then **OK** to close the preferences window.
5. Quit and restart the client so that the new options can take effect.

Follow these steps to verify that your client node is now accessing the server as the target node:

1. Open the tree window and check that the target node name specified by the **As Node Name** field appears as the node name at the top of the directory tree.
2. Verify the target node name in the **Accessing As Node** field in the **Connection Information** window.

To return to single node operation, delete the **As Node Name** from the **Accessing As Node** field in the **General** → **Preferences** tab.

Attention:

- All agent nodes in the multiple node environment must be of the same platform type.

Restrictions enforced within a proxied session:

- You cannot access another node or owner (either from GUI drop down or use of the ***fromnode***, ***fromowner*** options).

See "Asnodename" on page 123 for more information.

Displaying archive status

During an archive operation the **Task List** window to display statistics on various items, and to notify you when your archive completes. The **Task List** window does not appear during scheduled archives.

Transfer statistics, such as bytes transferred, not match the file statistics, such as file size, if the archive or retrieve command is retried due to a communications failure or session loss. The transfer statistics will show the bytes attempted to be transferred across all command attempts.

Deleting archive data

If your administrator has given you authority, you can delete individual archive copies from the Tivoli Storage Manager server without deleting the entire file space. To determine if you have this authority, select **File** → **Connection Information** from the Tivoli Storage Manager GUI main menu. Your authority status is provided in the **Delete Archive Files** field.

To delete archive copies from the Tivoli Storage Manager GUI:

1. Select **Delete Archive Data** from the **Utilities** menu. The Archive Delete window appears.
2. Expand the Directory tree by clicking on the disclosure triangle next to the object you want to expand. Objects on the tree are grouped by archive package description.
3. Click the selection boxes next to objects that you want to delete. If you want to estimate the amount of time it takes to process your files and directories, click the **Estimate** button.
4. Click the **Delete** button. Tivoli Storage Manager prompts you for confirmation before deleting archive selections. The Archive Delete Task List window displays the progress of the delete.

To delete archive copies using the Tivoli Storage Manager command line client, use the **delete archive** command. See "Delete Archive" on page 264 for more information.

Retrieving archives

Retrieve a file when you want to return an archive copy from the server to your workstation.

Many of the advanced considerations for retrieving files are the same as for restoring files.

Note: When retrieving a directory, its modification date and time is set to the date and time of the retrieve, not to the date and time the directory had when it was archived. This is because Tivoli Storage Manager retrieves the directories first, then adds the files to the directories.

Retrieving data using the GUI

To retrieve an archived file:

1. Click **Retrieve** from the main window. The Retrieve window appears.
2. Expand the folder tree. Select the object you want to retrieve. To search or filter files, click on the **Edit** menu **Find** item.

   ***To search*:**
   a. Enter your search criteria in the Find Files (Retrieve) window.
   b. Click the **Search** button. The Matching Files (Retrieve) window appears.
   c. Click the selection boxes next to the files you want to retrieve and close the Matching Files (Retrieve) window.

   ***To filter*:**
   a. Enter your filter criteria in the Find Files (Retrieve) window.
   b. Click the **Filter** button. The Retrieve window displays the filtered files.
   c. Click the selection boxes next to the filtered files or directories you want to retrieve.
3. To modify specific retrieve options, click the **Options** button. Any options you change are effective during the current session *only*. To estimate the transfer time for your archived selections, click the **Estimate** button.
4. Click **Retrieve**. The Retrieve Destination window appears. Enter the appropriate information in the Retrieve Destination window.
5. Click **Retrieve**. The Retrieve **Task List** window displays the retrieve processing status.

Considerations:

- When **TSM Backup for Administrators** is used to start the client, the client is running with a UID of zero. This means that if you create a folder in which to retrieve your files, that folder is owned by root. To access the files you must change the permissions of the folder. You can change the folder owner from a terminal window using the **sudo chown** command. Please see your operating system documentation for more information on how to accomplish this.
- When retrieving files with the ***replace*** option set to *no*, existing files will not be overwritten, but existing directories will. To leave existing directories intact during a retrieve operation, select the **Options** button → **All selected files and directories** dropdown menu → **Files only** option.
- When folders are retrieved from a case sensitive file sytem (UFS, HFSX, or XSAN) to a case insensitive file system (HFS or HFS+) and they differ only in case, the client will retrieve the contents of both folders to one folder.

Retrieving data using the command line

Use the **retrieve** command to retrieve files from from storage to your workstation. Table 27 shows examples of using the **retrieve** command. See "Retrieve" on page 300 for additional examples, and detailed information about the **retrieve** command.

Table 27. Command line examples of retrieving archives

Task	Command	Considerations
Retrieve the /Users/jones/Documents/h1.doc file to its original directory.	dsmc retrieve /Users/jones/Documents/h1.doc	If you do not specify a destination, the files are retrieved to their original location.
Retrieve the /Users/jones/Documents/h1.doc file under a new name and directory.	dsmc retrieve /Users/jones/Documents/h1.doc /Users/smith/Documents/h2.doc	None
Retrieve all files from the /Users/jones/Documents directory that end with the characters .bak to the /Users/smith/Documents directory.	dsmc retrieve "/Users/jones/Documents/*.bak" /Users/smith/Documents/	None.
Use the ***pick*** option to display a list of archives from which you can select files to retrieve.	dsmc retrieve "/Users/jones/Documents/*" -pick	See "Pick" on page 197 for more information about the ***pick*** option.
Retrieve files listed in retrievelist.txt.	dsmc retrieve -filelist=/Usrs/av/Doc/retrievelist.txt	See "Filelist" on page 159 for more information about retrieving a list of files.

Understanding how your archives are managed

As with backing up files, Tivoli Storage Manager checks the ***include*** options in your include-exclude options list to determine which management class to assign to your archived files. If you do not specifically assign a management class to a file with an ***include*** option, Tivoli Storage Manager assigns the file the default management class. Tivoli Storage Manager can only archive a file if the selected management class contains an archive copy group.

You can override the default management class by using the ***archmc*** option, or by selecting the management class from the **Options** menu in the GUI.

You can also add include-exclude statements in the Tivoli Storage Manager Client GUI. Then you can use the **Utilities Preview Include-Exclude** function to preview the include-exclude list prior to sending data to the server. For more information about the ***preview*** command, see "Preview" on page 277.

For information on the various management class attributes used to manage your archives, see "Displaying information about management classes and copy groups" on page 95. See "Assigning a management class to files" on page 99 for information about using the include-exclude options list.

Chapter 7. Automating tasks

Your administrator can schedule Tivoli Storage Manager to perform tasks automatically. For example, you can automatically back up files at the end of each day or archive some of your files every Friday. This procedure, known as *central scheduling*, is a cooperative effort between the server and your client node. Your administrator associates clients with one or more schedules that are part of the policy domain maintained in the server database. The administrator defines central scheduling on the server and you start the client scheduler on your workstation. Once you start the client scheduler, further intervention is not necessary.

With client scheduling, you can also:
- Display information about available schedules.
- Display information about work that the schedule has completed.
- Modify scheduling options in the TSM System Preferences file. See "Scheduling options" on page 112 for more information.

Specifying scheduling options

Most options that apply to scheduling are in the TSM System Preferences file and can be set in the Preferences editor. However, server options can override option settings established in client option files.

For more information about scheduling options, changing the scheduling mode, or specifying the TCP/IP address or port number, see "Scheduling options" on page 112.

Configuring the client scheduler

See the following sections for more information:
- "Configuring the client scheduler" on page 19
- "Setting the client scheduler process to run as a background task and start automatically at boot time" on page 317

Starting the client scheduler

You can run scheduling services by using the command line client.

Using the command line client to handle scheduled events

System Administrator

You can configure Tivoli Storage Manager to use the command line client interface to handle scheduled events. The command line tools must be installed to enable this function.

A system administrator can use either of the following methods to enable the Tivoli Storage Manager Client Acceptor daemon (CAD) to launch the command line client in schedule mode to handle scheduled events during system boot up.

Method 1 (recommended)

1. From the Tivoli Storage Manager main GUI window, select **Utilities** → **Setup Assistant**. The Client Configuration Assistant appears.

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2. Select the **Help me configure the TSM Client Acceptor Daemon and TSM Client Scheduler** and click the **OK** button. The Scheduler Wizard panel appears.
3. Select the task you want to perform. You can install a new client scheduler, update the settings for a scheduler, or remove a scheduler.
4. Complete each panel and click the right arrow to continue. To go back to a previous panel, click the left arrow.

Method 2

1. In `"/Library/Application Support/tivoli/tsm/ba/client/Resources"` is a shell script that you can use to install the CAD as a Startup Item. The script name is install_cad.sh. See this script for more details.
2. In addition to the install_cad.sh script, you must complete the following steps before the CAD will work. You must complete these steps before running the install_cad.sh script.
   a. Set the ***managedservices*** option to *schedule* in the TSM System Preferences file. See "Managedservices" on page 183 for more information.
   b. Set the ***passwordaccess*** option to *generate* in the TSM System Preferences file. See "Passwordaccess" on page 194 for more information.
   c. The system administrator *must* generate a password so that Tivoli Storage Manager can store the password in the TSM.PWD file.

Considerations:

- The Tivoli Storage Manager command line tools must be installed before you can use the CAD to run the client scheduler. If you performed an Easy Install of the Tivoli Storage Manager client, the command line tools are automatically installed. If you performed a Custom Install, you must install the command line tools by selecting TSM Command Line Tools from the Installer window.
- The ***passwordaccess*** option is automatically set to *generate* option when you install the client scheduler by using the setup assistant.
- If you include files for encryption processing, ensure that you select the **Save Encryption Key Password Locally** option in the Authorization Preferences window so that the client scheduler can perform unattended scheduled services without prompting the user for the encryption key. If the encryption key has not been previously saved, you must perform an attended backup of at least one file so that the encryption prompt will be given and the key can be saved.
- To start the CAD manually, Enter the following command in a terminal window:
  ```
  sudo /sbin/SystemStarter start dsmcad
  ```
- To check if the CAD is running, enter the following command:
  ```
  ps -x | grep dsmcad
  ```
  If the CAD is running, one of the processes listed will have the path /usr/bin/dsmcad.

Defining a schedule

To define a schedule for a Macintosh node that is using any release prior to Tivoli Storage Manager Version 5.3, the schedule object must be specified in HFS format. For example, to back up the `Macintosh HD` volume, the schedule object would be `Macintosh HD:`. To back up the `Users` folder on the `Macintosh HD` volume, the schedule object would be `Macintosh HD:Users:`

Beginning with the Tivoli Storage Manager Version 5.3 Macintosh Client, the schedule object must be specified with the UNIX path. For example, assume that the `Macintosh HD` is the startup disk for the system. The correct schedule object for the `Macintosh HD` volume is `/`. To back up the `Users` folder on the `Macintosh HD` volume, the schedule object would be `/Users/`.

If `Macintosh HD` is *not* the startup disk, the correct path is likely to be `/Volumes/Macintosh HD`. The correct schedule object for the `Macintosh HD` volume is `"/Volumes/Macintosh HD/"`. To back up the `Users` folder on the `Macintosh HD` volume, the schedule object would be `"/Volumes/Macintosh HD/Users/"`.

Notes:

1. If the system only has one volume, then / is the correct UNIX path to use.
2. Most secondary filesystem paths start with `/Volumes/<name of volume>`.
3. The **df** command will show the correct UNIX paths for all volumes.

Configuring Tivoli Storage Manager client/server communication across a firewall

In most cases, the Tivoli Storage Manager server and clients can work across a firewall. Because every firewall is different, the firewall administrator need to consult the instructions for the firewall software or hardware in use.

There are two methods for enabling client and server operations through a firewall:

Method 1:

To allow clients to communicate with a server across a firewall, the following ports must be opened in the firewall by the firewall administrator:

TCP/IP port

To enable the backup-archive client, command line admin client, and the scheduler to run outside a firewall, the port specified by the server option ***tcpport*** (default 1500) must be opened by the firewall administrator. This port is set on the client and the server using the ***tcpport*** option. The setting must be the same on the client and server. See "Tcpport" on page 239 for more information. This will allow Tivoli Storage Manager scheduler communications in both *polling* and *prompted* mode, CAD-managed schedulers, and regular backup-archive client operations.

Note: The client not use the port specified by the ***tcpadminport*** option (on the server) for client session. That port be used for administrative sessions only.

TCP/IP ports for the remote workstation

The two TCP/IP ports for the remote workstation client must be opened. Use the ***webports*** option in the remote workstation client options file to specify these ports. If you do not specify the values for the ***webports*** option, the default zero (0) causes TCP/IP to randomly assign two free port numbers. See "Webports" on page 251 for more information about the ***webports*** option.

TCP/IP port for administrative sessions

Specifies a separate TCP/IP port number on which the server is waiting for requests for administrative client sessions, allowing secure administrative sessions within a private network. See "Tcpadminport" on page 234 for more information.

Method 2:

For the client scheduler in prompted mode, it is unnecessary to open *any* ports on the firewall. If you set the ***sessioninitiation*** option to *serveronly*, the client will not attempt to contact the server. *All sessions will be initiated by server prompted scheduling* on the port defined on the client with the ***tcpclientport*** option. The ***sessioninitiation*** option only affects the behavior of the client scheduler running in the prompted mode.

The Tivoli Storage Manager server must set the SESSIONINITiation parameter on the REGISTER NODE and UPDATE NODE commands for each node. If the server specifies SESSIONINITiation=*clientorserver*, the default, the client can decide which method to use. If the server specifies SESSIONINITiation=*serveronly*, all sessions are initiated by the server.

Notes:

1. Using the ***sessioninitiation*** option requires a Tivoli Storage Manager Version 5.2 or higher server and client.
2. If you set the ***sessioninitiation*** option to *serveronly*, with the exception of CAD-managed schedulers, the command line client and GUI client will still attempt to initiate sessions, but are blocked by the Tivoli Storage Manager server for nodes which have the ***sessioninitiation*** option set to *serveronly*.
3. When installing Tivoli Storage Manager scheduler using the setup wizard, and the Tivoli Storage Manager server is behind a firewall, the node password will not get stored on the client machine. As a result, the scheduler service be unable to authenticate to the server when the server contacts client to execute a schedule. In this case, you can run the scheduler from the command line (dsmc schedule), wait until a scheduled operation starts, and enter the password for your node when prompted.

   A similar problem can occur if an encryption key is required for backup operations. In this case, you can run the scheduler from the command line (dsmc schedule), wait until a scheduled backup starts, and enter the encryption key when prompted. After the password and encryption key are updated, you must restart the scheduler.

If you set the ***sessioninitiation*** option to *client*, the client will initiate sessions with the server (Method 1) by communicating on the TCP/IP port defined with the *server* option ***tcpport***. This is the default. Server prompted scheduling be used to prompt the client to connect to the server.

See "Sessioninitiation" on page 226 for more information about the ***sessioninitiation*** option.

When using Tivoli Storage Manager across a firewall, please consider the following:

- In *prompted* mode the Tivoli Storage Manager server needs to contact the client. In order to do this, some software need to be installed on the Tivoli Storage Manager server to route the request through the firewall. This software routes the server request through a socks port on the firewall. This is typically called *socksifying* a system. Proxies are not supported, because they only route a few types of communication protocols (HTTP, FTP, GOPHER). Tivoli Storage Manager communications are not routed by proxies. It is important to note that the client creates a new connection to the Tivoli Storage Manager server when prompted. This means that the firewall configuration discussed above must be in place.

- The server cannot log events to a Tivoli Enterprise Console server across a firewall.

In an enterprise environment, we strongly recommend that you use the Tivoli Storage Manager Secure Web Administrator Proxy for Web administration of the Tivoli Storage Manager server. Install the proxy on a Web server that sits on the firewall so that the Web server can access resources on both sides of the firewall (this is sometimes called the *demilitarized zone*). When you set up the proxy, you can use it to administer any Tivoli Storage Manager server at Version 3.7 or higher. For more information on how to install and use the proxy, see the appendix about the Web proxy in the Tivoli Storage Manager Quick Start manuals listed in Table 28.

Table 28. Tivoli Storage Manager Quick Start publications

Publication title	Order number
IBM Tivoli Storage Manager for AIX Quick Start	GC32-0770
IBM Tivoli Storage Manager for HP-UX Quick Start	GC32-0774
IBM Tivoli Storage Manager for Linux Quick Start	GC23-4692
IBM Tivoli Storage Manager for z/OS Quick Start	GC32-0777
IBM Tivoli Storage Manager for OS/400 PASE Quick Start	GC23-4696
IBM Tivoli Storage Manager for Sun Solaris Quick Start	GC32-0780
IBM Tivoli Storage Manager for Windows Quick Start	GC32-0784

Return codes from the command line interface

The backup-archive command line interface and the scheduler exit with return codes that accurately reflect the success or failure of the client operation. Users who already have scripts, batch files, or other scheduling or automation facilities that interpret the return code from the command line interface need to make changes in order to accommodate these new return codes.

In general, the return code is related to the highest severity message during the client operation.

- If the highest severity message is informational (ANSnnnnI), then the return code will be 0.
- If the highest severity message is a warning (ANSnnnnW), then the return code will be 8.
- If the highest severity message is an error (ANSnnnnE or ANSnnnnS), then the return code will be 12.

The exception to the above rules is warning or error messages that individual files could not be processed. For such a skipped file, the return code will be 4. For cases where the return code is not 0, you can examine the TSM Error Log file (and, for scheduled events, the dsmsched.log file).

For a description of the return codes and their meanings, see Table 29

Table 29. Return codes and their meanings

Code	Explanation
0	All operations completed successfully.

Table 29. Return codes and their meanings (continued)

Code	Explanation
4	The operation completed successfully, but some files were not processed. There were no other errors or warnings. This return code is very common. Files are not processed for various reasons. The most common reasons are: • The file satisfies an entry in an exclude list. • The file was in use by another application and could not be accessed by the client. • The file changed during the operation to an extent prohibited by the copy serialization attribute. See "Copy serialization" on page 97.
8	The operation completed with at least one warning message. For scheduled events, the status will be *Completed*. Review TSM Error Log (and dsmsched.log for scheduled events) to determine what warning messages were issued and to assess their impact on the operation.
12	The operation completed with at least one error message (except for error messages for skipped files). For scheduled events, the status will be *Failed*. Review the TSM Error Log file (and dsmsched.log file for scheduled events) to determine what error messages were issued and to assess their impact on the operation. As a general rule, this return code means that the error was severe enough to prevent the successful completion of the operation. For example, an error that prevents an entire from being processed yields return code 12. When a file is not found the operation yields return code 12.
other	For scheduled operations where the scheduled action is COMMAND, the return code will be the return code from the command that was executed. If the return code is 0, the status of the scheduled operation will be *Completed*. If the return code is nonzero, then the status will be *Failed*. Some commands issue a nonzero return code to indicate success. For these commands, you can avoid a *Failed* status by *wrapping* the command in a script that invokes the command, interprets the results, and exits with return code 0 if the command was successful (the script should exit with a nonzero return code if the command failed). Then ask your Tivoli Storage Manager server administrator to modify the schedule definition to invoke your script instead of the command.

The return code for a client macro will be the highest return code issued among the individual commands that comprise the macro. For example, suppose a macro consists of these commands: If the first command completes with return code 0; the second command completes with return code 8; and the third command completes with return code 4, the return code for the macro will be 8.

Also see "Handling return codes from preschedulecmd and postschedulecmd scripts" on page 316.

Displaying information about scheduled work

Schedules can be classic or enhanced, depending on how the interval to the next execution is defined. Classic schedules allow the period to be as small as an hour. Enhanced schedules allow actions to be executed on specific days. Enhanced schedules were added in Tivoli Storage Manager Version 5.3, but they can be executed by pre-Version 5.3 clients. If using a pre-Version 5.3 client, users should pay attention to the ″next execution″ field.

To view schedules that are defined for your client node, enter:

```
dsmc query schedule
```

Tivoli Storage Manager displays detailed information about all scheduled work for your client node. Figure 1 displays sample classic **query schedule** output.

```
 Schedule Name: DAILY_INC
   Description: Daily System-wide backup
Schedule Style: Classic
        Action: Incremental
       Options: QUIET
       Objects:
      Priority: 1
Next Execution: 30 minutes
      Duration: 4 Hours
        Period: 1 Day
   Day of Week: Any
         Month:
  Day of Month:
 Week of Month:
        Expire: Never

 Schedule Name: WEEKLY_INC
   Description: Weekly backup for project files
Schedule Style: Classic
        Action: Incremental
       Options: QUIET
       Objects: /proj
      Priority: 1
Next Execution: 60 minutes
      Duration: 8 Hours
        Period: 7 Days
   Day of Week: Friday
         Month:
  Day of Month:
 Week of Month:
        Expire: Never
```

Figure 1. Sample classic query schedule output

The schedule name, **DAILY_INC**, starts a daily incremental backup. The next incremental backup will start in 30 minutes. Because no objects are listed, Tivoli Storage Manager runs the incremental backup on your default domain. The schedule has no expiration date.

To more accurately determine the status of scheduled events, the **query schedule** output for an enhanced schedule, on Tivoli Storage Manager Version 5.3 client and above, includes new fields. These fields are always displayed, even if it is a classic schedule or a Tivoli Storage Manager Version 5.3 client session with a pre-Version 5.3 server, but the new fields are blank. Note that for a down-level (prior to Tivoli Storage Manager Version 5.3) client, the server reports the period as indefinite and the day of week as an illegal day. Figure 2 on page 90 displays sample enhanced **query schedule** output.

```
Schedule Name: QUARTERLY_FULL
     Description: Quarterly full backup
  Schedule Style: Enhanced
          Action: Selective
         Options: subdir=yes
         Objects: \* \volumes\fs2\*
        Priority: 5
  Next Execution: 1744 Hours and 26 Minutes
        Duration: 1 Day
          Period:
     Day of Week: Friday
           Month: March, June, September, December
    Day of Month: Any
   Week of Month: Last
          Expire: Never

Schedule Name: QUARTERLY_FULL
     Description: Quarterly full backup
  Schedule Style: Enhanced
          Action: Selective
         Options: subdir=yes
         Objects: /* /Volumes/fs2/*
         Priority: 5
  Next Execution: 1744 Hours and 26 Minutes
        Duration: 1 Day
          Period:
     Day of Week: Friday
           Month: March, June, September, December
    Day of Month: Any
   Week of Month: Last
          Expire: Never
```

Figure 2. Sample enhanced query schedule output

For more information about the enhanced **query schedule**, see the following publications:

- *IBM Tivoli Storage Manager for AIX Administrator's Reference*
- *IBM Tivoli Storage Manager for AIX Administrator's Guide*
- *IBM Tivoli Storage Manager for HP-UX Administrator's Reference*
- *IBM Tivoli Storage Manager for Linux Administrator's Reference*
- *IBM Tivoli Storage Manager for Sun Solaris Administrator's Reference*
- *IBM Tivoli Storage Manager for Sun Solaris Administrator's Guide*
- *IBM Tivoli Storage Manager for Windows Administrator's Reference*
- *IBM Tivoli Storage Manager for Windows Administrator's Guide*

Displaying information about completed work

After scheduled work is performed, check the schedule log to verify that all work completed successfully.

When a scheduled command is processed the schedule log contains the following entry:

```
Scheduled event eventname completed successfully
```

The client indicates whether Tivoli Storage Manager successfully issued the scheduled command associated with the *eventname*. No attempt is made to determine the success or failure of the command. You can assess the status of the

command by evaluating the return code from the scheduled command in the schedule log. The schedule log entry for the command's return code is prefaced with the following text:

```
Finished command. Return code is:
```

The schedule log continues to grow unless you prune it using the ***schedlogretention*** option or specify a maximum size using the ***schedlogmax*** option.

Scheduling options for commands

The scheduler executes commands under a user ID of `0` (root); however, some commands might need to be executed under a user ID other than `0`. In this case, your Tivoli Storage Manager administrator can define schedules for commands that will be executed under a user ID different from the scheduler user ID using the ***schedcmduser*** server option.

The ***schedcmduser*** option specifies the name of a valid user on the system where a scheduled command is executed. This option can only be defined by the Tivoli Storage Manager server administrator. If this option is specified, the command is executed with the authorization of the specified user. Otherwise, it is executed with the scheduler authorization.

```
►►──SCHEDCMDUser──user_name──────────────────────────────────────────►◄
```

user_name
Specifies the name of a valid user on the system where a scheduled command is executed.

Note: The ***schedcmduser*** option does NOT affect the user ID used for the pre-schedule and post-schedule commands. Pre-schedule and post-schedule always run as root (user ID 0).

Enabling or disabling scheduled commands

You can use the ***schedcmddisabled*** option to disable the scheduling of commands by the server. Commands are scheduled by using the ***action***=**command** option on the **define schedule** server command.

The ***schedcmddisabled*** option does not disable the ***preschedulecmd*** and ***postschedulecmd*** commands. However, you can specify ***preschedulecmd*** or ***postschedulecmd*** with a blank or a null string to disable the scheduling of these commands. See "Schedcmddisabled" on page 215 for more information.

Chapter 8. Understanding storage management policies

Storage management policies are rules your administrator defines in order to manage your backups and archives on the server. You can associate (or *bind*) your data to these policies; then when the data is backed up or archived, it is managed according to policy criteria. Policy criteria include a policy domain, a policy set, a management class, and a copy group .

Policies determine:
- Whether a file is eligible for backup or archive services.
- How many backup versions to keep.
- How long to keep inactive backup versions and archive copies.
- Where to place the copies in storage.
- For incremental backup, policies also determine:
  - How frequently a file can be backed up.
  - Whether a file must change before it is backed up again.

This chapter explains:
- Policy criteria (policy domains, policy sets, copy groups, and management classes).
- How to display policies.
- How Tivoli Storage Manager associates your data with policies.

Using policy domains and policy sets

A *policy domain* is a group of clients with similar requirements for backing up and archiving data. Policy domains contain one or more policy sets. An administrator uses policy domains to manage a group of client nodes in a logical way. For example, a policy domain might include:
- A department, such as Accounting.
- A physical location, such as a particular building or floor.
- A local area network, such as all clients associated with a particular file server.

Tivoli Storage Manager includes a default policy domain named *Standard*. At first, your client node might be associated with the default policy domain. However, your administrator can define additional policy domains if there are groups of users with unique backup and archive requirements.

A *policy set* is a group of one or more management classes. Each policy domain can hold many policy sets. The administrator uses a policy set to implement different management classes based on business and user needs. Only one of these policy sets can be active at a time. This is called the *active policy set*. Each policy set contains a *default management class* and any number of additional management classes.

Using management classes and copy groups

A *management class* is a collection of backup and archive copy groups that establishes and contains specific storage management requirements for backing up and archiving data. An administrator can establish separate management classes to meet the backup and archive requirements for different kinds of data, such as:
- System data that is critical for the business.

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- Application data that changes frequently.
- Report data that Management reviews monthly.
- Legal information that must be retained indefinitely, requiring a large amount of disk space.

Most of the work you do with storage management policies is with management classes. You must associate (or *bind*) each file and directory that you back up and each file that you archive with a management class:

- If you do not associate a file with a management class, Tivoli Storage Manager uses the default management class in the active policy set.
- For backing up directories, you can specify a management class with an ***include*** statement or the ***dirmc*** option. If you do not specify a management class, Tivoli Storage Manager uses the management class in the active policy set specifying the longest retention period.
- For archiving directories, you can specify a management class with an ***include.archive*** statement or the ***archmc*** option. If you do not specify a management class, the server assigns the default management class to the archived directory. If the default management class has no archive copy group, the server assigns the management class that currently has the archive copy group with the shortest retention time.

You can use ***include*** statements in your include-exclude list to associate files with management classes. See "Selecting a management class for files" on page 98 for more information. In your Preferences file, you can associate folders with a management class, using the ***dirmc*** option. See "Selecting a management class for folders" on page 100 for more information.

Within a management class, the specific backup and archive requirements are in *copy groups*. Copy groups define the specific storage management attributes that describe how the server manages backed up or archived data. Copy groups include both *backup copy groups* and *archive copy groups*. A management class can have one backup copy group, one archive copy group, both, or neither.

A *backup copy group* contains attributes that are used during the backup process to determine:

- Whether a file that has changed since the last backup is backed up again.
- How many days must elapse before a file is backed up again.
- How a file is processed during a backup if it is in use.

It also contains attributes to manage the backup versions of your files on the server. These attributes control:

- Where the server stores backup versions of your files and folders.
- How many backup versions the server keeps of your files and folders.
- How long the server keeps backup versions of your files and folders.
- How long the server keeps inactive backup versions.
- How long the last remaining inactive version of a file is kept.

An *archive copy group* contains attributes that control:

- Whether a file is archived if it is in use
- Where the server stores archived copies of your files
- How long the server keeps archived copies of your files

When the server is unable to rebind a file to an appropriate management class, the server uses one of two values to determine the number of days to retain the file. If it is a backup version, the server uses *backup retention grace period*. Archive copies

are never rebound because each archive operation creates a different archive copy. Archive copies remain bound to the management class name specified when the user archived them. If the management class to which an archive copy is bound no longer exists or no longer contains an archive copy group, the server uses the default management class. If you later change or replace the default management class, the server uses the updated default management class to manage the archive copy. If the default management class does not contain an archive copy group, the server uses the *archive retention grace period* specified for the policy domain. For more information about grace periods, see "Using a retention grace period" on page 101.

Displaying information about management classes and copy groups

Before you select the management classes you want to use, click **View policy information** from the Utilities menu. The **Display policy information** window is displayed. You can then determine which management classes are available.

The **Display policy information** window provides the following information:
- The name of the default management class.
- The name of the policy domain to which the management class belongs.
- The policy set that is currently active.
- The date and time that this policy set became active.
- The number of backup versions which are maintained for files which still exist on your workstation.
- The number of backup versions which are maintained for files which have been deleted from your workstation.
- The number of days to keep inactive backup versions.
- The number of days to keep the last backup version.
- The management class name and a description.

You can also use the ***detail*** option on the **query mgmtclass** command to view the available management classes.

Table 30 shows the default values for the backup and archive copy groups in the standard management class. Each attribute is discussed in more detail immediately following the table.

Table 30. Default values in the standard management class

Attribute	Backup default	Archive default
Copy group name	Standard	Standard
Copy type	Backup	Archive
Copy frequency	0 days	CMD (Command)
Versions data exists	Two versions	Does not apply
Versions data deleted	One version	Does not apply
Retain extra versions	30 days	Does not apply
Retain only version	60 days	Does not apply
Copy serialization	Shared static	Shared static
Copy mode	Modified	Absolute
Copy destination	Backuppool	Archivepool
Retain versions	Does not apply	365 days

Copy group name

The name of the copy group. The default value for both backup and archive is *Standard*.

Copy type

The type of copy group. The value for backup is always *Backup*, and the value for archive is always *Archive*.

Copy frequency

Copy frequency is the minimum number of days that must elapse between successive incremental backups. Use this attribute during a full incremental backup.

Copy frequency works with the *mode* parameter. For example, if frequency is *zero (0)* and mode is *modified*, a file or folder is backed up *only if* it changed since the last incremental backup. If frequency is *zero (0)* and mode is *absolute*, a file is backed up every time you run an incremental backup against it. This attribute is not checked for selective backups.

For archive copy groups, copy frequency is always CMD (command). There is no restriction on how often you archive a file.

Versions data exists

The *Versions Data Exists* attribute specifies the maximum number of different backup versions retained for files and folders currently on your volume. If you select a management class that permits more than one backup version, the most recent version is called the *active* version. All other versions are called *inactive* versions. If the maximum number of versions permitted is five, and you run a backup that creates a sixth version, the oldest version is deleted from server storage.

Versions data deleted

The *Versions Data Deleted* attribute specifies the maximum number of different backup versions retained for files and folders that you erased from your volume. This parameter is ignored as long as the file or folder remains on your volume.

If you erase the file or folder, the next time you run an incremental backup, the active backup version is changed to inactive and the oldest versions are erased that exceed the number specified by this parameter.

The expiration date for the remaining versions is based on the *retain extra versions* and *retain only version* parameters.

Retain extra versions

The *Retain Extra Versions* attribute specifies how many days all but the most recent backup version is retained. The most recent version is the active version, and active versions are never erased. If *Nolimit* is specified, then extra versions are kept until the number of backup versions exceeds the *versions data exists* or *versions data deleted* parameter settings. In this case, the oldest extra version is deleted immediately.

Retain only version

The *Retain Only Version* attribute specifies the number of days the last remaining inactive version of a file or folder is retained. If *Nolimit* is specified, the last version is retained indefinitely.

This parameter goes into effect during the next incremental backup after a file is deleted from the client machine. Any subsequent updates to this parameter will not affect files that are already inactive. For example: If this parameter is set to 10 days when a file is inactivated during an incremental backup, the file will be deleted from the server in 10 days.

Copy serialization

The *Copy Serialization* attribute determines whether a file can be in use during a backup or archive, and what to do if it is. The value for this attribute can be one of the following:

- **Static**. A file or folder must not be modified during a backup or archive. If the object is changed during a backup or archive attempt, it is not backed up or archived.
- **Shared static**. A file or folder must not be modified during backup or archive. Tivoli Storage Manager attempts to perform a backup or archive as many as four additional times, depending on the value specified on the ***changingretries*** option in your Preferences file. If the object is changed during every backup or archive attempt, it is not backed up or archived.
- **Dynamic**. A file or folder is backed up or archived on the first attempt regardless of whether it changes during a backup or archive.
- **Shared dynamic**. A file or folder is backed up or archived regardless of whether it changes during a backup or archive. Tivoli Storage Manager attempts to perform a backup or archive as many as four additional times, depending on the value specified on the ***changingretries*** option in your Preferences file without the file changing during the attempt. The file is backed up or archived on the last try even if it has changed.

  Attention: Be careful when you select a management class containing a copy group that specifies shared dynamic or dynamic for serialization backup. If you select a management class that permits a file to be backed up or archived while it is in use, the backup version or archived copy stored on the server might be a fuzzy copy. A *fuzzy copy* is a backup version or archived copy that does not accurately reflect what is currently in the file. It might contain some, but not all, of the changes. If that is not acceptable, select a management class that creates a backup version or archive copy only if the file does not change during a backup or archive.

  If you restore or retrieve a file that contains a fuzzy copy, the file might not be usable. You should not use dynamic or shared dymamic serialization to back up files, unless you are absolutely certain that a restore of a fuzzy copy will be usable.

Copy mode

The *Copy Mode* attribute determines whether a file or folder is considered for incremental backup regardless of whether it changed or not since the last backup. Tivoli Storage Manager does not check the mode for selective backups. The value for this parameter can be one of the following:

- **Modified.**The file is considered for incremental backup *only if* it has changed since the last backup. A file is considered changed if any of the following are true:
  - The date or time of the last modification is different.
  - The file size is different.
  - If only the file meta-data changes (such as access permissions), but the file data does not change, Tivoli Storage Manager back up only the meta-data.
- **Absolute.** The file is considered for incremental backup regardless of whether it changed since the last backup. For archive copy groups, the mode is always *absolute*, indicating that a file is archived regardless of whether it changed since the last archive request.

Copy destination

Names the destination where backups or archives are stored. The destination can be either a storage pool of disk devices or a storage pool of devices that support removable media, such as tape.

Retain versions

Specifies the number of days an archived file remains in storage. When the specified number of days elapse for an archived copy of a file, it is deleted from server storage.

Selecting a management class for files

If the default management class meets the backup and archive requirements for all the files on your workstation, it is not necessary to take any action to associate your files with that management class. This is done automatically when you back up or archive your files.

When selecting a different management class for your files, consider these questions:

- Does the management class contain a backup copy group?

  If you attempt to back up a file associated with a management class that does not contain a backup copy group, the file is not backed up.
- Does the management class contain an archive copy group?

  You cannot archive a file associated with a management class that does not contain an archive copy group.
- Does the backup copy group contain attributes that back up your files often enough?

  Mode and frequency work together to control how often a file is backed up when you use incremental backup. Tivoli Storage Manager does not check those attributes for selective backup.
- Do the copy groups specify either static or shared static for serialization?

  If serialization is shared dynamic or dynamic, you might get fuzzy backups or archive copies. Verify that this is acceptable. For example, you might want to use shared dynamic or dynamic serialization for a file to which log records are continuously added. If you used static or shared static serialization, the file might never be backed up because it is constantly in use. With shared dynamic or dynamic serialization, the file is backed up, but the backup version of the file might contain inconsistent data. Do not use shared dynamic or dynamic serialization for a file if it is very important that the backup version or archive copy contain all changes.

- Does the backup copy group specify an adequate number of backup versions to keep, along with an adequate length of time to keep them?
- Does the archive copy group specify an adequate length of time to keep archived copies of files?

Assigning a management class to files

A management class defines when your files are included in a backup, how long they are kept on the server, and how many versions of the file the server should keep. The server administrator selects a default management class. You can specify your own management class to override the default management class.

To assign a management class other than the default to folders, use the ***dirmc*** option in your TSM System Preferences file *within* a server stanza. See "Dirmc" on page 141 for more information.

You can assign a management class for a file or file group by using an **include** statement in your Preferences file. Management class names are not case-sensitive.

Using the command line client, to associate the file `/Users/jones/budget.jan` with the management class budget, you would enter:

```
include /Users/jones/budget.jan budget
```

To specify a management class named **managall** to use for all files to which you do not explicitly assign a management class, enter:

```
include /.../* managall
```

The example below demonstrates how to use a management class:

```
exclude /.../*sno
include "/Volumes/La Pomme/winter/.../*Ice"      mcweekly
include "/Volumes/La Pomme/winter/December/*Ice" mcdaily
include "/Volumes/La Pomme/winter/January/*Ice"  mcmonthly
include "/Volumes/La Pomme/winter/winter/white sno"
```

Processing follows these steps:

1. The file name white sno is backed up following bottom-up processing rules. Because you did not specify a management class, the file is assigned to the default management class.
2. Any file ending with `ice` in the /Volumes/La Pome/winter/January folder is assigned to the management class, **mcmonthly**.
3. Any file ending with `ice` in the /Volumes/La Pome/winter/December folder is assigned to the management class, **mcdaily**.
4. Any files ending with `ice` in any directory under /Volumes/La Pomme/winter/December are assigned to the management class, **mcweekly**.
5. Any file ending with `sno` (except (for /Volumes/La Pomme/winter/winter/white sno) in any directory is excluded from backup.

To specify your own default management class for files that are not explicitly included, specify:

```
include /.../* mgmt_class_name
```

as the first include or exclude option defined. See "Include options" on page 173 for more information about the ***include*** option.

Overriding the management class for archived files

When you archive a file, you can override the assigned management class using the graphical user interface (GUI), or by using the ***archmc*** option on the **archive** command. Overriding the management class using the GUI is equivalent to using the ***archmc*** option on the **archive** command. To use the GUI, press the **Options** button on the archive tree to override the management class and select a different management class.

On the command line, to associate the file `/Users/van/Documents/budget.jan` with the management class **ret2yrs**, you would enter:

```
dsmc archive –archmc=ret2yrs /Users/van/Documents/budget.jan
```

Selecting a management class for folders

If the management class in your active policy set containing the longest "Retain only version" (RETONLY) setting meets your backup requirements for folders, it might not be necessary to take any action to associate folders with that management class. Tivoli Storage Manager does it automatically when it backs up your folders.

If there is more than one management class with the longest RETONLY setting, then the Tivoli Storage Manager client selects the management class whose name is first or last in alphabetical order.

If the default management class does not meet your requirements, select a management class with an adequate retention period specified by the *retain only version* parameter. For example, if the management class happens to back up data directly to tape, but you want your directory backups to go to disk, you will need to choose a different management class. You should keep directories at least as long as you keep the files associated with those folders.

For backup directories, use the ***dirmc*** option to specify the management class to which directories will be bound.

For archive directories, use the ***archmc*** option with the **archive** command.

You can use these methods to view the available management classes and their attributes:

- GUI : Select **View Policy Information** from the **Utilities** menu.
- Command line client: Run **dsmc query mgmtclass -detail**.

Note: During expiration processing on a Tivoli Storage Manager server, if an archived directory is eligible for expiration, the server checks if any existing archived files require the archived directory to remain. If so, the archived directory is not expired and the Tivoli Storage Manager client updates the insert date on the archived directory to ensure that the directory is not expired before the files under it.

Binding and rebinding management classes to files

Binding associates a file with a management class. When you back up a file for the first time, Tivoli Storage Manager binds it to either the default management class or the management class specified in your include-exclude list. In later full incremental backups of the same file, if you change the management class, both active and inactive versions are bound again to the new management class.

If the backup copy group for the management class specifies keeping multiple backup versions of the file, and you request multiple backups, the server always has one active backup version (the current version) and one or more inactive backup versions of the file. All backup versions of a file are bound to the same management class and are managed based on the attributes in the backup copy group.

When you archive a file for the first time, Tivoli Storage Manager binds it to the default management class, to the management class specified in your include-exclude list, or to a management class you specify when modifying your archive options during an archive.

Archived files are never rebound to a different management class. If you change the management class for a file using an ***include.archive*** statement, the ***archmc*** option, or through the Tivoli Storage Manager GUI, any previous copies of the file that you archived remain bound to the management class specified when you archived them.

Rebinding backup versions of files

Backups of files are bound again to a different management class in the following conditions. In each condition, the files (active and inactive) are not bound again until the next backup.

- You specify a different management class in an Include statement to change the management class for the file. The backups are managed based on the old management class until you run another backup.
- Your administrator deletes the management class from your active policy set. The default management class is used to manage the backup versions when you back up the file again.
- Your administrator assigns your client node to a different policy domain and the active policy set in that domain does not have a management class with the same name. The default management class for the new policy domain is used to manage the backup versions.

Using a retention grace period

Tivoli Storage Manager also provides a *backup retention grace period* and an *archive retention grace period* to help protect your backup and archive data when it is unable to rebind a file to an appropriate management class. The backup retention grace period is used when:

- You change the management class for a file, but neither the default management class nor the new management class contain a backup copy group.
- The management class to which a file is bound no longer exists, and the default management class does not contain a backup copy group.

The backup retention grace period, defined in your policy domain, starts when you run an incremental backup. The default is 30 days. However, your administrator can lengthen or shorten this period.

When Tivoli Storage Manager manages a file using the backup retention grace period, it does not create any new backup versions of the file. All existing backup versions of the file expire 30 days (or the number of days specified in your policy domain) from the day they are marked inactive.

Archive copies are never rebound because each archive operation creates a different archive copy. Archive copies remain bound to the management class name specified when the user archived them. If the management class to which an archive copy is bound no longer exists or no longer contains an archive copy group, the server uses the default management class. If you later change or replace the default management class, the server uses the updated default management class to manage the archive copy. If the default management class does not contain an archive copy group, the server uses the archive retention grace period specified for the policy domain.

Using event-based policy retention protection

All management classes with an archive copy group must specify a retention period, for example, the number of days that an archived object will be stored on the server before being deleted. Event-based policy provides the option of beginning the retention period either at the time the object is archived or at a later date when an activation event is sent to the server for that object.

Using the Tivoli Storage Manager copy group value RETINIT=CREATE starts the data retention period when the file is archived. Using the copy group value RETINIT=EVENT starts the data retention period when the server is notified that the event has occurred.

The following example demonstrates this concept:

The user has two files, `create.file` and `event.file`. The user has available two management classes; CREATE, with RETINIT= CREATE, and EVENT, with RETINIT=EVENT. Both management classes have a 60-day retention period. The user, on the same day, archives both files:

```
dsmc archive create.file -archmc=CREATE
dsmc archive event.file -archmc=EVENT
```

Ten days later, the user issues the **set event** ***-type=hold*** command for the `create.file` file, so the file cannot be deleted. On the same day the user issues the **set event** ***-type=activate*** for the `event.file` file. At this time, `create.file` has 50 days left on its retention period, and `event.file` has 60 days. If no other action is taken, `create.file` will remain on the server forever, and `event.file` will be expired 70 days after it was created (60 days after its event occurred). However, let's say that 20 days after the initial archive, the user issues **set event** ***-type=release*** for the `create.file` file. Thirty days of its retention period have passed, so the file will be expired in 30 days (the hold does not extend the retention period).

Archiving files on a data retention server

Up to this point, there is no difference between archiving files on a normal server or a data retention server.

The following example demonstrates the differences between the two servers, and what can be done at day 5:

If the files were archived on a non-data retention server, the user can issue the **delete archive** ***create.file event.file*** command and both files will be deleted. If the files were archived on a data retention server, the same command will fail both files. The data retention server forces the user to keep archives until the stated retention criteria are met.

Now let's see the difference at day 15 (after the hold):

The **delete archive** ***create.file event.file*** command on the non-data retention server now deletes `event.file`, but returns a *cannot delete* error for `create.file` because it is in hold status. That same command to a data retention server still rejects the deletion of both files.

Refer to "Set Event" on page 309 for more information about the **set event** command.

See the *IBM Tivoli Storage Manager Administrator's Guide* for your operating system, for more information about RETINIT.

Chapter 9. Using processing options

You can use defaults for processing options or you can tailor the processing options to meet your specific needs. This chapter:
- Provides an overview of processing options.
- Includes an options reference section that provides detailed information about each option. See "Using options with commands" on page 116 for more information.

Overview of processing options

Tivoli Storage Manager uses *processing options* that you specify in your TSM System Preferences or TSM User Preferences to control communications, backup-archive processing, and other types of processing.

This section provides an overview of the following types of options that you can use:
- Communication options
- Server and Node options
- Backup and archive processing options
- Restore and retrieve processing options
- Scheduling options
- Format and language options
- Authorization options
- Error processing options
- Transaction processing option
- Diagnostics options

See Chapter 2, "Configuring Tivoli Storage Manager," on page 11 for information on how to create and modify your TSM System Preferences or TSM User Preferences file.

Tivoli Storage Manager also includes a group of client command options that you can enter *only* on the command line with specific commands. You can override some of the options in your options file by entering them with appropriate backup-archive commands. For a complete list of command line options, a description, and where to go in this book for more information, see Table 42 on page 117.

Communication options

You use communication options to specify how your client node communicates with a Tivoli Storage Manager server.

Macintosh only supports the TCP/IP communication protocol. Use the ***commmethod*** option to specify the TCP/IP communication protocol. For more information, see "Commmethod" on page 129.

Ask your Tivoli Storage Manager administrator for assistance in setting your communication options.

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TCP/IP options

To use the TCP/IP communication protocol, you must include the ***tcpserveraddress*** option in your TSM System Preferences file. The other TCP/IP options have default values that you can modify if you want to change the default value.

Table 31. TCP/IP options

Option	Description	Page
lanfreetcpserveraddress	Specifies the TCP/IP address for the Tivoli Storage Manager storage agent.	235
tcpbuffsize	Specifies the size, in kilobytes, of the Tivoli Storage Manager internal TCP/IP communication buffer.	235
tcpnodelay	Specifies whether the server or client disables the delay of sending successive small packets on the network.	238
tcpadminport	Specifies a separate TCP/IP port number on which the server is waiting for requests for administrative client sessions, allowing secure administrative sessions within a private network.	234
tcpport	Specifies the TCP/IP port address for a Tivoli Storage Manager server.	239
tcpserveraddress	Specifies the TCP/IP address for a Tivoli Storage Manager server.	240
tcpwindowsize	Specifies the size, in kilobytes, of the TCP/IP sliding window for your client node.	241
webports	Enables the use of the scheduler program outside a firewall by specifying the TCP/IP port number used by the Client Acceptor daemon.	251

Server and Node options

Use the following options to specify the server to contact for backup-archive services, and the client node for which to request backup-archive services.

Server options

Use the ***servername*** option in your TSM System Preferences file to begin a group of options (stanzas) used to connect to a Tivoli Storage Manager server. You can set up multiple groups of stanzas in the TSM System Preferences file to connect to different servers. Each servername stanza must have listed below it all client option stanzas required to establish communication with a server. The stanza list can also contain other options for backup-archive operations.

If your TSM System Preferences file contains only one stanza - Your client node contacts the server you specify in that stanza for all services.

If your TSM System Preferences file contains more than one stanza - You can specify a default server with the ***defaultserver*** option. If you do not specify a default server, Tivoli Storage Manager contacts the server you specify in the first stanza of your TSM System Preferences file.

Place the ***defaultserver*** option at the beginning of your TSM System Preferences file before any server stanzas. See “Defaultserver” on page 137 for more information.

Use the ***servername*** option in the TSM User Preferences file to specify a server to contact for backup-archive services. This overrides the default server specified in your TSM System Preferences file.

Figure 3 shows a sample TSM System Preferences file.

```
DEFAULTServer                 server2

SErvername     server1
  NODename                    node1
  COMMMethod                  TCPip
  TCPPort                     1500
  TCPServeraddress            node.domain.company.com
  PASSWORDAccess              generate
  GRoups                      qadev qadev1 tools23
  USERs                       ashton stewart kaitlin
  inclexcl                    /Users/user1/Documents/backup1.excl
SErvername     server2
  NODename                    node2
  COMMMethod                  TCPip
  TCPPort                     1500
  TCPServeraddress            node.domain.company.com
  PASSWORDAccess              prompt
  GRoups                      qadev qadev1 tools23
  USERs                       ashton stewart kaitlin
  inclexcl                    /Users/user1/Documents/backup2.excl
```

Figure 3. Sample TSM System Preferences file

Node options

Table 32. Server and Node Options

Option	Description	Page
defaultserver	The name of the Tivoli Storage Manager server to contact for backup-archive services by default if more than one server is defined in the TSM System Preferences file.	137
asnodename	Use the ***asnodename*** option to allow agent nodes to back up or restore data on behalf of another node (the target node). This enables concurrent operations from multiple nodes to store data to the same target node and file space in parallel.	123
nodename	Use the ***nodename*** option in your TSM System Preferences file *within* a server stanza to identify your workstation to the server to establish communications.	188
servername	In the TSM System Preferences file, this option specifies the name of a server and starts a server stanza. In the TSM User Preferences file, this option specifies the Tivoli Storage Manager server to contact for services.	224
virtualnodename	The ***virtualnodename*** option specifies the node name of your workstation when you want to restore or retrieve files to a different workstation.	250

Backup and archive processing options

You can use the following options to control some aspects of backup and archive processing.

Table 33. Backup and archive processing options

Option	Description	Page
archmc	Use the ***archmc*** option with the **archive** command to specify the available management class for your policy domain to which you want to bind your archived files.	122
asnodename	Use the ***asnodename*** option to allow agent nodes to back up or restore data on behalf of another node (the target node). This enables concurrent operations from multiple nodes to store data to the same target node and file space in parallel.	123
autofsrename	Specifies whether to rename an existing file space on a Unicode-enabled server so a Unicode-enabled file space can be created for the current operation.	125
changingretries	Specifies the number of retries when attempting to back up or archive a file that is in use.	127
compressalways	The ***compressalways*** option specifies whether to continue compressing an object if it grows during compression. Use this option with the ***compression*** option.	132
compression	The ***compression*** option compresses files *before* you send them to the server. Compressing your files reduces data storage for backup versions and archive copies of your files.	133
deletefiles	Use the ***deletefiles*** option with the **archive** command to delete files from your workstation after you archive them.	138
description	The ***description*** option assigns or specifies a description for files when performing archive, delete, retrieve, query archive or query backupset operations.	139
detail	Use the ***detail*** option to display management class, file space, backup, and archive information depending on the command with which it is used.	140
dirmc	Specifies the management class to use for directories. If you do not specify this option, the client uses the management class in the active policy set of your policy domain with the longest retention period.	141
dirsonly	Backs up, restores, archives, retrieves, or queries directories *only*.	142
domain	Specifies the volumes to include in your default client domain for an incremental backup.	144
enablearchiveretentionprotection	Allows the client to connect to a data retention server.	147

Table 33. Backup and archive processing options (continued)

Option	Description	Page
exclude ***exclude.backup*** ***exclude.file*** ***exclude.file.backup***	Use these options to exclude a file or group of files from backup services.	156
exclude.archive	Excludes a file or a group of files that match the pattern from archive services *only*.	156
exclude.attribute.symlink	Excludes a file or a group of files that are symbolic links or aliases from backup processing only.	156
exclude.compression	Excludes files from compression processing if you set the ***compression*** option to *yes*. This option applies to backups and archives.	156
exclude.dir	Excludes a directory, its files, and all its subdirectories and their files from backup processing.	156
exclude.encrypt	Excludes specified files from encryption processing.	156
filelist	Specifies a list of files to be processed for the command. Tivoli Storage Manager opens the designated filelist and processes the files listed within according to the command.	159
filesonly	Backs up, restores, retrieves, or queries files *only*.	162
guitreeviewafterbackup	Specifies whether the GUI client is returned to the Backup, Restore, Archive, or Retrieve window after a successful operation completes.	168
inclexcl	Specifies the path and file name of an include-exclude options file.	171
include ***include.backup*** ***include.file***	Use these options to include files or assign management classes for backup processing.	173
include.archive	Includes files or assigns management classes for archive processing.	173
include.compression	Includes files for compression processing if you set the ***compression*** option to *yes*. This option applies to backups and archives.	173
include.encrypt	Includes the specified files for encryption processing. By default, Tivoli Storage Manager does not perform encryption processing.	173
incrbydate	Use with the **incremental** command to request an incremental backup by date.	176
memoryefficientbackup	Specifies a memory-saving backup algorithm for incremental backups when used with the **incremental** command.	186
noprompt	suppresses the confirmation prompt that is presented by the **delete group**, **delete archive**, **expire**, **restore image**, and **set event** commands.	190
optfile	Specifies the you want to use when you start a Tivoli Storage Manager session.	192

Table 33. Backup and archive processing options (continued)

Option	Description	Page
removeoperandlimit	Specifies that Tivoli Storage Manager removes the 20-operand limit for the Macintosh OS X platform. If you specify the ***removeoperandlimit*** option with the **incremental**, **selective**, or **archive** commands, the 20-operand limit is not enforced and is restricted only by available resources or other operating system limits.	209
skipacl	Specifies whether to skip ACL processing completely.	228
skipaclupdatecheck	Specifies whether to perform checksum and size comparisons before and after backup and during incremental processing.	229
subdir	Specifies whether to include subdirectories of a named directory.	230
tapeprompt	Specifies whether you want Tivoli Storage Manager to wait for a tape mount if it is required for a backup, archive, restore, or retrieve process, or to be prompted for a choice.	232
type	Use the ***type*** option with the **query node** command to specify the type of node to query.	246
v2archive	Use the ***v2archive*** option with the **archive** command to archive only files to the server. Tivoli Storage Manager will not process directories that exist in the path of the source file specification.	248

Restore and retrieve processing options

The following options relate to restore and retrieve processing.

Table 34. Restore and retrieve processing options

Option	Description	Page
dirsonly	Qualifies the operation (backup, archive, restore, retrieve) to process directories alone.	142
filelist	Specifies a file containing a list of files to be processed by the specified command.	159
filesonly	Qualifies the operation (backup, archive, restore, retrieve) to process files alone.	162
fromdate	Use the ***fromdate*** option with the ***fromtime*** option to specify a date and time from which you want to search for backups or archives during a restore, retrieve, or query operation.	163
fromnode	Permits one node to perform commands for another node. A user on another node must use the **set access** command to permit you to query, restore, or retrieve files for the other node.	164
fromowner	Displays file spaces for an alternate owner. Also specifies an alternate owner from which to restore or retrieve files.	165

Table 34. Restore and retrieve processing options (continued)

Option	Description	Page
fromtime	Use the ***fromtime*** option with the ***fromdate*** option to specify a beginning time from which you want to search for backups or archives during a restore, retrieve or query operation.	166
guitreeviewafterbackup	Specifies whether the GUI client is returned to the Backup, Restore, Archive, or Retrieve window after a successful operation completes.	168
ifnewer	Replaces an existing file with the latest backup version only if the backup version is newer than the existing file.	169
inactive	Displays a list of active and inactive files when used with the ***pick*** option.	170
latest	Restores the most recent backup version of a file whether it is active or inactive.	179
localbackupset	Specifies whether the Tivoli Storage Manager GUI bypasses initial logon with the server to restore a local backup set on a standalone workstation.	180
location	Specifies where Tivoli Storage Manager searches for the backup set during a query or restore operation.	181
noprompt	suppresses the confirmation prompt that is presented by the **delete group**, **delete archive**, **expire**, **restore image**, and **set event** commands.	190
optfile	Specifies the you want to use when you start a Tivoli Storage Manager session.	192
pick	Creates a list of backup versions or archive copies that match the file specification you enter. From the list, you can select the versions to process. Include the ***inactive*** option to view both active and inactive objects.	197
pitdate	Use the ***pitdate*** option with the ***pittime*** option to establish a point in time for which you want to display or restore the latest version of your backups.	198
pittime	Use the ***pittime*** option with the ***pitdate*** option to establish a point in time for which you want to display or restore the latest version of your backups.	199
preservepath	Specifies how much of the source path to reproduce as part of the target directory path when you restore or retrieve files to a new location.	204
replace	Specifies whether to overwrite an existing file, or to prompt you for your selection when you restore or retrieve files.	210
	Specifies whether you want to include subdirectories of a named directory.	230

Table 34. Restore and retrieve processing options (continued)

Option	Description	Page
tapeprompt	Specifies whether you want Tivoli Storage Manager to wait for a tape required for a restore or retrieve to be mounted, or to prompt you for your choice.	232
todate	Use the ***todate*** option with the ***totime*** option to specify an ending date and time to which you want to search for backups or archives during a restore, retrieve, or query operation.	243
totime	Use the ***totime*** option with the ***todate*** option to specify an ending date and time to which you want to search for backups or archives during a restore, retrieve, or query operation.	243
type	Use the ***type*** option with the **query node** command to specify the type of node to query.	246

Scheduling options

You can use the following options to regulate central scheduling. Tivoli Storage Manager uses scheduling options only when the Scheduler is running.

Table 35. Scheduling options

Option	Description	Page
managedservices	Specifies whether the Storage Manager Client Acceptor daemon manages the scheduler program.	183
maxcmdretries	Specifies the maximum number of times the client scheduler attempts to process a scheduled command that fails.	185
postschedulecmd, postnschedulecmd	Specifies a command to process after running a schedule.	200
preschedulecmd, prenschedulecmd	Specifies a command to process before running a schedule.	202
queryschedperiod	Specifies the number of hours the client scheduler waits between unsuccessful attempts to contact the server for scheduled work.	207
retryperiod	Specifies the number of minutes the client scheduler waits between attempts to process a scheduled command that fails or between unsuccessful attempts to report results to the server.	214
schedcmddisabled	Specifies whether to disable the scheduling of generic commands specified by your Tivoli Storage Manager administrator.	215
schedcmduser (server defined only)	The scheduler executes commands under a uid of 0, however, there be some users who have a different user ID. In this case, your Tivoli Storage Manager administrator can define schedules and allow these schedules to be executed under a uid other than 0, using this option.	91
schedlogmax	Specifies the maximum size of the scheduler log, in megabytes.	216

Table 35. Scheduling options (continued)

Option	Description	Page
schedlogname	Specifies the path and file name where you want to store schedule log information.	217
schedlogretention	Specifies the number of days to keep log file entries in the schedule log, and whether to save pruned entries.	218
schedmode	Specifies which schedule mode to use, *polling* or *prompted*.	
sessioninitiation	Use the ***sessioninitiation*** option to control whether the server or client initiates sessions through a firewall. The default is that the client can initiate sessions.	226
tcpclientaddress	Specifies a TCP/IP address if your client node has more than one address, and you want the server to contact an address other than the one that was used to make the first server contact. Use this option only when the scheduler is running.	236
tcpclientport	Specifies a different TCP/IP port number for the server to contact than the one that was used to make the first server contact. Use this option only when the scheduler is running.	237

Format and language options

You can use the following options to select different formats for date, time, numbers, and for different languages if you have the appropriate client language pack installed for that language.

Table 36. Format and language options

Option	Description	Page
dateformat	Specifies the format for displaying dates.	136
language	Specifies the language used for messages.	177
numberformat	Specifies the format for displaying numbers.	191
timeformat	Specifies the format for displaying time.	242

Command processing options

The following options apply when you use Tivoli Storage Manager commands.

Table 37. Command processing options

Option	Description	Page
editor	Specifies if the command-line interface editor and command retrieve capability is turned on or off.	146
quiet	Limits the number of messages that are displayed on your screen during processing. This option can be overidden by the server.	208
scrolllines	Specifies the number of lines of information that are displayed on your screen at one time. Use this option only when ***scrollprompt*** is set to *yes*.	222

Table 37. Command processing options (continued)

Option	Description	Page
scrollprompt	Specifies whether you want Tivoli Storage Manager to stop and wait after displaying the number of lines of information you specified with the ***scrolllines*** option, or scroll through and stop at the end of the information list.	223
verbose	Specifies that processing information should be displayed on your screen. The alternative is ***quiet***. This option can be overridden by the server.	249

Authorization options

These options control access to a Tivoli Storage Manager server.

Table 38. Authorization options

Option	Description	Page
encryptiontype	Allows you to select AES 128-bit data encryption, providing a stronger form of data encryption than DES 56-bit data encryption.	149
encryptkey	Specifies whether to save the encryption key password locally when performing a backup-archive operation or whether to prompt for the encryption key password.	150
groups	Specifies the groups on your workstation that you want to authorize to request Tivoli Storage Manager services from the server.	167
mailprog	Specifies the program and user ID where you want to send a newly-generated password when the old one expires.	182
password	Specifies a Tivoli Storage Manager password.	193
passwordaccess	Specifies whether you want to use a generated password or be prompted for a password each time you start the client.	194
passworddir	Specifies the directory in which you want to store the automatically generated password for your client node. The encryption key and password are encrypted and stored in the `TSM.PWD` file.	196
users	Authorizes specific users on your workstation to request services from a server.	247

Error processing options

These options specify the name of the error log file and how Tivoli Storage Manager treats the entries in the log file.

Table 39. Error processing options

Option	Description	Page
errorlogmax	Specifies the maximum size of the error log, in megabytes.	152

Table 39. Error processing options (continued)

Option	Description	Page
errorlogname	Specifies the fully qualified path and file name of the file where you want to store information about errors that occur during processing.	153
errorlogretention	Specifies how many days to maintain error log entries before pruning, and whether to save the pruned entries.	154

Transaction processing options

These options control how Tivoli Storage Manager processes transactions between the client and server.

Table 40. Transaction processing options

Option	Description	Page
collocatebyfilespec	Specifies that you want the Tivoli Storage Manager client to use only one server session to send objects generated from one file specification. Setting the ***collocatebyfilespec*** option to *yes* eliminates interspersing of files from different file specifications, by limiting the client to one server session per file specification. Therefore, if you store the data to tape, files for each file specification are stored together on one tape (unless another tape is required for more capacity).	128
commrestartduration	Specifies the maximum number of minutes you want the client to try to reconnect to a Tivoli Storage Manager server after a communication error occurs.	130
commrestartinterval	Specifies the number of seconds you want the client to wait between attempts to reconnect to a Tivoli Storage Manager server after a communication error occurs.	131
diskbuffsize	Specifies the maximum disk I/O buffer size (in kilobytes) that the client can use when reading files.	143
largecommbuffers	This option has been replaced by the ***diskbuffsize*** option. At this time, ***largecommbuffers*** will continue to be accepted by the Tivoli Storage Manager client in order to ease the transition to the new option. However, the value specified by ***largecommbuffers*** will be ignored in favor of the ***diskbuffsize*** setting. **Recommendation:** Discontinue the use of ***largecommbuffers*** because future releases of Tivoli Storage Manager might not accept this option.	
nfstimeout	Specifies the number of seconds the server waits for a status system call on an NFS file system before it times out.	187

Table 40. Transaction processing options (continued)

Option	Description	Page
resourceutilization	Use the ***resourceutilization*** option in your fileTSM System Preferences file *within* a server stanza to regulate the level of resources the Tivoli Storage Manager server and client can use during processing.	212
txnbytelimit	Specifies the number of kilobytes the client program buffers before it sends a transaction to the server.	245

Diagnostics options

Use the **query systeminfo** command to gather Tivoli Storage Manager system information and output this information to a file or the console. The **query systeminfo** command is intended primarily as a diagnostic aid. You can submit the resulting information to technical support personnel for problem diagnosis. See "Query Systeminfo" on page 292 for more information.

Table 41. Diagnostics options

Option	Description	Page
console	Use the ***console*** option with the **query systeminfo** command to output system information to the console.	135
filename	Use the ***filename*** option with the **query systeminfo** command to specify a file name in which to store the system information.	161

Using options with commands

You can override some of the options in your TSM System Preferences file or TSM User Preferences file by entering them with appropriate Tivoli Storage Manager commands.

Tivoli Storage Manager processes options in the following order (precedence):
1. Options defined on the server with server-enforced client options. The server overrides client values.
2. Options entered locally on the command line.
3. Options defined on the server for a schedule using the options parameters.
4. Options entered locally in the options file.
5. Options received from the server with client option sets not set as forced by the server. The server *does not* override client values if not forced.
6. Default option values.

Tivoli Storage Manager also includes a group of client command options that you can enter *only* on the command line with specific commands. For a complete list of command line options, a description, and where to go in this book for more information, see Table 42 on page 117.

Entering options with a command

Follow these general rules to enter options with a command:

- Enter a command, a dash (–), the option name, an equal sign (=), and the option value or parameter. There should be no spaces on either side of the = sign. For example,

  ```
  dsmc archive -description="year end 2002" /Users/agordon/Documents/proj1.rtf
  ```

- For options that do not include parameters, enter a command, a dash (–) and the option name. For example,

  ```
  dsmc incremental -quiet
  ```

  Note: Use a leading dash (-) to indicate that the following text is the name of an option. If an object name begins with a dash, you must surround it in either single quotes (′) or double quotes (″). Most operating system command line processors strip the quotes before submitting the command line arguments to the Tivoli Storage Manager client application. In such cases, using escape characters or doubling the quotes allows the client to receive the quoted object name. In loop mode, surround such objects in either single quotes (′) or double quotes (″).

- Enter either the option name, or an abbreviation for the option name. For example, to enter the ***latest*** option, enter either `-lat` or `-latest`. The capital letters in the syntax of each option indicate the minimum abbreviation for that option name. For information about how to read the syntax diagrams, see "Reading syntax diagrams" on page x.
- Enter options before or after command parameters. For example, you can enter the option before or after a file specification:

  ```
  dsmc selective -subdir=yes "/Users/user1/Documents/*"
  dsmc selective "/Users/user1/Documents/*" -subdir=yes
  ```

- When entering several options on a command, separate them with a blank space.
- Enclose the value in quotes (" ") if the option value that you enter contains a blank space. For example:

  ```
  dsmc archive -description="Project A" "/Users/user1/Documents/*"
  ```

- Most options that you enter on the command line override the value set in the preferences file. However, when you use the ***domain*** option with the **incremental** command, it adds to the domain specified in your preferences file rather than overriding the current value.
- The maximum number of characters for a file name is 255. The maximum combined length of the file name and path name is 1024 characters. Long file name support is provided while running Tivoli Storage Manager on Macintosh X. The maximum length of a file name is limited to 504 bytes (not characters). Because the Unicode representation of a character occupy several bytes, the maximum number of characters that a file name contain can vary.

Table 42 lists client command options that you can enter only on the command line with specific commands.

Table 42. Client command options

Command option	Description	Commands	Page
archmc	Use the ***archmc*** option with the **archive** command to specify the available management class for your policy domain to which you want to bind your archived files.	**archive**	122
console	Use the ***console*** option with the **query systeminfo** command to output system information to the console.	**query systeminfo**	135

Table 42. Client command options (continued)

Command option	Description	Commands	Page
deletefiles	Deletes the local copy of files from your workstation after they are archived on the server.	**archive**	138
description	Assigns or specifies a description for files when performing archive, delete, retrieve, or query archive operations.	**archive** **delete archive** **query archive** **query backupset** **retrieve**	139
detail	Displays management class, file space, backup, and archive information depending on the command with which it is used.	**delete filespace** **query archive** **query backup** **query filespace** **query mgmtclass**	140
dirsonly	Backs up, restores, archives, retrieves, or queries directories *only*.	**archive** **incremental** **query archive** **query backup** **restore** **restore backupset** **retrieve** **selective**	142
filelist	Specifies a list of files to be processed for the command. Tivoli Storage Manager opens the designated filelist and processes the files listed within according to the command.	**archive** **delete archive** **delete backup** **expire** **incremental** **query archive** **query backup** **restore** **retrieve** **selective**	159
filename	Use the ***filename*** option with the **query systeminfo** command to specify a file name in which to store the system information.	**query systeminfo**	161
filesonly	Backs up, restores, retrieves, or queries files *only*.	**archive** **incremental** **query archive** **query backup** **restore** **restore backupset** **retrieve** **selective**	162
fromdate	Use the ***fromdate*** option with the ***fromtime*** option to specify a date and time from which you want to search for backups or archives during a restore, retrieve, or query operation.	**delete backup** **query archive** **query backup** **restore** **retrieve**	163
fromnode	Permits one node to perform commands for another node. A user on another node must use the **set access** command to permit you to query, restore, or retrieve files for the other node.	**query archive** **query backup** **query filespace** **query mgmtclass** **restore** **retrieve**	164

Table 42. Client command options (continued)

Command option	Description	Commands	Page
fromowner	Displays file spaces for an alternate owner. Also specifies an alternate owner from which to restore or retrieve files.	**query archive** **query backup** **restore** **retrieve**	165
fromtime	Specifies a beginning time on the specified date. Use with the ***fromdate*** option. This option is ignored if the ***fromdate*** option is absent.	**query archive** **query backup** **restore** **retrieve**	166
ifnewer	Replaces existing files with the latest backup version only if the backup version is newer than the existing version.	**restore** **restore backupset** **retrieve**	169
inactive	Displays a list of active and inactive files when used with the ***pick*** option.	**query backup** **restore**	170
incrbydate	Requests an incremental backup by date.	**incremental**	176
latest	Restores the most recent backup version of a file whether it is active or inactive.	**restore**	179
location	Specifies whether Tivoli Storage Manager searches for a backup set on the during a query or restore operation.	**query backupset** **restore backupset**	181
noprompt	suppresses the confirmation prompt that is presented by the **delete group**, **delete archive**, **expire**, **restore image**, and **set event** commands.	**delete archive** **delete backup** **expire**	190
optfile	Specifies the you want to use when you start a Tivoli Storage Manager session.		192
pick	Creates a list of backup versions or archive copies that match the file specification you enter. From the list, you can select the versions to process. Include the ***inactive*** option to view both active and inactive objects.	**delete archive** **delete backup** **expire** **restore** **retrieve**	197
pitdate	Use the ***pitdate*** option with the ***pittime*** option to establish a point in time for which you want to display or restore the latest version of your backups.	**query backup** **restore**	198
pittime	Use the ***pittime*** option with the ***pitdate*** option to establish a point in time for which you want to display or restore the latest version of your backups.	**query backup** **restore**	199
preservepath	Specifies how much of the source path to reproduce as part of the target directory path when you restore or retrieve files to a new location.	**restore** **restore backupset** **retrieve**	204
removeoperandlimit	Specifies that Tivoli Storage Manager removes the 20-operand limit for the Macintosh OS X platform. If you specify the ***removeoperandlimit*** option with the **incremental**, **selective**, or **archive** commands, the 20-operand limit is not enforced and is restricted only by available resources or other operating system limits.	**incremental** **selective** **archive**	209
todate	Use the ***todate*** option with the ***totime*** option to specify an ending date and time to which you want to search for backups or archives during a restore, retrieve, or query operation.	**query archive** **query backup** **restore** **retrieve**	243

Table 42. Client command options (continued)

Command option	Description	Commands	Page
totime	Use the ***totime*** option with the ***todate*** option to specify an ending date and time to which you want to search for backups or archives during a restore, retrieve, or query operation.	**query archive** **query backup** **restore** **retrieve**	244
type	Use the ***type*** option with the **query node** command to specify the type of node to query.	**query node**	246
v2archive	Use the ***v2archive*** option with the **archive** command to archive only files to the server. Tivoli Storage Manager will not process directories that exist in the path of the source file specification.	**archive**	248

Initial command line only options

There is a subset of client options that are valid on the initial command line only. Many of these options establish the runtime environment, such as the ***commmethod*** and ***optfile*** options. Options in this category are not valid in interactive, macro, or scheduler modes. They generate an error and cause processing to stop.

Table 43. Options that are valid on the initial command line only

Options valid on the command line

commmethod	***schedlogname***
diskbuffsize	***schedlogretention***
editor	***schedmode***
errorlogname	***servername***
errorlogretention	***sessioninitiation***
language	***tapeprompt***
maxcmdretries	***tcpbuffsize***
nodename	***tcpclientaddress***
optfile	***tcpclientport***
password	***tcpport***
postschedulecmd, postnschedulecmd	***tcpserveraddress***
preschedulecmd, prenschedulecmd	***tcpwindowsize***
queryschedperiod	***txnbytelimit***
resourceutilization	***virtualnodename***
retryperiod	

Client options reference

The following sections contain detailed information about each of the Tivoli Storage Manager processing options. Information for each option includes:

- A description of the option.
- A syntax diagram of the option. The option name contains uppercase and lowercase characters. The uppercase characters indicate the minimum abbreviation you can use for the option name. See "Reading syntax diagrams" on page x for an explanation of these diagrams.
- Detailed descriptions of the option parameters. If the parameter is a constant (a value that does not change), use the minimum abbreviation.
- Examples of using the option in the Preferences file.

Notes:

1. For options with a **yes** parameter, acceptable alternatives are **1**, **true**, and **on**. For options with a **no** parameter, acceptable alternatives are **0**, **false**, and **off**.

2. Do not enclose an option value with single or double quotes, unless the value is a file specification that contains spaces or wildcard characters. For example, the following option is not valid:

```
passwordaccess  "generate"
```

Archmc

Use the ***archmc*** option with the **archive** command to specify the available management class for your policy domain to which you want to bind your archived files and directories. When you archive a file, you can override the assigned management class using the ***archmc*** option on the **archive** command or by using the graphical user interface (GUI). Overriding the management class using the GUI is equivalent to using the ***archmc*** option on the **archive** command.

Syntax

```
►►──ARCHMc =─managementclass──────────────────────────────────────►◄
```

Parameters

managementclass
Specifies an available management class in the active policy set of your policy domain. This management class overrides the default management class and any ***include*** statements for the files and directories you are archiving.

Examples

Command line:

```
dsmc archive –archmc=ret2yrs /Users/van/Documents/budget.jan
```

Asnodename

Authorized User

Use the ***asnodename*** option to allow agent nodes to back up or restore data on behalf of another node (the target node). This enables concurrent operations from multiple nodes to store data to the same target node and file space in parallel. Your client node must be granted access to the target node by the Tivoli Storage Manager server administrative client **grant proxynode** command.

An agent node is a client node which has been granted authority to perform client operations on behalf of a target node.

A target node is a client node which grants authority to one or more agent nodes to perform client operations on its behalf.

For example, you can use the following command to back up shared data for file space /Users stored under the node name MyCluster:

```
dsmc incremental /Users -asnodenodename=MyCluster
```

You can also use the ***asnodename*** option to restore data under another node name on the Tivoli Storage Manager server. You can only restore the data that you own.

The ***asnodename*** option differs from the ***nodename*** option as follows:

- When using the ***nodename*** option, you must enter the password for the node name you specify.
- When using the ***asnodename*** option, you must enter the password for your client agent node to access the data stored for the client target node.

Restrictions: You cannot use the ***asnodename*** option with -fromnode Also, ***asnodename*** can be used for clustered systems, although no specific cluster software is supported.

Supported Clients

This option is valid for all Macintosh clients.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **General** category of the Preferences editor.

Syntax

```
►►──ASNODEname─ targetnode──────────────────────────────────────────►◄
```

Parameters

targetnode
Specifies the node name on the Tivoli Storage Manager server under which you want to back up or restore data.

Examples

TSM System Preferences:

```
asnodename mycluster
```

Command line:

```
-asnodename=mycluster
```

This option is not valid in interactive mode, but it can be defined in the options portion of a schedule definition.

Autofsrename

Authorized User

The ***autofsrename*** option renames an existing file space that is not Unicode enabled on the Tivoli Storage Manager server so that a Unicode-enabled file space with the original name can be created for the current operation.

When you specify `autofsrename yes` in your TSM System Preferences file, and the server value of ***autofsrename*** is set to `client`, Tivoli Storage Manager generates a unique name by appending _OLD to the file space name you specify in the current operation. For example, Tivoli Storage Manager renames the file space `Jaguar` to `Jaguar_OLD`. If the new file space name is too long, the suffix replaces the last characters of the file space name. For example, the `mylongfilesystemname` file space name is renamed to:

```
mylongfilesystem_OLD
```

If the new file space name already exists on the server, Tivoli Storage Manager renames the new file space `Jaguar_OLDx`, where `x` is a unique number.

Tivoli Storage Manager proceeds to create new Unicode-enabled file spaces that contain only the data specified in the current operation. For example, assume that `Jaguar` is the name of your startup disk and you archive all of the .log files in the /Users/user5/Documents directory. Before the archive takes place, the server renames the file space to `Jaguar_OLD`. The archive places the data specified in the current operation into the Unicode-enabled file space named `Jaguar`. The new Unicode-enabled file space now contains only the Users/user5/logs directory and the *.log files specified in the operation. Tivoli Storage Manager stores all subsequent full and partial incremental, selective backup, and archive data in the new Unicode-enabled file spaces.

Renamed file spaces remain on the server as stabilized file spaces. *These file spaces contain all the original data, which you can restore as long as they remain on the server.*

Note: When an existing file space is renamed during Unicode conversion, any access rules defined for the file space remain applicable to the original file space. New access rules must be defined to apply to the new Unicode file space.

After installation, it is recommended that you perform a full incremental backup and rename all existing file spaces that are not Unicode enabled and back up the files and directories within them under the new Unicode-enabled file spaces. This operation requires increased processing time and storage on the server.

File spaces that are not Unicode enabled can be viewed in the character set of the locale from which Tivoli Storage Manager backed up the files. A workstation running in a different locale be unable to view or restore from these file spaces. Unicode-enabled file spaces that are backed up in one locale are visible in all other locales, provided that the workstation has the proper fonts installed. For more information on migrating to Unicode-enabled file spaces, see “Migrating to the Unicode-enabled client” on page 3.

To restore or retrieve from a file space that is not Unicode enabled, specify the source on the server and the destination on the client.

The server can define the ***autofsrename*** option and override the ***autofsrename*** setting on the client.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **General** category, **Rename non-Unicode filespaces during backup/archive** drop-down list box of the Preferences editor.

Syntax

```
                    ┌─Prompt─┐
►►──AUTOFsrename────┼────────┼──────────────────────────────────────────►◄
                    │─Yes────│
                    └─No─────┘
```

Parameters

Yes Specifies that Tivoli Storage Manager automatically renames all file spaces that are not Unicode enabled in the current backup or archive operation.

No Specifies that Tivoli Storage Manager does not rename file spaces that are not Unicode enabled in the current backup or archive operation.

Prompt
Specifies that Tivoli Storage Manager prompts you whether to rename the file spaces that are not Unicode enabled in the current operation. This is the default.

Considerations:

1. This option applies *only* when the server sets the ***autofsrename*** option to `client`.
2. When the client scheduler is running, the default behavior is to not prompt. The next interactive session prompts you to rename the file space.
3. The client prompts one time per file space *only*. If you specify `no` at the prompt, the client cannot rename the file spaces later. However, the Tivoli Storage Manager administrator can rename the file spaces on the server.
4. When backing up files to a file space that is not Unicode enabled, the Unicode-enabled client skips the files and directories with names containing characters from a code page that is different from the current locale.
5. If files and directories with names containing characters from a code page other than the current locale were previously backed up with a client that was not Unicode enabled, they be expired. The Unicode-enabled client expires these files if you do not migrate the file space to a Unicode-enabled file space. You can back up and archived these files to a Unicode-enabled file space.

Examples

TSM System Preferences:

```
autofsrename yes
```

Changingretries

Authorized User

The ***changingretries*** option specifies how many additional times you want the client to attempt to back up or archive a file that is in use. Use this option with the **archive**, **incremental**, and **selective** commands.

This option is applied only when *serialization*, an attribute in a management class copy group, is *shared static* or *shared dynamic*.

With *shared static* serialization, if a file is open during an operation, the operation repeats the number of times that you specify. If the file is open during each attempt, the operation does not complete.

With *shared dynamic* serialization, if a file is open during an operation, the operation repeats the number of times that you specify. The backup or archive occurs during the last attempt whether the file is open or not.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Backup** category, **Number of retries if file is in use** field of the Preferences editor.

Syntax

```
►►──CHAngingretries─ numberretries──────────────────────────────────────►◄
```

Parameters

numberretries
Specifies the number of times a backup or archive operation is attempted if the file is in use. The range of values is zero through 4; the default is 4.

Examples

TSM System Preferences:

```
changingretries 3
```

Command line:

```
-cha=3
```

Collocatebyfilespec

Use the ***collocatebyfilespec*** option to specify whether the Tivoli Storage Manager client uses only one server session to send objects generated from one file specification.

Setting the ***collocatebyfilespec*** option to *yes* attempts to eliminate interspersing of files from different file specifications, by limiting the client to one server session per file specification. Therefore, if you store the data to tape, files for each file specification are stored together on one tape (unless another tape is required for more capacity).

Considerations:

- Use the ***collocatebyfilespec*** option only if the storage pool is going directly to tape. If you use this option going to a disk storage pool, you could affect some load balancing, and therefore, performance.

Note: The server can also define this option in a client option set.

Preferences File

Place this option in the TSM User Preferences file.

Syntax

```
►►──COLlocatebyfilespec──┬─No──┬──────────────────────────────────────►◄
                         └─Yes─┘
```

Parameters

Yes Specifies that you want the Tivoli Storage Manager client to use only one server session to send objects generated from one file specification. Therefore, if you store the data to tape, files for each file specification are stored together on one tape, unless another tape is required for more capacity. Restore performance can increase as a result.

No Specifies that the Tivoli Storage Manager client (depending on the execution dynamics and on the setting of the ***resourceutilization*** option of 3 or higher), use more than one server session to send the files from one file specification. This is the default.

Backup performance increase as a result. If the files are backed up to tape, files will be stored on multiple tapes. Generally, the files specified in the file specification will still be contiguous.

Examples

TSM System Preferences:

```
collocatebyfilespec yes
```

Command line:

```
-collocatebyfilespec=yes
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Commmethod

Authorized User

The ***commmethod*** option specifies the communication method you use to provide connectivity for client-server communication.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Communication** category, **Communication Method** list of the Preferences editor. TCP/IP is the only choice.

Syntax

```
►►──COMMMethod──┬──────────┬──────────────────────────────────────────►◄
                │ ┌─TCPip─┐ │
```

Parameters

TCPip
The Transmission Control Protocol/Internet Protocol (TCP/IP) communication method. This is the default.

Examples

TSM System Preferences:

```
commm tcpip
```

Command line:

```
-commm=tcpip
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Commrestartduration

Authorized User

The ***commrestartduration*** option specifies the maximum number of minutes you want the client to try to reconnect to a Tivoli Storage Manager server after a communication error occurs.

Note: A scheduled event will continue if the client reconnects with the server before the ***commrestartduration*** value elapses, even if the event's startup window has elapsed.

You can use the ***commrestartduration*** option and the ***commrestartinterval*** in busy or unstable network environments to decrease connection failures.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Communication** category, **Common Options** section of the Preferences editor.

Syntax

```
►►──COMMRESTARTDuration─ minutes──────────────────────────────────────►◄
```

Parameters

minutes
: The maximum number of minutes you want the client to attempt to reconnect with a server after a communication failure occurs. The range of values is zero through 9999; the default is 60.

Examples

TSM System Preferences:

```
commrestartduration 90
```

Command line:

```
Does not apply.
```

Commrestartinterval

Authorized User

The ***commrestartinterval*** option specifies the number of seconds you want the client to wait between attempts to reconnect to a Tivoli Storage Manager server after a communication error occurs.

Note: Use this option only when ***commrestartduration*** is a value greater than zero.

You can use the ***commrestartduration*** option and the ***commrestartinterval*** in busy or unstable network environments to decrease connection failures.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Communication** category, **Common Options** section of the Preferences editor.

Syntax

```
►►──COMMRESTARTInterval─ seconds──────────────────────────────────────►◄
```

Parameters

seconds
The number of seconds you want the client to wait between attempts to reconnect with a server after a communication failure occurs. The range of values is zero through 65535; the default is 15.

Examples

TSM System Preferences:

```
commrestartinterval 30
```

Command line:

```
Does not apply.
```

Compressalways

The ***compressalways*** option specifies whether to continue compressing an object if it grows during compression. Use this option with the ***compression*** option.

Use the ***compressalways*** option with the **archive**, **incremental**, and **selective** commands.

Preferences File

Place this option in the TSM User Preferences file. You can set this option on the **Backup** category, **Continue Compressing if Object Grows** check box of the Preferences editor.

Syntax

```
►►──COMPRESSAlways──┬─Yes─┬──────────────────────────────────────────►◄
                    └─No──┘
```

Parameters

Yes File compression continues even if the file grows as a result of compression. This is the default.

No Backup-archive client objects are resent uncompressed if they grow during compression.

Examples

TSM User Preferences:

```
compressalways yes
```

Command line:

```
-compressa=no
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Compression

Authorized User

The ***compression*** option compresses files *before* you send them to the server. Compressing your files reduces data storage for backup versions and archive copies of your files. It can, however, affect Tivoli Storage Manager throughput. A fast processor on a slow network connection benefits from compression, but a slow processor on a fast network connection does not.

Use the ***compression*** option with the **archive**, **incremental**, and **selective** commands.

If you set the ***compressalways*** option to *yes*, compression continues even if the file size increases. To stop compression if the file size grows, and resend the file uncompressed, set the ***compressalways*** option to *no*.

If you set the ***compression*** option to *yes*, you can control compression processing in the following ways:

- Use the ***exclude.compression*** option in your TSM System Preferences file to exclude specific files or groups of files from compression processing. See "Exclude options" on page 156 for more information.
- Use the ***include.compression*** option in your TSM System Preferences file to include files within a broad group of excluded files for compression processing. See "Include options" on page 173 for more information.

This option controls compression *only if* your administrator specifies that your client node can compress files before sending them to the server.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Backup** category, **Compress objects** check box of the Preferences editor.

Syntax

```
►►──COMPRESSIon──┬─No──┬──────────────────────────────────────────►◄
                 └─Yes─┘
```

Parameters

No Files are not compressed before they are sent to the server. This is the default.

Yes Files are compressed before they are sent to the server.

Examples

TSM System Preferences:

```
compression yes
```

Command line:

```
-compressi=no
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Console

Use the ***console*** option with the **query systeminfo** command to output information gathered from one or more of the following items to the console:

- DSMOPTFILE - The contents of TSM User Preference file.
- DSMSYSFILE - The contents of the TSM System Preferences file.
- ENV - Environment variables.
- ERRORLOG - The Tivoli Storage Manager error log file.
- FILE - Attributes for the file name that you specify.
- INCLEXCL - Compiles a list of include-exclude in the order in which they are processed during backup and archive operations.
- OPTIONS - Compiled options.
- OSINFO - Name and version of the client operating system
- POLICY - Policy set dump.
- SCHEDLOG - The contents of the Tivoli Storage Manager schedule log (usually TSM Schedule Log).

Note: The **query systeminfo** command is intended primarily as an aid for IBM support to assist in diagnosing problems, although users who are familiar with the concepts addressed by this information also find it useful. If you use the ***console*** option, no special formatting of the output is performed to accommodate screen height or width. Therefore, the console output be difficult to read due to length and line-wrapping. In this case, it is recommended that you use the ***filename*** option with the **query systeminfo** command to allow the output to be written to a file that can subsequently be submitted to IBM support. See "Filename" on page 161 for more information.

Syntax

```
►►──CONsole──────────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this option.

Examples

Command line:

```
query systeminfo dsmoptfile errorlog -console
```

Dateformat

The ***dateformat*** option specifies the format you want to use to display dates.

By default, the backup-archive and administrative clients obtain format information from the locale definition in effect at the time you start the client. Consult the documentation on your local system for details about setting up your locale definition.

Note: When you change the date format and use the ***schedlogretention*** option to prune the schedule log, Tivoli Storage Manager removes all entries in the schedule log with a different date format when pruning the log. When you change the date format and use the ***errorlogretention*** option to prune the error log, Tivoli Storage Manager removes all entries in the error log with a different date when pruning the log. When changing the date format, copy the schedule log and error log if you want to preserve log entries that contain a different date format.

You can use the ***dateformat*** option with the following commands:

- **delete archive**
- **delete backup**
- **expire**
- **query archive**
- **query backup**
- **query filespace**
- **restore**
- **retrieve**
- **set event**

Preferences File

Place this option in the TSM User Preferences file. You can set this option on the **Regional Settings** category, **Date Format** drop-down list of the Preferences editor.

Syntax

```
►►──DATEformat─ format_number──────────────────────────────────────►◄
```

Parameters

format_number

Displays the date using one of the following formats. Select the number that corresponds to the date format you want to use:

1 MM/DD/YYYY
2 DD-MM-YYYY
3 YYYY-MM-DD
4 DD.MM.YYYY
5 YYYY.MM.DD

Examples

TSM User Preferences:

```
dateformat 3
```

Command line:

```
-date=3
```

Defaultserver

Authorized User

Use the ***defaultserver*** option to specify the name of the Tivoli Storage Manager server to contact for backup-archive services if more than one server is defined in the TSM System Preferences file. By default, Tivoli Storage Manager will contact the server defined by the first stanza in the TSM System Preferences file. This option is only used if the ***servername*** option is not specified in the TSM User Preferences file.

Preferences File

Place this option *at the beginning* of the TSM System Preferences file *before* any server stanzas.

Syntax

```
►►──DEFAULTServer─ servername──────────────────────────────────────────►◄
```

Parameters

servername
Specifies the name of the default server to which you back up or archive files.

Examples

TSM System Preferences:

```
defaults server_a
```

Command line:

```
Does not apply.
```

Deletefiles

Use the ***deletefiles*** option with the **archive** command to delete files from your workstation after you archive them.

Syntax

```
►►──DELetefiles──────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc archive "/Users/dgordon/Documents/*.c" –deletefiles
```

Description

The ***description*** option assigns or specifies a description for files when performing archive, delete archive, retrieve, query archive, or query backupset.

For example, if you want to archive a file named budget.jan and assign to it the description **2002 Budget for Proj 1**, you would enter:

```
dsmc archive –des="2003 Budget for Proj 1" /Users/van/Documents/budget.jan
```

Notes:
1. The maximum length of a description is 254 characters.
2. Enclose the value in quotes (" ") if the option value that you enter contains a blank space.

Use the ***description*** option with the following commands:
- **archive**
- **delete archive**
- **query archive**
- **query backupset**
- **retrieve**

Syntax

```
►►──DEScription =– description──────────────────────────────────────────►◄
```

Parameters

description

Assigns a description to the file you are archiving. If you do not specify a description with the **archive** command, the default is `Archive Date:x`, where `x` is the current system date. Note that the date is always 10 characters long. If your date format uses a two digit year, there will be two blank spaces at the end of the date. For example, a default description using a four-digit year might be `"Archive Date: 2002/05/03"`, and the same default with a two-digit year might be `"Archive Date: 02/05/03 "` (note the two spaces at the end). When retrieving files using the two-digit year description, you can enter the ***-description*** option string in either of the following ways:

```
-description="ArchiveDate: 02/05/03  "
 or
-description="ArchiveDate: 02/05/03*"
```

If you use the **archive** command to archive more than one file, the description you enter applies to each file. For example, to archive a group of files and assign the same description, *Project X*, to each file, you would enter:

```
dsmc archive –description="Project X" "/Users/van/Documents/*.x"
```

You can then use the description to retrieve all of the files.

Examples

Command line:

```
dsmc archive "/Users/van/Documents/*.prj" -des="2003 Budget for Proj 1"
```

Detail

Use the ***detail*** option to display management class, file space, backup, and archive information depending on the command with which it is used.

Use the ***detail*** option with the **query mgmtclass** command to display detailed information about each management class in your active policy set. If you do not use the ***detail*** option, only the management class name and a brief description are displayed on the screen. If you specify the ***detail*** option, information about attributes in each copy group contained in each management class is displayed on the screen. A management class can contain a backup copy group, an archive copy group, both, or neither.

A Unicode-enabled file space not display correctly if the server cannot display the Unicode name. In this case, use the file space identifier (fsID) of the file space to identify these file spaces on the server. Use the ***detail*** option with the **delete filespace** and **query filespace** commands to determine the fsID of a file space. The fsID also appears in the file information dialog in the client GUI.

Use the ***detail*** option with the **query backup** and **query archive** commands to display the last modification date and the of the file you specify.

Syntax

```
►►──DETail──────────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc query mgmtclass -detail
dsmc query filespace -detail
```

Dirmc

Authorized User

The ***dirmc*** option specifies the management class you want to use for directories. If you do not specify this option to associate a management class with directories, the client program uses the management class in the active policy set of your policy domain with the longest retention period. It is recommended that you select a management class for individual directories that retains directories at least as long as it retains the files associated with them.

Note: If you want to back up specific files to a management class see "Assigning a management class to files" on page 99 for more information.

If you specify a management class with this option, all directories specified in a backup operation are bound to that management class.

The ***dirmc*** option specifies the management class of directories you back up and does not effect archived directories. Use the ***archmc*** option with the **archive** command to specify the available management class for your policy domain to which you want to bind your archived directories and files. If you do not use the ***archmc*** option, the server binds archived directories to the default management class. If the default management class has no archive copy group, the server binds archived directories to the management class with the shortest retention period.

The server can also define this option.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Backup** category, **Directory Management Class** section in the Preferences editor.

Syntax

```
►►──DIRMc─ mgmtclassname──────────────────────────────────────────►◄
```

Parameters

mgmtclassname
Specifies the name of the management class you want to associate with directories. The client uses the management class name that you specify for all directories that you back up. If you do not specify this option, the client associates the management class with the longest retention period with directories.

Examples

TSM System Preferences:

```
dirm managdir
```

Command line

```
Does not apply.
```

Dirsonly

The ***dirsonly*** option processes directories *only*. The client does not process files.

Use the ***dirsonly*** option with the following commands:

- **archive**
- **incremental**
- **query archive**
- **query backup**
- **restore**
- **restore backupset**
- **retrieve**
- **selective**

Syntax

```
►►──DIrsonly──────────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc query backup -dirsonly "/Users/*"
```

Diskbuffsize

Authorized User

The ***diskbuffsize*** option specifies the maximum disk I/O buffer size (in kilobytes) that the client can use when reading files.

Note: The ***diskbuffsize*** option replaces the ***largecommbuffers*** option.

Optimal backup, archive migration client performance can usually be achieved if the value for this option is equal to or smaller than the amount of file read ahead provided by the client file system. A larger buffer will require more memory and might not improve performance.

Recommendation: Use the default setting, unless otherwise directed by IBM support personnel.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax

```
►►──DISKBuffsize─ size──────────────────────────────────────────────►◄
```

Parameters

size Specifies the maximum disk I/O buffer size (in kilobytes) that the client will use when reading files. The range of values is 16 through 1023; the default is 32.

Examples

TSM System Preferences:

```
diskbuffsize 32
```

Command line:

```
Does not apply.
```

Domain

The ***domain*** option specifies the volumes that you want to include for incremental backup in your client domain.

Note: The server can also define this option.

Use the ***domain*** option in your TSM User Preferences file to define your default client domain. Tivoli Storage Manager uses your default client domain in the following situations to determine which volumes to process during an incremental backup:

- When you run an incremental backup using the **incremental** command and you do not specify which volumes to process.
- When your administrator defines a schedule to run an incremental backup for you, but does not specify which volumes to process.
- When you select the **Backup Domain** action from the Tivoli Storage Manager GUI .

If you do not use the ***domain*** option to specify volumes in your TSM User Preferences file, Tivoli Storage Manager uses the *all-local* parameter as the default.

When you use the ***domain*** option with the **incremental** command, Tivoli Storage Manager adds volumes that you specify to the volumes defined in your TSM User Preferences file. For example, if you enter the following in your preferences file:

```
domain /
```

and the following on the command line:

```
dsmc incremental -domain=/Volumes/puma
```

Tivoli Storage Manager performs an incremental backup of the startup disk and /Volumes/puma, the puma volume.

If you use both a file specification and the ***domain*** option with the **incremental** command, Tivoli Storage Manager ignores the ***domain*** option and processes only those volumes that you specify in the file specification. For example, if you enter:

```
dsmc incremental /Volumes/jaguar -domain=/Volumes/puma
```

Tivoli Storage Manager performs an incremental backup for the /Volumes/jaguar volume only.

You can also exclude volumes by specifying the dash (-) operator before the volumes. For example, in the following option Tivoli Storage Manager will process all local volumes except for the jaguar volume:

```
domain ALL-LOCAL -/Volumes/jaguar
```

Note: You cannot use the (-) operator in front of a domain keyword such as ALL-LOCAL.

Preferences File

Place this option in the TSM User Preferences file. You can set this option on the **Backup** category, **Domain for Backup** section of the Preferences editor.

Syntax

```
                  ┌──────────────┐
                  │  ┌─all-local─┐│
►►──DOMain────────┴──┼─domain────┼┴──────────────────────────────────────►◄
                     └─ -domain──┘
```

Parameters

all-local
Backs up all local volumes. This is the default.

domain
Defines the volumes to include in your default client domain.

A volume name must be enclosed in quotes if it includes any spaces.

-domain
Defines the volumes to exclude in your default client domain.

Examples

TSM User Preferences:

```
domain all-local
domain all-local -/Volumes/volume2
domain all-local -/Volumes/volume2 '-/Volumes/Macintosh HD'
```

Command line:

```
-domain="/ /Volumes/volume2"
-domain="all-local -/Volumes/volume2"
```

Editor

The ***editor*** option turns the command line interface (CLI) editor and retrieve capability on or off.

Because certain terminal settings result in non-standard input, the editor not work as defined in this document. In this case, you can disable the editor by setting the ***editor*** option to *no* in your TSM System Preferences file *or* the TSM Users Preferences file.

Preferences File

Place this option in the TSM System Preferences file *or* the TSM Users Preferences file.

Syntax

```
►►──EDitor──┬─Yes─┬──────────────────────────────────────────────────►◄
            └─No──┘
```

Parameters

Yes Turns on the CLI editor and command retrieve capability. This is the default.

No Turns off the CLI editor and command retrieve capability.

Examples

TSM System Preferences or TSM User Preferences:

```
editor yes
```

Command line:

```
-editor=yes
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Enablearchiveretentionprotection

The ***enablearchiveretentionprotection*** option allows the client to connect to a Tivoli Storage Manager data retention server to ensure that archive objects will not be deleted from the server until policy-based retention requirements for that object have been satisfied. This option is ignored if the client connects to a server that is not retention protection enabled. If the option is 'no' (the default) and an attempt is made to connect to a data retention server, the connection will be refused.

The data retention server is specially configured for that task, so normal backup or restore processing is rejected by the server. When the client is connected to a data retention server, the following commands will not be available. If you attempt to use these commands, a message will be displayed indicating that they are not valid with this server.

- incremental
- backup (all subcommands)
- selective
- restore (all subcommands except **restore backupset -*location=file*** or **-*location=tape***)

  Note: **restore backupset -*location=file*** or **-*location=tape*** do not connect to any server (except the virtual one) and thus will not be blocked under any circumstances.
- restart restore
- delete backup
- delete group
- expire
- All queries *except:*
  - query access
  - query archive
  - query diskinfo
  - query filespace
  - query inclexcl
  - query managementclass
  - query node
  - query options
  - query schedule
  - query session
  - query systeminfo
  - query tracestatus

Preferences File

This option is valid only in a server stanza in the TSM System Preferences file and is not valid in a client option set from the server. It is not valid on any command line.

Syntax

```
►►──ENABLEARCHIVERETENTIONProtection──┬─No──┬──────────────────────────────►◄
                                      └─Yes─┘
```

Parameters

No The data retention server connection is refused. This is the default.

Yes The client connects to a data retention server.

Encryptiontype

The ***encryptiontype*** option allows you to select AES 128-bit data encryption, providing a stronger form of data encryption than DES 56-bit data encryption. The encryption type only affects backup and archive operations. The data that you include is stored in encrypted form, and encryption does not affect the amount of data sent or received. During restore and retrieve operations, the encrypted data will be decrypted with the proper encryption algorithm, regardless of the setting for this option.

Notes:

1. Files that are backed up using AES 128-bit encryption cannot be restored with an older level client. However, if you ever need to reinstall and use an older client, files backed up by the Tivoli Storage Manager Version 5.3 client, using 56-bit DES encryption, can be restored with an older client.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can also set this option on the **Authorization** tab of the Preferences editor. The server can override this.

Syntax

```
►►──ENCRYPTIONType──┬─DES56──┬──────────────────────────────────────►◄
                    └─AES128─┘
```

Parameters

DES56
DES 56-bit data encryption. This is the default.

AES128
AES 128-bit data encryption. AES 128-bit data encryption provides a stronger form of data encryption than DES 56-bit data encryption.

Examples

Options file:

```
encryptiontype aes128
```

Command line:

```
Does not apply.
```

Encryptkey

Authorized User

The ***encryptkey*** option specifies whether to save the encryption key password locally when performing a backup-archive operation or whether to prompt for the encryption key password. The encryption key password is saved to the TSM.PWD file in encrypted format. Tivoli Storage Manager client encryption allows you to enter a value of up to 63 characters in length. This encryption password needs to be confirmed when encrypting the file for backup, and also needs to be entered when performing restores of encrypted files.

If you set the ***encryptkey*** option to *save*, you are only prompted the first time you perform an operation. Thereafter, Tivoli Storage Manager does not prompt for the password.

If you do not save the encryption key password, you are prompted for the initial encryption key password when you begin encryption processing.

You can encrypt the data that is sent to the server during a backup or archive operation using standard encryption. If you use the encryption feature to encrypt your data during backup or archive, you *must* have the encryption key in order to restore or retrieve the data. If the encryption key is not available on the client machine (via the ***encryptkey*** option) and you forgot the encryption key, then the data *cannot* be restored or retrieved under any circumstances.

Table 44 shows how both Authorized Users and non-Authorized Users can encrypt or decrypt data during a backup or restore operation depending on the value specified for the ***passwordaccess*** option. The encryption key is saved when an encrypted backup operation is run by the Authorized User, ***passwordaccess*** is set to generate and ***encryptkey*** is set to *save*.

Table 44. Encrypting or decrypting data

Operation	Passwordaccess option	Encryptkey option	Result
Authorized user backup	generate	prompt	prompted for encryptkey password, data encrypted
	generate	save	data encrypted using the saved key
	prompt	prompt	prompted for encryptkey password, data encrypted
	prompt	save	data not encrypted
Non-authorized user backup	generate	prompt	encryption not authorized
	generate	save	data encrypted using the saved key
	prompt	prompt	encryption not authorized
	prompt	save	encryption not authorized
Authorized or non-authorized user restore	generate	prompt	prompted for encryptkey password, data decrypted
	generate	save	data decrypted using the saved key
	prompt	prompt	prompted for encryptkey password, data decrypted
	prompt	save	prompted for encryptkey password, data decrypted

Preferences File

Place this option in the TSM System Preferences file. You can set this option on the **Authorization** category, **Encryption Key Password** section of the Preferences editor.

Syntax

```
►►──ENCRYPTKey──┬─save───┬──────────────────────────────────────────►◄
                └─prompt─┘
```

Parameters

save
Specifies that you want to save the encryption key password to the local TSM.PWD file. If you set the ***encryptkey*** option to *save*, you are only prompted the first time you perform an operation. Thereafter, Tivoli Storage Manager does not prompt for the encryption password. This is the default.

prompt
Tivoli Storage Manager prompts for the encryption password for each backup, archive, and restore operation.

Examples

TSM System Preferences:

```
encryptkey prompt
```

Errorlogmax

Authorized User

The ***errorlogmax*** option specifies the maximum size of the error log, in megabytes.

If you change from ***errorlogmax*** to ***errorlogretention***, all existing log entries are retained and the log is pruned using the new ***errorlogretention*** criteria.

If you change from ***errorlogretention*** to ***errorlogmax***, all records in the existing log are copied to the pruned log TSM Error Pruned Log, the existing log is emptied, and logging begins under the new log wrapping criteria.

If you change the value of the ***errorlogmax*** option, the existing log is extended or shortened to accommodate the new size. If the value is reduced, the oldest entries are deleted to reduce the file to the new size.

Restriction: You cannot specify a non-zero ***errorlogmax*** value *and* enable ***errorlogretention***.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **General** category, **Select Error Log** button of the Preferences editor.

Syntax

```
►►──ERRORLOGMAX─ size──────────────────────────────────────────────►◄
```

Parameters

size
Specifies the maximum size, in megabytes, for the log file. The range of values is 0 to 2047; the default is 0, which disables log file wrapping and allows the log file to grow indefinitely.

Examples

TSM System Preferences:

```
errorlogmax 2000
```

Command line:

```
-errorlogmax=2000
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Errorlogname

Authorized User

The ***errorlogname*** option specifies the fully qualified path and file name of the file in which to store information about errors that occur during processing.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **General** category, **Select Error Log** button of the Preferences editor.

Syntax

```
►►──ERRORLOGName─ filespec──────────────────────────────────────────►◄
```

Parameters

filespec

The fully qualified path and file name in which to store error log information. If any part of the path you specify does not exist, Tivoli Storage Manager attempts to create it.

Attention: Use the DSM_LOG environment variable to specify the directory where the log is to be placed. The directory specified must have permissions which allow write access from the account under which the client is run.

The default file name is 'TSM Error Log' and it is placed one of the following locations:

```
~/Library/Logs/tivoli/tsm/
/Library/Logs/tivoli/tsm/
```

Examples

TSM System Preferences:

```
errorlogname /Users/user1/tsmerror.log
```

Command line:

```
-errorlogname=/Users/user1/tsmerror.log
```

This option is valid only on the initial command line. It is not valid in interactive mode.

The location of the log file specified using the Client Service Configuration Utility or the client configuration wizard overrides the location specified in the client options file (dsm.opt).

Errorlogretention

Authorized User

The ***errorlogretention*** option specifies how many days to maintain error log entries before pruning, and whether to save the pruned entries. The error log is pruned when the first error is written to the log after a Tivoli Storage Manager session is started. If the only session you run is the client scheduler, and you run it twenty-four hours a day, the error log might not be pruned according to your expectations. Stop the session and start it again to prune the error log when the next error is written.

If you change from ***errorlogretention*** to ***errorlogmax***, all records in the existing log are copied to the pruned log TSM Error Pruned Log, the existing log is emptied, and logging begins under the new log wrapping criteria.

If you change from ***errorlogmax*** to ***errorlogretention***, all existing log entries are retained and the log is pruned using the new ***errorlogretention*** criteria.

Restriction: You cannot specify ***errorlogretention*** *and* a non-zero ***errorlogmax*** value.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **General** category, **Select Error Log** button of the Preferences editor.

Syntax

```
►►──ERRORLOGRetention──┬─N────────┬──┬─D─┬──────────────────────────────►◄
                       └─days─────┘  └─S─┘
```

Parameters

N or *days*
Specifies how long to wait before pruning the error log.

N Do not prune the error log. This permits the error log to grow indefinitely. This is the default.

days
The number of days to keep log file entries before pruning the log. The range of values is zero through 9999.

D or *S*
Specifies whether to save the pruned entries. Enter a space or comma to separate this parameter from the previous one.

D Discard the error log entries when you prune the log. This is the default.

S Save the error log entries when you prune the log.

The pruned entries are copied from the error log to **TSM Error Pruned Log**.

Examples

TSM System Preferences:

```
errorlogretention 400 S
```

Command line:

```
-errorlogr=400,S
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Exclude options

Authorized User

The exclude options exclude objects from backup or archive services. For example, you might want to exclude all temporary files, any local caches of network files, all files that contain compiled object code that you can easily reproduce using other methods, or your operating system files.

You can exclude specific files from encryption processing during a backup.

Notes:

1. When you exclude a file that was previously included, existing backup versions become inactive during the next incremental backup.
2. The server can define exclude options with the ***inclexcl*** option.

Exclude any system files that could corrupt the operating system when recovered. You should also exclude the directory containing the Tivoli Storage Manager client files.

Attention: See "Excluding system files" on page 28 for a list of files that you should always exclude.

Use wildcard characters to exclude a broad range of files. See "Including and excluding groups of files" on page 30 for a list of wildcard characters that you can use. Then, if necessary, use the ***include*** option to make exceptions.

To exclude an entire directory called `/Volumes/User1/any/test`, enter the following:

```
exclude.dir /Volumes/User1/any/test
```

To exclude subdirectories that begin with `"test"` under the `any` directory, enter the following:

```
exclude.dir /.../any/test*
```

Controlling symbolic link and alias processing

Tivoli Storage Manager treats symbolic links and aliases as actual files and backs them up. However, the file referenced by the symbolic link is not backed up. In some cases symbolic links and aliases can be easily recreated and need not be backed up. In addition, backing up these symbolic links or aliases can increase backup processing time and occupy a substantial amount of space on the Tivoli Storage Manager server. You can use the ***exclude.attribute.symlink*** option to exclude a file or a group of files that are symbolic links or aliases from backup processing. If necessary, you can use the ***include.attribute.symlink*** option to include symbolic links or aliases within broad group of excluded files for backup processing. For example, to exclude all symbolic links or aliases from backup processing, except those that exist under the /Volumes/Users/user1/Documents directory, enter these statements in your TSM System Preferences file:

```
exclude.attribute.symlink /.../*
include.attribute.symlink /Volumes/Users/user1/Documents/.../*
```

See "Include options" on page 173 for more information about the ***include.attribute.symlink*** option.

Controlling compression processing

If you want to exclude specific files or groups of files from compression processing during a backup or archive operation, consider the following:

- Remember that Tivoli Storage Manager compares the files it processes against the patterns specified in the include-exclude statements, reading from the bottom to the top of the options file.
- You must set the ***compression*** option to *yes* to enable compression processing. If you do not specify the ***compression*** option or you set the ***compression*** option to *no*, Tivoli Storage Manager does not perform compression processing. See "Compression" on page 133 for more information.

  If you set the ***compression*** option to *yes* and no ***exclude.compression*** statements exist, Tivoli Storage Manager considers all files for compression processing.
- Tivoli Storage Manager processes ***exclude.dir*** and other include-exclude statements first. Tivoli Storage Manager then considers any ***exclude.compression*** statements. For example, consider the following include-exclude list:

  ```
  exclude /Users/jones/proj1/*.*
  exclude.compression /Users/jones/proj1/file.txt
  include /Users/jones/proj1/file.txt
  ```

  Tivoli Storage Manager examines the statements (reading from bottom to top) and determines that the /Users/jones/proj1/file.txt file is a candidate for backup, but is not a candidate for compression processing.
- Include-exclude compression processing is valid for backup and archive processing *only*. The ***exclude.compression*** option does not affect whether files are excluded from backup or archive processing, only whether they are excluded from compression processing.
- As with other include-exclude statements, you can use the ***inclexcl*** option to specify a file which is in Unicode format which contains ***exclude.compression*** statements specifying Unicode files. See "Inclexcl" on page 171 for more information.

Preferences File

Place these options in the TSM System Preferences file *within* a server stanza. You can set these options on the **Include-Exclude** category, **Define Include-Exclude Options** section of the Preferences editor.

Syntax

```
►►──options pattern──────────────────────────────────────────►◄
```

exclude, exclude.backup, exclude.file, exclude.file.backup
Use these options to exclude a file or group of files from backup services.

exclude.archive
Excludes a file or a group of files that match the pattern from archive services *only*.

exclude.attribute.symlink
Excludes a file or a group of files that are symbolic links or aliases from backup processing only.

exclude.compression
Excludes files from compression processing if the ***compression*** option is set to *yes*. This option applies to backups and archives.

exclude.dir
Excludes a directory, its files, and all its subdirectories and their files from

backup processing. For example, the statement exclude.dir /Users/dan/test/data1 excludes the /Users/dan/test/data1 directory, its files, and all its subdirectories and their files.

The next time that you perform an incremental backup, the previous backup versions will be inactive. If you exclude a directory that was previously included, Tivoli Storage Manager marks existing backup versions of the files and directories beneath it inactive during the next incremental backup. Use this option to exclude a portion of your data that has no underlying files to back up.

exclude.encrypt
Excludes the specified files from encryption processing. This option does not affect whether files are excluded from backup or archive processing, only whether they are excluded from encryption processing.

Parameters

pattern
Specifies the file or group of files that you want to exclude.

If the pattern begins with a single or double quote or contains any embedded blanks or equal signs, you must surround the value in either single (') or double (") quotation marks. The opening and closing quotation marks must be the same type of quotation marks.

Examples

TSM System Preferences:

```
exclude /unix/
exclude /.../core
exclude /Users/jones/proj1/*
exclude.archive /.../core
exclude.backup /Users/jones/proj1/devplan/
exclude.dir /Users/jones/tmp
exclude.backup /Users/home1/file1
exclude.encrypt /Users/home2/file1
exclude.compression /Users/gordon/proj1/*
exclude.attribute.symlink /.../*
```

Command line:

```
Does not apply.
```

Filelist

Use the ***filelist*** option with the following commands to process a list of files:

- **archive**
- **delete archive**
- **delete backup**
- **expire**
- **incremental**
- **query archive**
- **query backup**
- **restore**
- **retrieve**
- **selective**

The Tivoli Storage Manager client opens the file you specify with this option and processes the list of files within according to the specific command. With the exception of the **restore** and **retrieve** commands, when you use the ***filelist*** option, Tivoli Storage Manager ignores all other file specifications on the command line.

The files (entries) listed in the filelist must adhere to the following rules:

- Each entry must be a fully or partially qualified path to a file or directory or a relative path.
- Each entry must be on a new line.
- Do *not* use wildcard characters.
- Each entry results in the processing of only one object (file or directory).
- If the file name contains any spaces, enclose the file name with quotes.
- The filelist can be an MBCS file or a Unicode file with all Unicode entries.
- Tivoli Storage Manager ignores any entry that is not valid.

The following is an example of a list of files within a filelist:

```
/Users/mike/Documents/file1
/Users/van/Documents/file2
/Users/avi/Documents/file3
/Volumes/fs1/dir2/file3
"/Volumes/fs2/Ha Ha Ha/file.txt"
/Volumes/fs3/file.txt
```

If an entry in the filelist indicates a directory, only that directory will be processed and not the files within the directory.

If the file name (the `filelistspec`) you specify with the ***filelist*** option does not exist, the command fails. Tivoli Storage Manager skips any entries in the filelist that are not valid files or directories. Tivoli Storage Manager logs errors and processing continues to the next entry.

Use file specifications with the **restore** and **retrieve** commands to denote the destination for the restored filelist entries. For example, in the **restore** command:

```
restore -filelist=/Users/van/Documents/file3 /Users/mike/Documents/
```

the file specification /Users/mike/Documents/ represents the restore destination for all entries in the filelist. However, in the **selective** command:

```
selective -filelist=/Users/Documents/file3 /Users/mike/Documents/
```

the file specification /Users/mike/Documents/ is ignored.

If you specify a directory in a filelist for the **delete archive** or **delete backup** command, the directory is not deleted. Filelists that you use with the **delete archive** or **delete backup** command should not include directories.

The entries in the list are processed in the order they appear in the filelist. For optimal processing performance, pre-sort the filelist by file space name and path.

Note: Tivoli Storage Manager back up a directory twice if the following conditions exist:
- The filelist contains an entry for the directory
- The filelist contains one or more entries for files within that directory
- No backup of the directory exists

For example, your filelist includes the entries /Users/van/proj/myfile and /Users/van/proj. If the proj directory does not exist on the server, the /Users/van/proj directory is sent to the server a second time.

Syntax

```
►►──FILEList =─ filelistspec──────────────────────────────────────────►◄
```

Parameters

filelistspec
Specifies the location and name of the file that contains the list of files to process with the command.

Note: When you specify the ***filelist*** option on the command line, the option is ignored.

Examples

Command line:

```
selective -filelist=/Users/avi/Documents/filelist.txt
```

Filename

Use the ***filename*** option with the **query systeminfo** command to specify a file name in which to store information gathered from one or more of the following items:

- DSMOPTFILE - The contents of TSM User Preference file.
- DSMSYSFILE - The contents of the TSM System Preferences file.
- ENV - Environment variables.
- ERRORLOG - The Tivoli Storage Manager error log file.
- FILE - Attributes for the file name that you specify.
- INCLEXCL - Compiles a list of include-exclude in the order in which they are processed during backup and archive operations.
- OPTIONS - Compiled options.
- OSINFO - Name and version of the client operating system
- POLICY - Policy set dump.
- SCHEDLOG - The contents of the Tivoli Storage Manager schedule log (usually TSM Schedule Log).

Note: The **query systeminfo** command is intended primarily as an aid for IBM support to assist in diagnosing problems, although users who are familiar with the concepts addressed by this information also find it useful. If you use the ***console*** option, no special formatting of the output is performed to accommodate screen height or width. Therefore, the console output be difficult to read due to length and line-wrapping. In this case, it is recommended that you use the ***filename*** option with the **query systeminfo** command to allow the output to be written to a file that can subsequently be submitted to IBM support. See "Console" on page 135 for more information.

Syntax

```
►►──FILEName =─ outputfilename──────────────────────────────────────────►◄
```

Parameters

outputfilename
Specifies a file name in which to store the information. If you do not specify a file name, by default the information is stored in the dsminfo.txt file.

Examples

Command line:

```
query systeminfo dsmoptfile errorlog -filename=tsminfo.txt
```

Filesonly

The ***filesonly*** option restricts backup, restore, retrieve, or query processing to files *only*. You cannot restore or retrieve directories from the Tivoli Storage Manager server when using the ***filesonly*** option with the **restore** or **retrieve** commands. However, directories with default attributes are created, if required, as placeholders for files that you restore or retrieve.

You can also use the ***filesonly*** option with the following commands:

- **archive**
- **incremental**
- **query archive**
- **query backup**
- **restore**
- **restore backupset**
- **retrieve**
- **selective**

Syntax

```
►►──FILESOnly──────────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc incremental -filesonly
```

Fromdate

Use the ***fromdate*** option with the ***fromtime*** option to specify a date and time from which you want to search for backups or archives during a restore, retrieve, or query operation. Files that were backed up or archived before this date and time are not included, although older directories might be included, if necessary, to restore or retrieve the files.

Use the ***fromdate*** option with the following commands:

- **delete backup**
- **query archive**
- **query backup**
- **restore**
- **retrieve**

Syntax

```
►►──FROMDate =─ date──────────────────────────────────────────────────►◄
```

Parameters

date

Specifies the date from which you want to search for backup copies or archived files. Enter the date in the format you selected with the ***dateformat*** option.

When you include ***dateformat*** with a command, it must precede the ***fromdate***, ***pitdate***, and ***todate*** options.

Examples

Command line:

```
dsmc query backup -fromdate=12/11/2003 "/Users/van/Documents/*"
```

Fromnode

The ***fromnode*** option permits one node to perform commands for another node. A user on another node must use the **set access** command to permit you to query, restore, or retrieve files for the other node.

Use the ***fromnode*** option with the following commands:

- **query archive**
- **query backup**
- **query filespace**
- **query mgmtclass**
- **restore**
- **retrieve**

Syntax

```
►►──FROMNode =─ node──────────────────────────────────────────────────►◄
```

Parameters

node
Specifies the node name on a workstation or a file server whose backup copies or archived files you want to access.

Examples

Command line:

```
dsmc query archive -fromnode=bob -subdir=yes
"/Users/van/Documents/*"
```

Fromowner

The ***fromowner*** option specifies an alternate owner from which to restore backup versions or archived files. The owner must give access to another to use the files. For example, to restore files from the /Users/devel/proja directory belonging to *usermike* on system ***puma***, and place the restored files in a directory you own named /Users/id/proja, enter:

```
dsmc restore -fromowner=usermike -fromnode=puma /Users/devel/proja/
/Users/id/proja/
```

Note: If you specify the ***fromowner*** option without the ***fromnode*** option, the active user must be on the same node as the ***fromowner*** user.

See "How Tivoli Storage Manager handles long user and group names" on page 49 for information about the character limits for group names.

Use the ***fromowner*** option with the following commands:

- **query archive**
- **query backup**
- **restore**
- **retrieve**

Syntax

```
►►──FROMOwner =─ owner──────────────────────────────────────────────►◄
```

Parameters

owner
Name of an alternate owner.

Examples

Command line:

```
dsmc query archive "/Users/id/proja/*" -fromowner=mark
```

Fromtime

Use the ***fromtime*** option with the ***fromdate*** option to specify a beginning time from which you want to search for backups or archives during a restore, retrieve, or query operation. Tivoli Storage Manager ignores this option if you do not specify the ***fromdate*** option.

Use the ***fromtime*** option with the following commands:

- **delete backup**
- **query archive**
- **query backup**
- **restore**
- **retrieve**

Syntax

```
►►──FROMTime =─ time──────────────────────────────────────────────────►◄
```

Parameters

time

Specifies a beginning time on a specific date from which you want to search for backed up or archived files. If you do not specify a time, the time defaults to 00:00:00. Specify the time in the format you selected with the ***timeformat*** option.

When you include the ***timeformat*** option in a command, it must precede the ***fromtime***, ***pittime***, and ***totime*** options.

Examples

Command line:

```
dsmc q b -timeformat=4 -fromt=11:59AM -fromd=06/30/2003 -tot=11:59PM
-tod=06/30/2003 "/Users/*"
```

Groups

Authorized User

The ***groups*** option specifies system groups on your workstation that you want to authorize to request Tivoli Storage Manager services from the server. You can use the ***groups*** option more than once to specify several group names.

If you do not specify group names with the ***groups*** option, or user IDs with the ***users*** option, *all* users can request Tivoli Storage Manager services. If you use both the ***groups*** option and the ***users*** option, only users specified with these options can request Tivoli Storage Manager services. A root user is always authorized to request services.

See "How Tivoli Storage Manager handles long user and group names" on page 49 for information about the character limits for group names.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax

Parameters

groupname
Specifies the name of a group you want to authorize to request Tivoli Storage Manager services.

Examples

TSM System Preferences:

```
groups  dsmcdev  group1  test1  test2  design1
groups  endicott almaden qadev qadev1 tools23
```

Command line:

```
Does not apply.
```

Guitreeviewafterbackup

The ***guitreeviewafterbackup*** option specifies whether the client returns to the Backup, Restore, Archive, or Retrieve window after a successful operation completes.

Preferences File

Place this option in the TSM User Preferences file. You can set this option on the **General** category, **Return to tree window after function completed** check box of the Preferences editor.

Syntax

```
►►──GUITREEViewafterbackup──┬─No──┬──────────────────────────────────────►◄
                            └─Yes─┘
```

Parameters

No Returns you to the Tivoli Storage Manager main window after a successful operation completes. This is the default.

Yes Returns you to the Backup, Restore, Archive, or Retrieve window after a successful operation completes.

Examples

TSM User Preferences:

```
guitreeviewafterbackup yes
```

Command line:

```
Does not apply.
```

Ifnewer

The ***ifnewer*** option replaces an existing file with the latest backup version only if the backup version is newer than the existing file. Only active backups are considered unless you also use the ***inactive*** or ***latest*** options.

Note: Directory entries are replaced with the latest backup version, whether the backup version is older or newer than the existing version.

Use the ***ifnewer*** option with the following commands:
- **restore**
- **restore backupset**
- **retrieve**

Syntax

```
►►──IFNewer──────────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc restore "/Users/grover/Documents/*" -sub=y -rep=y -ifnewer
```

Inactive

Use the ***inactive*** option with the following commands to display both active and inactive objects:

- **query backup**
- **restore**

Recommendation: When using the ***inactive*** option during a restore operation, also use the ***pick*** or some other filtering option because, unlike the ***latest*** option, all versions will be restored in an indeterminate order. This option is implicit when ***pitdate*** is used.

Syntax

```
►►──INActive──────────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc restore "/Users/zoe/Documents/*" -inactive -pick
```

Inclexcl

Authorized User

The ***inclexcl*** option specifies the path and file name of an include-exclude options file.

Multiple inclexcl statements are permitted. However, you must specify this option for each include-exclude file.

Ensure that you store your include-exclude options file in a directory to which all users have read access.

When processing occurs, the include-exclude statements within the include-exclude file are placed in the list position occupied by the ***inclexcl*** option, in the same order, and processed accordingly.

Considerations for Unicode-enabled clients

The include-exclude file can be in Unicode or non-Unicode format. If you specify a non-Unicode include-exclude file, that file must be in the same code page the client is running. For example, a non-Unicode include-exclude file on an English Macintosh system cannot contain Japanese characters.

A Unicode include-exclude file provides the following benefits:

- Names with characters from another code page no longer have to be wildcarded.
- File names and directories from any code page can be *fully specified* for the Unicode-enabled client to process.

To create an include-exclude file in Unicode format, perform the following steps:

1. Open TextEdit. Click **Format →Make Plain Text**.
2. Enter your ***include*** and ***exclude*** statements using the appropriate include-exclude options in "Using include-exclude options" on page 27.
3. Click **File** and then click **Save As**. The Save As window displays.
4. From **Plain Text Encoding**, select **Unicode (UTF-16)**, specify the file and target directory, and save the file.
5. Place an ***inclexcl*** option specifying the include-exclude file you just created in your TSM System Preferences file.
6. Restart the Tivoli Storage Manager client.

For more information about creating an include-exclude options file, see "Creating an include-exclude list (optional root user or authorized user task)" on page 25.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Include-Exclude** category of the Preferences editor.

Syntax

```
►►──INCLExcl─ filespec──────────────────────────────────────────────────►◄
```

Parameters

filespec
Specifies the path and file name of *one* include-exclude options file.

Examples

TSM System Preferences:

```
INCLExcl /Users/user1/Documents/backup.excl
```

Command line:

```
Does not apply.
```

Include options

Authorized User

The include options specify any of the following:

- Objects within a broad group of excluded objects that you want to include for backup and archive services.
- Files that are included for backup or archive processing that you want to include for encryption processing.
- Files that are included for backup or archive processing that you also want to include for compression processing.
- Objects to which you want to assign a specific management class.
- A management class to assign to all objects to which you do not explicitly assign a management class.

If you do not assign a specific management class to objects, Tivoli Storage Manager uses the default management class in the active policy set of your policy domain. Use the **query mgmtclass** command to display information about the management classes available in your active policy set.

Notes:

1. The ***exclude.dir*** statement overrides all include statements that match the pattern.
2. The server can also define these options with the ***inclexcl*** option.

Controlling symbolic link and alias processing

Tivoli Storage Manager treats symbolic links and aliases as actual files and backs them up. However, the file referenced by the symbolic link is not backed up. In some cases symbolic links and aliases can be easily recreated and need not be backed up. In addition, backing up these symbolic links or aliases can increase backup processing time and occupy a substantial amount of space on the Tivoli Storage Manager server. You can use the ***exclude.attribute.symlink*** option to exclude a file or a group of files that are symbolic links or aliases from backup processing. If necessary, you can use the ***include.attribute.symlink*** option to include symbolic links or aliases within broad group of excluded files for backup processing. For example, to exclude all symbolic links or aliases from backup processing, except those that exist under the Jaguar:Users:user1:Documents directory, enter these statements in your TSM System Preferences file:

```
exclude.attribute.symlink /../*
include.attribute.symlink /Users/user1/Documents/.../*
```

See “Exclude options” on page 156 for more information about the ***exclude.attribute.symlink*** option.

Compression and encryption processing

If you want to include specific files or groups of files for compression and encryption processing during a backup or archive operation, consider the following:

- You must set the ***compression*** option to *yes* to enable compression processing. If you do not specify the ***compression*** option or you set the ***compression*** option to *no*, Tivoli Storage Manager does not perform compression processing. See “Compression” on page 133 for more information.

- Tivoli Storage Manager processes ***exclude.dir*** and other include-exclude statements first. Tivoli Storage Manager then considers any ***include.compression*** and ***include.encrypt*** statements. For example, consider the following include-exclude list:

  ```
  exclude /Users/jones/proj1/file.txt
  include.compression /Users/jones/proj1/file.txt
  include.encrypt /Users/jones/proj1/file.txt
  ```

  Tivoli Storage Manager examines the `exclude /Users/jones/proj1/file.txt` statement first and determines that `/Users/jones/proj1/file.txt` is excluded from backup processing and is, therefore, not a candidate for compression and encryption processing.
- Include-exclude compression and encryption processing is valid for backup and archive processing *only*.
- As with other include-exclude statements, you can use the ***inclexcl*** option to specify a file which is in Unicode format which contains ***include.compression*** and ***include.encrypt*** statements specifying Unicode files. See "Inclexcl" on page 171 for more information.

See "Creating an include-exclude list (optional root user or authorized user task)" on page 25 for more information.

Preferences File

Place these options in the TSM System Preferences file *within* a server stanza. You can set these options on the **Include-Exclude** category, **Define Include-Exclude Options** section of the Preferences editor. Remember that Tivoli Storage Manager compares the files it processes against the patterns specified in the include-exclude statements, reading from the bottom to the top of the options file.

Syntax

```
►►─options pattern ──┬──────────────┬──────────────────────────────►◄
                     └─ mgmtclassname─┘
```

include, include.backup, include.file

Use these options to include files or assign management classes for backup processing.

The ***include*** option affects archive and backup processing. If you want to assign different management classes for archive and backup processing, always specify ***include.archive*** and ***include.backup*** with their own management classes. In the following example, the `archmc` management class is assigned when an archive operation is performed, because ***include.backup*** is used only for backup processing, it is not used for archive processing.

```
include.archive /Users/dan/Documents/* archmc
include.backup /Users/dan/Documents/*
```

include.archive

Includes files or assigns management classes for archive processing.

include.attribute.symlink

Includes a file or a group of files that are symbolic links or aliases within a broad group of excluded files for backup processing only.

include.compression
Includes files for compression processing if you set the ***compression*** option to *yes*. This option applies to backups and archives.

include.encrypt
Includes the specified files for encryption processing. By default, Tivoli Storage Manager does not perform encryption processing.

Attention: The **include.encrypt** option is the only way to enable encryption on the Backup-Archive client. If no **include.encrypt** statements are used, encryption will not occur.

Parameters

pattern
Specifies the objects to include for backup or archive processing or to assign a specific management class.

If the pattern begins with a single or double quote or contains any embedded blanks or equal signs, you must surround the value in either single (') or double (") quotation marks. The opening and closing quotation marks must be the same type of quotation marks.

mgmtclassname
Specifies the name of the management class to assign to the objects. If a management class is not specified, the default management class is used.

Examples

TSM System Preferences:

```
include /Users/proj/text/devel.*
include /Users/proj/text/* textfiles
include * managall
include.archive /Users/proj/text/* myarchiveclass
include.backup /Users/proj/text/* mybackupclass
include.compression /Users/proj/text/devel.*
include.encrypt /Users/proj/gordon/*
include.attribute.symlink /Users/spike/.../*
```

Command line:

```
Does not apply.
```

Incrbydate

Use the ***incrbydate*** option with the **incremental** command to back up new and changed files with a modification date later than the last incremental backup stored at the server, unless you exclude the file from backup. Files added at the client after the last incremental backup, but with a modification date earlier than the last incremental, are not backed up.

An incremental-by-date updates the date and time of the last incremental at the server. If you perform an incremental-by-date on only part of a file system, the date of the last full incremental is not updated and the next incremental-by-date will back up these files again.

Both full incrementals and incrementals-by-date back up new and changed files. An incremental-by-date takes less time to process than a full incremental and requires less memory. However, unlike a full incremental, an incremental-by-date does not maintain current server storage of *all* your workstation files because:

- It does not expire backup versions of files that are deleted from the workstation.
- It does not rebind backup versions to a new management class if the management class has changed.
- It does not back up files with attributes that have changed, unless the modification dates and times have also changed.
- It ignores the copy group frequency attribute of management classes.

Note: If you have limited time during the week to perform backups, but extra time on weekends, you can maintain current server storage of your workstation files by performing an incremental backup with the ***incrbydate*** option on weekdays and a full incremental backup on weekends.

Syntax

```
►►──INCRbydate──────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc incremental -incrbydate
```

Language

The ***language*** option specifies the national language in which to present client messages.

You can use US English (ENU) with all clients. Currently, the Macintosh client only supports US English (ENU).

Preferences File

Place this option in the TSM User Preferences file. You can set this option on the **Regional Settings** category, **Language** drop-down list of the Preferences editor.

Syntax

```
►►──LANGuage─ language──────────────────────────────────────────────►◄
```

Parameters

language
Specifies the language you want to use.

Examples

TSM User Preferences:

```
language enu
```

Command line:

```
Does not apply.
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Largecommbuffers

The ***largecommbuffers*** option has been replaced by ***diskbuffsize***. At this time, ***largecommbuffers*** will continue to be accepted by the Tivoli Storage Manager client in order to ease the transition to the new option. However the value specified by ***largecommbuffers*** will be ignored in favor of the ***diskbuffsize*** setting.

Recommendation: Do not use ***largecommbuffers*** since future releases of Tivoli Storage Manager might not accept this option. See "Diskbuffsize" on page 143 for information on the ***diskbuffsize*** option.

Latest

Use the ***latest*** option with the following commands to restore the most recent backup version of a file, even if the backup is inactive:

- **restore**

If you are performing a point-in-time restore (using the ***pitdate*** option), it is not necessary to specify ***latest*** since this option is implicit when ***pitdate*** is used.

Syntax

```
►►──LATest──────────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc restore "/Users/devel/projecta/*" -latest
```

Localbackupset

The ***localbackupset*** option specifies whether the Tivoli Storage Manager GUI bypasses initial logon with the Tivoli Storage Manager server to restore a local backup set on a standalone workstation. You can place this option in the TSM User Preferences file.

If you set the ***localbackupset*** option to *yes*, the GUI does not attempt initial logon with the server. In this case, the GUI only enables the restore functionality.

If you set the ***localbackupset*** option to *no* (the default), the GUI attempts initial logon with the server and enables all GUI functions.

Note: The **restore backupset** command supports restore of local backup sets on a standalone workstation *without* using the ***localbackupset*** option. See "Restore Backupset" on page 298 for more information.

Preferences File

Place this option in the

TSM User Preferences file.

Syntax

```
►►──LOCALbackupset──┬─No──┬──────────────────────────────────────────►◄
                    └─Yes─┘
```

Parameters

No Specifies that the GUI attempts initial logon with the server and enables all functions. This is the default.

Yes Specifies that the GUI does not attempt initial logon with the server and enables only the restore functionality.

Examples

TSM User Preferences:

```
localbackupset yes
```

Location

The ***location*** option specifies where Tivoli Storage Manager searches for a backup set during a query or restore operation. You can use this option to locate backup sets on the server or local files.

Use the ***location*** option with the **query backupset** and **restore backupset** commands.

Notes:

1. If you use the **restore backupset** command on the initial command line and you set the ***location*** option to *file*, no attempt is made to contact the server.

Syntax

```
►►──LOCation =─┬─server─┬──────────────────────────────────────────►◄
               └─file───┘
```

Parameters

server
Specifies that Tivoli Storage Manager searches for the backup set on the server. This is the default.

file Specifies that Tivoli Storage Manager searches for the backup set on a local file.

Examples

Command line:

```
restore backupset mybackupsetname -loc=server
restore backupset /Users/budget/backupsetfile.name
  -loc=file
```

Mailprog

Authorized User

The ***mailprog*** option passes the information that is specified in the option value to the operating system to execute.

Preferences File

Place this option in the TSM System Preferences *within* a server stanza.

Syntax

```
►►──MAILprog command──────────────────────────────────────────────────►◄
```

Parameters

command
Indicates how you want to invoke a mail program.

Examples

TSM System Preferences:

```
mailprog /usr/bin/mail myusername
```

Command line:

```
Does not apply.
```

Managedservices

Authorized User

The ***managedservices*** option specifies whether the Tivoli Storage Manager Client Acceptor daemon (CAD) manages the scheduler.

See "Using the command line client to handle scheduled events" on page 83 for instructions to set up the CAD to manage the scheduler.

The CAD serves as an external timer for the scheduler. When the scheduler is started, it queries the server for the next scheduled event. The event is either executed immediately or the scheduler exits. The CAD restarts the scheduler when it is time to execute the scheduled event.

Notes:

1. If you set the ***schedmode*** option to *prompt*, the server prompts the CAD when it is time to run the schedule. The scheduler will connect and disconnect to the server when the CAD is first started.
2. Set the ***passwordaccess*** option to *generate* in your TSM System Preferences file and generate a password, so Tivoli Storage Manager can manage your password automatically. See "Passwordaccess" on page 194 for more information.

Using the CAD to manage the scheduler service can provide the following benefits:

- Scheduled events can occur with out a user being logged into the system.
- Memory retention problems that occur when using traditional methods of running the scheduler are resolved. Using the CAD to manage the scheduler requires very little memory between scheduled operations.
- The CAD can manage the scheduler program, reducing the number of background processes on your workstation.
- To use the CAD, you must specify this option in the TSM System Preferences file.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax

```
►►──MANAGEDServices──schedule──────────────────────────────────────────►◄
```

Parameters

schedule
Specifies that the CAD manages the scheduler. This value is required.

Examples

TSM System Preferences:

Task Specify that the CAD manages the scheduler.

```
managedservices schedule
```

Command line:
Does not apply.

Maxcmdretries

Authorized User

The ***maxcmdretries*** option specifies the maximum number of times the client scheduler (on your workstation) attempts to process a scheduled command that fails. The command retry starts *only if* the client scheduler has not yet backed up a file, never connected to the server, or failed before backing up a file. This option is only used when the scheduler is running.

Your Tivoli Storage Manager administrator can also set this option. If your Tivoli Storage Manager administrator specifies a value for this option, that value overrides what you specify in the TSM System Preferences file *after* your client node successfully contacts the server.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Scheduler** category, **Maximum command retries** field of the Preferences editor.

Syntax

```
►►──MAXCMDRetries─ maxcmdretries──────────────────────────────────────►◄
```

Parameters

maxcmdretries
Specifies the number of times the client scheduler can attempt to process a scheduled command that fails. The range of values is zero through 9999; the default is 2.

Examples

TSM System Preferences:

```
maxcmdr 4
```

Command line:

```
-maxcmdretries=4
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Memoryefficientbackup

The ***memoryefficientbackup*** option specifies a memory-conserving algorithm for processing incremental backups, that backs up one directory at a time, using less memory. Use this option with the **incremental** command when your workstation is memory constrained.

Preferences File

Place this option in the TSM User Preferences file. You can set this option on the **Backup** category, **Use memory-saving algorithm** checkbox of the Preferences editor.

Syntax

```
►►──MEMORYEFficientbackup──┬─Yes─┬──────────────────────────────────────►◄
                           └─No──┘
```

Parameters

No Your client node uses the faster, more memory-intensive method when processing incremental backups.

Yes Your client node uses the method that requires less memory when processing incremental backups. This is the default.

Examples

TSM User Preferences:

```
memoryefficientbackup yes
```

Command line:

```
-memoryef=no
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Nfstimeout

Authorized User

The ***nfstimeout*** option specifies the number of seconds the client waits for a status system call on an NFS file system before it times out.

You can use this option to mitigate the default behavior of status calls on file systems. For example, if an NFS file system is stale, a status system call will be timed out by NFS (softmounted) or hang the process (hardmounted).

When the value of this option is changed to a value other than zero, a new thread is created by a caller thread to issue the status system call. The new thread is timed out by the caller thread and the operation can continue.

Preferences File

Place this option in the TSM System Preferences file within a server stanza *or* the client options file TSM User Preferences.

Syntax

```
►►──NFSTIMEout number──────────────────────────────────────────►◄
```

Parameters

number
Specifies the number of seconds the client waits for a status system call on a file system before timing out. The range of values is 0 through 120; the default is 0 seconds.

Examples

Options file:

```
nfstimeout 10
```

Command line:

```
-nfstimeout=10
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Nodename

Authorized User

Use the ***nodename*** option in your TSM System Preferences file *within* a server stanza to identify your workstation to the server. You can use different node names to identify multiple operating systems on your workstation.

If you do not specify this option in the TSM System Preferences file, Tivoli Storage Manager prompts you for the node name when it starts.

When you use the ***nodename*** option, Tivoli Storage Manager prompts for the password assigned to the node you specify, if a password is required.

If you want to restore or retrieve files from the server while you are working from a different workstation, use the ***virtualnodename*** option. See "Virtualnodename" on page 250 for more information.

When connecting to a server, the client must identity itself to the server. This login identification is determined in the following manner:

- In the absence of a ***nodename*** entry in the TSM System Preferences file, or a ***virtualnodename*** entry in the TSM User Preferences file, or a virtual node name specified on a command line, the default login ID is the name that the **hostname** command returns.
- If a ***nodename*** entry exists in the TSM System Preferences file, the ***nodename*** entry overrides the name that the **hostname** command returns.
- If a ***virtualnodename*** entry exists in the TSM User Preferences file, or a virtual node name is specified on a command line, it cannot be the same name as the name returned by the **hostname** command. When the server accepts the virtual node name, a password is required (if authentication is on), even if the ***passwordaccess*** option is *generate*. When a connection to the server is established, access is permitted to any file that is backed up using this login ID.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **General** category, **Node Name** field of the Preferences editor.

Syntax

```
►►──NODename─ nodename──────────────────────────────────────────────►◄
```

Parameters

nodename

Specifies a 1 to 64 character node name for which you want to request Tivoli Storage Manager services. The default is the value returned with the **hostname** command.

Not specifying a node name will permit the node name to default to the host name of the workstation

Examples

TSM System Preferences:

```
nodename cougar
```

Noprompt

The ***noprompt*** option suppresses the confirmation prompt that is presented by the **delete group**, **delete archive**, **expire**, **restore image**, and **set event** commands.

Syntax

```
►►──NOPrompt──────────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc delete archive -noprompt "/Users/van/Documents/*"
```

Numberformat

The ***numberformat*** option specifies the format you want to use to display numbers.

Use this option if you want to change the default number format for the language of the message repository you are using.

By default, the backup-archive and administrative clients obtain format information from the locale definition in effect at the time the client is called. Consult the documentation on your local system for details about setting up your locale definition.

You can use the ***numberformat*** option with the following commands:

- **delete archive**
- **delete backup**
- **expire**
- **query archive**
- **query backup**
- **restore**
- **retrieve**
- **set event**

Preferences File

Place this option in the TSM User Preferences file. You can set this option on the **Regional Settings** category, **Number Format** field of the Preferences editor.

Syntax

```
►►──NUMberformat─ number──────────────────────────────────────────►◄
```

Parameters

number

Displays numbers using any one of the following formats. Specify the number (0–6) that corresponds to the number format you want to use.

0 Use the locale-specified date format. This is the default.
1 1,000.00
2 1,000,00
3 1 000,00
4 1 000.00
5 1.000,00
6 1’000,00

Examples

TSM User Preferences:

```
num 4
```

Command line:

```
-numberformat=4
```

Optfile

The ***optfile*** option specifies the Preferences file you want to use when you start a Tivoli Storage Manager session.

Syntax

```
►►──OPTFILE =─ file_name──────────────────────────────────────────────────►◄
```

Parameters

file_name
Specifies an alternate preferences file, if you use the fully qualified path name. If you specify only the file name, Tivoli Storage Manager assumes the file name specified is located in the current working directory. The default is /Library/Preferences/Tivoli Storage Manager/TSM User Preferences.

Restriction: Specify the full path when you use this option with the Client Acceptor Daemon (dsmcad), because the CAD changes its working directory to root (″/″) after initialization.

Examples

Command line:

```
dsmc query session -optfile="/Users/tsm/Prefs Alpha"
```

CAD:

```
dsmcad -optfile=/Users/admin/Library/Preferences/tsm/mytsm.opt
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Password

Authorized User

The ***password*** option specifies a Tivoli Storage Manager password. If you do not specify this option and your administrator has set authentication to *On*, you are prompted for a password when you start a Tivoli Storage Manager session.

Notes:

1. If the server prompts for a password, the password is not displayed as you enter it. However, if you use the password option on the command line, your password will be displayed as you enter it.
2. If the Tivoli Storage Manager server name changes or Tivoli Storage Manager clients are directed to a different Tivoli Storage Manager server, all clients must re-authenticate with the server because the stored encrypted password must be regenerated.

The ***password*** option is ignored when the ***passwordaccess*** option is set to *generate*.

Preferences File

Place this option in the TSM User Preferences file.

Syntax

```
►►──PASsword─ password──────────────────────────────────────────►◄
```

Parameters

password

Specifies a 1 to 63 character password. A password is not case-sensitive. Valid characters include:

Characters	Description
A–Z	Any letter, A through Z, uppercase or lowercase
0–9	Any number, 0 through 9
+	Plus
.	Period
_	Underscore
-	Hyphen
&	Ampersand

Examples

TSM User Preferences:

```
password secretword
```

Command line:

```
-password=secretword
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Passwordaccess

Authorized User

The ***passwordaccess*** option specifies whether you want to generate your password automatically or set as a user prompt. Your administrator can require a password for your client node by enabling the authentication feature. Ask your administrator if a password is required for your client node.

If a password is required, you can choose to:

- Set the password for your client node yourself and have Tivoli Storage Manager prompt for it each time you request services.
- Let Tivoli Storage Manager automatically generate a new password for your client node each time it expires, encrypt and store the password in a file, and retrieve the password from that file when you request services. You are not prompted for the password.

For information on where the password is stored, see "Passworddir" on page 196.

When the ***passwordaccess*** option is set to *generate* and you specify the ***password*** option, the ***password*** option is ignored.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Authorization** category, **Password Access** section of the Preferences editor.

Syntax

```
►►─PASSWORDAccess─┬─prompt───┬──────────────────────────────────────►◄
                  └─generate─┘
```

Parameters

prompt

You are prompted for your workstation password each time a client connects to the server. This is the default.

To keep your client node password secure, enter commands without the password and wait for Tivoli Storage Manager to prompt you for the password.

Each user must know the Tivoli Storage Manager password for your client node. Any user who knows the password for your client node can gain access to *all* backups and archives that originate from your client node. For example:

- If the user enters the node name and password for your client node from a different client node, the user becomes a virtual root user.

generate

Encrypts and stores your password locally and generates a new password when the old password expires.

A password prompt is displayed when registering a workstation with a server using open registration or if your administrator changes your password manually.

When logging in locally, users do not need to know the Tivoli Storage Manager password for the client node. However, by using the ***nodename*** option at a remote node, users can access files they own and files to which another user grants access.

Examples

TSM System Preferences:

```
passwordaccess generate
```

Command line:

Does not apply.

Passworddir

Authorized User

The ***passworddir*** option specifies the directory location in which to store an encrypted password file. The default directory is ″/Library/Preferences/Tivoli Storage Manager″. Regardless of where it is stored, the password file created by Tivoli Storage Manager is always named TSM.PWD.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Authorization** category, **Location** section of the Preferences editor.

Syntax

```
►►──PASSWORDDIR─ directoryname──────────────────────────────────────►◄
```

Parameters

directoryname
Specifies the path in which to store the encrypted password file. The name of the password file is TSM.PWD. If any part of the specified path does not exist, Tivoli Storage Manager attempts to create it.

Examples

TSM System Preferences:

```
passworddir "/Users/user1/Library/Preferences/Tivoli Storage
Manager/"
```

Command line:

```
Does not apply.
```

Pick

The ***pick*** option creates a list of backup versions or archive copies that match the file specification you enter. From the list, you can select the versions to process. Include the ***inactive*** option to view both active and inactive objects.

Use the ***pick*** option with the following commands:

- **delete archive**
- **delete backup**
- **expire**
- **restore**
- **retrieve**

Syntax

```
►►──PIck──────────────────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this option.

Examples

Command line:

```
dsmc restore "/Users/van/Documents/*" -pick -inactive
```

Pitdate

Use the ***pitdate*** option with the ***pittime*** option to establish a point in time for which you want to display or restore the latest version of your backups. Files that were backed up *on or before* the date and time you specified, and which were not deleted *before* the date and time you specified, are processed. Backup versions that you create after this date and time are ignored.

Use the ***pitdate*** option with the following commands:

- **delete backup**
- **query backup**
- **restore**

When ***pitdate*** is used, the ***inactive*** and ***latest*** options are implicit.

Syntax

```
►►──PITDate =─ date──────────────────────────────────────────────────►◄
```

Parameters

date

Specifies the appropriate date. Enter the date in the format you selected with the ***dateformat*** option.

When you include ***dateformat*** with a command, it must precede the ***fromdate***, ***pitdate***, and ***todate*** options.

Examples

Command line:

```
dsmc restore "/Volumes/proj4/myproj/*" -sub=y -pitdate=08/01/2003
-pittime=06:00:00
```

Pittime

Use the ***pittime*** option with the ***pitdate*** option to establish a point in time for which you want to display or restore the latest version of your backups. Files that were backed up *on or before* the date and time you specify, and which were not deleted *before* the date and time you specify, are processed. Backup versions that you create after this date and time are ignored. This option is ignored if you do not specify ***pitdate*** option.

Use the ***pittime*** option with the following commands:

- **delete backup**
- **query backup**
- **restore**

Syntax

```
►►──PITTime =– time──────────────────────────────────────────────────►◄
```

Parameters

time

Specifies a time on a specified date. If you do not specify a time, the time defaults to 23:59:59. Specify the time in the format you selected with the ***timeformat*** option.

When you include the ***timeformat*** option in a command, it must precede the ***fromtime***, ***pittime***, and ***totime*** options.

Examples

Command line:

```
dsmc query backup -pitt=06:00:00 -pitd=08/01/2003
"/Volumes/proj5/myproj/*"
```

Postschedulecmd/Postnschedulecmd

Authorized User

The ***postschedulecmd*** option specifies a command that the client program processes after it runs a schedule. The client program waits for the command to complete before it continues with other processing.

If you do not want to wait, specify ***postnschedulecmd***.

Notes:

1. If the ***postschedulecmd*** command does not complete with return code 0, the client will report that the scheduled event completed with return code 8 (unless the scheduled operation encounters a more severe error yielding a higher return code). If you do not want the ***postschedulecmd*** command to be governed by this rule, you can create a script or batch file that invokes the command and exits with return code 0. Then configure ***postschedulecmd*** to invoke the script or batch file. The return code for the ***postnschedulecmd*** command is not tracked, and does not influence the return code of the scheduled event.
2. The server can also define the ***postschedulecmd*** option (and the ***postnschedulecmd*** option).

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Scheduler** category, **Schedule Command** button of the Preferences editor.

Syntax

```
►►──┬─POSTSchedulecmd──┬── "cmdstring" ──────────────────────────────►◄
    └─POSTNschedulecmd─┘
```

Parameters

"cmdstring"

Specifies the command to process. You can enter a command to be executed after a schedule with this option. Use only one ***postschedulecmd*** option.

If the command string contains blanks, enclose the command string in double quotes. If you placed double quotes within the command string, then enclose the entire command string in single quotes.

Use a blank, or null, string for *cmdstring* if you want to prevent any commands from running that the Tivoli Storage Manager server administrator uses for ***postschedulecmd*** or ***preschedulecmd***. If you specify a blank or null string on *either* option, it prevents the administrator from using a command on *both* options.

If your administrator uses a blank or null string on the ***postschedulecmd*** option, you cannot run a post-schedule command.

Otherwise, update the command string to contain the full path of the file, such as:

```
"/Volumes/La Pomme/Scripting/Database Script"
```

If the ***postschedulecmd*** schedule command is an AppleScript, you must use the osascript command to run the script. For example, if "***Database Script***" is an AppleScript, enter this command:

```
postschedulecmd osascript "/Volumes/La Pomme/Scripting/
  Database Script"
```

If the ***postschedulecmd*** schedule command is a UNIX shell script, enter the name of the script to run. For example, if "***presched.sh***" is a UNIX shell script, enter this command:

```
postschedulecmd "/Volumes/La Pomme/Scripting/presched.sh"
```

Note: The ***postschedulecmd*** schedule command expects the path to the script to be the same as what you would enter to run the script from a terminal window; the path to the script must be the UNIX version of the path. For example, in the Finder, the path to presched.sh would be:

```
"/Volumes/La Pomme/Scripting/presched.sh"
```

However, in a terminal window, the path is:

```
"/Volumes/La Pomme/Scripting/presched.sh"
```

Examples

TSM System Preferences:

```
postschedulecmd "/Volumes/La Pomme/Scripting/postsched.sh"
```

Command line:

```
-postschedulecmd="/Volumes/La Pomme/Scripting/postsched.sh"
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Preschedulecmd/Prenschedulecmd

Authorized User

The ***preschedulecmd*** option specifies a command that the client program processes before it runs a schedule. The client program waits for the command to complete before it starts the schedule.

If you do not want it to wait, specify ***prenschedulecmd***.

Notes:

1. Successful completion of the ***preschedulecmd*** command is considered to be a prerequisite to running the scheduled operation. If the ***preschedulecmd*** command does not complete with return code 0, the scheduled operation and any ***postschedulecmd*** and ***postnschedulecmd*** commands will not run. The client will report that the scheduled event failed, and the return code will be 12. If you do not want the ***preschedulecmd*** command to be governed by this rule, you can create a script or batch file that invokes the command and exits with return code 0. Then configure ***preschedulecmd*** to invoke the script or batch file. The return code for the ***prenschedulecmd*** command is not tracked, and does not influence the return code of the scheduled event.
2. The server can also define the ***preschedulecmd*** option (and the ***prenschedulecmd*** option).

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Scheduler** category, **Schedule Command** button of the Preferences editor.

Syntax

```
►►──┬─PRESchedulecmd──┬── "cmdstring" ──────────────────────────────►◄
    └─PRENSchedulecmd─┘
```

Parameters

"cmdstring"

Specifies the command to process. Use only one ***preschedulecmd*** option. You can enter a command to be executed before a schedule using this option.

If the command string contains blanks, enclose the command string in double quotes. If you placed double quotes within the command string, then enclose the entire command string in single quotes.

Use a blank or null string for *cmdstring* if you want to prevent any commands from running that the Tivoli Storage Manager server administrator uses for ***postschedulecmd*** and ***preschedulecmd***. If you specify a blank or null string on *either* option, it prevents the administrator from using a command on *both* options.

If your administrator uses a blank or null string on the ***preschedulecmd*** option, you cannot run a pre-schedule command.

The command string should contain the full path of the file, such as:

```
"/Volumes/La Pomme/Scripting/Database Script"
```

If the ***preschedulecmd*** schedule command is an AppleScript, you must use the osascript command to run the script. For example, if "***Database Script***" is an apple script, enter this command:

```
preschedulecmd osascript "/Volumes/La Pomme/Scripting/
  Database Script"
```

If the ***preschedulecmd*** schedule command is a UNIX shell script, enter the name of the script to run. For example, if "***presched.sh***" is a UNIX shell script, enter this command:

```
preschedulecmd "/Volumes/La Pomme/Scripting/presched.sh"
```

However, in a terminal window, the path is:

```
"/Volumes/La Pomme/Scripting/presched.sh"
```

Examples

TSM System Preferences:

```
preschedulecmd "/Volumes/La Pomme/Scripting/presched.sh"
```

Command line:

```
-preschedulecmd="/Volumes/La Pomme/Scripting/presched.sh"
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Preservepath

The ***preservepath*** option specifies how much of the source path to reproduce as part of the target directory path when you restore or retrieve files to a new location. Use the ***-subdir***=*yes* option to include the entire subtree of the source directory (directories and files below the lowest-level source directory) as source to be restored. If a required target directory does not exist, it is created. If a target file has the same name as a source file, it is overwritten. Use the ***-replace***=*prompt* option to have Tivoli Storage Manager prompt you before files are overwritten.

Use the ***preservepath*** option with the following commands:

- **restore**
- **restore backupset**
- **retrieve**

Syntax

```
                    ┌─Subtree──┐
►►──PRESERvepath =──┼──────────┼──────────────────────────────────────────►◄
                    ├─Complete─┤
                    ├─NOBase───┤
                    └─NONe─────┘
```

Parameters

Subtree
Creates the lowest-level source directory as a subdirectory of the target directory. Files from the source directory are stored in the new subdirectory. This is the default.

Complete
Restores the entire path, starting from the root, into the specified directory. The entire path includes all the directories *except* the file space name.

NOBase
Restores the contents of the source directory without the lowest level, or base directory, into the specified destination directory.

NONe
Restores all selected source files to the target directory. No part of the source path at or above the source directory is reproduced at the target.

If you specify =*yes*, Tivoli Storage Manager restores all files in the source directories to the single target directory.

Examples

Command line:

For the examples below, assume that the server file space contains the following backup copies:

```
/Volumes/fs/h1/m1/file.a
/Volumes/fs/h1/m1/file.b
/Volumes/fs/h1/m1/l1/file.x
/Volumes/fs/h1/m1/l1/file.y
```

This command:

```
dsmc res /Volumes/fs/h1/m1/ /Volumes/devel/ann/ -preser=complete
```

Restores these directories and files:

```
/Volumes/devel/ann/h1/m1/file.a
/Volumes/devel/ann/h1/m1/file.b
```

This command:

```
dsmc res /Volumes/fs/h1/m1/ /Volumes/devel/ann/ -preser=nobase
```

Restores these directories and files:

```
/Volumes/devel/ann/file.a
/Volumes/devel/ann/file.b
```

This command:

```
dsmc res backupset /Volumes/fs/h1/m1/ /Volumes/devel/ann/ -su=yes
-preser=nobase -loc=file
```

Restores these directories and files:

```
/Volumes/devel/ann/file.a
/Volumes/devel/ann/file.b
/Volumes/devel/ann/file.x
/Volumes/devel/ann/file.y
```

This command:

```
dsmc res /Volumes/fs/h1/m1/ /Volumes/devel/ann/ -preser=subtree
```

Restores these directories and files:

```
/Volumes/devel/ann/m1/file.a
/Volumes/devel/ann/m1/file.b
```

This command:

```
dsmc res /Volumes/fs/h1/m1/ /Volumes/devel/ann/ -preser=none
```

Restores these directories and files:

```
/Volumes/devel/ann/file.a
/Volumes/devel/ann/file.b
```

This command:

```
dsmc res /Volumes/fs/h1/m1/ /Volumes/devel/ann/ -su=yes -preser=complete
```

Restores these directories and files:

```
/Volumes/devel/ann/h1/m1/file.a
/Volumes/devel/ann/h1/m1/file.b
/Volumes/devel/ann/h1/m1/l1/file.x
/Volumes/devel/ann/h1/m1/l1/file.y
```

This command:

```
dsmc res /Volumes/fs/h1/m1/ /Volumes/devel/ann/ -su=yes -preser=nobase
```

Restores these directories and files:

```
/Volumes/devel/ann/file.a
/Volumes/devel/ann/file.b
/Volumes/devel/ann/l1/file.x
/Volumes/devel/ann/l1/file.y
```

This command:

```
dsmc res /Volumes/fs/h1/m1/ /Volumes/devel/ann/ -su=yes -preser=subtree
```

Restores these directories and files:

```
/Volumes/devel/ann/m1/file.a
/Volumes/devel/ann/m1/file.b
/Volumes/devel/ann/m1/l1/file.x
/Volumes/devel/ann/m1/l1/file.y
```

This command:

```
dsmc res /Volumes/fs/h1/m1/ /Volumes/devel/ann/ -su=yes -preser=none
```

Restores these directories and files:

```
/Volumes/devel/ann/file.a
/Volumes/devel/ann/file.b
/Volumes/devel/ann/file.x
/Volumes/devel/ann/file.y
```

Queryschedperiod

The ***queryschedperiod*** option specifies the number of hours you want the client scheduler to wait between attempts to contact the server for scheduled work. This option applies only when you set the ***schedmode*** option to *polling*. This option is used only when the **scheduler** is running.

Your administrator can also set this option. If your administrator specifies a value for this option, that value overrides the value set in your TSM System Preferences file after your client node successfully contacts the server.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Scheduler** category, **Query Schedule Interval** field of the Preferences editor.

Syntax

```
►►──QUERYSCHedperiod─ hours──────────────────────────────────────────►◄
```

Parameters

hours
Specifies the number of hours the client scheduler waits between attempts to contact the server for scheduled work. The range of values is 1 through 9999; the default is 12.

Examples

TSM System Preferences:

```
querysch 6
```

Command line:

```
-queryschedperiod=8
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Quiet

The ***quiet*** option limits the number of messages that are displayed on your screen during processing. For example, when you run the **incremental**, **selective**, or **archive** commands, information appear about each file that is backed up. Use the ***quiet*** option if you do not want to display this information.

When you use the ***quiet*** option, error and processing information appears on your screen, and messages are written to log files. If you do not specify ***quiet***, the default option, ***verbose*** is used.

Note: The server can also define the **quiet** option, overriding the client setting.

Preferences File

Place this option in the TSM User Preferences file. You can set this option on the **Command Line** category, **Do not display process information on screen** checkbox of the Preferences editor.

Syntax

```
►►──QUIET──────────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this option.

Examples

TSM User Preferences:

```
quiet
```

Command line:

```
-quiet
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Removeoperandlimit

The ***removeoperandlimit*** option specifies that Tivoli Storage Manager removes the 20-operand limit for the Macintosh OS X platform. If you specify the ***removeoperandlimit*** option with the **incremental**, **selective**, or **archive** commands, the 20-operand limit is not enforced and is restricted only by available resources or other operating system limits.

The ***removeoperandlimit*** option can be useful if you generate scripts which invoke the command line client with a large number of operands. For example, you prescan a directory tree looking for files to back up. As each *eligible* file is discovered, it is added to the operand list of a **selective** command. Later, this **selective** command is submitted by a controlling script. In this case, specifying the ***removeoperandlimit*** option removes the 20-operand limit for the Macintosh OS X platform.

Notes:

1. The ***removeoperandlimit*** option *must* be placed immediately after the **incremental**, **selective**, or **archive** command before any file specifications.
2. This option does not accept a value. If this option is specified on a command, the 20-operand limit for the Macintosh OS X platform is removed.
3. Because it adversely affects performance to allow the shell to expand wild cards, it is recommended that you use the ***removeoperandlimit*** option in backup or archive operations in which wild cards are not used.
4. The ***removeoperandlimit*** option is valid only on the **incremental**, **selective**, or **archive** commands in batch mode. It is not valid in the TSM User Preferences file or TSM System Preferences file.

Syntax

```
►►──REMOVEOPerandlimit──────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this option.

Examples

Command line:

```
-removeoperandlimit
```

Replace

The ***replace*** option specifies whether to overwrite existing files on your workstation, or to prompt you for your selection when you restore or retrieve files.

Attention: The ***replace*** option does not affect recovery of directory objects. Directory objects are always recovered, even when specifying **REPlace**=*no*. To prevent overwriting existing directories, use the FILESonly option.

You can use this option with the following commands:

Note: Replace prompting does not occur during a scheduled operation. If you set the ***replace*** option to prompt, Tivoli Storage Manager skips files without prompting during a scheduled operation.

Preferences File

Place this option in the TSM User Preferences file. You can set this option on the **Restore** category, **Action for files that already exist** section of the Preferences editor.

Syntax

```
                 ┌─Prompt─┐
►►──REPlace──────┼────────┼──────────────────────────────────────────────────►◄
                 ├─All────┤
                 ├─Yes────┤
                 └─No─────┘
```

Parameters

Prompt
You are prompted whether to overwrite a file that already exists on your workstation. If the existing file is read-only, you are prompted whether to overwrite it. This is the default.

All
All existing files are overwritten, including read-only files. If access to a file is denied, you are prompted to skip or overwrite the file. No action is taken on the file until there is a response to the prompt.

Yes
Any existing files are overwritten, *except* read-only files. If a file is read-only, you are prompted to overwrite the file or skip it. No action is taken on the file until there is a response to the prompt. If access to a file is denied, the file is skipped.

No Existing files are not overwritten. No prompts will be displayed.

Note: When restoring or retrieving files with the ***replace*** option set to *no*, existing files will not be overwritten, but existing directories will. To leave existing directories intact during a restore or retrieve operation, select the **Options** button → **All selected files and directories** dropdown menu → **Files only** option from the Tivoli Storage Manager GUI.

Examples

TSM User Preferences:

```
replace all
```

Command line:

```
-replace=no
```

This option is valid on the initial command line and in interactive mode. If you use this option in interactive mode, it affects only the command with which it is specified. When that command completes, the value reverts to the value at the beginning of the interactive session. This will be the value from the TSM User Preferences file unless overridden by the initial command line or by an option forced by the server.

Resourceutilization

Authorized User

Use the ***resourceutilization*** option in your TSM System Preferences file *within* a server stanza to regulate the level of resources the Tivoli Storage Manager server and client can use during processing.

Regulating backup and archive sessions

When you request a backup or archive, the client can use more than one session to the server. The default is to use a maximum of two sessions; one to query the server and one to send file data. The client can use only one server session if you specify a ***resourceutilization*** setting of 1. The client is also restricted to a single session if a user who is not an authorized user invokes a Macintosh client with ***passwordaccess***=*generate* specified.

A client can use more than the default number of sessions when connecting to a server that is Version 3.7 or higher. For example, ***resourceutilization***=10 permits up to eight sessions with the server. Multiple sessions be used for querying the server and sending file data.

Multiple query sessions are used when you specify multiple file specifications with a backup or archive command. For example, if you enter:

```
inc /Volumes/filespaceA /Volumes/filespaceB
```

and you specify ***resourceutilization***=5, the client start a second session to query files on file space B. Whether or not the second session starts depends on how long it takes to query the server about files backed up on file space A. The client also try to read data from the file system and send it to the server on multiple sessions.

Note: During a backup operation, if you enter multiple file specifications, the result be that files from one file specification are stored on multiple tapes and interspersed with files from different file specifications. This can decrease restore performance. Setting the ***collocatebyfilespec*** option to *yes* eliminates interspersing of files from different file specifications, by limiting the client to one server session per file specification. Therefore, if you store the data to tape, files for each file specification are stored together on one tape (unless another tape is required for more capacity). See “Collocatebyfilespec” on page 128 for more information.

Regulating restore sessions

When you request a restore, the default is to use a maximum of one session, based on how many tapes the requested data is stored on, how many tape drives are available, and the maximum number of mount points allowed for the node.

Notes:

1. If all of the files are on disk, only one session is used. There is no multi-session for a pure disk storage pool restore. However, if you are performing a restore in which the files reside on 4 tapes and some on disk, you could use up to 5 sessions during the restore.
2. The Tivoli Storage Manager server can set the maximum number of mount points a node can use on the server using the MAXNUMMP parameter. If the ***resourceutilization*** option value exceeds the value of the MAXNUMMP on the server for a node, the backup can fail with an *Unknown System Error* message.

For example, if the data you want to restore is on 5 different tape volumes, the maximum number of mount points is 5 for your node, and ***resourceutilization*** is set to 3, then 3 sessions will be used for the restore. If you increase the

resourceutilization setting to 5, then 5 sessions will be used for the restore. There is a 1 to 1 relationship to the number of restore sessions allowed for the ***resourceutilization*** setting. Multiple restore sessions are only allowed for no query restore operations.

Considerations

The following factors can affect the throughput of multiple sessions:

- The server's ability to handle multiple client sessions. Is there sufficient memory, multiple storage volumes, and CPU cycles to increase backup throughput?
- The client's ability to drive multiple sessions (sufficient CPU, memory, etc.).
- The configuration of the client storage subsystem. File systems that are striped across multiple disks, using either software striping or RAID-5 can better handle an increase in random read requests than a single drive file system. Additionally, a single drive file system not see performance improvement if it attempts to handle many random concurrent read requests.
- Sufficient bandwidth in the network to support the increased traffic.

Potentially undesirable aspects of running multiple sessions include:

- The client could produce multiple accounting records.
- The server not start enough concurrent sessions. To avoid this, the server *maxsessions* parameter must be reviewed and possibly changed.
- A query node command not summarize client activity.

Note: The server can also define this option.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **General** category, **Resource Utilization** field of the Preferences editor.

Syntax

```
►►──RESOURceutilization─ number──────────────────────────────────────►◄
```

Parameters

number
Specifies the level of resources the Tivoli Storage Manager server and client can use during processing. The range of values that you can specify is 1 through 10.

Examples

TSM System Preferences:

```
resourceutilization 8
```

Command line:

```
-resourceutilization=7
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Retryperiod

Authorized User

The ***retryperiod*** option specifies the number of minutes the client scheduler waits between attempts to process a scheduled command that fails, or between unsuccessful attempts to report results to the server. Use this option only when the scheduler is running.

Your administrator can also set this option. If your administrator specifies a value for this option, that value overrides the value in your TSM System Preferences file after your client node successfully contacts the server.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Scheduler** category, **Retry period** field of the Preferences editor.

Syntax

```
►►──RETRYPeriod─ minutes──────────────────────────────────────────►◄
```

Parameters

minutes
Specifies the number of minutes the client scheduler waits between attempts to contact the server, or to process a scheduled command that fails. The range of values is 1 through 9999; the default is 20.

Examples

TSM System Preferences:

```
retryp 10
```

Command line:

```
-retryperiod=10
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Schedcmddisabled

Authorized User

The ***schedcmddisabled*** option specifies whether to disable the scheduling of commands by the server ***action***=**command** option on the **define schedule** server command.

This option does not disable the ***preschedulecmd*** and ***postschedulecmd*** commands. However, you can specify ***preschedulecmd*** or ***postschedulecmd*** with a blank or a null string to disable the scheduling of these commands.

You can disable the scheduling of commands defined by your Tivoli Storage Manager administrator by setting the ***schedcmddisabled*** option to *yes*.

Use the **query schedule** command to query the schedules defined by your administrator. See "Query Schedule" on page 290 for more information.

Note: The server can also define this option.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax

```
►►──SCHEDCMDDisabled──┬─No──┬──────────────────────────────────────►◄
                      └─Yes─┘
```

Parameters

Yes Specifies that Tivoli Storage Manager disables the scheduling of commands by the server using the ***action***=**command** option on the **define schedule** server command.

No Specifies that Tivoli Storage Manager does not disable the scheduling of commands by the server using the ***action***=**command** option on the **define schedule** server command. This is the default.

Examples

TSM System Preferences:

```
schedcmddisabled no
```

Command line:

```
Does not apply.
```

Schedlogmax

Authorized User

The ***schedlogmax*** option specifies the maximum size of the schedule log, in megabytes. Log records are added to the end of the file, until the maximum specified size is reached. When the maximum specified size is reached, a log record saying "Continued at beginning of file" is placed as the last record in the file. Subsequent logging is resumed at the top of the file. The end of the wrapped log is indicated by a record saying "END OF DATA". Log messages that are overwritten by wrapping are not saved in a prune file, as they are with the pruning method of log size management.

If you change from ***schedlogmax*** to ***schedlogretention***, all existing log entries are retained and the log is pruned using the new ***schedlogretention*** criteria.

If you change from ***schedlogretention*** to ***schedlogmax***, all records in the existing log are copied to the pruned log, TSM Sched Prune Log, the existing log is emptied, and logging begins under the new log wrapping criteria.

If you change the value of the ***schedlogmax*** option, the existing log is extended or shortened to accommodate the new size. If the value is reduced, the oldest entries are deleted to reduce the file to the new size.

Restriction: You cannot specify a non-zero ***schedlogmax*** value *and* enable ***schedlogretention***.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Scheduler** category, **Schedule Log** button of the Preferences editor.

Syntax

```
►►──SCHEDLOGMAX─ size──────────────────────────────────────────────────►◄
```

Parameters

size
Specifies the maximum size, in megabytes, for the log file. The range of values is 0 to 2047; the default is 0, which disables log file wrapping and allows the log file to grow indefinitely.

Examples

TSM System Preferences:

```
schedlogmax 100
```

Command line:

```
-schedlogmax=100
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Schedlogname

Authorized User

The ***schedlogname*** option specifies the path and file name where you want to store schedule log information. Use this option only when you want to store schedule log information. This option applies only when the scheduler is running. If this option is not used, the TSM Schedule Log file is created in the same directory as the TSM Error Log file. See "Errorlogname" on page 153 for more information on placement of the TSM Schedule Log file.

When you run the **schedule** command, output from scheduled commands appears on your screen. Output is also sent to the file you specify with this option. If any part of the path you specify does not exist, Tivoli Storage Manager attempts to create it

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Scheduler** category, **Schedule Log** button of the Preferences editor.

Attention: Set the SCHEDLOGNAME option to name a directory where the log is to be placed. The directory specified must have permissions which allow write access from the account under which the client is run.

Syntax

```
►►──SCHEDLOGName─ filespec──────────────────────────────────────────►◄
```

Parameters

filespec
Specifies the path and file name where you want to store schedule log information when processing scheduled work. If any part of the path you specify does not exist, Tivoli Storage Manager attempts to create it.

If you specify a file name only, the file is stored in your default folder. The default directories are:

```
~/Library/Logs/tivoli/tsm
/Library/Logs/tivoli/tsm
```

The **TSM Schedule Log** file *cannot* be a symbolic link.

Examples

TSM System Preferences:

```
SCHEDLOGN /Users/user1/Library/Logs/schedlog.jan
```

Command line:

```
-schedlogname=/Users/user1/Library/Logs/schedlog.jan
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Schedlogretention

Authorized User

The ***schedlogretention*** option specifies the number of days to keep entries in the schedule log, and whether to save the pruned entries. The schedule log is pruned during the initial start of scheduler and after a scheduled event completes.

If you change from ***schedlogretention*** to ***schedlogmax***, all records in the existing log are copied to the pruned log TSM Sched Prune Log, the existing log is emptied, and logging begins under the new log wrapping criteria.

If you change from ***schedlogmax*** to ***schedlogretention***, all existing log entries are retained and the log is pruned using the new ***schedlogretention*** criteria.

Restriction: You cannot specify a non-zero ***schedlogmax*** value *and* enable ***schedlogretention***.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Scheduler** category, **Schedule Log** button of the Preferences editor.

Syntax

```
►►──SCHEDLOGRetention──┬─N────────┬──┬─D─┬──────────────────────────────►◄
                       └─days─────┘  └─S─┘
```

Parameters

N or *days*
Specifies how long to wait before pruning the schedule log.

N Do not prune the log. This permits the log to grow indefinitely. This is the default.

days
Specifies the number of days to keep log file entries before pruning. The range of values is zero through 9999.

D or *S*
Specifies whether to save the pruned entries. Use a space or comma to separate this parameter from the previous one.

D Discards the log entries when pruning the log. This is the default.

S Saves the log entries when pruning the log.

Tivoli Storage Manager copies the entries pruned from the log to **TSM Sched Pruned Log**.

Examples

TSM System Preferences:

```
schedlogretention 30 S
```

Command line:

```
-schedlogretention=30,S
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Schedmode

Authorized User

The ***schedmode*** option specifies whether you want to use the *polling* mode (your client node periodically queries the server for scheduled work), or the *prompted* mode (the server contacts your client node when it is time to start a scheduled operation). All communication methods can use the client polling mode, but only TCP/IP can use the server prompted mode.

This option applies *only if* you are using the TCP/IP communication method, and the **schedule** command is running.

Your administrator can specify that the server support both modes or just one mode. If your administrator specifies that both modes are supported, you can select either schedule mode. If your administrator specifies only one mode, you must specify that mode in your TSM System Preferences file or scheduled work will not be processed.

If you specify the *prompted* mode, you must supply values for the ***tcpclientaddress*** and ***tcpclientport*** options in your file or on the **schedule** command. You can then be contacted at an address or port other than the one that made first contact with the server.

Notes:

1. When changing the setting of this option in the TSM System Preferences you must stop and restart the scheduler service for the setting to take effect.
2. The server can also define this option.
3. See 86 for information about enabling the scheduler to run outside a firewall.

Preferences File

Place this option in the TSM System Preferences. You can set this option on the **Scheduler** category, **Schedule Mode** section of the Preferences editor.

Syntax

```
►►──SCHEDMODe──┬─POlling──┬──────────────────────────────────────────►◄
               └─PRompted─┘
```

Parameters

POlling
The client scheduler queries the server for scheduled work at prescribed time intervals. This is the default. You can set the time intervals using the ***queryschedperiod*** option.

PRompted
The client scheduler waits for the server to contact your client node when scheduled work needs to be done.

Examples

Options file:

```
schedmode prompted
```

Command line:

```
-schedmod=po
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Scrolllines

The ***scrolllines*** option specifies the number of lines of information that are displayed on your screen at one time. Use this option when you set the ***scrollprompt*** option to *Yes* and you use one of the following commands.

You can use the ***scrolllines*** option with the following commands only:
- **delete filespace**
- **query archive**
- **query backup**
- **query backupset**
- **query filespace**
- **query options**

Note: The server can also define this option.

Preferences File

Place this option in the TSM User Preferences file. You can set this option on the **Command Line** category, **Number of lines to display on screen** field of the Preferences editor.

Syntax

```
►►──SCROLLLines─ number──────────────────────────────────────────►◄
```

Parameters

number
Specifies the number of lines of information that are displayed on your screen at one time. The range of values is 1 through 80; the default is 20.

Examples

TSM User Preferences:

```
-scrolll=25
```

Command line:

```
-scrolll=25
```

This option is valid on the initial command line and in interactive mode. If you use this option in interactive mode, it affects only the command with which it is specified. When that command completes, the value reverts to the value at the beginning of the interactive session. This will be the value from the TSM User Preferences file unless overridden by the initial command line or by an option forced by the server.

Scrollprompt

The ***scrollprompt*** option specifies whether you want Tivoli Storage Manager to stop and wait after displaying the number of lines of information you specified with the ***scrolllines*** option, or scroll through and stop at the end of the information list.

You can use the ***scrollprompt*** option with the following commands only:
- **delete filespace**
- **query archive**
- **query backup**
- **query backupset**
- **query filespace**
- **query options**

Note: The server can also define this option.

Preferences File

Place this option in the TSM User Preferences file. You can set this option on the **Command Line** category, **Pause after displaying the following number of lines** field of the Preferences editor.

Syntax

```
►►──SCROLLPrompt──┬─No──┬──────────────────────────────────────────────►◄
                  └─Yes─┘
```

Parameters

No Scrolls to the end of the list and stops. This is the default.

Yes Stops and waits after displaying the number of lines you specified with the ***scrolllines*** option. The following prompt is displayed at the bottom of the screen:

```
Press 'Q' to quit, 'C' to continuous scroll, or 'Enter' to
continue.
```

Examples

TSM User Preferences:

```
-scrollp=yes
```

Command line:

```
-scrollp=yes
```

This option is valid on the initial command line and in interactive mode. If you use this option in interactive mode, it affects only the command with which it is specified. When that command completes, the value reverts to the value at the beginning of the interactive session. This will be the value from the TSM User Preferences file unless overridden by the initial command line or by an option forced by the server.

Servername

In your TSM System Preferences file, the ***servername*** option specifies the name you want to use to identify a server and to begin a stanza containing options for that server. You can name and specify options for more than one server.

The following example demonstrates how to specify options for two different servers:

```
SErvername     server1
  NODename                    node1
  COMMMethod                  TCPip
  TCPPort                     1500
  TCPServeraddress            node.domain.company.com
  PASSWORDAccess              generate
  GRoups                      qadev qadev1 tools23
  USERs                       ashton stewart kaitlin
  inclexcl                    /Users/user1/Documents/backup1.excl
SErvername     server2
  NODename                    node2
  COMMMethod                  TCPip
  TCPPort                     1500
  TCPServeraddress            almvmd.almaden.ibm.com
  PASSWORDAccess              prompt
  GRoups                      qadev qadev1 tools23
  USERs                       ashton stewart kaitlin
  inclexcl                    /Users/user1/Documents/backup2.excl
```

In your TSM User Preferences file, the ***servername*** option specifies which server, of those named in your TSM System Preferences file, to contact for backup-archive services. When specified in a TSM User Preferences file or on the command line, the ***servername*** option overrides the default server specified in your TSM System Preferences file.

Note: If the Tivoli Storage Manager server name changes or Tivoli Storage Manager clients are directed to a different Tivoli Storage Manager server, all clients will need to have a new password initialized for the new server name.

Preferences File

Place this option in the TSM System Preferences file (*to begin* a server stanza) or the TSM User Preferences file to select a server stanza.

Syntax

```
►►──SErvername servername──────────────────────────────────────────►◄
```

Parameters

servername

In your TSM System Preferences file, specify the name you want to assign to a particular server. In your TSM User Preferences file or on the command line, specify the name of the server you want to contact for backup-archive services. A server name is not case sensitive; it can have up to 64 characters.

Examples

TSM System Preferences or TSM User Preferences:

```
servername yakima
```

Command line:

```
-se=server_b
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Sessioninitiation

Authorized User

Use the ***sessioninitiation*** option to control whether the server or client initiates sessions through a firewall. The default is that the client initiates sessions. You can use this option with the **schedule** command.

For the client scheduler, it is unnecessary to open *any* ports on the firewall. If you set the ***sessioninitiation*** option to *serveronly*, the client will not attempt to contact the server. *All sessions must be initiated by server prompted scheduling* on the port defined on the client with the ***tcpclientport*** option. The ***sessioninitiation*** option only affects the behavior of the client scheduler running in the prompted mode. If you set the ***sessioninitiation*** option to *serveronly*, with the exception of CAD-managed schedulers, the command line client and GUI client will still attempt to initiate sessions.

Attention: You cannot use the dsmcad for scheduling when you set the ***sessioninitiation*** option to *serveronly*.

Note: If you set the ***sessioninitiation*** option to *serveronly*, the client setup wizard and scheduler service be unable to authenticate to the Tivoli Storage Manager server. In this case, you can execute the scheduler from the command line (dsmc schedule) and enter the password for your node when prompted.

A similar problem can occur if an encryption key is required for backup operations. In this case, you can execute the scheduler from the command line (dsmc schedule) and enter the encryption key when prompted. After the password and encryption key are updated, you must restart the scheduler.

If you set the ***sessioninitiation*** option to *client*, the client will initiate sessions with the server by communicating on the TCP/IP port defined with the *server* option ***tcpport***. This is the default. Server prompted scheduling be used to prompt the client to connect to the server.

Notes:

1. See "Configuring Tivoli Storage Manager client/server communication across a firewall" on page 85 for more information about Tivoli Storage Manager firewall support.
2. The Tivoli Storage Manager server can specify SESSIONINITiation=*clientorserver* or SESSIONINITiation=*serveronly* on the QUERY NODE, REGISTER NODE, and UPDATE NODE commands. If the server specifies SESSIONINITiation=*clientorserver*, the client can decide which method to use. If the server specifies SESSIONINITiation=*serveronly*, all sessions are initiated by the server.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Scheduler** category, **Session Initiation** field of the Preferences editor.

Syntax

```
►►──SESSIONINITiation──┬─Client──────┬──────────────────────────────────►◄
                       └─SERVEROnly──┘
```

Parameters

Client
Specifies that the client will initiate sessions with the server by communicating on the TCP/IP port defined with the *server* option ***tcpport***. This is the default. Server prompted scheduling be used to prompt the client to connect to the server.

SERVEROnly
Specifies that the server will not accept client requests for sessions. All sessions must be initiated by server prompted scheduling on the port defined on the client with the ***tcpclientport*** option (see "Tcpclientport" on page 237. Except for CAD-managed schedulers, the command line client and GUI client will still attempt to initiate sessions.

Examples

TSM System Preferences:

```
sessioninitiation serveronly
```

Command line:

```
schedule -sessioninitiation=serveronly
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Skipacl

The ***skipacl*** option allows you to back up or restore ACL data. When set to *yes* (default is *no*), the Tivoli Storage Manager client will skip ACL processing completely. No ACL data will be backed up or restored. ***skipacl***=*yes* should be used only when ACLs are not defined on the file system or when the loss of data contained in the ACLs during restore is acceptable. The file mode permissions (rwx) will continue to be backed up and restored as before.

If a prior version of the file being restored has ACL data backed up, ACLs will be restored even when the ***skipacl*** option is set.

Supported Clients

This option is valid for all Macintosh clients.

Preferences File

Place this option in the options file TSM System Preferences file *within* a server stanza.

Syntax

```
►►──SKIPACL──┬─No──┬──────────────────────────────────────────────►◄
             └─Yes─┘
```

Parameters

No If you specify *No*, the ACL data is backed up. This is the default.

Yes If you specify *Yes*, the ACL data is not backed up. ***skipacl***=*yes* overrides ***skipaclupdatecheck*** settings.

Examples

Options file:

```
skipacl yes
```

Command line:

```
-skipacl=yes
```

Skipaclupdatecheck

The ***skipaclupdatecheck*** option enables checksum and size comparisons of ACL data. When set to *yes* (default is *no*), the Tivoli Storage Manager client will not perform checksum and size comparisons before or after backup and during incremental processing (ACL checksum from previous backup and current ACL) to detect ACL updates. However, current ACL data will be backed up if the file is selected for backup due to other reasons. If only ACLs are updated on a file, the next incremental backup will not recognize this ACL update, and the file will not be backed up.

Supported Clients

This option is valid for all Macintosh clients.

Preferences File

Place this option in the options file TSM System Preferences file *within* a server stanza.

Syntax

```
►►──SKIPACLUPdatecheck──┬─No──┬──────────────────────────────────────►◄
                        └─Yes─┘
```

Parameters

No If you specify *No*, the Tivoli Storage Manager client performs checksum and size comparisons of the ACL data, before and after backup and during incremental processing. This is the default.

Yes If you specify *Yes*, the Tivoli Storage Manager client does not perform checksum and size comparisons of the ACL data.

Examples

Options file:

```
skipaclup yes
```

Command line:

```
-skipaclup=yes
```

Subdir

The ***subdir*** option specifies whether you want to include subdirectories of named directories for processing on the following commands:

- **archive**
- **delete archive**
- **delete backup**
- **incremental**
- **query archive**
- **query backup**
- **restore**
- **restore backupset**
- **retrieve**
- **selective**

For example, if you set the ***subdir*** option to *yes* when backing up a specific path and file, Tivoli Storage Manager recursively backs up *all* subdirectories under that path, and any instances of the specified file that exist under *any* of those subdirectories.

Note: The server can also define this option.

Preferences File

Place this option in the TSM User Preferences file.

Syntax

```
►►──SUbdir──┬─No──┬──────────────────────────────────────────────────────►◄
            └─Yes─┘
```

Parameters

No Subdirectories are not processed. This is the default.

Yes Subdirectories are processed. Because the client program searches all subdirectories of a directory that is being processed, processing can take longer to complete. Specify *Yes* only when necessary.

Note: If you use the *preservepath* option in addition to ***subdir***=*yes*, it can affect which subdirectories are processed. For more information, see "Preservepath" on page 204.

Examples

TSM User Preferences:

```
subdir no
```

Command line:

To restore the structure:

```
/Users/mike/dir1
/Users/mike/dir1/file1
/Users/mike/dir1/dir2
/Users/mike/dir1/dir2/file1
```

enter any of the following commands:

```
dsmc rest "/Users/van/dir1/*" /Users/mike/ -su=yes
dsmc rest "/Users/van/dir1/file*" /Users/mike/ -su=yes
dsmc rest "/Users/van/dir1/file1*" /Users/mike/ -su=yes
```

This option is valid on the initial command line and in interactive mode. If you use this option in interactive mode, it affects only the command with which it is specified. When that command completes, the value reverts to the value at the beginning of the interactive session. This will be the value from the TSM User Preferences file unless overridden by the initial command line or by an option forced by the server.

Tapeprompt

The ***tapeprompt*** option specifies whether you want Tivoli Storage Manager to wait for a tape mount if it is required for a backup, archive, restore, or retrieve process, or to be prompted for a choice.

In the Tivoli Storage Manager GUI, the Media Mount dialog can display the **Information Not Available** value in the Device and Volume Label fields if you perform a standard (also known as classic) restore or retrieve operation. This value means that this information is only available for no query restore or retrieve operations; not a standard restore or retrieve operation. The Device field displays the name of the device on which to mount the media needed to process an object. The Volume Label field displays the name of the volume needed to process an object. See "No query restore" on page 64 for a discussion of standard and no query restore operations.

Tape prompting does not occur during a scheduled operation regardless of the setting for the ***tapeprompt*** option.

The ***tapeprompt*** option can be used with the following commands:
- **archive**
- **delete archive**
- **delete backup**
- **incremental**
- **restore**
- **retrieve**
- **selective**

Note: The server can also define this option.

Preferences File

Place this option in the TSM User Preferences file. You can set this option on the **General** category, **Prompt before mounting tapes** checkbox of the Preferences editor.

Syntax

```
►►──TAPEPrompt──┬─No──┬──────────────────────────────────────────►◄
                └─Yes─┘
```

Parameters

No You are not prompted for your choice. The server waits for the appropriate tape to mount. This is the default.

Yes You are prompted when a tape is required to back up, archive, restore, or retrieve data. At the prompt, you can wait for the appropriate tape to be mounted, always wait for a tape to be mounted, skip a particular object, skip all objects on a single tape, skip all objects on all tapes, or cancel the entire operation.

Examples

TSM User Preferences:

```
tapeprompt yes
```

Command line:

```
-tapep=yes
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Tcpadminport

Authorized User

Use the ***tcpadminport*** option to specify a separate TCP/IP port number on which the server waits for requests for administrative client sessions, allowing secure administrative sessions within a private network.

The client ***tcpadminport*** setting depends on how the Tivoli Storage Manager server ***tcpadminport*** and ***adminonclientport*** options are configured. The Tivoli Storage Manager server has a ***tcpadminport*** setting that indicates on which port the server listens for administrative sessions, and the ***adminonclientport*** setting, which can be either *yes* or *no*.

If ***tcpadminport*** is not set on the server, then administrative sessions will be allowed on the same port as client sessions.

If ***tcpadminport*** is set on the server, then administrative sessions will be allowed on the port specified by that setting. In this case, if ***adminonclientport*** *yes* is in effect, then administrative sessions can connect on either the regular client port *or* the port specified by ***tcpadminport***. If ***adminonclientport*** *no* is in effect, then administrative sessions can connect only on the port specified by ***tcpadminport***.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Communication** category, **Admin Port** field of the Preferences editor. See the *IBM Tivoli Storage Manger Administrator's Reference* for your operating system, for more information.

Syntax

```
►►──TCPADMINPort──┬─ ──────────────────┬──────────────────────────────────►◄
                  └─admin_port_address─┘
```

Parameters

admin_port_address
Specifies the port number of the server. The default value is the value of the ***tcpport*** option.

Examples

TSM System Preferences:

```
tcpadminport 1502
```

Tcpbuffsize

Authorized User

The ***tcpbuffsize*** option specifies the size of the internal TCP/IP communication buffer used to transfer data between the client node and server. Although it uses more memory, a larger buffer can improve communication performance.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Communication** category, **Buffer Size** field of the Preferences editor.

Syntax

```
►►──TCPBuffsize─ size──────────────────────────────────────────────────►◄
```

Parameters

size

Specifies the size, in kilobytes, that you want to use for the internal TCP/IP communication buffer. The range of values is 1 through 512; the default is 32.

Depending on the operating system communication settings, your system might not accept all values in the range of 1 through 512.

Examples

TSM System Preferences:

```
tcpb 32
```

Command line:

```
-tcpbuffsize=32
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Tcpclientaddress

Authorized User

The ***tcpclientaddress*** option specifies a TCP/IP address if your client node has more than one address, and you want the server to contact an address other than the one that was used to make the first server contact.

Use this option only if you use the *prompted* parameter with the ***schedmode*** option or when the **schedule** command is running.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Scheduler** category, **Your TCP/IP address** field of the Preferences editor.

Syntax

```
►►──TCPCLIENTAddress─ client_address──────────────────────────────────────►◄
```

Parameters

client_address
Specifies the TCP/IP address you want the server to use to contact your client node. Specify a TCP/IP Internet domain name or a dot address.

Examples

TSM System Preferences:

```
tcpclienta dsmclnt.mycompany.mydomain.com
or
tcplienta 192.168.0.1
```

Command line:

```
-tcpclientaddress=128.33.10.249
or
-tcplcientaddress=khoyt.mycompany.mydomain.com
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Tcpclientport

Authorized User

The ***tcpclientport*** option specifies a different TCP/IP port number for the server to contact than the one that was used to make the first server contact. If the default port or the specified port is busy, the server attempts to use any available port. Use this option only if you specify the *prompted* parameter with the ***schedmode*** option or when the **schedule** command is running.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Scheduler** category, **Your TCP/IP port** field of the Preferences editor.

Syntax

```
►►──TCPCLIENTPort─ client_port_address──────────────────────────────────►◄
```

Parameters

client_port_address
Specifies the TCP/IP port address you want the server to use to contact your client node. The range of values is 1000 through 32767; the default is 1501.

Examples

TSM System Preferences:

```
tcpclientp 1502
```

Command line:

```
-tcpclientport=1492
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Tcpnodelay

Authorized User

The ***tcpnodelay*** option specifies whether the client disables the delay of sending successive small packets on the network, per transaction. Change the value from the default of *yes* only under one of these conditions:

- You are directed to change the option by IBM technical support.
- You fully understand the effects of the TCP Nagle algorithm on network transmissions. Setting the option to *no* enables the Nagle algorithm, which delays sending small successive packets.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax

```
►►──TCPNodelay──┬─Yes─┬──────────────────────────────────────────────►◄
                └─No──┘
```

Parameters

No Specifies that the server does not allow successive small packets to be sent immediately over the network. Setting this option to *no* can degrade performance.

Yes Specifies that the server or client allows successive small packets to be sent immediately over the network. The default is *yes*.

Examples

TSM System Preferences:

```
tcpnodelay yes
```

Command line:

```
Does not apply.
```

Tcpport

Authorized User

The ***tcpport*** option specifies a TCP/IP port address for a Tivoli Storage Manager server. You can obtain this address from your administrator.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Communication** category, **Server Port** field of the Preferences editor.

Syntax

```
►►──TCPPort─ port_address──────────────────────────────────────────►◄
```

Parameters

port_address
Specifies the TCP/IP port address that is used to communicate with a server. The range of values is 1000 through 32767; the default is 1500.

Examples

TSM System Preferences:

```
tcpp 1501
```

Tcpserveraddress

Authorized User

The ***tcpserveraddress*** option specifies the TCP/IP address for a Tivoli Storage Manager server. You can obtain this port address from your administrator.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Communication** category, **Server Address** field of the Preferences editor.

Syntax

```
►►──TCPServeraddress─ server_address──────────────────────────────────────►◄
```

Parameters

server_address
Specifies a 1 to 64 character TCP/IP address for a server. Specify a TCP/IP domain name or a dot address.

Examples

TSM System Preferences:

```
tcps dsmchost.xyzcompany.vas.com
```

Command line:

```
Does not apply.
```

Tcpwindowsize

Authorized User

Use the ***tcpwindowsize*** option to specify, in kilobytes, the size you want to use for the TCP/IP sliding window for your client node. The sending host cannot send more data until it receives an acknowledgment and a TCP receive window update. Each TCP packet contains the advertised TCP receive window on the connection. A larger window allows the sender to continue sending data and improve communication performance.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Communication** category, **Window Size** field of the Preferences editor.

Syntax

```
►►──TCPWindowsize─ window_size──────────────────────────────────────►◄
```

Parameters

window_size

Specifies the size, in kilobytes, to use for your client node TCP/IP sliding window. The range of values is 1 through 128; the default is 63.

If you specify a value less than 1, the TCP window size defaults to 1. If you specify a value greater than 128, the TCP window size defaults to 128.

Notes:

1. The TCP window acts as a buffer on the network. It is not related to the ***tcpbuffsize*** option, or to the send and receive buffers allocated in client or server memory.
2. A window size larger than the buffer space on the network adapter might degrade throughput due to resending packets that were lost on the adapter.
3. Depending on the operating system communication settings, your system might not accept all values in the range of values.

Examples

TSM System Preferences:

```
tcpwindowsize 63
```

Command line:

```
-tcpw=63
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Timeformat

The ***timeformat*** option specifies the format in which you want to display system time.

By default, the backup-archive and administrative clients obtain format information from the locale definition in effect at the time the client is called. Consult the documentation on your local system for details about setting up your locale definition.

You can use the ***timeformat*** option with the following commands:

- **delete archive**
- **delete backup**
- **expire**
- **query archive**
- **query backup**
- **query filespace**
- **restore**
- **retrieve**
- **set event**

Preferences File

Place this option in the TSM User Preferences file. You can set this option on the **Regional Settings** category, **Time Format** field of the Preferences editor.

Syntax

```
►►──TIMEformat─ format_number──────────────────────────────────────────►◄
```

Parameters

format_number

Displays time in one of the formats listed below. Select the format number that corresponds to the format you want to use. When you include the ***timeformat*** option in a command, it must precede the ***fromtime***, ***pittime***, and ***totime*** options.

1 23:00:00
2 23,00,00
3 23.00.00
4 12:00:00 A/P

Examples

TSM User Preferences:

```
timeformat 4
```

Command line:

```
-time=3
```

Todate

Use the ***todate*** option with the ***totime*** option to specify an ending date and time to which you want to search for backups or archives during a restore, retrieve, or query operation. For example, you might request a list of files that were backed up before 11:59 PM on June 30, 2002.

Use the ***todate*** and ***totime*** options with the ***fromtime*** and ***fromdate*** options to request a list of backed up or archived files within a period of time. For example, you might request a list of files that were backed up between 6:00 AM on July 1, 2002 and 11:59 PM on July 30, 2002.

Use the ***todate*** option with the following commands:

- **delete backup**
- **query archive**
- **query backup**
- **restore**
- **retrieve**

Syntax

```
►►──TODate =─ date──────────────────────────────────────────────────►◄
```

Parameters

date

Specifies an ending date. Enter the date in the format you selected with the ***dateformat*** option.

When you include ***dateformat*** with a command, it must precede the ***fromdate***, ***pitdate***, and ***todate*** options.

Examples

Command line:

```
dsmc restore "/Users/agordon/Documents/*" -todate=12/11/2003
```

Totime

Use the ***totime*** option with the ***todate*** option to specify an ending date and time to which you want to search for backups or archives during a restore, retrieve, or query operation. For example, you might request a list of files that were backed up before 11:59 PM on June 30, 2003. Tivoli Storage Manager ignores this option if you do not specify the ***todate*** option.

Use the ***totime*** and ***todate*** options with the ***fromtime*** and ***fromdate*** options to request a list of files that were backed up within a period of time. For example, you might request a list of files that were backed up between 6:00 AM on July 1, 2003 and 11:59 PM on July 30, 2003.

Use the ***totime*** option with the following commands:

- **delete backup**
- **query archive**
- **query backup**
- **restore**
- **retrieve**

Syntax

```
►►──TOTime =- time──────────────────────────────────────────────────►◄
```

Parameters

time

Specifies an ending time. If you do not specify a time, the time defaults to 23:59:59. Specify the time in the format you selected with the ***timeformat*** option.

When you include the ***timeformat*** option in a command, it must precede the ***fromtime***, ***pittime***, and ***totime*** options.

Examples

Command line:

```
dsmc restore "/Users/van/Documents/myfiles/*" -todate=09/17/2003
-totime=23:00:00
```

Txnbytelimit

Authorized User

The ***txnbytelimit*** option specifies the number of kilobytes the client program buffers before it sends a transaction to the server. A *transaction* is the unit of work exchanged between the client and server. Because the client program can transfer more than one file or directory between the client and server before it commits the data to server storage, a transaction can contain more than one file or directory. This is called a *transaction group*.

This option permits you to control the amount of data sent between the client and server before the server commits the data and changes to the server database, thus changing the speed with which the client performs work. The amount of data sent applies when files are batched together during backup or when receiving files from the server during a restore procedure.

The server administrator can limit the number of files or directories contained within a transaction group using the ***txngroupmax*** option on the server, so the actual size of a transaction can be less than your ***txnbytelimit***. Once this number is reached, the client sends the files to the server *even if* the transaction byte limit is not reached.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **General** category **Transaction Buffer Size** field of the Preferences editor.

Syntax

```
►►──TXNBytelimit─ number──────────────────────────────────────────►◄
```

Parameters

number
Specifies the number of kilobytes the client program can buffer together in a transaction before it sends data to the server. The range of values is 300 through 2097152 (2 GB); the default is 25600.

Examples

TSM System Preferences:

```
txnb 25600
```

Command line:

```
-txnb=25600
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Type

Use the ***type*** option with the **query node** command to specify the type of node to query.

Syntax

```
►►──TYpe =┌─any────┐──────────────────────────────────────────────────►◄
          ├────────┤
          ├─server─┤
          └─client─┘
```

Parameters

any
Specifies all nodes registered at the server. This is the default.

server
Specifies client nodes that are other Tivoli Storage Manager servers.

client
Specifies client nodes that are backup-archive clients.

Examples

Command line:

```
query node -type=client
```

Users

Authorized User

The ***users*** option authorizes specific users on your workstation to request services from a server. You can use this option more than once to specify a large number of user IDs. If you do not specify group names with the ***groups*** option, or user IDs with the ***users*** option, all users can request Tivoli Storage Manager services. If you use the ***groups*** option, the ***users*** option, or both, only users included in one of the specified groups, or included in the list of users, can request Tivoli Storage Manager services.

Define your root user name only with the ***users*** option to exclude all other users from accessing the server.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax

Parameters

username
Names a user that you want to authorize to request Tivoli Storage Manager services.

See "How Tivoli Storage Manager handles long user and group names" on page 49 for information about the character limits for group names.

Examples

TSM System Preferences:

```
users  carol  larry  davecd  kathyba  michelle
users  amyb  tkaspar  kbsmith  egray  srjames
```

Command line:

Does not apply.

V2archive

Use the ***v2archive*** option with the **archive** command to archive only files to the server. Tivoli Storage Manager will not process directories that exist in the path of the source file specification.

This option differs from the ***filesonly*** option in that the ***filesonly*** option archives the directories that exist in the path of the source file specification.

The ***v2archive*** and ***dirsonly*** options are mutually exclusive and an error message is displayed if you use both options in the same **archive** command.

If you use this option, you want to consider the following:

- You experience performance problems when retrieving large amounts of data archived with this option.
- You want to use this option only if you are concerned about expiration performance on a server that already contains extremely large amounts of archived data.
- If there are multiple files with the same name for the ***v2archive*** option, the files are archived multiple times, with their directory structure. The ***v2archive*** option archives only the files.

Syntax

```
►►──V2archive──────────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this option.

Examples

This command:

```
dsmc archive "/Users/user2/Documents/*" -v2archive -su=y.
```

Archives these files:

```
/Users/user2/Documents/file1
/Users/user2/Documents/file2
/Users/user2/Documents/file3
/Users/user2/Documents/dir2/file4
/Users/user2/Documents/dir2/file5
```

Note: Tivoli Storage Manager does not archive `/Users/user2/Documents` and `/Users/user2/Documents/dir2`.

Verbose

The ***verbose*** option specifies that you want to display detailed processing information on your screen. This is the default. When you run the **incremental**, **selective**, or **archive** commands, information is displayed about each file that is backed up. Use the ***quiet*** option if you do not want to display this information.

The following behavior applies when using the ***verbose*** and ***quiet*** options

- If the server specifies either the ***quiet*** or ***verbose*** option in the server client option set, the server settings override the client values, even if **force** is set to *no* on the server.
- If you specify ***quiet*** in your TSM User Preferences file, and you specify *-verbose* on the command line, *-verbose* prevails.
- If you specify both *-quiet* and *-verbose* on the same command, the last option encountered during options processing prevails. If you specify *-quiet -verbose*, *-verbose* prevails. If you specify *-verbose -quiet*, *-quiet* prevails.

The information is displayed on your screen in the Scheduler Status window. This option only applies when you are running the scheduler and Tivoli Storage Manager is performing scheduled work.

Note: The server can also define this option.

Preferences File

Place this option in the TSM User Preferences file. You can set this option on the **Command Line** category, **Do not display process information on screen** checkbox of the Preferences editor.

Syntax

```
►►──VErbose──────────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this option.

Examples

TSM User Preferences:

```
verbose
```

Command line:

```
-verbose
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Virtualnodename

The ***virtualnodename*** option specifies the node name of your workstation when you want to restore or retrieve files to a different workstation.

When you use the ***virtualnodename*** option in your TSM User Preferences file, or with a command:

- You must specify the name you specified with the ***nodename*** option in your TSM System Preferences file.
- Tivoli Storage Manager prompts for the password assigned to the node you specify, if a password is required. If you enter the correct password, you have access to all backups and archives that originated from the specified node.

When connecting to a server, the client must identity itself to the server. This login identification is determined in the following ways:

- If the ***nodename*** and ***virtualnodename*** options are not specified, you are prompted for a node name.
- If the ***virtualnodename*** option is specified, or a virtual node name is specified on a command line, it cannot be the same name as the name specified by the ***nodename*** option.

When the virtual node name is accepted by the server, a password is required (assuming authentication is on), even if the ***passwordaccess*** option is *generate*. Once a connection to the server is established, then access is permitted to any file backed up using this login ID.

Preferences File

Place this option in the TSM User Preferences file.

Syntax

```
►►──VIRTUALNodename─ nodename──────────────────────────────────────►◄
```

Parameters

nodename
Specifies a 1- to 64-character name that identifies the node for which you want to request Tivoli Storage Manager services. There is no default.

Examples

TSM User Preferences:

```
virtualnodename cougar
```

Command line:

```
-virtualn=banshee
```

This option is valid only on the initial command line. It is not valid in interactive mode.

Webports

The ***webports*** option enables the use of the scheduler program outside a firewall by specifying the TCP/IP port number used by the Tivoli Storage Manager Client Acceptor daemon.

A value for the Client Acceptor daemon is required. If you do not specify this option, the default value, zero (0), is used for the Client Acceptor daemon. This causes TCP/IP to randomly assign a free port number for the Client Acceptor daemon.

For further considerations regarding Tivoli Storage Manager firewall support, see "Configuring Tivoli Storage Manager client/server communication across a firewall" on page 85.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza. You can set this option on the **Scheduler** category, **Client Acceptor Port** field of the Preferences editor.

Syntax

```
►►──WEBPorts─ cadport──────────────────────────────────────────────►◄
```

Parameters

cadport
Specifies the *required* Tivoli Storage Manager Client Acceptor port number. The range of values is 1000 through 32767. If a value is not specified, the default, zero (0), causes TCP/IP to randomly assign a free port number.

Examples

TSM System Preferences:

```
webports 2123
```

Command line:

```
Does not apply.
```

Chapter 10. Using commands

Tivoli Storage Manager provides a command line interface (CLI) that you can use as an alternative to the graphical user interface (GUI). This chapter describes how to start or end a client command session and how to enter commands. Table 45 shows a list of tasks related to entering commands.

Table 45. Entering commands

Task	Page
Starting and ending a client command session	254
Entering client commands	255
Remembering previous commands	258
Using wildcard characters	258

Table 46 provides an alphabetical list of the commands, a brief description, and where to locate more information.

Table 46. Commands

Command	Description	Page
archive	Archives files from a workstation to Tivoli Storage Manager storage.	260
cancel restore	Displays a list of restartable restore sessions from which you can select one to cancel.	262
delete access	Deletes authorization rules for files that are stored on the server.	263
delete archive	Deletes archived files from Tivoli Storage Manager server storage.	264
delete backup	Deletes active and inactive backup files from Tivoli Storage Manager server storage.	266
delete filespace	Deletes file spaces in Tivoli Storage Manager server storage.	268
expire	Inactivates backup objects that you specify in the file specification or with the ***filelist*** option.	269
help	Displays a Table of Contents of help topics for the command line client..	270
incremental	Backs up all new or changed files or directories in the default client domain or from file systems, directories, or files you specify, unless you exclude them from backup services.	271
loop	Starts an interactive command session.	275
macro	Executes commands within a macro file that you specify.	276
preview	Generates a file that lists objects to be backed up or archived according to the include-exclude list, prior to sending any data to the server.	277
query access	Displays a list of current authorization rules.	278
query archive	Displays a list of archived files.	279
query backup	Displays a list of backup versions.	281

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Table 46. Commands (continued)

Command	Description	Page
query backupset	Queries a backup set from a local file or the Tivoli Storage Manager server.	283
query filespace	Displays a list of file spaces in Tivoli Storage Manager storage. You can also specify a single file space name to query.	284
query inclexcl	Displays a list of include-exclude statements in the order in which they are processed during backup and archive operations.	285
query mgmtclass	Displays information about available management classes.	286
query node	Displays all the nodes for which an administrative user ID has authority to perform operations.	287
query options	Displays all or part of your options and their current settings.	288
query restore	Displays a list of your restartable restore sessions in the server database.	289
query schedule	Displays information about scheduled events for your node.	290
query session	Displays information about your session, including the current node name, when the session was established, server information, and server connection information.	291
query systeminfo	Gathers Tivoli Storage Manager system information and outputs this information to a file or the console.	292
restart restore	Displays a list of restartable restore sessions from which you can one to restart.	294
restore	Restores copies of backup versions of your files from a Tivoli Storage Manager server.	295
restore backupset	Restores a backup set from the Tivoli Storage Manager server or a local file.	298
retrieve	Retrieves copies of archived files from the Tivoli Storage Manager server.	300
schedule	Starts the client scheduler on the workstation.	303
selective	Backs up selected files.	305
set access	Authorizes another user to access your backup or archive data.	307
set event	Allows you to specify the circumstances for when archived data is deleted.	309
set password	Changes the Tivoli Storage Manager password for your workstation.	311

Starting and ending a client command session

You can start or end a client command session in either batch mode or interactive mode. Use batch mode when you want to enter a *single* client command. Tivoli Storage Manager processes the command and returns to the command prompt.

Use interactive mode when you want to enter a *series* of commands. Since Tivoli Storage Manager establishes connection to the server only once for interactive mode, a series of commands can be processed more quickly. Tivoli Storage Manager processes the commands and returns to the **tsm>** prompt.

Process commands in batch mode

When you enter a *single* command in batch mode, precede it with the executable program name, **dsmc**. For example, to process the **incremental** command in batch mode, you would enter:

```
dsmc incremental
```

Tivoli Storage Manager prompts you each time you enter a command if the ***passwordaccess*** option is set to *prompt* and authentication on the server is set to *On*. Type your password and press Enter.

You can also enter your password using the ***password*** option with a command, but your password appears on the screen. For example, if your password is ***secret***, enter:

```
dsmc incremental -password=secret
```

If you set the ***passwordaccess*** option to *generate* in your TSM System Preferences file, you do not need to specify the password with the command. Tivoli Storage Manager *only* prompts you for your password if you are registering your workstation with a server or manually changing your password.

Process commands in interactive mode

Use the *interactive* mode (or *loop* mode) to enter a series of commands. Enter **dsmc** on the command line and press Enter. When the **tsm>** command prompt appears, type the command name and press Enter. *Do not* precede each command with the executable program name, **dsmc**. Alternatively, you can enter **dsmc loop** on the command line to start a client command session in interactive mode. **Loop** is the default command for **dsmc**.

If a password is required, Tivoli Storage Manager prompts you before you enter the first command. Type your user ID and password and press Enter. You can also enter your password using the ***password*** option with the **loop** command, but your password appears on the screen. For example, if your password is ***secret***, enter:

```
dsmc loop -password=secret
```

To end an interactive session, enter **quit** at the prompt.

Entering client commands

A client command can include one or more of these components:
- Command name
- Options
- Parameters

The sections that follow describe each of these components.

Command name

The first part of a command is the command name. The command name consists of a single word, such as **help** or **schedule**, or an action word and an object for

that action, such as **query archive**. Enter the full command name, or its minimum abbreviation. For example, you can enter any of the following versions of the **query schedule** command:

```
query schedule
q sc
q sched
query sc
```

Options

There are two groups of options that you can use with commands:

- **Client options**: The group of options that are set in your TSM System Preferences file or TSM User Preferences file. To override an option in the TSM System Preferences file or TSM User Preferences file, enter the option with a command. For detailed information about client options, see "Client options reference" on page 120.
- **Client command options**: Use this group of options with specific commands on the command line *only*. For detailed information about client command options, see "Client options reference" on page 120.

Options handling in interactive mode

In interactive mode, options you enter on the initial command line will override the value that you specified in your TSM User Preferences file or TSM System Preferences file. This value remains in effect for the entire interactive session unless overridden by a different value on a given interactive command. For example, if you set the ***subdir*** option to *yes* in your TSM User Preferences file, and you specify ***-subdir***=*no* on the initial command line, the ***-subdir***=*no* setting remains in effect for the entire interactive session unless overridden by the ***-subdir***=*yes* value on a given interactive command. However, the ***subdir***=*yes* value specified within the interactive session only affects the command on which it is entered. When that command completes, the value reverts back to ***-subdir***=*no*, the value at the beginning of the interactive session.

Parameters

Commands can have required parameters, optional parameters, or no parameters at all. Required parameters provide information to perform a task. The most commonly required parameter is a file specification. For example, if you want to archive a file named budget.fin from the /project directory, you would enter:

```
dsmc archive /project/budget.fin
```

Some commands have optional parameters. If you do not enter a value for an optional parameter, Tivoli Storage Manager uses the default value. For example, the **restore** command includes a required parameter, *sourcefilespec*, that specifies the path and file name in storage that you want to restore. The optional parameter, *destinationfilespec*, specifies the path and file name where you want to place the restored files. If you do not specify the *destinationfilespec*, by default Tivoli Storage Manager restores the files to the original source path. If you want to restore the files to a *different* directory, enter a value for *destinationfilespec*. For example, to restore the /project/budget.fin file to /newproj/newbudg.fin, enter:

```
dsmc restore /project/budget.fin /newproj/newbudg.fin
```

Enter parameters in the order indicated in the command syntax diagram.

File specification syntax

Use the following syntax rules when entering file specification parameters, such as *filespec*, *sourcefilespec*, and *destinationfilespec*:

- The command line client accepts a forward slash (/) delimiter. For example, to back up all files in the /Volumes/fs1/devel directory with an extension of .c, enter:

  ```
  dsmc sel "/Volumes/fs1/devel/*.c"
  ```

- If a file specification does not begin with a file space name (an opening directory delimiter), the file specification is assumed to be a subdirectory of the current working directory and Tivoli Storage Manager builds the fully qualified file specification. For example, if the current working directory is /Users/me, then the *destinationfilespec* would be /Users/me/mydir in the following command:

  ```
  dsmc restore "/Volumes/fs/dir1/*" mydir/
  ```

- The only command that accepts a simple file space name is the **incremental** command. The following example is valid:

  ```
  dsmc i /Users
  ```

  The following example is *not* valid:

  ```
  dsmc sel /Users
  ```

- When entering the *sourcefilespec*, if the directory name ends with **/**, then **/*** is implied.

  When entering a *destinationfilespec*, if the name ends with **/**, then it is considered a directory, otherwise it is considered a file.

  The following example illustrates these two rules. Even though `mydir` and `yourdir` are directories, the command will fail because `/*` is implied after `mydir`, and `yourdir` is considered a file:

  ```
  restore /Users/mydir/ /Volumes/away/yourdir
  ```

  The following example illustrates the second rule. Even though `mydir` and `yourdir` are directories, the command will fail because `mydir` and `yourdir` are considered files:

  ```
  restore /Users/mydir /Volumes/away/yourdir
  ```

- Do not use wildcards as part of the file space name or anywhere in the *destinationfilespec*. The one exception to this rule is the **set access** command where wildcards are permitted in the two lowest-levels of the file spec. For example, to allow access to all files in all directories *in* and *below* the /Users directory, enter:

  ```
  set access backup /Users/* * *
  set access backup /Users/*/* * *
  ```

  Do not use wildcards for the directory path name, for example:

  ```
  /Users/j*asler/file1.c
  ```

- The maximum number of characters for a file name is 255. The maximum number of characters for a path name is 1023 characters.
- The maximum number of file specifications per command:
  - The Query commands can accept only one file specification.
  - The **restore** and **retrieve** commands can accept a *sourcefilespec* and a *destinationfilespec*.
  - Unless the *removeoperandlimit* option is used, there is a 20-operand limit on these commands. This is to prevent inadvertent use of wildcards, which get expanded by the shell command processor. Allowing the command processor to expand wildcards results in very inefficient processing by the Tivoli Storage Manager client. You can use the ***filelist*** option to process a list of

files. The Tivoli Storage Manager client opens the file you specify with this option and processes the list of files within according to the specific command. See "Filelist" on page 159 for more information.

Notes:

1. You can overcome these limitations by using the ***filelist*** option to process a list of files. The Tivoli Storage Manager client opens the file you specify with this option and processes the list of files within according to the specific command. See "Filelist" on page 159 for more information.
2. You can also use the ***removeoperandlimit*** option to specify that Tivoli Storage Manager removes the 20-operand limit for the Macintosh OS X platform. If you specify the ***removeoperandlimit*** option with the **incremental**, **selective**, or **archive** commands, the 20-operand limit is not enforced and is restricted only by available resources or other operating system limits. See "Removeoperandlimit" on page 209

Remembering previous commands

If you set the ***editor*** option to *yes* in your TSM User Preferences, Tivoli Storage Manager permits you to recall and edit as many as 20 previously entered commands by using the Up arrow and Down arrow keys. If you set the ***editor*** option to *no*, the feature to recall previous commands is not active. If the editor and command retrieve functions are not working on a specific workstation setting, you should turn off the ***editor*** option. For more information regarding the ***editor*** option, see "Editor" on page 146.

Pressing the Up arrow key displays the previous command in memory. Pressing the Down arrow key displays the next command in memory. Table 47 lists other functions you can perform when you recall commands.

Table 47. Command recall and edit functions

Function	Press
Display the previous command in memory.	Up arrow
Display the next command in memory.	Down arrow
Move to the left.	Left arrow
Move to the right.	Right arrow
Move five spaces to the right.	Tab right
Move to the beginning of the previous word	Ctrl-left arrow or CTRL-L
Move to the beginning of the next word.	Ctrl-right arrow or CTRL-R
Delete a character to the right of the cursor.	Del
Delete a character to the left of the cursor.	Delete
Finish or execute the command.	Return
Quit the program.	F3 or Esc
End the program.	CTRL-C

Using wildcard characters

In a command, you can use wildcard characters in the file name or file extension *only*. You cannot use them to specify destination files, file systems, or directories. You cannot specify a directory whose name contains an asterisk (*) or a question mark (?). Tivoli Storage Manager recognizes these characters only as wildcard

characters. Use wildcard characters when you want to specify multiple files with similar names in *one* command. Without wildcard characters, you must repeat the command for each file. Valid wildcard characters that you can use include:

***** Asterisk. Matches zero or more characters.

? Question mark. Matches any single character at the present position.

Table 48 shows examples of each wildcard.

Table 48. Wildcard characters

Pattern	Matches	Does not match
Asterisk (*)		
ab*	ab, abb, abxxx	a, b, aa, bb
ab*rs	abrs, abtrs, abrsrs	ars, aabrs, abrss
ab*ef*rs	abefrs, abefghrs	abefr, abers
abcd.*	abcd.c, abcd.txt	abcd, abcdc, abcdtxt
Question Mark (?)		
ab?	abc	ab, abab, abzzz
ab?rs	abfrs	abrs, abllrs
ab?ef?rs	abdefjrs	abefrs, abdefrs, abefjrs
ab??rs	abcdrs, abzzrs	abrs, abjrs, abkkkrs

Note: In batch mode, you must enclose values containing wildcards in double quotes. For example:

```
dsmc selective "/Users/me/*.c"
```

Entering commands

Follow the general rules below when you enter commands:

- When you enter options with a command, always precede the option with a dash (–).
- Enter more than one option in any order in a command before or after the file specification. Separate multiple options with a blank space.

Client commands reference

The following sections contain detailed information about each of the Tivoli Storage Manager commands. Information for each command includes:

- A description of the command.
- A syntax diagram of the command. The command name contains uppercase and lowercase characters. The uppercase characters indicate the minimum abbreviation you can use for the command name. See “Reading syntax diagrams” on page x for an explanation of these diagrams.
- Detailed descriptions of the command parameters. If the parameter is a constant (a value that does not change), the minimum abbreviation appears in uppercase letters.
- Examples of using the command.

Archive

The **archive** command archives a single file, selected files, or all files in a directory and its subdirectories on a server.

Archive files that you want to preserve in their current condition. To release storage space on your workstation, delete files as you archive them using the ***deletefiles*** option. Retrieve the archived files to your workstation whenever you need them again.

See "Supported file systems" on page 48 for supported file systems, ACL, and Extended Attribute support.

Removing operand limits

You can use the ***removeoperandlimit*** option to specify that Tivoli Storage Manager removes the 20-operand limit for the Macintosh OS X platform. If you specify the ***removeoperandlimit*** option with the **archive** command, the 20-operand limit is not enforced and is restricted only by available resources or other operating system limits. See "Removeoperandlimit" on page 209

Migrating to Unicode-enabled file spaces

Please see "Autofsrename" on page 125 for information about using the Unicode-enabled client.

Syntax

```
►►─Archive──┬──────────┬──┬─────────┬──┬──────────────────────────────►◄
            └─options──┘  └─filespec─┘  │
                          └─"filespec"─┘
```

Parameters

options

Table 49. Archive command: Related options

Option	Where to use	Page
archmc	Command line only.	122
autofsrename	TSM System Preferences only.	125
changingretries	TSM System Preferences file *within* a server stanza, or command line.	127
compressalways	TSM User Preferences file or command line.	132
compression	TSM System Preferences file *within* a server stanza or command line.	133
deletefiles	Command line only.	138
description	Command line only.	139
dirsonly	Command line only.	142
filelist	Command line only.	159
filesonly	Command line only.	162
removeoperandlimit	Command line only.	209
subdir	TSM User Preferences file or command line.	230

Table 49. Archive command: Related options (continued)

tapeprompt	TSM User Preferences file or command line.	232
v2archive	Command line only.	248

filespec
Specifies path and name of the file you want to archive. You can use wildcards to specify groups of files or all the files in a directory. See "Maximum file size for backup and restore" on page 49 for the maximum file size for archive processing.

Examples

Task Archive a single file named budget.jan in the /Users/mike/Documents directory.

Command: `archive /Users/mike/Documents/budget.jan`

Task Archive a single file named budget.jan in the /Volumes/proj4 directory.

Command: `archive /Volumes/proj4/budget.jan`

Task Archive all files in the /Users/user1/Documents directory with a file extension of .txt.

Command: `archive /Users/user1/Documents/*.txt`

Task Archive all files in the directory tree headed by the /Users directory.

Command: `archive -subdir=yes /Users/*`

Cancel Restore

The **cancel restore** command displays a list of your restartable restore sessions in the server database. You can only cancel one restartable restore session at a time. Run the **cancel restore** command again to cancel additional restores. To restart restartable restore sessions, use the **restart restore** command.

Use the **cancel restore** command when:

- You cannot back up files affected by the restartable restore.
- Restartable restore sessions lock the file space so that files cannot be moved off of the server's sequential volumes.

Syntax

```
►►──Cancel Restore──────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this command.

Examples

Task Cancel a restore operation.

Command: `cancel restore`

Delete Access

The **delete access** command deletes authorization rules for files that are stored on the server. When you delete an authorization rule, you revoke user access to any files specified by that rule.

Syntax

```
►►──Delete ACcess──────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this command.

Examples

Task Display a list of current authorization rules and select the rules you want to delete.

Command: `delete access`

See the following screen example:

```
Index   Type       Node    Owner   Path
_____   _______    ____________________________
1       Backup     NODE1   USER1   /Users/dthomas/proja
                                   /list/
2       Archive    NODE3   LUIE    /Users/budg/depta/
3       Backup     NODE4   USER2   /Users/exp/deptc/
4       Archive    NODE5   USER2S  /Users/mfg/invn
                                   /parta/
Enter Index of rule(s) to delete, or quit to cancel:
```

To delete the authorization rules that let **luie** and **user2s** access your files , type: **2 4** or **(2,4)** and press Enter.

Delete Archive

The **delete archive** command deletes archived files from Tivoli Storage Manager server storage. Your administrator must give you authority to delete archived files.

Attention: When you delete archived files, ***you cannot retrieve them.*** Verify that the files are obsolete *before* you delete them.

Syntax

```
►►─Delete ARchive──┬──────────┬──┬─ filespec ─┬──────────────────────────────►◄
                   └─ options─┘  └─ "filespec"─┘
```

Parameters

options

Table 50. Delete Archive command: Related options

Option	Where to use	Page
dateformat	TSM User Preferences file or command line.	136
description	Command line only.	139
filelist	Command line only.	159
noprompt	Command line only.	190
numberformat	TSM User Preferences file or command line.	191
pick	Command line only.	197
subdir	TSM User Preferences file or command line.	230
tapeprompt	TSM User Preferences file or command line,	232
timeformat	TSM User Preferences file or command line.	242

filespec
Specifies the path and file name that you want to delete from storage. Use wildcard characters to specify a group of files or all files in a directory.

Examples

Task Delete a file named budget.jan.

Command: `delete archive /Users/user2/Documents/budget.jan`

Task Delete a file named budget.jan in the /Volumes/proj4 directory.

Command: `delete archive /Volumes/proj4/budget.jan`

Task Delete all files archived from the /Users/user1/Documents directory with a file extension of `.txt`.

Command: `delete archive /Users/user1/Documents/*.txt`

Task Delete files archived from the /Users/user1/Documents directory using the ***pick*** option to display a list of archive copies that match the file specification. From the list, you can select the versions to process.

Command: `delete archive /Users/user1/Documents/*.* -pick`

Task Delete selected files from the group of files archived with the description "Monthly Budgets 1999".

Command: `delete ar -description="Monthly Budgets 1999" -pick`

Delete Backup

The **delete backup** command deletes backup files from Tivoli Storage Manager server storage. Your administrator must give you authority to delete backup files.

Attention: After you delete backup files, ***you cannot restore them.*** Verify that the backup files are no longer needed before you delete them. Tivoli Storage Manager will prompt whether you want to continue with the delete. If you specify *yes*, the specified backup files are immediately deleted and removed from Tivoli Storage Manager server storage.

Syntax

```
                                                   ┌─objtype=FILE──┐
►►─Delete BAckup──┬──────────┬──┬─ filespec ──┬──┬──────────────┬──►
                  └─ options─┘  └─ "filespec"─┘  └─objtype=IMAGE─┘

  ┌─deltype=ACTIVE───────┐
►─┼──────────────────────┼──────────────────────────────────────►◄
  ├─deltype=INACTIVE─────┤
  └─ALL──────────────────┘
```

Parameters

options

Table 51. Delete Backup command: Related options

Option	Where to use	Page
description	Command line only.	139
filelist	Command line only.	159
fromdate	Command line, and in GUI find function.	159
fromtime	Command line, and in GUI find function.	159
noprompt	Command line only.	190
pick	Command line only.	197
pitdate	Command line, and in GUI find function.	159
pittime	Command line, and in GUI find function.	159
subdir	TSM User Preferences file or command line.	230
tapeprompt	TSM User Preferences file or command line,	232
timeformat	TSM User Preferences file or command line.	242
todate	Command line, and in GUI find function.	159
totime	Command line, and in GUI find function.	159

deltype

Specifies the type of backup delete you want to perform. You can specify any of the following values:

ACTIVE

Specifies that you want to delete only active objects. Directories will not be deleted. This is the default.

Note: If you have any inactive objects after the current active object is deleted, the most current inactive object will be changed from inactive to active.

INACTIVE
Specifies that you want to delete only inactive objects. Directories will not be deleted.

ALL
Specifies that you want to delete all objects, including directories.

filespec
Specifies the path and file name that you want to delete from storage. Use wildcard characters to specify a group of files or all files in a directory.

objtype
Specifies the type of backup delete you want to perform. You can specify either of the following values:

FILE
Specifies that you want to delete directories and files. This is the default.

IMAGE
Specifies that you want to delete an image backup.

Examples

Task Delete a file named budget.jan.

Command: `delete backup /Users/user2/Documents/budget.jan`

Task Delete a file named budget.jan in the /Volumes/proj4 directory.

Command: `delete backup /Volumes/proj4/budget.jan`

Task Delete all files backed up from the /Users/user1/Documents directory with a file extension of `.txt`.

Command: `delete backup /Users/user1/Documents/*.txt`

Task Delete files backed up from the /Users/user1/Documents directory using the ***pick*** option to display a list of backup copies that match the file specification. From the list, you can select the versions to process.

Command: `delete backup /Users/user1/Documents/*.* -pick`

Delete Filespace

System Administrator

The **delete filespace** command deletes file spaces in Tivoli Storage Manager server storage. A *file space* is a logical space on the server that contains files you backed up or archived. Tivoli Storage Manager assigns a separate file space on the server for each workstation file system from which you back up or archive files. The file space name is the same as the file system name. When you enter the **delete filespace** command, a list of your file spaces is displayed. From this list, select the file space that you want to delete.

Your administrator must give you authority to delete a file space. You need BACKDEL authority if the file space you want to delete contains backup versions, or ARCHDEL authority if the file space contains archive copies. If the file space contains *both* backup versions and archive copies, you need both types of authority.

Attention: When you delete a file space, you delete *all* backup versions and archive copies within that file space. When you delete a file space, ***you cannot restore the files***. Verify that the files are obsolete *before* you delete them.

Syntax

```
►►─Delete Filespace──┬──────────┬──────────────────────────────────────►◄
                     └─ options─┘
```

Parameters

options

Table 52. Delete Filespace command: Related options

Option	Where to use	Page
detail	Command line only.	140
scrolllines	TSM User Preferences file or command line.	222
scrollprompt	TSM User Preferences file or command line.	223

Examples

Task Delete a file space.

Command: `delete filespace`

Expire

The **expire** command inactivates the backup objects you specify in the file specification or with the ***filelist*** option.

When working in interactive mode, a prompt notifies you before files are expired.

The **expire** command does not remove workstation files. If you expire a file or directory that still exists on your workstation, the file or directory is backed up again during the next incremental backup unless you exclude the object from backup processing.

If you expire a directory that contains active files, those files will not appear in a subsequent query from the GUI. However, these files will be displayed on the command line, if you specify the proper query with a wildcard character for the directory.

Syntax

```
►►─EXPire──┬──────────┬─ filespec──────────────────────────────────►◄
           └─ options─┘
```

Parameters

options

Table 53. Expire command: Related options

Option	Where to use	Page
dateformat	TSM User Preferences file or command line.	136
filelist	Command line only.	159
noprompt	Command line only.	190
numberformat	TSM User Preferences file or command line.	191
pick	Command line only.	197
timeformat	TSM User Preferences file or command line.	242

Note: If you specify ***filelist***, then ***pick*** is ignored.

filespec
Specifies a path and a filename that you want to expire. You can enter only one file specification on this command. However, you can use wildcards to select a group of files or all the files in a directory. If you specify the ***filelist*** option, the `filespec` designation is ignored.

Examples

Task Inactivate the letter1.txt file in the home directory.

Command: `dsmc expire /Users/home/letter1.txt`

Task Inactivate all files in the /Users/user1/Documents/ directory.

Command: `expire /Users/user1/Documents/*`

Task Inactivate all files in the /Users/avi/Documents/filelist.txt file.

Command: `expire -filelist=/Users/avi/Documents/filelist.txt`

Help

The **help** command displays a Table of Contents of help topics for the command line client. The topics include help for the following:

- Summary of Changes
- Using Commands
- Using Processing Options
- Glossary
- Messages

Enter the number of the topic that you want to view. If there is more than one screen of topics, scroll backward or forward through the list. To exit, type **q** and press Enter.

Note: If you use the **help** command on the initial command line, no server contact is made and no password is needed.

Syntax

```
►►──Help──────────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this command.

Examples

Task Display a list of help topics.

Command: `help`

Incremental

The **incremental** command backs up all new or changed files or directories in the default client domain or from file systems, directories, or files you specify, unless you exclude them from backup services. See "Supported file systems" on page 48 for supported file systems, ACL, and Extended Attribute support.

To incrementally back up selected files or directories, enter a file specification in the command. If you do not enter a file specification, the default is to back up files or directories in the default domain. See "Domain" on page 144 for information on how to change which objects are included in the default domain.

The following attributes in the management class assigned to the file or directory affect whether the data is actually backed up:

Frequency
The number of days that must elapse between successive backups for the file. The **frequency** attribute applies only to a full incremental backup.

Mode Permits you to back up only files that changed since the last backup (*modified*) or back up the files whether they changed or not (*absolute*).

Serialization
Permits or denies backup of files or directories according to the following values:
- **static**: In order to be backed up, data must not be modified during backup or archive.
- **shared static**: If data in the file or directory changes during each of the allowed attempts to back up or archive it, it is not backed up or archived. The value of the ***changingretries*** option determines how many attempts are made. The default is 4.
- **dynamic**: The object is backed up or archived on the first attempt whether or not data changes during the process.
- **shared dynamic**: The object is backed up or archived on the last attempt, even if data changes during the process.

For more information on management classes, see Chapter 8, "Understanding storage management policies," on page 93.

Using the ***include*** option in an include-exclude list, you can override the default management class for a file or group of files.

You can perform either a *full incremental* backup or an *incremental by date* backup. The default is a full incremental backup.

You can also use the **selective** command to perform a *selective* backup that backs up only the files, directories or empty directories that you specify regardless of whether they have changed. For more information, see "Selective" on page 305.

A full incremental backs up all files or directories that are new or have changed since the last incremental backup. During a full incremental backup, the client queries the server . Tivoli Storage Manager uses this information to:
- Back up new files or directories.
- Back up files or directories whose contents have changed.
- Mark inactive backup versions on the server for files or directories that are deleted from the workstation.
- Rebind backup versions to management classes if the management class assignments change.

Removing operand limits

Please see "Removeoperandlimit" on page 209 for information about operand limits.

Migrating to Unicode-enabled file spaces

Please see "Autofsrename" on page 125 for information about using the Unicode-enabled client.

Incremental-by-Date

An incremental-by-date backup backs up new and changed files with a modification date later than the date of the last incremental backup stored at the server, unless the files are excluded from backup by an **exclude** statement.

If an incremental-by-date is performed on only part of a file system, the date of the last full incremental is not updated, and the next incremental-by-date will back up these files again. Changes to the access control lists (ACL) or Extended Attributes do not cause the files to be backed up during an incremental-by-date. Use the **query filespace** command to determine the date and time of the last incremental backup of the entire file system.

To perform an incremental-by-date backup, use the ***incrbydate*** option with the **incremental** command.

Unlike a full incremental, an incremental-by-date does not maintain current server storage of *all* your workstation files because:

- It does not expire backup versions of files that are deleted from the workstation.
- It does not rebind backup versions to a new management class if the management class has changed.
- It does not back up files with attributes that have changed, unless the modification dates and times have also changed.
- It ignores the copy group frequency attribute of management classes.

For these reasons, if you have limited time during the week to perform backups, but extra time on the weekends, you can perform an incremental-by-date backup on weekdays and a full incremental backup on weekends to maintain current server storage of your workstation files.

If the **incremental** command is retried because of a communication failure or session loss, the transfer statistics will display the number of bytes Tivoli Storage Manager attempted to transfer during *all* command attempts. Therefore, the statistics for bytes transferred not match the file statistics, such as those for file size.

Syntax

```
►►─Incremental──┬──────────┬──┬──────────┬──┬──────────┬──────────►◄
                └─options──┘  │ filespec │  │          │
                              └ "filespec"┘  │          │
                                             │          │
                                             └──────────┘
```

Parameters

options

Table 54. Incremental command: Related options

Option	Where to use	Page
changingretries	TSM System Preferences file *within* a server stanza, or command line.	127
compressalways	TSM User Preferences file or command line.	132
compression	TSM System Preferences file *within* a server stanza or command line.	133
dirsonly	Command line only.	142
domain	TSM System Preferences file *within* a server stanza or command line only.	144
filelist	Command line only.	159
filesonly	Command line only.	162
incrbydate	Command line only.	176
memoryefficientbackup	TSM User Preferences file or command line.	186
removeoperandlimit	Command line only.	209
subdir	TSM User Preferences file or command line.	230
tapeprompt	TSM User Preferences file or command line.	232

filespec

Specifies the path and file name that you want to back up. Use wildcards to select a group of files or all the files in a directory. If you do not specify a file specification, the default domain or the domain specified as an option is backed up. See "Maximum file size for backup and restore" on page 49 for the maximum file size for backup processing.

If you specify a file system, all new and changed files are backed up. In addition, the last incremental date for the file space is updated on the server. If you specify a file or directory, the last incremental date is not updated. This means the file or directory might be backed up again if a later backup is performed using the ***incrbydate*** option.

If you specify a file system, specify the file system without a trailing slash.

Examples

Task Run an incremental backup of the default client domain specified in your TSM System Preferences file.

Command: `Incremental`

Task Run an incremental-by-date backup for the /Users file system.

Command: `Incremental -incrbydate /Users`

Task Run an incremental backup of all files in the /Volumes/proj6 directory that begin with the string abc.

Command: `Incremental -subdir=yes /Volumes/proj6/abc*`

Task Run an incremental backup of the abc file in the /Users/user1/Documents directory.

Command: `Incremental -subdir=yes /Users/user1/Documents/abc`

Task Run an incremental backup of the directory object /Users/user2/Documents, but not any of the files in the /Users/user2/Documents directory.

Command: `Incremental /Users/user2/Documents`

Task Run an incremental backup of the directory object /Users/user2/Documents, all of the files in the /Users/user2/Documents directory, and all files and subdirectories under /Users/user2/Documents.

Command: `Incremental -subdir=yes /Users/user2/Documents/`

Loop

The **loop** command starts an interactive command line session that is maintained until you enter **quit**.

If you are required to enter a password, you will be prompted for it before the loop mode prompt appears.

Note: It is not possible to enter loop mode without a valid server contact. One of the consequences is that certain commands, such as `restore backupset -location=file`, will only be accepted on the initial command line when a valid server is not available.

In an interactive command line session, it is unnecessary to precede each command name with **dsmc** and your password, if one is required.

In interactive mode, options you enter on the initial command line will override the value that you specified in your TSM System Preferences file or TSM User Preferences file. This value remains in effect for the entire interactive session unless overridden by a different value on a given interactive command. For example, if you set the ***subdir*** option to *yes* in your TSM User Preferences file, and you specify ***-subdir***=*no* on the initial command line, the ***-subdir***=*no* setting remains in effect for the entire interactive session unless overridden by the ***-subdir***=*yes* value on a given interactive command. However, the ***subdir***=*yes* value only affects the command it is entered on. When that command completes, the value reverts back to ***-subdir***=*no*, the value at the beginning of the interactive session.

You can enter all valid commands in interactive mode *except* the **schedule** and **loop** commands.

There are some options that you cannot use in the interactive session created by the **loop** command and are identified in the option description by this statement: *This option is valid only on the initial command line. It is not valid in interactive mode*.

See Chapter 9, "Using processing options," on page 105 for options that you cannot use in interactive mode.

Syntax

```
►►──LOOP──────────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this command.

Examples

Task Start an interactive command line session.

Command: `dsmc`

At the **tsm>** prompt, enter a command.

Macro

The **macro** command executes a series of commands that you specify in a macro file. By including the **macro** command within a macro file, you can nest as many as ten levels of commands.

Comment lines are not supported within the macro file that you specify for the **macro** command.

Syntax

```
►►──MAcro─ macroname──────────────────────────────────────────►◄
```

Parameters

macroname
Specifies the fully qualified name of the file containing the commands.

Examples

The following is an example of how to use the **macro** command.

Task Selectively back up files in the following directories:

```
/Users/user3/Documents/proja
/Users/user3/Documents/projb
/Users/user3/Documents/projc
```

Command: `macro backabc.mac`

where `backabc.mac` contains the following statements:

```
Selective /Users/user3/Documents/proja/
Selective /Users/user3/Documents/projb/
Selective /Users/user3/Documents/projc/
```

Preview

The **preview** command simulates a backup or archive command without sending data to the server. The **preview** command generates a tab delineated text file that can be imported into a spreadsheet program. The preview contains information such as whether the file is excluded or included. If the file is excluded, the pattern, or reason, the file is excluded will be listed, along with the source for the pattern.

Syntax

```
►►──PREview──Backup|Archive──filespec──-filter=──┬─ALL──┬──┬──────────────►
                                                 ├─INCL─┤  └─-filename=─┘
                                                 └─EXCL─┘

►──┬──────────┬──┬──────────┬──┬──────────────────────────────────────►◄
   └─-console─┘  │ ┌─yes─┐  │
                 │ └─no──┘  │
                 └─-traverse=┘
```

Parameters

Backup|Archive
Indicates whether to preview output from a selective backup or archive operation.

filespec
Specifies the path and file name that you want to back up. Use wildcard characters to select a group of files or all of the files in a directory.

-filter Specifies the output to display – included objects, excluded objects, or both.

ALL Display output for included and excluded objects. This is the default.

INCLuded
Display output for included objects only.

EXCLuded
Display output for excluded objects only.

-filename=
Specifies the filename in which to write the tab-delineated output. The default is dsmprev.txt.

-console
Output is written to the console, and the file.

-traverse
Preview the current directory and subdirectories.

Yes Preview the current directories and subdirectories. This is the default.

No Preview only the current directory, not subdirectories.

Attention: Specifying **-traverse** does not preview directories excluded using the ***exclude.dir*** option.

Query Access

The **query access** command displays a list of users to whom you have given access to backup versions or archive copies of specific files. Tivoli Storage Manager displays a list of authorization rules that you defined with the **set access** command or with ***Node Access List*** on the graphical user interface (GUI) Utilities menu. The information includes:

- Authority you gave a user to restore backup versions or retrieve archive copies.
- The node name of the user to whom you gave authorization.
- The ID of the user at that node to whom you gave authorization.
- The files to which the user has access.

Syntax

```
►►──Query ACcess──────────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this command.

Examples

Task Display a list of users who have access to your files.

Command: `query access`

Query Archive

The **query archive** command displays a list of your archived files and the following information about each file:

- File size
- Archive date
- File specification
- Expiration date
- Archive description

If you use the ***detail*** option with the **query archive** command, the client displays the following additional information:

- Last modification date

Syntax

```
►►─Query ARchive──┬──────────┬──┬─ filespec ──┬──────────────────────────►◄
                  └─ options─┘  └─ "filespec" ─┘
```

Parameters

options

Table 55. Query Archive command: Related options

Option	Where to use	Page
dateformat	TSM User Preferences file or command line.	136
description	Command line only.	139
detail	Command line only.	140
dirsonly	Command line only.	142
filelist	Command line only.	159
filesonly	Command line only.	162
fromdate	Command line only.	163
fromnode	Command line only.	164
fromowner	Command line only.	165
fromtime	Command line only.	166
numberformat	TSM User Preferences file or command line.	191
scrolllines	TSM User Preferences file or command line.	222
scrollprompt	TSM User Preferences file or command line.	223
subdir	TSM User Preferences file or command line.	230
timeformat	TSM User Preferences file or command line.	242
todate	Command line only.	243
totime	Command line only.	244

filespec

Specifies the path and file name that you want to query. Use wildcard characters to specify a group of files or all the files in a directory.

Examples

Task Display a list of all your archived files in the current working directory.

Command: `q archive *`

Task Display a list of all your archived files in the /Users/user3/Documents directory and all of its subdirectories.

Command: `query archive /Users/user3/Documents/*`

Task Display a list of all your archived files in the current directory. Use the ***dateformat*** and ***timeformat*** options to reformat the dates and times.

Command: `q ar –date=5 –time=1 *`

Task Display a list of all your archived files in the current directory. Use the ***detail*** option to display the last modification date and the of each file.

Command: `q ar -detail *`

Task Display a list of archived files in the /Users/user1/Documents directory whose first four characters of the file name begin with proj.

Command: `q ar /Users/user1/Documents/proj*`

Query Backup

The **query backup** command displays a list of backup versions of your files. File information includes the following:

- File specification
- File size
- Backup date
- Whether the file is active or inactive
- The management class assigned to the file. Only the first ten characters of the management class name appear.

If you use the ***detail*** option with the **query archive** command, the client displays the following additional information:

- Last modification date

Syntax

```
►►─Query Backup──┬──────────┬──┬─ filespec ─┬──────────────────────────────►◄
                 └─ options─┘  └─ "filespec"─┘
```

Parameters

options

Table 56. Query Backup command: Related options

Option	Where to use	Page
dateformat	TSM User Preferences file or command line.	136
detail	Command line only.	140
dirsonly	Command line only.	142
filelist	Command line only.	159
filesonly	Command line only.	162
fromdate	Command line only.	163
fromnode	Command line only.	164
fromowner	Command line only.	165
fromtime	Command line only.	166
inactive	Command line only.	170
numberformat	TSM User Preferences file or command line.	191
pitdate	Command line only.	198
pittime	Command line only.	199
scrolllines	TSM User Preferences file or command line.	222
scrollprompt	TSM User Preferences file or command line.	223
subdir	TSM User Preferences file or command line.	230
timeformat	TSM User Preferences file or command line.	242
todate	Command line only.	243
totime	Command line only.	244

filespec
Specifies the path and file name that you want to query. Use wildcard characters to specify a group of files or all the files in a directory.

Examples

Task Display a list of all active and inactive backup versions of your files in the current directory.

Command: `query backup –inactive *`

Task Display a list of all your backups in the current directory. Use the ***detail*** option to display the last modification date and the last access date of each file.

Command: `q backup -detail *`

Task Display a list of files that were backed up from the /Users/user3/Documents directory with file names that begin with proj.

Command: `q b /Users/user3/Documents/proj*`

Query Backupset

The **query backupset** command queries a backup set from a local file or the Tivoli Storage Manager server. This command displays the backup set name, generation date, retention, and description.

Syntax

```
►►─Query BACKUPSET─┬──────────┬─┬──────────────┬─────────────────────────►◄
                   └─options──┘ ├─ backupsetname─┤
                                └─ filename──────┘
```

Parameters

options

Table 57. Query Backupset command: Related options

Option	Where to use	Page
location	Command line only.	181
scrolllines	TSM User Preferences file or command line.	222
scrollprompt	TSM User Preferences file or command line.	223

backupsetname
Specifies the name of the backup set on the server you want to query when ***-location***=*server* is in effect. You can use wildcards to specify the backup set name. If you use wildcards or do not specify a backup set name, all backup sets that you own are displayed on the screen. When a backup set is created, the server assigns root as the owner of the backup set. When querying a backup set on the server, a non-root user will not see the backup set listed, even if they know the backup set name and use it in the query.

filename
Specifies the file name on your local workstation that contains the backup set you want to query when ***-location***=*file* is in effect.

Examples

Task Query a backup set called `mybackupsetname` on the server.

Command: `query backupset "mybackupsetname" -loc=server`

Task Query the backup set in the backupsetfile.name file in the budget directory.

Command: `dsmc query backupset /Users/user4/Documents/budget/backupsetfile.name loc=file`

Query Filespace

The **query filespace** command displays a list of file spaces for a node that are stored on the Tivoli Storage Manager server. You can also specify a single file space name to query. A *file space* is a logical space on the server that contains files you backed up or archived. Tivoli Storage Manager assigns a separate file space on the server for each file system at your workstation from which you back up or archive files.

A Unicode file space name not display correctly if the server is unable to display the Unicode name. In this case, use the file space identifier (fsID) to identify these file spaces on the server. Use the **query filespace** command with the ***detail*** option to determine the fsID of a file space.

Syntax

```
►►─Query Filespace──┬──────────────┬──┬──────────┬──────────────────────────►◄
                    └─ filespacename─┘  └─ options─┘
```

Parameters

filespacename
Specifies an optional character string which can include wildcards. Use this argument to specify a subset of file spaces. The default is to display all file spaces.

options

Table 58. Query Filespace command: Related options

Option	Where to use	Page
dateformat	TSM User Preferences file or command line.	136
detail	Command line only.	140
fromnode	Command line only.	164
fromowner	Command line only.	165
scrolllines	TSM User Preferences file or command line.	222
scrollprompt	TSM User Preferences file or command line.	223
timeformat	TSM User Preferences file or command line.	242

Examples

Task Display your file spaces.

Command: query filespace

Task Display your file spaces. Use the ***dateformat*** and ***timeformat*** options to reformat the dates and times.

Command: `query filespace –date=5 –time=4`

Task Display the /Users file space.

Command: `query filespace /Users`

Query Inclexcl

The **query inclexcl** command displays a list of include-exclude statements in the order in which they are processed during backup and archive operations. The list displays the type of option, the scope of the option (archive, all, etc.), and the name of the source file.

You can test the validity of patterns you wish to use in your include-exclude list before you actually insert them in your options file. See the *test pattern* explanation below.

Syntax

```
►►──Query INCLexcl─ ┬──────────────┬──────────────────────────────────►◄
                    └─test pattern─┘
```

Parameters

test pattern
Use for testing the validity of patterns you wish to use in your include-exclude list. When you use a test pattern with this command, the following occurs:

- The internal include-exclude list is *not* displayed
- The pattern is processed as if it had come from an include-exclude statement, including all the usual error checking
- The pattern is displayed as it would appear in the include-exclude list

If the test pattern has no errors, the compiled pattern result is the same as the test pattern.

Examples

Task Display a list of include-exclude statements.

Command: `query inclexcl`

Task Test the validity of this pattern: /.../?x?/*.log

Command: `query inclexcl /.../?x?/*.log`

Note: Some system files are excluded explicitly by Tivoli Storage Manager. You can use the **query inclexcl** command to display a list of these files.

Query Mgmtclass

The **query mgmtclass** command displays information about the management classes available in your active policy set.

Your administrator defines management classes that contain attributes controlling whether a file is eligible for backup or archive services. Management classes also determine how backups and archives are managed on the server.

Your active policy set contains a default management class; it can contain any number of additional management classes. You can assign specific management classes to files using ***include*** options that are located in the TSM System Preferences file. If you do not assign a management class to a file, Tivoli Storage Manager uses the default management class.

When you archive files, you can override the assigned management class by using the ***archmc*** option.

Syntax

```
►►─Query Mgmtclass──┬──────────┬──────────────────────────────────►◄
                    └─ options─┘
```

Parameters

options

Table 59. Query Mgmtclass command: Related options

Option	Where to use	Page
detail	Command line only.	140
fromnode	Command line only.	164

Examples

Task Display default and available management classes.

Command: `query mgmtclass`

Query Node

The **query node** command displays all the nodes for which an administrative user ID has authority to perform operations. The authorized administrative user ID should have at least client owner authority over the client workstation node they are using from command line.

When using an interactive command line session with a non-administrative ID, Tivoli Storage Manager prompts for an administrator ID.

Use the ***type*** option to specify the type of node to filter for. Valid values are *client*, *server*, and *any*. The default is *any*. See "Type" on page 246 for more information.

Syntax

```
►►──Query Node──┬──────────┬──────────────────────────────────────────►◄
                └─ options─┘
```

Parameters

options

Table 60. Query Node command: Related options

Option	Where to use	Page
type	Command line only.	246
scrolllines	TSM User Preferences file or command line.	222
scrollprompt	TSM User Preferences file or command line.	223

Examples

Task Display all client nodes that are backup-archive clients.

Command: `query node -type=client`

Query Options

Use the **query options** command to display all or part of your options and their current settings relevant to the command line client.

Syntax

```
►►─Query Options─┬──────────┬─ pattern──────────────────────────────►◄
                 └─ options─┘
```

Parameters

pattern
An optional character string which can include wildcards. Use this argument to specify a subset of options. The default is to display all options.

options

Table 61. Query Options command: Related options

Option	Where to use	Page
scrolllines	TSM User Preferences file or command line.	222
scrollprompt	TSM User Preferences file or command line.	223

Examples

Task Display all options and their values.

Command: `query options`

Task Display only options beginning with ***comm***.

Command: `query options comm*`

Task Display the value of the ***replace*** option.

Command: `query options replace`

Query Restore

The **query restore** command displays a list of your restartable restore sessions in the server database. The list contains these fields: owner, replace, subdir, preservepath, source, and destination.

A restartable restore session is created when a wildcard restore command fails because of network outage, client failure, server outage, or a similar problem. When such a failure occurs, the file space is locked on the server and its files cannot be moved off the server's sequential volumes. To unlock the file space, either restart the restore and allow it to complete (**restart restore** command), or cancel the restore (**cancel restore** command). Use **query restore** to determine if you have any restartable restore sessions and which file spaces are affected.

Syntax

```
►►──Query Restore──────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this command.

Examples

Task Display your restartable restore session in the server database.

Command: `query restore`

Query Schedule

The **query schedule** command displays the events scheduled for your node. Your administrator can set up schedules to perform automatic backups and archives for you. To plan your work, use this command to determine when the next scheduled events occur.

The enhanced **query schedule** command on a Tivoli Storage Manager Version 5.3 and above client reports new parameters. The **query schedule** command prior to Tivoli Storage Manager Version 5.3 is referred to as classic. Refer to the Administrator's Guide and Administrator's Reference for your operating system for more information on the classic and enhanced commands.

Syntax

```
►►──Query SChedule──────────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this command.

Examples

Task Display your scheduled events.

Command: `query schedule`

Query Session

The **query session** command displays information about your session, including the current node name, when the session was established, server information, and server connection information.

Syntax

```
►►──Query SEssion──────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this command.

Examples

Task Display your session information.

Command: `query session`

A sample **query session** display follows:

```
TSM Server Connection Information

Server Name.............: FIJI_0918GA
Server Type.............: AIX-RS/6000
Server Version..........: Ver. 5, Rel. 1, Lev. 0.0
Last Access Date........: 09/04/1999 15:09:40
Delete Backup Files.....: "Yes" or "No"
Delete Archive Files....: "Yes" or "No"

Node Name...............: EPSILON3
User Name...............: thompson
```

Query Systeminfo

Use the **query systeminfo** command to gather information on one or more of the following items and output this information to a file or the console:

- DSMOPTFILE - The contents of TSM User Preference file.
- DSMSYSFILE - The contents of the TSM System Preferences file.
- ENV - Environment variables.
- ERRORLOG - The Tivoli Storage Manager error log file.
- FILE - Attributes for the file name that you specify.
- INCLEXCL - Compiles a list of include-exclude in the order in which they are processed during backup and archive operations.
- OPTIONS - Compiled options.
- OSINFO - Name and version of the client operating system
- POLICY - Policy set dump.
- SCHEDLOG - The contents of the Tivoli Storage Manager schedule log (usually TSM Schedule Log).
- ENCRYPT - Available encryption methods.

Notes:

1. Use the ***filename*** option to specify a file name in which to store the information gathered from the items you specify. If you do not specify a file name, by default the information is stored in the /Library/Application Support/tivoli/tsm/client/ba/bin/dsminfo.txt file . See "Filename" on page 161 for more information.
2. Use the ***console*** option if you want to output the information to the console. See "Console" on page 135 for more information.

Note: This command is intended primarily as an aid for IBM support to assist in diagnosing problems, although users who are familiar with the concepts addressed by this information also find it useful. If you use the ***console*** option, no special formatting of the output is performed to accommodate screen height or width. Therefore, the console output be difficult to read due to length and line-wrapping. In this case, it is recommended that you use the ***filename*** option with the **query systeminfo** command to allow the output to be written to a file that can subsequently be submitted to IBM support.

Syntax

```
►►─Query SYSTEMInfo──┬─item─┬──┬──────────┬──────────────────────────────►◄
                     ▲      │  └─options──┘
                     └──────┘
```

Parameters

item

Specifies one or more items from which you want to gather information and output the information to the file name that you specify with the ***filename*** option or to the console.

options

Table 62. Query Systeminfo command: Related options

Option	Where to use	Page
console	Command line only.	135
filename	Command line only.	161

Examples

Task Gather and store the contents of the TSM User Preference file and the Tivoli Storage Manager error log file in the tsminfo.txt file.

Command: `query systeminfo dsmoptfile errorlog -filename=tsminfo.txt`

Restart Restore

The **restart restore** command displays a list of your restartable restore sessions in the server database. You can only restart one restartable restore session at a time. Run the **restart restore** command again to restart additional restores.

The restarted restore uses the same options you used in the failed restore. The restarted restore continues from the point at which the restore previously failed.

To cancel restartable restore sessions, use the **cancel restore** command. Use the **restart restore** command when:

- Restartable restore sessions lock the file space at the server so that files cannot be moved off the server's sequential volumes.
- You cannot back up files affected by the restartable restore.

Options from the failed session supersede new or changed options for the restarted session.

Syntax

```
►►──RESTArt Restore──────────────────────────────────────────────────►◄
```

Parameters

There are no parameters for this command.

Examples

Task Restart a restore.

Command: `restart restore`

Restore

The **restore** command obtains copies of backup versions of your files from a Tivoli Storage Manager server. To restore files, specify the directories or selected files, or select the files from a list. Restore files to the directory from which you backed them up or to a different directory. Tivoli Storage Manager uses the ***preservepath*** option with the *subtree* value as the default for restoring files. For more information, see "Preservepath" on page 204.

See "Supported file systems" on page 48 for supported file systems, ACL, and Extended Attribute support.

Note: When restoring a directory, its modification date and time is set to the date and time of the restore, not to the date and time the directory had when it was backed up. This is because Tivoli Storage Manager restores the directories first, then adds the files to the directories.

If you set the ***subdir*** option to *yes* when restoring a specific path and file, Tivoli Storage Manager recursively restores *all* subdirectories under that path, and any instances of the specified file that exist under *any* of those subdirectories.

For a restore which is not restartable, enter:

```
dsmc rest /Users/user1/file?.c -sub=yes
```

Use the **query restore** command to display a list of your restartable restore sessions in the server database. Further backups of the file system cannot be performed unless the restartable restore completes using the **restart restore** command or is cancelled using the **cancel restore** command.

```
dsmc rest /Users/user1/file?.c -sub=yes
```

When you restore an entire directory or directory tree, and you do not specify the ***inactive***, ***latest***, ***pick***, ***todate***, and ***fromdate*** options on the **restore** command, Tivoli Storage Manager tracks which objects are restored. If the restore process is interrupted for any reason, you can restart the restore at the point of interruption by entering the **restart restore** command. It is possible to create more than one restartable restore session. Restores are only restartable if the *filespec* is fully wildcarded. For example, for a restore which is restartable, enter:

```
dsmc rest /Users/user1/* -sub=yes
```

For a restore which is not restartable, enter:

```
dsmc rest /Users/user1/file?.c -sub=yes
```

Use the **query restore** command to display a list of your restartable restore sessions in the server database. Further backups of the file system cannot be performed unless the restartable restore completes using the **restart restore** command or is cancelled using the **cancel restore** command.

Restoring from file spaces that are not Unicode enabled

If you want to restore from file spaces that are not Unicode enabled, you must specify the source on the server and a destination on the client. For example, assume that `Jaguar` is the name of your startup disk and you back up all of the .log files in the /Users/user5/Documents directory. Before the backup takes place, the server renames the file space to `Jaguar_OLD`. The backup places the data specified in the current operation into the Unicode-enabled file space named `/`. The new Unicode-enabled file space now contains only the /Users/user5/Documents directory and the *.log files specified in the operation.

If you want to restore a file from the (old) *renamed* file space to its original location, you must enter both the source and destination as follows:

```
restore Jaguar_OLD/Users/user5/Documents/mylog.log /Users/user5/Documents/
```

Syntax

```
►►─REStore──┬─ FILE─┬──┬─────────┬──┬─ sourcefilespec ──────────────────►
            │       │  └─ options─┘  └─ "sourcefilespec" ─┘
►──┬─────────────────────┬──────────────────────────────────────────────►◄
  └─ destinationfilespec─┘
```

Parameters

file

This parameter specifies that the source file specification is an explicit file name. This parameter is required when you restore a file name from the current path, when you do not specify a relative or absolute path, and when the file name conflicts with one of the reserved **restore** command keywords, such as **restore** ***backupset***.

options

Table 63. Restore command: Related options

Option	Where to use	Page
dateformat	TSM User Preferences file or command line.	136
dirsonly	Command line only.	142
filelist	Command line only.	159
filesonly	Command line only.	162
fromdate	Command line only.	163
fromnode	Command line only.	164
fromowner	Command line only.	165
fromtime	Command line only.	166
ifnewer	Command line only.	169
inactive	Command line only.	170
latest	Command line only.	179
numberformat	TSM User Preferences file or command line.	191
pick	Command line only.	197
pitdate	Command line only.	198
pittime	Command line only.	199
preservepath	Command line only.	204
replace	TSM User Preferences file or command line.	210
subdir	TSM User Preferences file or command line.	230
tapeprompt	TSM User Preferences file or command line.	232
timeformat	TSM User Preferences file or command line.	242
todate	Command line only.	243

Table 63. Restore command: Related options (continued)

totime	Command line only.	244

sourcefilespec
Specifies the path and file name in storage that you want to restore. Use wildcard characters to specify a group of files or all the files in a directory.

destinationfilespec
Specifies the path and file name where you want to place the restored files. If you do not specify a destination, Tivoli Storage Manager restores the files to the original source path.

Examples

Task Restore a single file named budget in the /Users/user1/Documents directory.

Command: `restore /Users/user1/Documents/budget`

Task Restore a single file named budget in the /Volumes/proj5 directory.

Command: `restore /Volumes/proj5/budget`

Task Restore a single file named budget which resides in the current directory.

Command: `restore file budget`

Task Restore all files with a file extension of .c from the /Users/user3/Documents directory.

Command: `restore /Users/user3/Documents/*.c`

Task Restore files in the /Users/user4/Documents directory. Use the ***pick*** and ***inactive*** options to select active and inactive backup versions.

Command: `/Users/user4/Documents/* -pi -ina`

Task Restore all files from the /Volumes/fs2/projecta directory that end with the character .c to the /Volumes/newfs/projectn/projecta directory. If the projectn or the projectn/projecta directory does not exist, it is created.

Command: `restore /Volumes/fs2/projecta/*.c /Volumes/newfs/projectn/projecta`

Task Restore all files in the /Users/user1/Documents directory to their state as of 1:00 PM on August 17, 2002.

Command: `restore -pitd=8/17/2002 -pitt=13:00:00 /Users/user1/Documents/`

Task Restore a file from the renamed file space Jaguar_OLD to its original location. Enter both the source and destination as follows:

Command: `res Jaguar_OLD/user5/Documents/myresume.doc /Users/user5/Documents/`

Task Restore files specified in the filelist to a different location.

Command: `res -filelist=/Users/user1/documents/restorelist.txt /Users/user1/NewRestoreLocation/`

Restore Backupset

The **restore backupset** command restores a backup set from the Tivoli Storage Manager server or a local file.

Use the ***location*** option with the **restore backupset** command to specify where Tivoli Storage Manager searches for a backup set during the restore operation. See "Location" on page 181 for more information.

If you are restoring a file space from a backup set to a system that did not perform the original backup, you need to:
- Specify a destination
- Use the syntax below to specify the source file
- Do both of the above

```
dsmc restore backupset backupsetname "/fsname/*" /destfs/ -subdir=yes
```

Considerations:
- You must be a root user or an authorized user to restore an entire backup set from the server, otherwise only files you own are restored.
- If you are unable to restore a backup set from portable media, check with your Tivoli Storage Manager administrator to ensure that the portable media was created on a device using a compatible format.
- If you use the **restore backupset** command on the initial command line and you set the ***location*** option to *file*, no attempt is made to contact the server.
- If the object you want to restore is part of a backup set generated on a node, and the node name is changed on the server, any backup set objects that were generated prior to the name change will not match the new node name. Ensure that the node name is the same as the node for which the backup set was generated.

Syntax

```
►►─RESTORE BACKUPSET──┬──────────┬──┬─ backupsetname ──┬──┬─ sourcefilespec ──┬──►
                      └─options──┘  └─ filename ────────┘  └─ "sourcefilespec" ─┘

►──┬──────────────────────────────────────────────────────────────────────────►◄
   └─ destinationfilespec─┘
```

Parameters

options

Table 64. Restore Backupset command: Related options

Option	Where to use	Page
dirsonly	Command line only.	142
filesonly	Command line only.	162
ifnewer	Command line only.	169
location	Command line only.	181
preservepath	Command line only.	204
quiet	TSM User Preferences file or command line.	208
replace	TSM User Preferences file or command line.	210

Table 64. Restore Backupset command: Related options (continued)

subdir	TSM User Preferences file or command line.	230

backupsetname
Specifies the name of the backup set on the server from which to perform a restore operation. You cannot use wildcard characters to specify the backup set name. Tivoli Storage Manager restores the backup set from the server via LAN.

filename
Specifies the name of a local file from which to perform a restore operation.

sourcefilespec
Specifies the source path which can be a portion of the backup set. The default is to restore the entire backup set.

destinationfilespec
Specifies the destination path for the restored files. If you do not specify a *sourcefilespec*, you cannot specify a *destinationfilespec*. If you do not specify a destination, Tivoli Storage Manager restores the files to the original source path. If you are restoring more than one file, you must end the file specification with a directory delimiter (/), otherwise, Tivoli Storage Manager assumes the last name is a file name and reports an error. If you are restoring a single file, you can optionally end the destination file specification with a file name if you want to give the restored file a new name.

Examples

Task Restore a backup set called mybackupsetname from the server.

Command: `dsmc restore backupset mybackupsetname -loc=server`

Task Restore the backup set contained in the backupsetfile.name file in the /Users/mike/Documents directory.

Command: `dsmc restore backupset /Users/mike/Documents/backupsetfile.name loc=file`

Task Restore the backup set contained in local file /Users/user3/Documents/bset01.file.

Command: `dsmc restore backupset /Users/user3/Documents/bset01.file loc=file`

Retrieve

The **retrieve** command obtains copies of archived files from the Tivoli Storage Manager server. You can retrieve specific files or entire directories.

Use the ***description*** option to specify the descriptions assigned to the files you want to retrieve.

Use the ***pick*** option to display a list of your archives from which you can select an archive to retrieve.

Retrieve the files to the same directory from which they were archived, or to a different directory. Tivoli Storage Manager uses the *preservepath* option with the *subtree* value as the default for restoring files. For more information, see "Client options reference" on page 120.

Note: When retrieving a directory, its modification date and time is set to the date and time of the retrieve, not to the date and time the directory had when it was archived. This is because Tivoli Storage Manager retrieves the directories first, then adds the files to the directories.

Retrieving from file spaces that are not Unicode enabled

If you want to retrieve archives from file spaces that were renamed by the Unicode-enabled client, you must specify the source on the server and a destination on the client. For example, assume that `Jaguar` is the name of your startup disk and you archive all of the .log files in the /Users/user5/Documents directory. Before the archive takes place, the server renames the file space to `Jaguar_OLD`. The archive places the data specified in the current operation into the Unicode-enabled file space named /. The new Unicode-enabled file space now contains only the Users/user5/Documents directory and the *.log files specified in the operation.

If you want to retrieve a file from the (old) *renamed* file space to its original location, you must enter both the source and destination as follows:

```
retrieve Jaguar_OLD/Users/user5/Documents/mylog.log /Users/user5/Documents/
```

Syntax

```
►►─RETrieve──┬──────────┬──┬─ sourcefilespec ─────────┬──┬──────────────────────────┬──►◄
             └─ options─┘  └─ "sourcefilespec" ─────────┘  └─ destinationfilespec ────┘
```

Parameters

options

Table 65. Retrieve command: Related options

Option	Where to use	Page
dateformat	TSM User Preferences file or command line.	136
description	Command line only.	139
dirsonly	Command line only.	142
filelist	Command line only.	159
filesonly	Command line only	162
fromdate	Command line only	163

Table 65. Retrieve command: Related options (continued)

fromnode	Command line only.	164
fromowner	Command line only	165
fromtime	Command line only	166
ifnewer	Command line only	169
pick	Command line only.	197
preservepath	Command line only.	204
replace	TSM User Preferences file or command line.	210
subdir	TSM User Preferences file or command line.	230
tapeprompt	TSM User Preferences file or command line	232
timeformat	TSM User Preferences file or command line.	242
todate	Command line only.	243
totime	Command line only.	244

sourcefilespec
Specifies the path and file name that you want to retrieve. Use wildcard characters to specify a group of files or all the files in a directory. See "Maximum file size for backup and restore" on page 49 for the maximum file size for retrieve processing.

destinationfilespec
Specifies the path and file name where you want the files to reside. If you do not specify a destination, Tivoli Storage Manager restores the files to the original source path.

Examples

Task Retrieve a single file named budget.

Command: `dsmc retrieve /Users/user5/Documents/budget`

Task Retrieve all files with an extension of .c from the /Volumes/proj5 directory.

Command: `dsmc retrieve "/Volumes/proj5/*.c"`

Task Retrieve all files in the /Users/devel/Documents directory.

Command: `dsmc retrieve "/Users/devel/Documents/*"`

Task Retrieve all files with a file extension of .c from the /Users/devel/projecta directory to the /Users/newdevel/projectn/projecta directory. If the /projectn or the /projectn/projecta directory does not exist, it is created.

Command: `retrieve /Users/devel/projecta/*.c /Users/newdevel/projectn/projecta/`

Task Retrieve files in the /Users/user5/Documents directory. Use the ***pick*** option.

Command: `ret /Users/user5/Documents/* -pick`

Task Retrieve all files archived from the /Users/user1/proj directory with the description "2002 survey results."

Command: `retrieve /Users/user1/proj/* -desc="2002 survey results"`

Task Retrieve a file from the renamed file space `Jaguar_OLD` to its original location. Enter both the source and destination as follows:

Command: `ret Jaguar_OLD/user5/Documents/myresume.doc /Users/user5/Documents/`

Schedule

System Administrator

The **schedule** command starts the client scheduler on your workstation. The client scheduler must be running before scheduled work can start.

Notes:

1. The **schedule** command cannot be used if the ***managedservices*** option is set.
2. This command is valid only on the initial command line. It is not valid in interactive mode or in a macro file.

If the ***schedmode*** option is set to polling, the client scheduler contacts the server for scheduled events at the hourly interval you specified with the ***queryschedperiod*** option in your TSM System Preferences file. If your administrator sets the ***queryschedperiod*** option for all nodes, that setting overrides the client setting.

If you are using TCP/IP communications, the server can prompt your workstation when it is time to run a scheduled event. To do so, set the ***schedmode*** option to *prompted* in the TSM User Preferences file or on the **schedule** command.

You can use the *sessioninitiation* option with the **schedule** command to control whether the server or client initiates sessions through a firewall. See "Sessioninitiation" on page 226 for more information. See "Configuring Tivoli Storage Manager client/server communication across a firewall" on page 85 for more information about Tivoli Storage Manager firewall support.

After you start the client scheduler, it continues to run and to start scheduled events until you press Ctrl+C, press the Q key twice, start the workstation again, or turn off the workstation to end it.

See "Migrating to the Tivoli Storage Manager Version 5.3 Macintosh client" on page 1 for updates to the scheduler paths.

Note: You *cannot* enter this command in interactive mode.

Syntax

```
►►──SCHedule──┬──────────┬──────────────────────────────────────────►◄
              └─ options─┘
```

Parameters

options

Table 66. Schedule command: Related options

Option	Where to use	Page
maxcmdretries	TSM System Preferences file or command line.	185
password	TSM User Preferences file or command line.	193
queryschedperiod	TSM System Preferences file or command line.	207
retryperiod	TSM System Preferences file or command line.	214
schedlogname	TSM System Preferences file or command line.	217
tcpclientport	TSM System Preferences file or command line.	237

Examples

Task Start the client scheduler.

Command: `dsmc sch –password=notell`

Task Run the schedule command in the background and keep the client scheduler running, even if you log off your system. Ensure the ***passwordaccess*** option is set to *generate*.

Command: `nohup dsmc schedule 2> /dev/null &`

When you run the **schedule** command, all messages regarding scheduled work are sent to the TSM Schedule Log file or to the file you specify with the ***schedlogname*** option in your TSM User Preferences file. If you do not specify a directory path with the file name in the ***schedlogname*** option, the TSM Schedule Log file will reside in the default directory:

`/Library/Logs/tivoli/tsm/`

Attention: To prevent log write failures and process termination in certain cases, set the DSM_LOG environment variable to name a directory where default permissions allow the required access.

Selective

The **selective** command backs up files that you specify. If these files become damaged or lost, you can replace them with backup versions from the server. When you run a selective backup, all the files are candidates for back up unless you exclude them from backup, or they do not meet management class requirements for serialization. See "Supported file systems" on page 48 for supported file systems, ACL, and Extended Attribute support.

During a selective backup, copies of the files are sent to the server even if they did not change since the last backup. This might result in more than one copy of the same file on the server. If this occurs, you might not have as many different down-level versions of the file on the server as you intended. Your version limit might consist of identical files. To avoid this, use the **incremental** command to back up only new and changed files.

You can selectively back up single files *or* directories. You can also use wildcard characters to back up groups of related files.

If you set the ***subdir*** option to *yes* when backing up a specific path and file, Tivoli Storage Manager recursively backs up *all* subdirectories under that path, and any instances of the specified file that exist under *any* of those subdirectories.

During a selective backup, a directory path be backed up, even if the specific file that was targeted for backup is not found. For example:

```
selective /Users/user1/Documents/dir1/bogus.txt
```

still backs up Documents/dir1 even if the file `bogus.txt` does not exist.

If the **selective** command is retried because of a communication failure or session loss, the transfer statistics will display the number of bytes Tivoli Storage Manager attempts to transfer during *all* command attempts. Therefore, the statistics for bytes transferred not match the file statistics, such as those for file size.

Removing operand limits

You can use the ***removeoperandlimit*** option to specify that Tivoli Storage Manager removes the 20-operand limit for the Macintosh OS X platform. If you specify the ***removeoperandlimit*** option with the **selective** command, the 20-operand limit is not enforced and is restricted only by available resources or other operating system limits. See "Removeoperandlimit" on page 209

Migrating to Unicode-enabled file spaces

Please see "Autofsrename" on page 125 for information about using the Unicode-enabled client.

Syntax

Parameters

options

Table 67. Selective command: Related options

Option	Where to use	Page
changingretries	TSM System Preferences file *within* a server stanza, or command line.	127
compressalways	TSM User Preferences file or command line.	132
compression	TSM System Preferences file *within* a server stanza or command line.	133
dirsonly	Command line only.	142
filelist	Command line only.	159
filesonly	Command line only.	162
removeoperandlimit	Command line only.	209
subdir	TSM User Preferences file or command line.	230
tapeprompt	TSM User Preferences file or command line.	232

filespec
Specifies the path and file name that you want to back up. Use wildcard characters to select a group of files or all the files in a directory. When backing up a file system, specify the file system with a trailing slash.

Examples

Task Back up the proja file in the /Users/user1/Documents directory.

Command: `selective /Users/user1/Documents/proja`

Task Back up all files in the /Users/user2/Documents directory whose file names begin with proj.

Command: `selective /Users/user2/Documents/proj*`

Task Back up all files in the /Users/user3/Documents directory whose file names begin with proj. Back up the single file named budget in the /Users/user3/Documents/proja directory.

Command: `selective /Users/user3/Documents/proj* /Users/user3/Documents/proja/budget`

Task Back up the /Users file system.

Command: `selective /Users/ -subdir=yes`

Set Access

The **set access** command gives users at other nodes access to your backup versions or archived copies. You can give another user access to a specific file, multiple files, or all files in a directory. When you give access to another user, that user can restore or retrieve your objects. Specify in the command whether you are giving access to archives or backups.

Note: You cannot give access to both archives and backups using a single command.

When an existing file space is renamed during Unicode conversion, any access rules defined for the file space remain applicable to the original file space. However, new access rules must be defined to apply to the new Unicode file space, if necessary.

Syntax

```
►►─SET Access──┬─ Archive─┬─ filespec─ node──┬──────────┬──────────────────────►◄
               └─ Backup──┘                  └─ user────┘
```

Parameters

Archive
Permits access to archived files.

Backup
Permits access to backup versions of files.

filespec
Specifies the path, file or directory to which you are giving access to another node or user. Use wildcard characters to specify a group of files, or all files in a directory; all objects in a directory branch; or all objects in a volume. Use a single asterisk "*" for the file spec to give access to all files owned by you and backed up on the server. When the command **set access backup** "*" **node** is entered, no check is made with the server; it is assumed you have at least one object backed up.

If you give access to a branch of the current working directory, you only need to specify the branch. If you give access to objects that are not in a branch of the current working directory, you must specify the complete path. The file spec to which you gave access must have at least one backup version or archive copy object (file or directory) on the server.

To specify all files in a named directory, enter /Users/mine/proj1/* on the command line.

To give access to all objects *below* a certain level, use an asterisk, directory delimiter, and an asterisk at the end of your file spec. For example, to give access to all objects below /Users/test, use file spec /Users/test/*/*.

Attention: Use of the form /*/* alone will not give access to objects in the named directory; only those in directories below the named directory will be accessible.

The rules are essentially the same when considering the root directory. Enter /* on one set access command and /*/* on another if you want another user to have access to all files and directories *in* and *below* the root directory. The first

/* gives access to all directories and all files in the root directory. The second /* allows access to all directories and files below the root directory.

For example:

- Your directory structure is multilevel: /Users/sub1/subsub1.
- The /Users directory contains the h1.txt and h2.txt files.
- The /Users/sub1 directory contains file s1.htm.
- The /Users/sub1/sub2 directory contains the ss1.cpp file.

To allow access to all files in the /Users/sub1/sub2 directory, enter:

```
set access backup /Users/sub1/sub2/* * *
```

To allow access to only those files in the /Users directory, enter:

```
set access backup /Users/* * *
```

To allow access to all files in all directories *in* and *below* the /Users directory, enter:

```
set access backup /Users/* * *
set access backup /Users/*/* * *
```

node
Specifies the client node of the user to whom you are giving access. Use wildcards to give access to more than one node with similar node names. Use an asterisk (*) to give access to all nodes.

user
This is an optional parameter that restricts access to the named user at the specified node.

Examples

Task Give the user at `node_2` authority to restore the `budget` file from the /Users/user1/documents directory.

Command: `set access backup /Users/user1/documents/budget node_2`

Task Give `node_3` authority to retrieve all files in the /Users/user2/documents/proja directory whose file names end with .

Command: `set access archive /Users/user2/documents/proja/*.c node_3`

Task Give `node_3` the authority to retrieve all files in the /Users/user3/proja directory.

Command: `set access archive /Users/user3/proja/ node_3`

Set Event

The **set event** command allows you to specify the circumstances for when archived data is deleted. You can use the **set event** command to:

- Prevent the deletion of data at the end of its assigned retention period. (Deletion hold)
- Allow the expiration to take place, as defined by the archive copy group (Release a deletion hold)
- Start the expiration clock running when a particular event occurs (Notify the server that an event has occurred)

Objects affected can be specified with a standard Tivoli Storage Manager filespec (including wildcards), a list of files whose names are in the file specified using the *filelist* option, or a group of archived files with the description specified with the *description* option.

Note: When only a <filespec> is used, *all* archived copies of files or folders matching the filespec are affected. If you only want to affect certain versions of a file, use the *-pick* option and select from the displayed list.

Interaction with down-level servers:

If the **set event** command is issued when the client is connected to a server that does not support event-based policy (previous to Tivoli Storage Manager 5.2.2), the command will be rejected with an error message indicating that the current server does not support event-based policy.

Syntax

```
►►──SET Event──-TYPE=──┬─Hold──────────────┬── ──<filespec>──────────────────────►
                       ├─Release───────────┤
                       └─Activateretention─┘

►─ ──-filelist=<filespec>── ──-description=──-pick──────────────────────────────►◄
```

Parameters

TYPE=

Specifies the event type setting. This parameter must be specified.

hold

Prevents the object from being deleted regardless of expiration policy.

release

Allows normal event-controlled expiration to take place.

activateretention

Signals the server that the controlling event has occurred and starts the expiration clock running.

-pick

Provides a list of objects from which the user can select to apply the event.

The following options can also be used and serve their usual purpose:

- ***Dateformat*** (See “Dateformat” on page 136)
- ***Numberformat*** (See “Numberformat” on page 191)
- ***Noprompt*** (See “Noprompt” on page 190)
- ***Subdir*** (See “Subdir” on page 230)
- ***Timeformat*** (See “Timeformat” on page 242)

Examples

Task The following example displays the verbose and statistics output from the **set event** command with objects rebound (as opposed to archived or some other notation):

```
Rebinding-->                 274
/home/accounting/ledgers/jan05.books
opt [Sent]
Rebinding-->                 290
/home/accounting/ledgers/feb05.books
opt [Sent]

Total number of objects archived:         0
Total number of objects failed:           0
Total number of objects rebound:          2
Total number of bytes transferred:        0  B
Data transfer time:                    0.00 sec
Network data transfer rate:            0.00 KB/sec
Aggregate data transfer rate:          0.00 KB/sec
Objects compressed by:                    0%
Elapsed processing time:           00:00:02
```

Task The -pick option used with the set event command will show the event type instead of the command name:

```
TSM Scrollable PICK Window - Retention Event :  ACTIVATE

#    Archive Date/Time       File Size   File
----------------------------------------------------------------------
1. | 08/05/2003 08:47:46        766  B   \\user\c$\tsm521\common\winnt
2. | 08/01/2003 10:38:11        766  B   \\user\c$\tsm521\common\winnt
3. | 08/05/2003 08:47:46       5.79 KB   \\user\c$\tsm521\common\winnt
4. | 08/01/2003 10:38:11       5.79 KB   \\user\c$\tsm521\common\winnt
5. | 08/05/2003 08:47:46      10.18 KB   \\user\c$\tsm521\common\winnt
```

```
TSM Scrollable PICK Window - Retention Event :  ACTIVATE

#    Archive Date/Time       File Size   File
----------------------------------------------------------------------
1. | 08/05/2003 08:47:46        766  B   /user/tsm521/common/unix
2. | 08/01/2003 10:38:11        766  B   /user/tsm521/common/unix
3. | 08/05/2003 08:47:46       5.79 KB   /user/tsm521/common/unix
4. | 08/01/2003 10:38:11       5.79 KB   /user/tsm521/common/unix
5. | 08/05/2003 08:47:46      10.18 KB   /user/tsm521/common/unix
```

Set Password

System Administrator

The **set password** command changes the Tivoli Storage Manager password for your workstation. If you omit the old and new passwords when you enter the **set password** command, you are prompted once for the old password and twice for the new password.

A password is *not* case-sensitive, and it can be as many as 63 characters. Valid characters are:

a–z Any letter, a through z, upper or lower-case
0–9 Any number, 0 through 9
+ Plus
. Period
_ Underscore
- Hyphen
& Ampersand

Syntax

```
►►──SET Password──┬──────────────┬──────────────────────────────────────►◄
                  └─ oldpw newpw─┘
```

Parameters

oldpw
Specifies the current password for your workstation.

newpw
Specifies the new password for your workstation.

Examples

The following is an example of using the **set password** command.

Task Change your password from `osecret` to `nsecret`.

Command: `set password osecret nsecret`

Appendix. Using the Tivoli Storage Manager central scheduler

Overview of the Tivoli Storage Manager scheduler

The Tivoli Storage Manager central scheduler allows client operations to occur automatically at specified times. In order to understand scheduling with Tivoli Storage Manager, several terms need to be defined:

schedule definition
: A definition on the Tivoli Storage Manager server which specifies critical properties of the automated activity including the type of action, the time the action should take place, and how frequently the action will take place. There are numerous other properties which can be set (see the appropriate *Tivoli Storage Manager Administrator's Reference Guide* for a detailed description of the **define schedule**.)

schedule association
: An assignment to a specific schedule definition for a client node. Multiple schedule associations allow single schedule definitions to be used by many client nodes. Because schedule definitions are included with specific policy domains, it is only possible for nodes defined to a certain policy domain to be associated with schedules defined in that domain.

scheduled event
: A specific occurrence of when a schedule will be executed for a node. The following conditions must be met before automatic scheduled events will take place for a client:
- A schedule definition must exist for a specific policy domain.
- A schedule association must exist for the required node which belongs to that policy domain.
- The client scheduler process must be running on the client system (see "Setting the client scheduler process to run as a background task and start automatically at boot time" on page 317 for more information).

When creating a schedule definition on the Tivoli Storage Manager server, schedule actions that you can take include incremental, selective, archive, restore, retrieve, command, and macro. The scheduled action that is most frequently used is incremental with the *objects* parameter left undefined. With this setting, the Tivoli Storage Manager client performs a domain incremental backup of all drives defined by the client domain option. A schedule definition using the *command* action allows an operating system command or shell script to be executed.

The schedule *startup window* indicates the acceptable time period for a scheduled event to start. The startup window is defined by these schedule definition parameters: *startdate*, *starttime*, *durunits*, and *duration*. The *startdate* and *starttime* options define the beginning of the startup window for the very first scheduled event. The beginning of the startup windows for subsequent scheduled events will vary depending on the *period* and *perunit* values of the schedule definition. The *duration* of the schedule window defines the length of the startup window. The schedule action is required to start within the startup window. To illustrate, consider the results of the following schedule definition:

```
define schedule standard test1 action=incremental starttime=12:00:00 period=1
perunits=hour dur=30 duru=minutes
```

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Event	Window start	Window end	Actual start (just an example, times will vary)
1	12:00:00	12:30:00	12:05:33
2	13:00:00	13:30:00	13:15:02
3	14:00:00	14:30:00	14:02:00
and so on			

The variation in actual start times is a result of the randomization feature provided by the Tivoli Storage Manager central scheduler which helps to balance the load of scheduled sessions on the Tivoli Storage Manager server.

Handling spaces in file names in schedule definitions

When defining or updating a schedule *objects* parameter with file specifications that contain blank spaces, use double quotes around each file specification that contains blanks, then single quotes around all of the specifications. Examples:

```
objects='"/Users/user1/Documents/Some file.doc"'
objects='"/Users/user1/Documents/Some file.doc" "/Users/user5/Documents/
Another file.txt" /Users/user3/Documents/noblanks.txt'
objects='"/Users/user1/My Directory With Blank Spaces/"'
```

This will ensure that /Users/user1/Documents/Some file.doc is treated as a single file name, as opposed to two separate files (/Users/user1/Documents/Some, and file.doc).

Note: The examples above apply to the Tivoli Storage Manager Version 5.3 client only. For those nodes using previous versions of the clients, the following examples apply. Assume that 'Macintosh' is the name of the startup volume.

```
objects='"Machintosh:Users:user1:Documents:Some file.doc"'
objects=
'"Machintosh:Users:user1:Documents:Some file.doc"
"Machintosh:Users:user5:Documents:Another file.txt"
Machintosh:Users:user3:Documents:noblanks.txt'

objects='"Machintosh:Users:user1:My Directory With Blank Spaces:"'
```

You can also refer to the *objects* parameter information for the **define schedule** and **update schedule** commands in the appropriate *IBM Tivoli Storage Manager Administrator's Reference*

Preferential start times for certain nodes

Occasionally, you want to ensure that a particular node begins its scheduled activity as close as possible to the schedule's defined start time. The need for this typically arises when prompted mode scheduling is in use. Depending on the number of client nodes associated with the schedule and where the node is in the prompting sequence, the node might be prompted significantly later than the start time for the schedule. In this case, you can perform the following steps:

1. Copy the schedule to a new schedule with a different name (or define a new schedule with the preferred attributes).
2. Set the new schedule priority attribute so that it has a higher priority than the original schedule.
3. Delete the association for the node from the original schedule, then associate the node to the new schedule.

Now the Tivoli Storage Manager server will process the new schedule first.

Understanding scheduler processing options

There are several processing options which impact the behavior of the client scheduler. On the Tivoli Storage Manager client, you can define most of these options in the TSM User Preferences or TSM System Preferences files. However, some of these options can be set globally on the Tivoli Storage Manager server for all Tivoli Storage Manager clients. The **Managing Throughput of Scheduled Operations** section of the *Tivoli Storage Manager Administrator's Guide* provides detailed information on all topics described in the section.

Option	Client defined	Server defined	Server global override
managedservices	X		
maxcmdretries	X		**set maxcmdretries** command
maxschedsessions		X	
postschedulecmd, postnschedulecmd	X		
preschedulecmd, prenschedulecmd	X		
queryschedperiod	X		**set queryschedperiod** command
randomize		X	
retryperiod	X		**set retryperiod** command
schedcmddisabled	X		
schedlogname	X		
schedlogretention	X		
schedmode	X		**set schedmodes** command
sessioninitiation	X	X (**update node** command)	
tcpclientaddress	X	X (also defined on server when ***sessioninit***=*serveronly* as part of the node definition)	
tcpclientport	X	X (also defined on server when ***sessioninit***=*serveronly* as part of the node definition)	

Client defined options are defined in the TSM System Preferences or TSM User Preferences files. The Tivoli Storage Manager server can also define some options in a client options set, or as part of the options parameter of the schedule definition. The Tivoli Storage Manager server can also set some options globally for all clients. By default, the client setting for these options is honored. If the global override on the Tivoli Storage Manager server is set, the client setting for

the option is ignored. Defining client options as part of the schedule definition is useful if you want to use specific options for a scheduled action that differ from the option settings normally used by the client node, or are different for each schedule the node will execute.

The ***schedmode*** option controls the communication interaction between the Tivoli Storage Manager client and server. There are two variations on the schedule mode: *client polling* and *server prompted*.

Handling return codes from preschedulecmd and postschedulecmd scripts

Beginning with Tivoli Storage Manager Version 5.1, the scheduler exhibits the following behavior when the ***preschedulecmd*** and ***postschedulecmd*** options are used:

- If the command specified by the ***preschedulecmd*** option ends with a nonzero return code, Tivoli Storage Manager considers the command to have failed. In this case, neither the scheduled event nor any ***postschedulecmd*** or ***postnschedulecmd*** command will run. The administrative **query event** command with ***format***=*detailed* option will show that the event failed with return code 12.
- If the command specified by the ***postschedulecmd*** option ends with a nonzero return code, Tivoli Storage Manager considers the command to have failed. The administrative **query event** command with ***format***=*detailed* option will show that the event completed with return code 8, unless the scheduled operation completed with a higher return code, in which case the higher return code prevails. Therefore, if the scheduled operation completes with return code 0 or 4 and the ***postschedulecmd*** command fails, the administrative **query event** command will show that the event completed with return code 8. If the scheduled operation completes with return code 12, that return code prevails, and **query event** will show that the event failed with return code 12.

When interpreting the return code from a command, Tivoli Storage Manager considers 0 to mean success, and anything else to mean failure. While this behavior is widely accepted in the industry, it is not 100% guaranteed. For example, the developer of the command might exit with return code 3, if ran successfully. Therefore, it is possible that the ***preschedulecmd*** or ***postschedulecmd*** command end with a nonzero return code and be successful. To prevent Tivoli Storage Manager from treating such commands as failed, you should wrap these commands in a script, and code the script so that it interprets the command return codes correctly. The script should exit with return code 0 if the command was successful; otherwise it should exit with a nonzero return code. The logic for a script running widget might look like this:

```
run 'widget'
   if lastcc == 3
      exit 0
   else
      exit 1
```

See the following references for more information:

- "Postschedulecmd/Postnschedulecmd" on page 200
- "Preschedulecmd/Prenschedulecmd" on page 202
- "Return codes from the command line interface" on page 87

Using the client acceptor to manage scheduler services versus the traditional scheduler services

You can configure the Tivoli Storage Manager client to manage the scheduler process using the Tivoli Storage Manager Client Acceptor (CAD). The CAD provides a light-weight timer which automatically starts and stops the scheduler process as needed. Alternatively, the traditional method keeps the Tivoli Storage Manager scheduler process running continuously. Generally, using the CAD to manage the scheduler is the preferred method. These methods are compared as follows:

CAD-managed Services

- Defined using the ***managedservices*** option and started with CAD services (dsmcad).
- The CAD starts and stops the scheduler process as needed for each scheduled action.
- Requires fewer system resources when idle.
- Tivoli Storage Manager client options and Tivoli Storage Manager server override options are refreshed each time the CAD services start a scheduled backup.

Tivoli Storage Manager traditional scheduler services

- Started with command `dsmc sched` command.
- Remains active, even after scheduled backup is complete.
- Requires higher use of system resources when idle.
- Tivoli Storage Manager client options and Tivoli Storage Manager server override options are only processed once when `dsmc sched` is started.
- You must restart the scheduler process for updated Tivoli Storage Manager options to take effect.

Setting the client scheduler process to run as a background task and start automatically at boot time

You can configure the Tivoli Storage Manager client scheduler to run as a background system task which starts automatically when your system is started. This is true for both CAD-managed and traditional methods of running the Tivoli Storage Manager client scheduler. When running a CAD-managed schedule, only the CAD process should be set to start automatically at boot time; not the scheduler process. For the traditional method, the scheduler process should be set up to start automatically at boot time.

You can configure the CAD to run as a background system task which starts automatically when your system is started. To configure the CAD to manage scheduled backups, you must set the ***managedservices*** option to manage the scheduler. The method for setting up the CAD as a system task varies for each platform.

In order for the scheduler to start unattended, you must enable the client to store its password by setting the ***passwordaccess*** option to *generate*, and store the password by running a simple Tivoli Storage Manager client command such as `dsmc query session`. Note that for testing purposes, you can always start the scheduler in the foreground by running `dsmc sched` from a command prompt (without a 'managedservices' stanza set).

The Tivoli Storage Manager Client Acceptor daemon (CAD) must be installed as a Startup Item. The Tivoli Storage Manager Setup Assistant can do this for you. A System Administrator must use the **TSM Backup for Administrators** authorization tool to start Tivoli Storage Manager and use the setup assistant to install and configure the CAD. See "Using the command line client to handle scheduled events" on page 83 or "Configuring the client scheduler" on page 19 for more information on how to install and configure the CAD.

Managing multiple schedule requirements on one machine

In certain situations it is preferable to have more than one scheduled activity for each client system. Normally, you can do this by associating a node with more than one schedule definition. This is the standard method of running multiple schedules on one machine. You must ensure that the schedule windows for each schedule do not overlap. A single client scheduler process is not capable of executing multiple scheduled actions simultaneously, so if there is overlap, the second schedule to start will be missed if the first schedule does not complete before the end of the startup window of the second schedule. Suppose that most of the drives on your client system must be backed up daily, and that one drive containing critical data must be backed up hourly. In this case, you would need to define two schedules to handle this requirement. To avoid conflict between the hourly and daily backup schedule, the *starttime* of each schedule needs to be varied.

In certain cases, it is necessary to run more than one scheduler process on a system. Multiple processes require a separate options file for each process and must contain the following information:

- Define a unique node name for each process
- Specify unique schedule and error logs for each process
- When running in prompted mode, you must use the ***tcpclientport*** option to specify a unique port for each process.

The advantages of using multiple schedule processes:

- You can run more than one scheduled backup at the same time.
- You can specify different backup criteria for each schedule started, via Tivoli Storage Manager client option file or Tivoli Storage Manager server override options.

The disadvantages of using multiple schedule processes:

- A unique file space for each node name on the Tivoli Storage Manager server is created.
- When restoring the data, you must use the same node name associated with the backup.

Multiple schedule processes can run on Mac OS X platforms with either the CAD managed method, or the traditional method of running the scheduler. In either case, there are certain setup requirements:

- Each process must run using a different node name.
- You must create multiple stanzas in the TSM System Preferences file for each scheduler process. In each stanza, you must define a unique node name, along with unique values for the options ***errorlogname*** and ***schedlogname***. You also choose to define customized ***domain***, ***include***, and ***exclude*** statements for each stanza.

- In your TSM System Preferences file, set the ***passwordaccess*** option to generate in each stanza. The password must be generated for each node name that will be running a scheduler process, by running a command such as `dsmc query sess`.
- If running with the ***schedmode*** option set to *prompt*, you should set a unique ***tcpclientport*** value for each stanza.

You must start each `dsmc sched` command or instance with the -servername option to reference its unique stanza name in TSM System Preferences. For dsmcad, it is necessary to define the environment variable DSM_CONFIG for each instance of dsmcad to reference its unique option file.

The following is an example configuration of two schedule processes managed by the CAD in the TSM System Preferences file. Note that you must use full paths for the log file names to avoid the files being written in the root directory):

```
servername tsm1_sched1
 nodename        aixsvt01_sched1
 tcpserv         firebat
 tcpclientport   1507
 passwordaccess  generate
 domain          /svt1
 schedmode       prompted
 schedlogname    /tsm/dsmsched1.log
 errorlogname    /tsm/dsmerror1.log
 managedservices schedule

servername tsm1_sched2
  nodename        aixsvt01_sched2
  tcpserv         firebat
  tcpclientport   1508
  passwordaccess  generate
  domain          /svt1
  schedmode       prompted
  schedlogname    /tsm/dsmsched2.log
  errorlogname    /tsm/dsmerror2.log
  managedservices schedule
```

Contents of /test/dsm.opt1:

```
servername tsm1_sched1
```

Contents of /test/dsm.opt2:

```
servername tsm1_sched2
```

Open two shell command windows:

- In shell command window 1, enter:

  ```
  export DSM_CONFIG=/test/dsm.opt1
  sudo dsmcad
  ```

- In shell command window 2, enter:

  ```
  export DSM_CONFIG=/test/dsm.opt2
  sudo dsmcad
  ```

Restarting the scheduler process on a remote machine

When managing a large number of Tivoli Storage Manager clients running scheduler processes, it is helpful to be able to start and stop the client service from a remote machine.

The SystemStarter utility can be used to start, restart, or stop the CAD:

To start the CAD use the following command:

```
sudo /sbin/SystemStarter start dsmcad
```

To restart the CAD use the following command:

```
sudo /sbin/SystemStarter restart dsmcad
```

To stop the CAD use the following command:

```
sudo /sbin/SystemStarter stop dsmcad
```

It is also possible to stop the CAD by finding the PID of the dsmcad application and sending it a signal with the kill command:

```
sudo ps -x | grep dsmcad
sudo kill <dsmcad PID>
```

Using the scheduler through a firewall

See "Configuring Tivoli Storage Manager client/server communication across a firewall" on page 85 for more information.

Troubleshooting the Tivoli Storage Manager scheduler

The Tivoli Storage Manager server maintains records of scheduled events which can be helpful when managing Tivoli Storage Manager schedules on several client machines. The Tivoli Storage Manager server **query event** command allows an administrator to view event records on the Tivoli Storage Manager server. A useful query which shows all of the event results for the previous day is:

```
query event * * begind=today-1 begint=00:00:00 endd=today-1 endt=23:59:59
```

You can limit query results to exception cases with:

```
query event * * begind=today-1 begint=00:00:00 endd=today-1 endt=23:59:59
exceptionsonly=yes
```

Query results include a status field which gives a summary of the result for a specific event. By using the ***format***=*detailed* option on the **query event** command, complete information for events displays, including the return code passed back by the Tivoli Storage Manager client. Table 68 summarizes the meaning of the event status codes which are likely to exist for a scheduled event that has already taken place:

Table 68. Scheduled client event status codes

Status	Meaning
Completed	The scheduled client event ran to completion without a critical failure. There is a possibility that the event completed with some errors or warnings. Query the event with detailed format to inspect the event result for more information. The result can either be 0, 4, or 8.
Missed	The schedule start window elapsed without action from the Tivoli Storage Manager client. Common explanations are that the schedule service is not running on the client or a previous scheduled event is not complete for the same or a different schedule.

Table 68. Scheduled client event status codes (continued)

Status	Meaning
Started	Normally, this indicates that a scheduled event has begun. However, if an event showing a status of *Started* is followed by one more *Missed* events, it is possible that the client scheduler encountered a hang while processing that event. One common cause for a hanging client schedule is the occurrence of a user interaction prompt, such as a prompt for an encryption key, to which the user has not responded.
Failed	The client event ran to completion, however, a critical failure occurred.

Investigating abnormal scheduled events

If a particular client node displays multiple consecutive events with a result of *missed*, the client scheduler process is not running, has terminated, or is hanging. If a scheduled event is missed, but other consecutive scheduled events for that node show a result of *completed*, investigate the server activity log and the client schedule log to determine the cause. Scheduled events with a result of *failed*, have encountered a processing error originating either from the Tivoli Storage Manager client or server. The first place to check is the server activity log during the time period in which the scheduled event was processed. The activity log shows Tivoli Storage Manager server processing errors and some client errors which have been remotely logged to the Tivoli Storage Manager server. If the explanation cannot be found in the activity log, check the client schedule log.

Checking the server activity log

When checking the server activity log, narrow the query results down to the time period in which the scheduled event occurred. Begin the event log query at a time shortly before the start window of the scheduled event. For example, if you are investigating the following suspect event:

```
Scheduled Start      Actual Start         Schedule Name Node Name     Status
-------------------- -------------------- ------------- ------------- -------
08/21/2003 08:27:33                       HOURLY        NODEA         Missed
```

You could use one of the following queries:

```
query actlog begind=08/21/2003 begint=08:25:00
query actlog begind=08/21/2003 begint=08:25:00 originator=client node=nodea
```

Inspecting the Client Schedule Log

The Tivoli Storage Manager client maintains a detailed log of all scheduled activities. If queries of the server activity log do not explain a failed scheduled event, check the Tivoli Storage Manager client schedule log. Access to the client machine is required for inspecting the schedule log. The schedule log file typically resides in the same directory as the Tivoli Storage Manager client error log TSM Error Log, in a file named TSM Schedule Log. The default location for this log is /Library/Logs/tivoli/tsm. The location of the log file can be specified using the ***schedlogname*** option, so you need to refer to the options file to see if the ***schedlogname*** option was used to relocate the log file. When you locate the

schedule log, it is easy to search through the file to find the time period corresponding the start date and time of the scheduled event. Here are some tips on what to look for:

- If you are investigating a *missed* event, check the details of the previous event, including the time at which the previous event completed.
- If you are investigating a *failed* event, look for error messages which explain the failure, such as an exceeded Tivoli Storage Manager server session limit.
- If an explanation remains unclear, check the client error log file (usually named TSM Error Log.)

Understanding the scheduler log

The scheduler log file provides information about which schedule runs next and which files are processed. The default file name, **TSM Scheduler Log**, is created in the application folder. Use the ***schedlogname*** option to change the location and name of this file.

The schedule log continues to grow in size unless you prune it using the ***schedlogretention*** option or specify a maximum size using the ***schedlogmax*** option.

When the scheduler queries the server for the next schedule, it sends the schedule information to the log file. The following information is logged:

Table 69. Schedule log information

Category	Description
Schedule name	Specifies the name the administrator assigns to the schedule.
Action	Specifies the type of task to perform on the files listed in the Objects field: • Incremental. Incrementally backs up the files. • Selective. Backs up the files. • Archive. Archives the files. • Restore. Restores the files. • Retrieve. Retrieves the files. • Command. Executes a client operating system command described in the Objects field. • Macro. Executes a macro whose file name is described in the Objects field.
Objects	Names the volumes or files to process. If the action is a backup, archive, retrieve, or restore operation, the objects are file spaces, directories, or logical volumes. If this field is empty for an incremental backup, then the default is used. If the action is to run a command or macro, the object is the name of the command or macro to run.
Options	Overrides options that you set for scheduling in your Preferences file. See "Specifying scheduling options" on page 83 for more information about scheduling options.
Server window start	Specifies the date and time when the next schedule will run. If the server uses randomization for schedules, the schedule then runs *after* the specified time.

Output from scheduled commands is sent to the schedule log file. After scheduled work is performed, check the log to ensure the work completed successfully.

When a scheduled command is processed the schedule log contains the following entry:

```
Scheduled event eventname completed successfully
```

This is merely an indication that Tivoli Storage Manager successfully issued the scheduled command associated with the *eventname*. No attempt is made to determine the success or failure of the command. You should assess the success or failure of the command by evaluating the return code from the scheduled command in the schedule log. The schedule log entry for the command's return code is prefaced with the following text:

```
Finished command. Return code is:
```

You can modify the scheduling options in your Preferences file if you do not like the current values and the options are not over-ridden by server settings for your schedule. You can determine this by comparing a 'dsmc q options' output to your local options files. For more information about scheduling options, see "Scheduling options" on page 112.

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Glossary

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- The *American National Standard Dictionary for Information Systems*, ANSI X3.172-1990, copyright (ANSI). You can purchase copies from the American National Standards Institute, 11 West 42nd Street, New York, New York 10036.
- The *Information Technology Vocabulary*, developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTC2/SC1).

A

absolute mode. 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 *mode*. Contrast with *modified mode*.

access control list (ACL).

1. In computer security, a collection of all access rights for one object.
2. 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 a list that is associated with a file that identifies the users who can access the file and that identifies the users' access rights to that file.

ACL. See *access control list*.

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

active version. The most recent backup copy of a file stored by Tivoli Storage Manager. 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 workstation. Contrast with *inactive version*.

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*.

administrator. A user who has been registered to the server. Administrators can be authorized to one or more of the following administrative privilege classes: system, policy, storage, operator, or analyst. Administrators can use the administrative commands and queries allowed by their privileges.

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 data transfer rate. Dividing the total number of bytes transferred by the elapsed processing time calculates the data transfer rate.

archive. To copy one or more files to a storage pool for long-term storage. Archived files can include descriptive information, and you can retrieve them by archive date, file name, or by description. Contrast with *retrieve*.

archive copy. A file or group of files that have been archived to the Tivoli Storage Manager server.

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

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archive retention grace period. The number of days that Tivoli Storage Manager retains an archived copy when the server is unable to rebind the file to an appropriate management class.

authentication. The process of checking and authorizing a user's password before allowing that user to access the Tivoli Storage Manager server. An administrator with system privilege can enable or disable authentication.

authorization rule. A specification allowing another user to either restore or retrieve a user's files from Tivoli Storage Manager 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. An Authorized User is any user running with a real user ID of 0 (root) or a user who owns an executable whose owner execution permission bit is set to **s**. In the following example, the user **tivoli** is an Authorized User while running `dsmc` since the `dsmc` owner execution permission bit is set to **s**:

```
-rwsr-xr-x  1  tivoli  dsmdev  2880479  Nov  5 13:42   Tivoli Storage Manager
```

A system administrator becomes an Authorized User by using the Authorization tools.

B

back up. To copy information to another location to ensure against loss of data. In IBM Tivoli Storage Manager, you can back up user files, the IBM Tivoli Storage Manager database, and storage pools. Contrast with *restore*. See also *incremental* backup and *selective* backup.

backup-archive client. A program that runs on a file server, PC, or workstation 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 controlling the generation, destination, and expiration of backup versions of files. The backup copy group belongs to a management class.

backup retention grace period. The number of days Tivoli Storage Manager retains a backup version when the server is unable to rebind the file to an appropriate management class.

backup set. A collection of active files in your file spaces that reside on the Tivoli Storage Manager server. The Tivoli Storage Manager administrator creates the backup set and copies it onto portable media device that is supported by the Tivoli Storage Manager server and client.

backup version. A file that a user 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.

binding. The process of associating a file with a management class name. See also *rebinding*.

boot. To prepare a computer system for operation by loading an operating system.

C

CAD. Client acceptor daemon

central schedule. A function that allows 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*.

client. A program running on a PC, workstation, file server, LAN server, or mainframe that requests services of another program, called the server. The following types of clients can obtain services from a Tivoli Storage Manager server: administrative client, application client, API client, backup-archive client, and HSM client (also known as Tivoli Storage Manager for Space Management). See *administrative client* and *backup-archive client*.

client acceptor. The program that starts the client acceptor process is called dsmcad. A system administrator can use the client acceptor to launch the Tivoli Storage Manager scheduler during boot up.

client domain. The set of drives, file systems, or volumes that a user selects to back up or archive 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 options set. Client option sets allow the Tivoli Storage Manager administrator to specify additional options that not be included in the client options file, TSM User Preferences and TSM System Preferences. Client option sets are used in conjunction with client option files on client nodes.

client-polling scheduling mode. A client and server communication technique where the client node queries the server for scheduled work. Contrast with *server-prompted scheduling mode*.

client/server. A communications network architecture in which one or more programs (clients) request computing or data services from another program (the server).

client system options file. An editable file that contains communication, authorization, central scheduling, backup, archive, and space management options. A root user on your workstation sets the options in a client system options file. The file name is **TSM System Preferences** located in your Tivoli Storage Manager installation directory.

client user options file. A user-editable file containing options that identify the Tivoli Storage Manager server to contact, specify backup, archive, restore, retrieve, and space management options, and set date, time, and number formats. The file name is **TSM User Preferences** located in your Tivoli Storage Manager installation directory.

closed registration. A registration process in which a Tivoli Storage Manager administrator must 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.

command-click (Macintosh). Click on an item while pressing the Command key. In file and folder lists, this deselects individual items embedded in a group of selected items.

command line interface. A type of user interface where commands are specified on the command line. Contrast with *graphical user interface*.

communication method. The method by which a client and server exchange information. For Tivoli Storage Manager backup-archive clients, the method can be TCP/IP. See *Transmission Control Protocol/Internet Protocol*.

communication protocol. A set of defined interfaces that permits computers to communicate with each other.

copy group. A policy object that contains attributes that control backup and archive file:
- Generation
- Destination
- Expiration.

Backup and archive copy groups belong to management classes. See *frequency*, *destination*, *mode*, *retention*, *serialization*, and *version*.

D

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

destination. A copy group attribute that specifies the storage pool in which to back up or archive a file. At installation, Tivoli Storage Manager provides two storage destinations named **backuppool** and **archivepool**.

domain. See *policy domain* or *client domain*.

drag. Move the mouse while holding down the mouse button, thus moving the selected object.

drag-and-drop. Move (drag) an object on top of another object and release the mouse button, thus relocating the object.

dynamic. A copy group serialization value that specifies Tivoli Storage Manager accept the first attempt to back up or archive an object, regardless of any changes made during backup or archive processing. See *serialization*. Contrast with *shared static* and *static*.

E

error log. A text file written on disk that contains Tivoli Storage Manager processing error messages. The Tivoli Storage Manager server detects and saves these errors.

exclude. To identify files in an include-exclude list that you do not want to include in a specific client operation, such as backup or archive.

exabyte (EB). (1) For processor storage, real and virtual storage, and channel volume, 1,152,921,504,606,846,976 bytes. (2) For disk storage capacity and communications volume, 1,000,000,000,000,000,000 bytes.

expiration. The process in which files are identified for deletion because their expiration date or retention period is passed. Backups or archives are marked for deletion based on the criteria defined in the backup or archive copy group.

expiring file. A migrated or premigrated file that is marked for expiration and removal from Tivoli Storage Manager 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. It expires and is removed from Tivoli Storage Manager storage after the number of days specified with the ***migfileexpiration*** option have elapsed.

F

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

file space. A logical space on the Tivoli Storage Manager server that contains a group of files. In Tivoli Storage Manager, users can restore, retrieve, or delete file spaces from Tivoli Storage Manager storage. A file space for systems:

- **Windows**— file spaces for removable media are identified by volume label. Fixed drive file spaces are identified by Universal Naming Convention (UNC) name.
- **UNIX** — Logical space that contains a group of files backed up or archived from the same file system, or part of a file system defined with the virtualmountpoint option in the client system options file.

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

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. An archive copy of a file that might not accurately reflect what is currently in the file because Tivoli Storage Manager archived the file while the file was being modified.

G

generate password. Processing that 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 *options file.*

gigabyte (GB). (1) One billion (10^9) bytes. (2) When referring to memory capacity, 1 073 741 824 in decimal notation.

globally unique identifier (GUID). A 16-byte code that identifies an interface to an object across all computers and networks. The identifier is unique because it contains a time stamp and a code based on the network address that is hard-wired on the host computer's LAN interface card.

graphical user interface (GUI). A graphical user interface offers pictorial rather than text-based access to a computer. A graphical user interface includes:
- A combination of graphics and icons
- Use of a mouse or pointing device
- Menu bars, dropdown lists, and overlapping windows

Contrast with *command line interface*. See *windowed interface*.

GUI. Graphical user interface.

GUID. See *globally unique identifier*.

H

hierarchical storage management client. A program that runs on a workstation or file server to provide space management services. The hierarchical storage management client automatically migrates eligible files to Tivoli Storage Manager storage to maintain specific levels of free space on local file systems. Automatic recalls are made for migrated files when they are accessed. Users are also permitted to migrate and recall specific files.

HSM. Hierarchical Storage Management.

I

inactive version. A copy of a backup file in Tivoli Storage Manager storage that either is not the most recent version, or the corresponding original file was deleted from the client file system. Inactive backup versions are eligible for expiration according to the management class assigned to the file.

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 *include-exclude list*.

include-exclude list. A list of include and exclude 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. The include-exclude list is defined in one or more include-exclude files or in the TSM System Preferences file. See *TSM System Preferences file*.

incremental backup. A function that permits user to back up new or changed files or directories from a client domain or from specified directories or files. These directories or files are not excluded in the include-exclude list and meet the requirements for frequency, mode, and serialization as defined by a backup copy group of the management class assigned to each file. Contrast with *selective backup*.

inode. A data structure that describes the individual files in an operating system. There is one inode for each file. The number of inodes in a file system, and therefore the maximum number of files a file system can contain, is set when the file system is created. Hardlinked files share the same inode.

inode number. A number that specifies a particular inode in a file system.

IPL. Initial Program Load. See *boot* and *reboot*.

L

LAN. Local area network.

Local Area Network (LAN). A variable-sized communications network placed in one location. LAN connects servers, PCs, workstations, a network operating system, access methods, and communications software and links.

logical unit number (LUN). A logical unit number (LUN) is a unique identifier used on a SCSI bus that enables it to differentiate between up to eight separate devices (each of which is a logical unit). Each LUN is a unique number that identifies a specific logical unit, which be a hard disk, tape drive, or other device which understands the SCSI protocol.

M

management class. A policy object that is a named collection of copy groups. A management class is associated with a file to specify how the server should manage backup versions or archive copies of workstation files. See *binding* and *copy group*.

mode. A copy group attribute that specifies whether a backup file should be created for a file that was not modified since the last time the file was backed up. See *absolute* and *modified*.

modified. A backup copy group attribute indicating a file is considered for backup only if the file has been changed since the last backup. A file is considered changed if the date, size, owner, or permissions have changed. See *absolute* and *mode*.

N

network data transfer rate. The data transfer rate calculated by dividing the total number of bytes transferred by the data transfer time. For example, the time spent transferring data over the network.

node. See *client node*.

node name. A unique name used to identify a workstation, file server, or PC to the server.

non-Unicode file space. Non-Unicode file spaces and file names are limited to the character set of the current locale when the files were backed up.

O

open registration. A registration process in which users can register their own workstations or PCs as client nodes with the server. Contrast with *closed registration*.

owner. The owner of backup-archive files sent from a multi-user client node, such as UNIX, Linux, or Mac OS X.

P

pattern-matching character. See *wildcard character*.

plug-in. A self-contained software component that modifies (adds or changes) function in a particular software system. When you add a plug-in to a software system, the foundation of the original software system remains intact.

policy domain. A policy object that contains one or more policy sets. Client nodes are associated with a policy domain. See *policy set*, *management class*, and *copy group*.

policy set. A policy object that contains a group of management class definitions that exist for a policy domain. At any one time, there can be many policy sets within a policy domain, but only one policy set can be active. See *active policy set* and *management class*.

preferences file. A file that contains processing options.

- **TSM User Preferences file**

  Identifies Tivoli Storage Manager servers to contact, specifies communication methods, defines scheduling options, selects backup, archive, restore, and retrieve options. See also *TSM User Preferences file*
- **TSM System Preferences file**

  Contains stanzas describing Tivoli Storage Manager servers to contact for services. These stanzas also specify communication methods, backup and archive options, and scheduling options. See also *TSM System Preferences file*

progress indicator. A control used to inform a user about the progress of a process.

R

rebinding. The process of associating a backup with a new management class name. For example, rebinding occurs when the management class associated with a file is deleted. See also *binding*.

reboot. To restart the operating system.

registration. The process of identifying a client node or administrator to the server by specifying a user ID, password, and contact information. For client nodes, a policy domain, compression status, and deletion privileges are also specified.

restore. A function that permits users to copy a version of a backup file from the storage pool to a workstation or file server. The backup copy in the storage pool is not affected. Contrast with *backup*.

retention. The amount of time, in days, that inactive backed up or archived files are retained in the storage pool before they are deleted. The following copy group attributes define retention: retain extra versions, retain only version, retain version.

retrieve. A function permitting users to copy an archived file from the storage pool to the workstation or file server. The archive copy in the storage pool is not affected. Contrast with *archive*.

S

scheduling mode. The type of scheduling operation for the client-server node. Tivoli Storage Manager supports two scheduling modes: client-polling and server-prompted.

scroll. Move through a list of items in a window by operating the scrollbars with the mouse cursor.

select. Choose an item from a list or group of items.

selective backup. A function permitting users to back up specified files. These files are not excluded in the include-exclude list and meet the requirement for serialization in the backup copy group of the management class assigned to each file. Contrast with *incremental backup*.

serialization. A copy group attribute that specifies whether a file can be modified during a backup or archive operation. See *static*, *dynamic*, *shared static*, and *shared dynamic*.

server. A program running on a mainframe, workstation, or file server that provides shared services such as backup and archive to other various (often remote) programs (called clients).

server-prompted scheduling mode. A client-server communication technique where the server contacts the client node when tasks need to be done. Contrast with *sclient-polling scheduling mode*.

session. A period of time in which a user can communicate with a server to perform backup, archive, restore, or retrieve requests.

shared dynamic. A Tivoli Storage Manager copy group serialization mode. This mode specifies if a file changes during backup or archive and continues to change after a number of retries. The last retry commits the file to the Tivoli Storage Manager server whether or not the file changed during backup or archive. Contrast with *dynamic*, *shared static*, and *static*.

shared static. A copy group serialization value specifying 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 *serialization*. Contrast with *dynamic*, *shared dynamic*, and *static*.

share point. A drive or directory on Windows 2000, XP, and .NET whose files are available for shared access across a network. The share point name is part of a UNC name. See *Universal Naming Convention (UNC)* name.

shift-click. Click on an item while pressing the Shift key.

space management. The process of keeping sufficient free storage space available on a local file system for new data and making the most efficient and economical use of distributed storage resources.

stabilized file space. A file space that exists on the server but not on the client. This situation can arise in at least two instances:
1. A drive is removed from a client workstation
2. A file space is renamed on the server

Stabilized file spaces remain on the server until deleted by the user or administrator. Files and directories can be restored and retrieved from a stabilized file space. However, it is not possible to back up or archive data to a stabilized file space.

stanza. On UNIX, Linux, and Mac OS X, a stanza is a group of lines in a file that together have a common function or define a part of the system. The TSM System Preferences file contains a stanza for each server to which the client can connect. Each stanza begins with the ***servername*** option and ends at the next ***servername*** option or the end of file. Each stanza must include communications options.

static. A copy group serialization value specifying that a file must not be modified during a backup or archive operation. If the file is in use during the first attempt, Tivoli Storage Manager will not back up or archive the file. See *serialization*. Contrast with *dynamic*, *shared dynamic*, and *shared static*.

storage pool. A named set of storage volumes used as the destination of backup, archive, or migrated copies.

T

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 being operated on.

TCA. Trusted Communications Agent

TCP/IP. Transmission Control Protocol/Internet Protocol.

timeout. A time event involving:
- An event that happens at the end of a predetermined period of time that began at the happening of another specified event.
- A time interval allotted for certain operations to happen. For example, response to polling or addressing before system operation is interrupted and must be restarted.
- A terminal feature that logs off a user if an entry is not made within a specified period of time.

Tivoli Storage Manager. A client-server licensed program product that provides storage management and data access services to customers in a multivendor computer environment.

Transmission Control Protocol/Internet Protocol (TCP/IP). A standard set of communication protocols that supports peer-to-peer connectivity of functions for both local and wide-area networks.

Trusted Communications Agent (TCA). A program that can handle the sign-on password protocol when password access is generated. The main process (for example, ***dsmc***) makes a run time decision based on the password access option setting, the user ID, and the executables' access privileges to run this program. The file that contains this program (dsmtca) must have the 's' bit set in its mode field and the owner must be root.

TSM System Preferences file. An editable file that contains communication, authorization, central scheduling, backup, and archive options.

TSM User Preferences file. A file, used on Macintosh clients, that contains processing options. A sample of this file is provided during the initial installation and setup of Tivoli Storage Manager. A copy of the sample defaults file can be created to set up precise processing options.

V

version. Storage management policy allow back-level copies of backed up objects to be kept at the server whenever an object is newly backed up. The most recent backed up copy is called the "active" version. Earlier copies are "inactive" versions. The following backup copy group attributes define version criteria: versions data exists, and versions data deleted.

virtual file space. A representation of a directory on a network-attached storage (NAS) file system as a path to that directory. A virtual file space is used to back up the directory as a file space in Tivoli Storage Manager server storage.

W

wildcard character. An asterisk (*) or question mark (?) character used to represent multiple (*) or single (?) characters when searching for various combinations of characters in alphanumeric and symbolic names.

windowed interface. A type of user interface that is either a graphical user interface or a text-based interface. The text-based interface maintains a close affinity to the graphical user interface, including action bars and their associated pull-down menus and windows. See *graphical user interface*.

workstation. A programmable high-level workstation (usually on a network) with its own processing hardware such as a high-performance personal computer. In a local area network, a personal computer that acts as a single user or client. A workstation can also be used as a server.

world wide name. A unique 48 or 64 bit number assigned by a recognized naming authority (often via block assignment to a manufacturer) that identifies a connection or a set of connections to the network. Abbreviated WWN. A WWN is assigned for the life of a connection (device). Most networking technologies (e.g., Ethernet, FDDI, etc.) use a world wide name convention.

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