Tivoli® Storage Manager for SAN for Windows
Version 6.2

Storage Agent User's Guide

IBM®

SC23-9553-01

Tivoli® Storage Manager for SAN for Windows
Version 6.2

Storage Agent User's Guide

IBM®

SC23-9553-01

Note:
Before using this information and the product it supports, read the information in "Notices" on page 79.

This edition applies to Version 6.2 of IBM Tivoli Storage Manager for Storage Area Networks (product numbers 5608-E01, 5608-E02, 5608-E03, 5608-E07, 5608-E12) and to all subsequent releases and modifications until otherwise indicated in new editions or technical newsletters. This edition replaces SC23-9553-00.

© Copyright IBM Corporation 2000, 2010.
US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

Figures v

Tables vii

Preface ix
Who should read this guide ix
Publications ix
Tivoli Storage Manager publications x
Support information xi
Getting technical training xi
Searching knowledge bases xii
Contacting IBM Software Support xiii
Conventions used in this publication xv
Reading syntax diagrams xv
Syntax diagram descriptions xix

New for Tivoli Storage Manager for Storage Area Networks Version 6.2 . . xxiii

Chapter 1. Storage agent overview . . . 1
LAN-free client-data backup: Scenario 3
Multi-session no-query restore for LAN-free path: Scenario 4
Communications between the client, storage agent, and Tivoli Storage Manager server 4

Chapter 2. Planning for storage agent installation and configuration 7
Supported operating systems 7
Storage devices and the configuration of your environment 7
ACSLS, SCSI, and 349X tape-library sharing . . . 7
File device sharing using Tivoli SANergy 9
External Libraries 11
System requirements 13
Obtaining system configuration information for clients and servers 15
Client-system and server-system configuration work sheets 16
Obtaining device information 19
Verifying and updating client node information . . 21

Chapter 3. Installing and configuring tape-library and file-device-sharing environments 23
Establishing network connections 23
Installing and configuring software on client systems. 24
Installing and configuring the client 24
Installing and configuring the API. 26
Installing the storage agent 27
Configuring the storage agent 34
Defining the storage agent and configuring devices on the server 35
Setting up server-to-server communication . . . 35
Defining storage agents to the Tivoli Storage Manager server 36
Configuring SAN drives 36
Setting the LAN-free destination 38
Confirming client node registration and configuration 38
Defining paths from the storage agent to drives . . 39
Defining paths for tape devices. 40
Defining paths for disk devices. 40
Verifying the LAN-free configuration 41
Verifying LAN-free data movement 42
Setting up LAN-free data movement using the Administration Center wizard 43

Chapter 4. Installing and configuring external-library environments 45
Establishing network connections 45
Installing and configuring software on client systems. 46
Installing and configuring the client 46
Installing and configuring the API. 48
Installing the storage agent 49
Configuring the storage agent 56
Defining the storage agent and configuring devices on the server 57
Setting up server-to-server communication . . . 57
Installing an external media manager. 57
Defining storage agents to the Tivoli Storage Manager server 58
Configuring a path to the library manager . . . 58
Defining paths for ACSLS 59
Setting the LAN-free destination 59
Confirming client node registration and configuration 60
Verifying the LAN-free configuration 60
Verifying the LAN-free configuration 60
Verifying LAN-free data movement 61
Determining whether the data movement was LAN-free 61

Appendix A. Starting and stopping the storage agent 63
Automating the storage agent startup 63
Manually starting and stopping the storage agent 63

Appendix B. Customizing the storage agent environment 65
ACSLS legacy data migration and coexistence . . . 65
Configuring multiple clients to use the same storage agent 66

© Copyright IBM Corp. 2000, 2010

Using LAN and LAN-free paths in the same backup operation 67

Appendix C. Storage agent commands and configuration files 69
The device configuration file for the storage agent 69
The storage agent options file 70
DSMSTA SETSTORAGESERVER command 73
TSMDLST (Display information about devices) . . 75

Appendix D. Accessibility features for Tivoli Storage Manager. 77

Notices 79
Trademarks 81

Glossary 83

Index 85

Figures

1. SAN data movement 1
2. SAN data movement with the LANFREECOMMMETHOD option 2
3. Connections between the client, storage agent, and server 6
4. Library manager and client LAN-free configuration 9
5. Tivoli SANergy configurations 10
6. ACSLS library environment 12
7. Device information 39
8. Legacy ACSLS data migration 66

© Copyright IBM Corp. 2000, 2010

Tables

1. IBM Tivoli Storage Manager troubleshooting and tuning publications x
2. Tivoli Storage Manager server publications x
3. Tivoli Storage Manager storage agent publications x
4. Tivoli Storage Manager client publications xi
5. Tivoli Storage Manager Data Protection publications xi
6. Paths for data movement 15
7. External library environment 17
8. ACSLS, 3494, or SCSI tape-library sharing environment 17
9. Shared disk environment 17
10. External library environment 18
11. ACSLS, 3494, or SCSI library environment 18
12. Shared disk environment 18
13. Communications methods. 25
14. Server languages for Windows 33
15. Communications methods. 47
16. Server languages for Windows 55

© Copyright IBM Corp. 2000, 2010

Preface

This publication contains installation and operating instructions for the IBM® Tivoli® Storage Manager for Storage Area Networks.

Who should read this guide

This guide is for administrators who install and use the storage agent component of the Tivoli Storage Manager for Storage Area Networks product (referred to as the *storage agent* throughout this publication).

It provides:

- An overview of LAN-free data transfer
- Detailed explanations for installing, configuring, and using the Tivoli Storage Manager client and storage agent, and the Tivoli Storage Manager server)

To use this guide, you must know:

- The operating system on which the server will be installed
- The devices that can use Tivoli Storage Manager
- The workstation operating systems on which the clients reside
- The communication protocols installed on your client and server systems
- Storage area network (SAN) administration

Publications

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

You can search all publications in the Tivoli Storage Manager Information Center: http://publib.boulder.ibm.com/infocenter/tsminfo/v6r2.

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

Go to Tivoli Documentation Central to find information centers that contain official product documentation for current and previous versions of Tivoli products, including Tivoli Storage Manager products at http://www.ibm.com/developerworks/wikis/display/tivolidoccentral/Tivoli+Storage+Manager.

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

© Copyright IBM Corp. 2000, 2010

Tivoli Storage Manager publications

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

Table 1. IBM Tivoli Storage Manager troubleshooting and tuning publications

Publication title	Order number
IBM Tivoli Storage Manager Client Messages and Application Programming Interface Return Codes	SC27-2877
IBM Tivoli Storage Manager Server Messages and Error Codes	SC27-2878
IBM Tivoli Storage Manager Performance Tuning Guide	GC23-9788
IBM Tivoli Storage Manager Problem Determination Guide	GC23-9789

Table 2. Tivoli Storage Manager server publications

Publication title	Order number
IBM Tivoli Storage Manager for AIX Installation Guide	GC23-9781
IBM Tivoli Storage Manager for AIX Administrator's Guide	SC23-9769
IBM Tivoli Storage Manager for AIX Administrator's Reference	SC23-9775
IBM Tivoli Storage Manager for HP-UX Installation Guide	GC23-9782
IBM Tivoli Storage Manager for HP-UX Administrator's Guide	SC23-9770
IBM Tivoli Storage Manager for HP-UX Administrator's Reference	SC23-9776
IBM Tivoli Storage Manager for Linux Installation Guide	GC23-9783
IBM Tivoli Storage Manager for Linux Administrator's Guide	SC23-9771
IBM Tivoli Storage Manager for Linux Administrator's Reference	SC23-9777
IBM Tivoli Storage Manager for Sun Solaris Installation Guide	GC23-9784
IBM Tivoli Storage Manager for Sun Solaris Administrator's Guide	SC23-9772
IBM Tivoli Storage Manager for Sun Solaris Administrator's Reference	SC23-9778
IBM Tivoli Storage Manager for Windows Installation Guide	GC23-9785
IBM Tivoli Storage Manager for Windows Administrator's Guide	SC23-9773
IBM Tivoli Storage Manager for Windows Administrator's Reference	SC23-9779
IBM Tivoli Storage Manager Server Upgrade Guide	SC23-9554
IBM Tivoli Storage Manager Integration Guide for Tivoli Storage Manager FastBack	SC27-2828

Table 3. Tivoli Storage Manager storage agent publications

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

Table 4. Tivoli Storage Manager client publications

Publication title	Order number
IBM Tivoli Storage Manager for UNIX and Linux: Backup-Archive Clients Installation and User's Guide	SC23-9791
IBM Tivoli Storage Manager for Windows: Backup-Archive Clients Installation and User's Guide	SC23-9792
IBM Tivoli Storage Manager for Space Management for UNIX and Linux: User's Guide	SC23-9794
IBM Tivoli Storage Manager Using the Application Programming Interface	SC23-9793

Table 5. Tivoli Storage Manager Data Protection publications

Publication title	Order number
IBM Tivoli Storage Manager for Enterprise Resource Planning: Data Protection for SAP Installation and User's Guide for DB2	SC33-6341
IBM Tivoli Storage Manager for Enterprise Resource Planning: Data Protection for SAP Installation and User's Guide for Oracle	SC33-6340

Related software publications

Publication Title	Order Number
IBM TotalStorage SAN File System Administrator's Guide and Reference	GA27–4317
IBM Tivoli SANergy Administrator's Guide	GC26–7389
General Parallel File System: Concepts, Planning, and Installation Guide	GA76-0413

Support information

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

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

Getting technical training

Information about Tivoli technical training courses is available online.

Go to these Web sites for training information:

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

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

Searching knowledge bases

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

Begin by searching the Tivoli Storage Manager Information Center at http://publib.boulder.ibm.com/infocenter/tsminfo/v6r2. From this Web site, you can search the current Tivoli Storage Manager documentation.

Searching the Internet

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

To search multiple Internet resources, go to the support Web site for Tivoli Storage Manager at http://www.ibm.com/support/entry/portal/Overview/Software/Tivoli/Tivoli_Storage_Manager.

You can search for information without signing in. Sign in using your IBM ID and password, if you want to customize the site based on your product usage and information needs. If you do not already have an IBM ID and password, click **Sign in** at the top of the page and follow the instructions to register.

From the Support Web site, you can search various resources including:

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

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

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

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

To share your experiences and learn from others in the Tivoli Storage Manager user community, go to the Tivoli Storage Manager wiki at http://www.ibm.com/developerworks/wikis/display/tivolistoragemanager.

Using IBM Support Assistant

IBM Support Assistant is a complimentary software product that helps you with problem determination. You can install the stand-alone IBM Support Assistant application on any workstation. You can then enhance the application by installing product-specific plug-in modules for the IBM products that you use.

IBM Support Assistant helps you gather support information when you need to open a problem management record (PMR), which you can then use to track the problem. For more information, see the IBM Support Assistant Web site at http://www.ibm.com/software/support/isa/.

The product-specific plug-in modules provide you with the following resources:

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

Find add-ons for specific products here: http://www.ibm.com/support/docview.wss?&uid=swg27012689.

Finding product fixes

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

You can determine what fixes are available by checking the IBM Software Support Web site at http://www.ibm.com/support/entry/portal/.

- If you previously customized the site based on your product usage:
  1. Click the link for your Tivoli Storage Manager product, or one of the other Tivoli Storage Manager components that you want to find a fix for.
  2. Click **Downloads**, and then click **Fixes by version**.
- If you have not customized the site based on your product usage, click **Downloads** and search for your product.

Receiving notification of product fixes

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

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

1. From the support page at http://www.ibm.com/support/entry/portal/, click **My notifications** in the notifications module.
2. Sign in using your IBM ID and password. If you do not have an ID and password, click **register now** above the IBM ID and password.
3. Click the **Subscribe** tab to select your product family and click **Continue**.
4. Select the type of information that you want to receive, and add your personal preferences. You can specify how you want to be notified, how often, and you can also optionally select a folder for the notifications.
5. Click **Submit**.
6. For notifications for other products, repeat steps 4 and 5.

   Tip: You can also pick a product first, from the main support portal site, and then click in the **Notifications** section to create or update your subscription for that product.

Contacting IBM Software Support

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

Before you contact IBM Software Support, follow these steps:

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

Then see "Submitting the problem to IBM Software Support" on page xv for information on contacting IBM Software Support.

Setting up a subscription and support contract

Set up a subscription and support contract. The type of contract that you need depends on the type of product you have.

For IBM distributed software products (including, but not limited to, IBM Tivoli, Lotus®, and Rational® products, as well as IBM DB2® and IBM WebSphere® products that run on Microsoft® Windows® or UNIX® operating systems), enroll in IBM Passport Advantage® in one of the following ways:

- **Online:** Go to the Passport Advantage Web page at http://www.ibm.com/software/lotus/passportadvantage/, click **How to enroll**, and follow the instructions.
- **By Phone:** You can call 1-800-IBMSERV (1-800-426-7378) in the United States, or for the phone number to call in your country, go to the IBM Software Support Handbook Web page at http://www14.software.ibm.com/webapp/set2/sas/f/handbook/home.html and click **Contacts**.

Determining the business impact

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

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

Describing the problem and gather background information

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

To save time, know the answers to these questions:

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

Submitting the problem to IBM Software Support

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

Online

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

By phone

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

Conventions used in this publication

Typographic conventions are used in Storage Agent User's Guide.

Command to be entered on the command line:

```
> dsmadmc
```

Command to be entered on the command line of an administrative client:

```
query devclass
```

Reading syntax diagrams

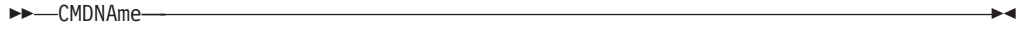
To read a syntax diagram for entering a command, follow the path of the line. Read from left to right and from top to bottom.

- The ►►— symbol indicates the beginning of a syntax diagram.
- The —► symbol, at the end of a line, indicates that the syntax diagram continues onto the next line.
- The ►— symbol, at the beginning of a line, indicates that a syntax diagram continues from the previous line.
- The —►◄ symbol indicates the end of a syntax diagram.

Abbreviations

The command name can consist of a single action word, such as HALT, or it can consist of an action word and an object for the action, such as DEFINE DOMAIN. You can enter the entire command name or the abbreviation that is specified in the syntax diagram for the command. Uppercase letters denote the shortest acceptable abbreviation. If an item appears entirely in uppercase letters, you cannot abbreviate the item. Enter the command in any column of the input line.

You can enter the item in uppercase letters, lowercase letters, or any combination. In this example, you can enter CMDNA, CMDNAM, or CMDNAME in any combination of uppercase and lowercase letters.



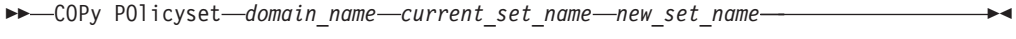
Variables

Highlighted lowercase items (*like this*) denote variables. In this example, *var_name* represents a variable you must specify when you code the CMDNAME command.

Positional parameters

Commands can have required or optional positional parameters. For positional parameters, you do not use an equal sign to specify a value. You must enter positional parameters in the order indicated in the syntax diagram for a command.

For example, to copy a policy set:



1. Enter the name of the policy domain to which the policy set belongs
2. Enter the name of the policy set you want to copy
3. Enter the name you want to assign the copy

```
copy policyset domain1 oldset newset
```

Keyword parameters

Commands can have required or optional keyword parameters. When included in a command, a keyword parameter must follow any positional parameters in the command. You use the equal sign with a keyword to specify its value. A keyword parameter can provide a description of an object, identify an object (such as a storage pool or policy domain), or specify a setting for an option. You can enter either the entire keyword or the abbreviation that is identified in the syntax diagram for the command.

For example, to include a description for a new policy domain, enter:

```
define domain acctg description="accounting"
```

Do not include any blanks immediately before or after the equal sign (=).

Symbols

You must code these symbols exactly as they appear in the syntax diagram.

*	Asterisk
:	Colon
,	Comma
=	Equal Sign
-	Hyphen
( )	Parentheses
.	Period
"	quotation mark
'	single quotation mark

Repetition

An arrow returning to the left means that the item can be repeated. A character within the arrow means that you must separate repeated items with that character.

A footnote (1) by the arrow refers to a limit that tells how many times the item can be repeated.

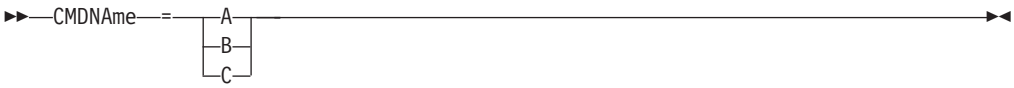
Notes:

1 Specify *repeat* up to 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 CMDNAME=A, CMDNAME=B, or CMDNAME=C.



Do not include any blanks immediately before or after the equal sign (=).

Optional choices

When an item is below the line, the item is optional. In this example, you can choose CMDNAME=A or nothing at all. Do not include any blanks immediately before or after the equal sign (=).

When two or more items are in a stack below the line, all of them are optional. In this example, you can choose CMDNAME=A, CMDNAME=B, CMDNAME=C, or nothing at all. Do not include any blanks immediately before or after the equal sign (=).

Defaults

Defaults are above the line. The system uses the default unless you override it. You can override the default by coding an option from the stack below the line.

In this example, CMDNAME=A is the default. You can also code CMDNAME=A, CMDNAME=B, or CMDNAME=C. Do not include any blanks before or after the equal sign (=).

Repeatable choices

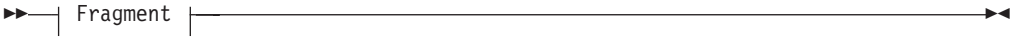
A stack of items followed by an arrow returning to the left means that you can select more than one item or, in some cases, repeat a single item. In this example, you can choose more than one value, with each name delimited with a comma. Do not include any blanks before or after the equal sign (=).

Syntax fragments

Some diagrams, because of their length, must display parts of the syntax with fragments. The fragment name appears between vertical bars in the diagram.

The expanded fragment appears in the diagram after all other parameters or at the bottom of the diagram. A heading with the fragment name identifies the expanded fragment. Commands appearing directly on the line are required.

In this example, the fragment is named “Fragment”.



Fragment:

Syntax diagram descriptions

This topic covers syntax diagrams including descriptions and examples:

Abbreviations: Uppercase letters denote the shortest acceptable abbreviation. If an item appears entirely in uppercase letters, you cannot abbreviate the item.

You can type the item in uppercase letters, lowercase letters, or any combination. In this example, you can enter CMDNA, CMDNAM, or CMDNAME in any combination of uppercase and lowercase letters.

Symbols: You must code these symbols exactly as they appear in the syntax diagram.

* Asterisk

: Colon

, Comma

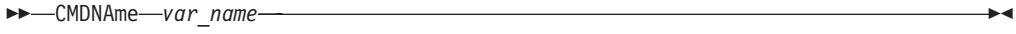
= Equal Sign

- Hyphen

( ) Parentheses

. Period

Variables: Highlighted lowercase items (*like this*) denote variables. In this example, *var_name* represents a variable you must specify when you code the CMDNAME command.



Repetition: An arrow returning to the left means that the item can be repeated. A character within the arrow means that you must separate repeated items with that character.

A footnote (1) by the arrow refers to a limit that tells how many times the item can be repeated.

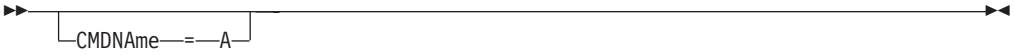
Notes:

1 Specify *repeat* up to 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 CMDNAME=A, CMDNAME=B, or CMDNAME=C. Do not include any blanks immediately before or after the equal sign (=).

Optional Choices: When an item is below the line, the item is optional. In this example, you can choose CMDNAME=A or nothing at all. Do not include any blanks immediately before or after the equal sign (=).



When two or more items are in a stack below the line, all of them are optional. In this example, you can choose CMDNAME=A, CMDNAME=B, CMDNAME=C, or nothing at all. Do not include any blanks immediately before or after the equal sign (=).

Defaults: Defaults are above the line. The system uses the default unless you override it. You can override the default by coding an option from the stack below the line.

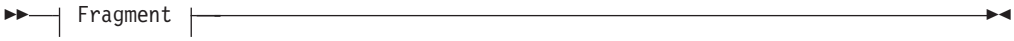
In this example, CMDNAME=A is the default. You can also code CMDNAME=A, CMDNAME=B, or CMDNAME=C. Do not include any blanks before or after the equal sign (=).

Repeatable Choices: A stack of items followed by an arrow returning to the left means that you can select more than one item or, in some cases, repeat a single item. In this example, you can choose more than one value, with each name delimited with a comma. Do not include any blanks before or after the equal sign (=).

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 in the diagram after all other parameters or at the bottom of the diagram. A heading with the fragment name identifies the expanded fragment. Commands appearing directly on the line are required.

In this example, the fragment is named "Fragment".



Fragment:

New for Tivoli Storage Manager for Storage Area Networks Version 6.2

With the new CHECKTAPEPOS server option, you can validate data position on tape.

The CHECKTAPEPOS option applies only to operations using tape drives. It does not apply to non-tape, sequential-access device classes such as FILE or OPTICAL. If the server information about position does not match the position detected by the drive, an error message is displayed, the transaction is rolled back, and the data is not committed to the database.

For details about storage agent options, see "The storage agent options file" on page 70.

Any updates that have been made since the previous edition are marked with a vertical bar (|) in the left margin.

© Copyright IBM Corp. 2000, 2010

Chapter 1. Storage agent overview

Tivoli Storage Manager for Storage Area Networks allows client systems to write data directly to, or read data directly from, storage devices attached to a SAN. This is called *LAN-free data movement*.

LAN-free data movement makes LAN bandwidth available for other uses and decreases the load on the Tivoli Storage Manager server, allowing it to support a greater number of concurrent client connections.

The key component of Tivoli Storage Manager for Storage Area Networks is the storage agent. You install the storage agent on a client system that shares storage resources with the Tivoli Storage Manager server, as shown in Figure 1.

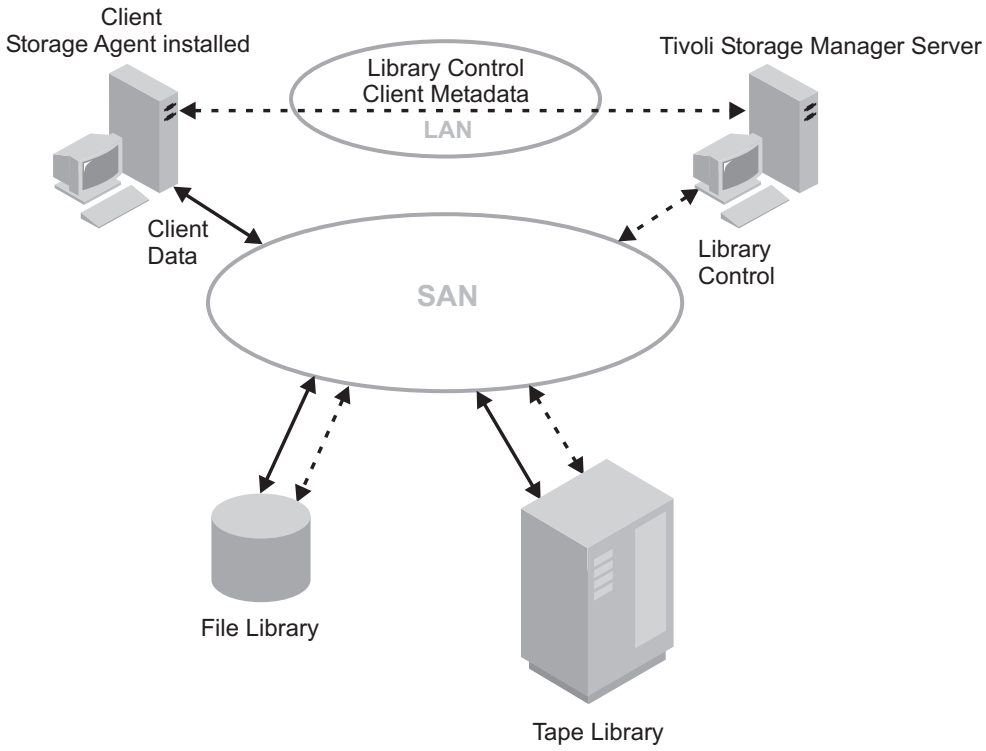


Figure 1. SAN data movement. Solid lines indicate data movement. Broken lines indicate movement of control information and metadata.

As shown in Figure 2 on page 2, the storage agent can support several clients while installed on only one of the clients. You can also install the storage agent on a client system that does not share storage resources with the Tivoli Storage Manager server, but that is connected to a client system that does share storage resources. The LANFREECOMMMETHOD option allows a client system that shares storage resources to communicate with the storage agent. The LANFREECOMMMETHOD option also allows the storage agent to support several clients while installed on only one of the clients.

© Copyright IBM Corp. 2000, 2010

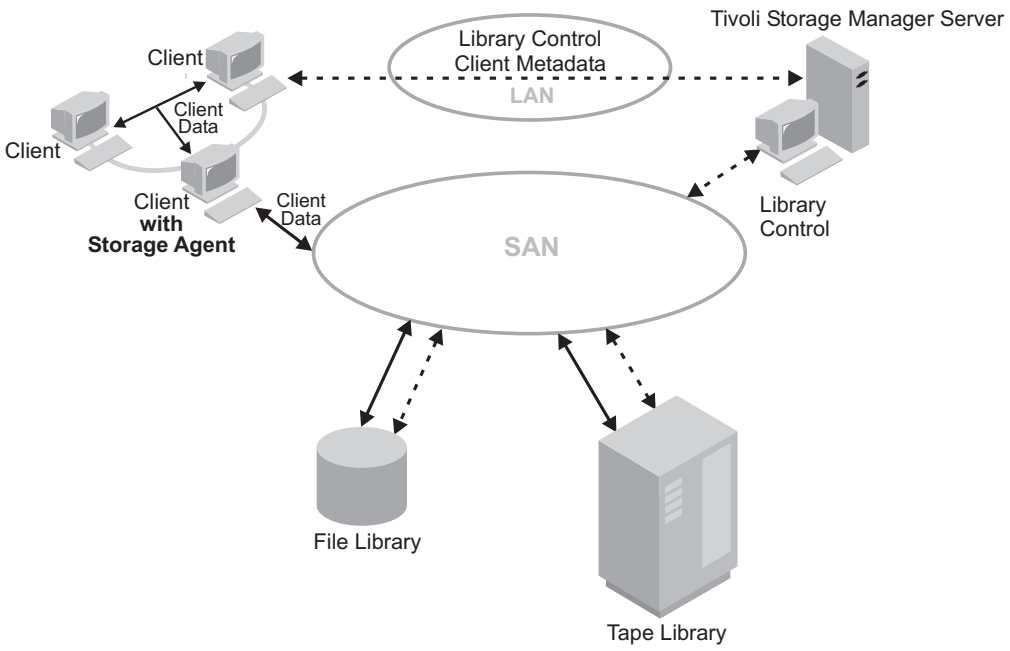


Figure 2. SAN data movement with the LANFREECOMMMETHOD option. Solid lines indicate data movement. Broken lines indicate movement of control information and metadata.

A Tivoli Storage Manager server, acting as a library manager, controls the storage devices. This server can be the server working in conjunction with the storage agent or another Tivoli Storage Manager server in the enterprise. The Tivoli Storage Manager server keeps track of the metadata that the client has stored. The metadata, such as policy information and file name and size, is passed over the LAN connection between the storage agent and server.

The storage agent communicates with the server to obtain and store database information and to coordinate device and volume access. The server and client coordinate and transfer data access through the SAN. The client uses the storage agent for operations where appropriate. For example, if a SAN path is defined, the client (by means of the storage agent) transfers data on that path. If a failure occurs on the SAN path, failover occurs and the client uses its LAN connection to the Tivoli Storage Manager server and moves the client data over the LAN.

The storage agent can send the data directly to the server using the LAN control paths between the storage agent and the server. An example is a LAN-free storage pool that is updated to read-only after the client connects to the server and obtains its initial policy information. The storage agent, instead of failing the operation, sends the data to the server. If the storage hierarchy is configured so that the Next storage pool destination is available, the server performs the operation.

You can also prevent data from transferring over the LAN by specifying the Tivoli Storage Manager server parameters DATAREADPATH and DATAWRITEPATH with the REGISTER NODE or UPDATE NODE commands for the desired node. To review these settings, issue the following command on the server for the node:

```
query node node_name format=detailed
```

Tivoli Storage Manager supports SAN-attached device sharing in the following environments:

- Tivoli Storage Manager native library management support consisting of an ACSLS, SCSI, or 349X library manager and library clients or just a library manager.
- Shared disk storage using a FILE library and the integration of IBM General Parallel File System, Tivoli SANergy®, or IBM TotalStorage® SAN File System. IBM General Parallel File System is the preferred option for operating systems on which it is supported.
- External libraries. For a description of external libraries, see the *Administrator's Guide*.

Related concepts

"ACSLS, SCSI, and 349X tape-library sharing" on page 7

"File device sharing using Tivoli SANergy" on page 9

"External Libraries" on page 11

Related information

IBM General Parallel File System

Tivoli SANergy

TotalStorage SAN File System

LAN-free client-data backup: Scenario

Media to be used for client backup data resides in a storage pool that uses a device shared on a SAN. A library manager sends the location to a storage agent. Backup data goes directly to the device over a SAN.

A typical scenario for LAN-free data movement consists of the following steps:

1. The backup-archive client begins a backup operation. The server reports policy information to the client, including whether a destination is LAN-free. As the client assigns policy settings for files during backup processing, it sends the data LAN-free when the destination for that policy is LAN-free enabled.

   A storage pool is a LAN-free destination when the storage pool uses a device shared on a SAN. That device must also have a defined path between the device and the storage agent.
2. The storage agent receives data for those files backed up by the client and assigned to policy settings that use a LAN-free enabled storage pool. The storage agent sends a request for a volume mount to the library manager server. In external libraries, the storage agent contacts the external library manager, using the path to the executable.
3. A request is made to the storage device to mount the appropriate media.
4. The library manager notifies the storage agent of the location where the mounted media resides. In external libraries, the storage agent is informed of the device location by the external library manager.
5. The client, by means of the storage agent, writes the backup data directly to the device over the SAN.
6. The storage agent sends metadata information to the Tivoli Storage Manager server, and the server stores the information in its database.

Restriction: LAN-free data movement takes precedence over client-side deduplication. If LAN-free data movement occurs during client-side deduplication, client-side deduplication is turned off, and a message is issued in the error log.

Multi-session no-query restore for LAN-free path: Scenario

When performing a no-query restore, the Tivoli Storage Manager server builds a list of files to restore and sends data to the client while continuing to build the list. This allows the restore to be restarted if interrupted.

Multiple sessions are used for the no-query restore when data for the restore resides on devices with a LAN-free path and devices with a LAN-only path. Some sessions restore data from the server with a LAN-only path. The other sessions use the storage agent to restore data over the LAN-free path. This works only with clients at Version 4.2 or above.

The number of sessions used for the restore is dependent on the value of the client RESOURCEUTILIZATION option and the number of server volumes that contain the client data to be restored.

The following actions outline a typical multi-session no-query restore for a LAN-free path:

1. The client requests a file space to be restored. This request is forwarded to the server.
2. The server determines the files to restore and the volume on which those files reside. The server generates a list, sorted by the volume name.
3. The client is informed of the progress and the number of volumes. The client can start more sessions to restore the information.
4. The location of the volume, and whether or not the storage agent can access the volume, will determine how the data is handled. When the volume can be mounted on a shared device that the storage agent can access, the data is read from the volume by the storage agent and sent to the client. When the volume cannot be mounted on a shared device that the storage agent can access, the data is read from the volume by the server and sent directly to the client. The client then begins additional sessions: some to the storage agent for the volumes that are LAN-free enabled and some sessions to the server for those volumes that are not LAN-free enabled.

The process repeats until all files in the list are restored.

Communications between the client, storage agent, and Tivoli Storage Manager server

Configuration tasks link the storage agent, the client, and the Tivoli Storage Manager server.

When configuring the client, storage agent, and server, keep in mind the following basic rules:

- Client nodes eligible for LAN-free data movement must be registered on the server. To register client nodes, use the REGISTER NODE or UPDATE NODE command. Specify **TYPE=CLIENT**.
- The client must point to the server and storage agent. Ensure that the following options are configured correctly in the client system-options file:
  - The LANFREETCPSERVERADDRESS option specifies the TCP/IP address of the system where the storage agent is installed.
  - The LANFREETCPPORT specifies the port on which the storage agent listens.

  - The TCPSERVERADDRESS option specifies the TCP/IP address for a Tivoli Storage Manager server.
  - The TCPPORT specifies a TCP/IP port address for a Tivoli Storage Manager server.
- The server must point to the storage agent, and the storage agent must point to the server:
  - To point the server to the storage agent, use the DEFINE SERVER or UPDATE SERVER command on the Tivoli Storage Manager.
  - To point the storage agent to the Tivoli Storage Manager server, you must configure the storage agent device configuration file and options file with the name of Tivoli Storage Manager server. To configure, you can edit each of the files manually or you can use the DSMSTA SETSTORAGESERVER command.

  Remember: When setting up communication between the storage agent and the Tivoli Storage Manager server, ensure that you are using the correct server name. To change the name of the Tivoli Storage Manager server, use the SET SERVERNAME command.

Figure 3 on page 6 shows how configuration connects the client, the storage agent, and the Tivoli Storage Manager server. Use this figure as a reference point while installing software on client systems and while defining the storage agent and configuring devices

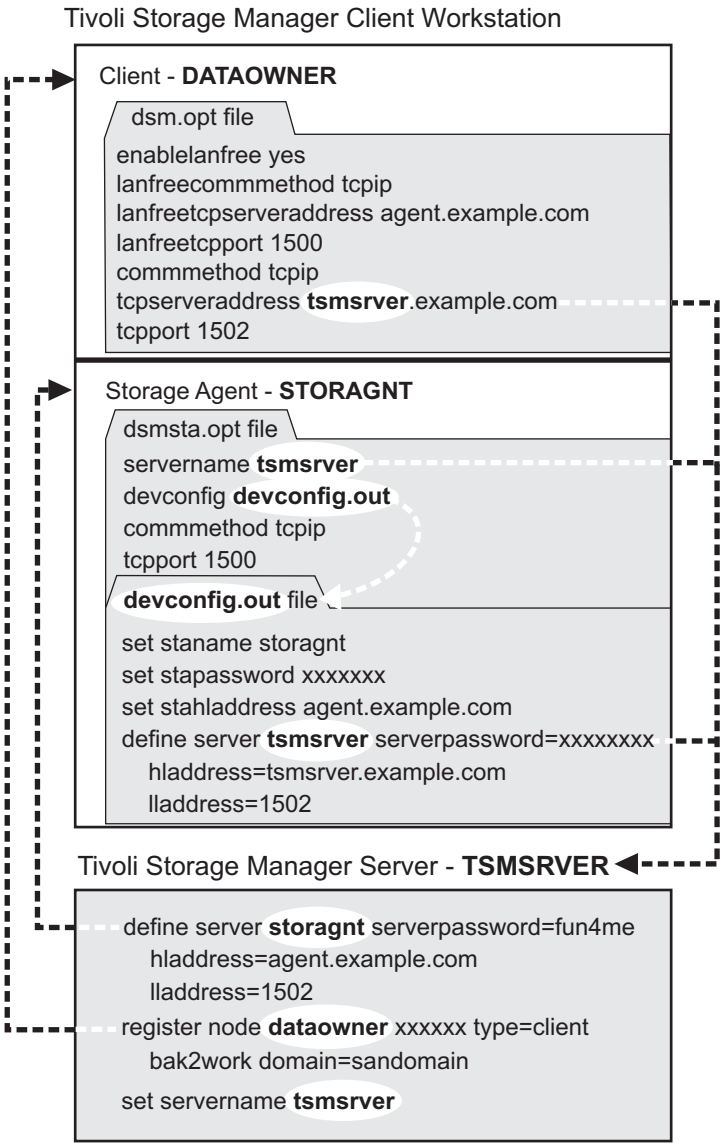


Figure 3. Connections between the client, storage agent, and server. The passwords are shown as *xxxxxxx* because they are encrypted in the file.

Related tasks

"Verifying and updating client node information" on page 21

Related reference

"The storage agent options file" on page 70

"The device configuration file for the storage agent" on page 69

"DSMSTA SETSTORAGESERVER command" on page 73

Chapter 2. Planning for storage agent installation and configuration

Planning the system configuration provides a smooth transition through system setup and into production.

As part of your planning, you need to identify the following:

- Which environment to implement.
- Devices to be used for LAN-free data movement.
- The clients that will use LAN-free data movement.
- The server that will manage particular clients' data.
- The library used for the LAN-free enabled device. If the library is a Tivoli Storage Manager shared library, you must identify the Tivoli Storage Manager server that is the library manager. If the library is an externally managed library using Sun StorageTek ACSLS, you must identify the control point.

Supported operating systems

You can use Tivoli Storage Manager for Storage Area Networks V6.2 on AIX®, HP-UX, Linux®, Sun Solaris, and Microsoft Windows.

When using a shared ACSLS library, the library manager must be a Tivoli Storage Manager server on AIX, HP-UX, Linux, Solaris, or Windows.

Storage devices and the configuration of your environment

The type of storage device you use for LAN-free data storage determines how to configure your environment.

For details about configuring the storage agent in a Microsoft Cluster Service environment, see the IBM Redbooks publication *IBM Tivoli Storage Manager in a Clustered Environment*.

You can use a variety of storage devices with the storage agent. For more information about devices, see the Tivoli Storage Manager device site.

ACSLS, SCSI, and 349X tape-library sharing

When Tivoli Storage Manager servers share an ACSLS, SCSI tape, or 349*x* tape library device, one server, the *library manager*, owns and controls the device.

The library manager operations include checking volumes into and out of the library, labeling volumes, mounting and dismounting volumes, auditing volumes, and tracking an inventory of library contents. The storage agents, along with other Tivoli Storage Manager servers that share this library are *library clients*. As a library client, the storage agent stores data and requests drives, tapes, and volumes.

When the Tivoli Storage Manager server (data manager server) is also the library manager for the devices where data is stored by the storage agent, then the storage agent communicates requests to this Tivoli Storage Manager server. When the Tivoli Storage Manager server (data manager server) is another library client, then the storage agent communicates requests for itself or the metadata server directly

© Copyright IBM Corp. 2000, 2010

to the library manager. The library manager operations include checking volumes into and out of the library, labeling volumes, mounting and dismounting volumes, auditing volumes, and tracking an inventory of library contents.

When using a shared ACSLS library, the library manager must be a Tivoli Storage Manager server on AIX, HP-UX, Linux, Solaris, or Windows.

A library client requests shared library resources, such as drives or media, from the library manager, but uses the resources independently. The library manager coordinates the access to these resources. Data moves over the SAN between the storage device and either the library manager or the library client. Either the library manager or any library client can manage the LAN-free movement of client data as long as the client system includes a storage agent.

In this library-sharing environment, the most important relationship is the one between the server and the storage agent. The server, working in conjunction with the storage agent, manages the storage hierarchy. The server could be a library client or library manager. It is responsible for:

- Migrations
- Expiration of files based on policy information
- Reclamation of free space on volumes and consolidation of the volumes
- Disaster recovery

The storage agent contributes information to the storage hierarchy through various operations, but this role is independent of the library sharing role.

The library manager and library client configurations are represented in Figure 4 on page 9.

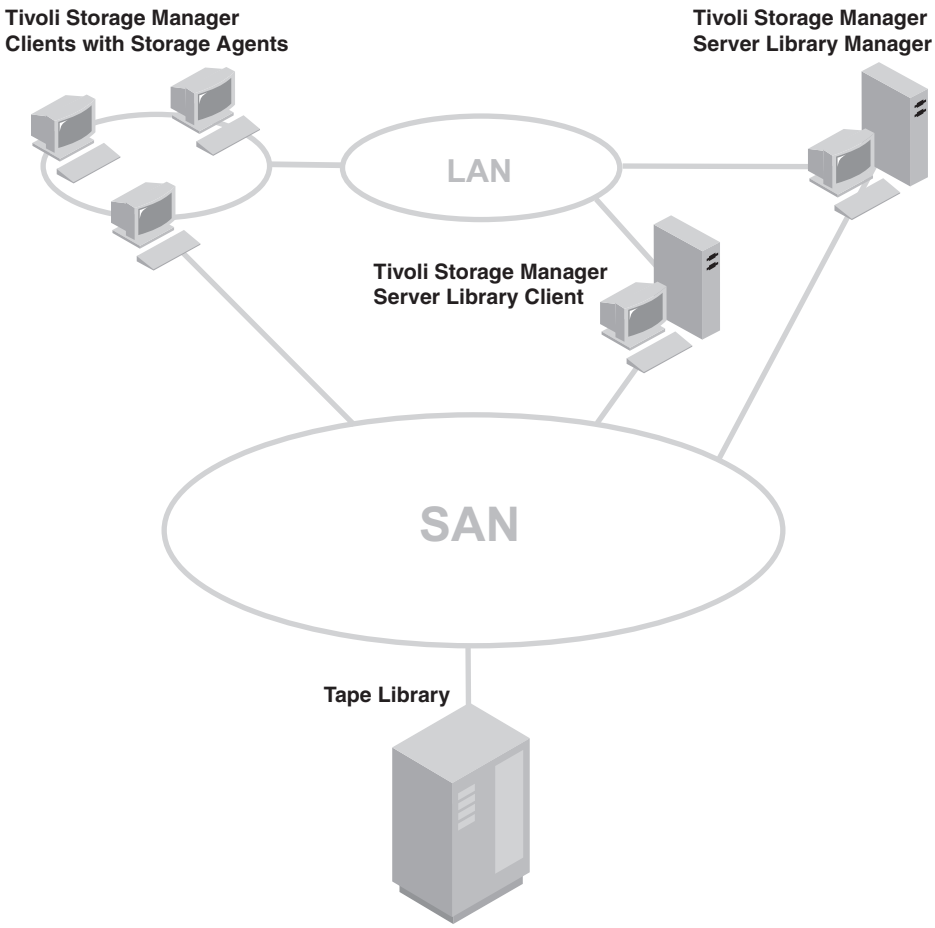


Figure 4. Library manager and client LAN-free configuration

Tips:

- An environment can have a library manager without a library client.
- In an environment where ACSLS library support is required, the library client and library manager can reside on a Tivoli Storage Manager server on AIX, HP-UX, Linux, Solaris, or Windows.

The following configurations are shown in Figure 4:

- A Tivoli Storage Manager server library manager manages a client's data, which is stored in a tape library.
- A Tivoli Storage Manager server library client manages a client's data, which is stored in a tape library.

File device sharing using Tivoli SANergy

When Tivoli Storage Manager servers share access to disk storage, the environment contains a shared FILE device class and utilizes file-sharing software such as Tivoli SANergy.

Remember: SANergy is just one option for file-sharing software. IBM General Parallel File System is the preferred option for the operating systems on which it is supported. IBM TotalStorage SAN File System is another option.

SANergy provides a file-sharing accelerator. Because you are using a FILE library, you must determine the location in which to install the Tivoli SANergy client and

the Tivoli SANergy Metadata Controller (MDC). On UNIX systems, Common Internet File System (CIFS) or a Network File Share (NFS) are required software.

Restriction: The Tivoli SANergy license (included with the storage agent media) is provided with Tivoli Storage Manager only for supporting LAN-free backup to disk.

Figure 5 shows the possible Tivoli SANergy configurations. (For additional information about configuring SANergy, refer to the SANergy publications.)

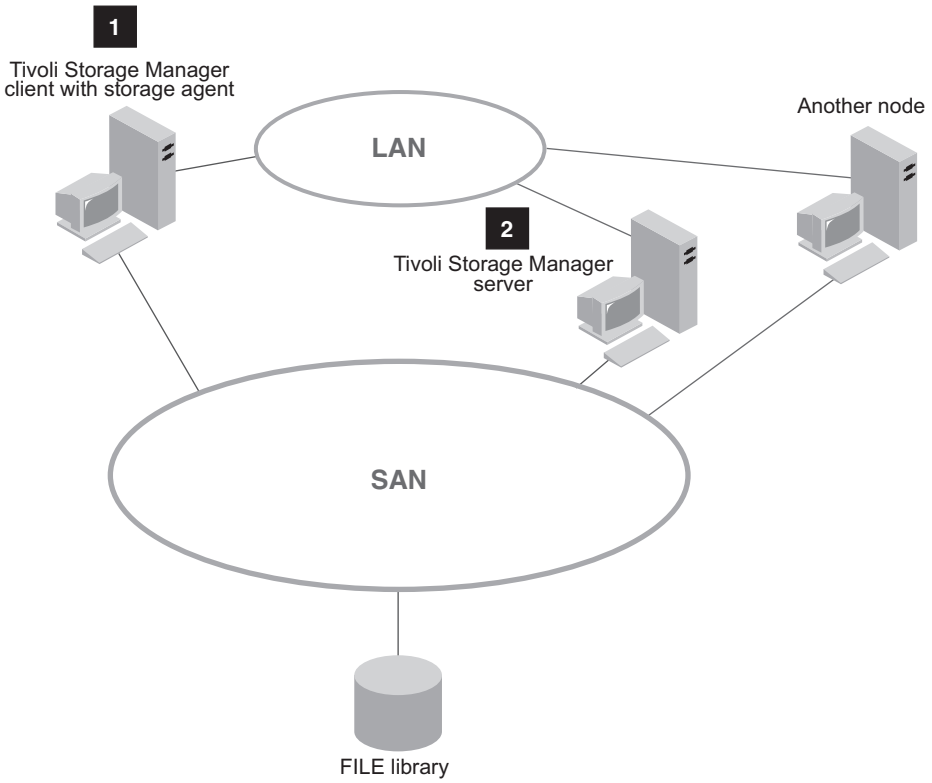


Figure 5. Tivoli SANergy configurations

One possible configuration is to install the Tivoli SANergy client on the Tivoli Storage Manager client system (1) and to install the Tivoli SANergy MDC on the Tivoli Storage Manager server (2). Configurations can also consist of multiple platforms. For example, an environment can consist of a SANergy MDC working with Windows and AIX clients.

Related information

IBM General Parallel File System

Tivoli SANergy

TotalStorage SAN File System

External Libraries

If Tivoli Storage Manager native library (SCSI, 3494, and ACSLS) support cannot be used, the alternative is to configure external library support.

A typical external library configuration includes an external library manager such as the IBM Enterprise Removable Media Manager (eRMM).

The Sun StorageTek Automated Cartridge System Library Software (ACSLS) Server or the LibraryStation on z/OS® manages the physical aspects of tape cartridge storage and retrieval. (See Figure 6 on page 12.) The external library manager communicates with the ACSLS Server or the LibraryStation on z/OS to access tape cartridges in an automated Sun StorageTek library. The storage agent is installed on a system containing the external library manager and a Tivoli Storage Manager backup-archive client or a Tivoli Storage Manager data protection application client. This configuration provides access to SAN-attached storage devices using LAN-free data movement. The continued connection to the LAN provides a metadata (control information) path. If the storage agent is not available, the SAN provides a failover path for data backup and recovery.

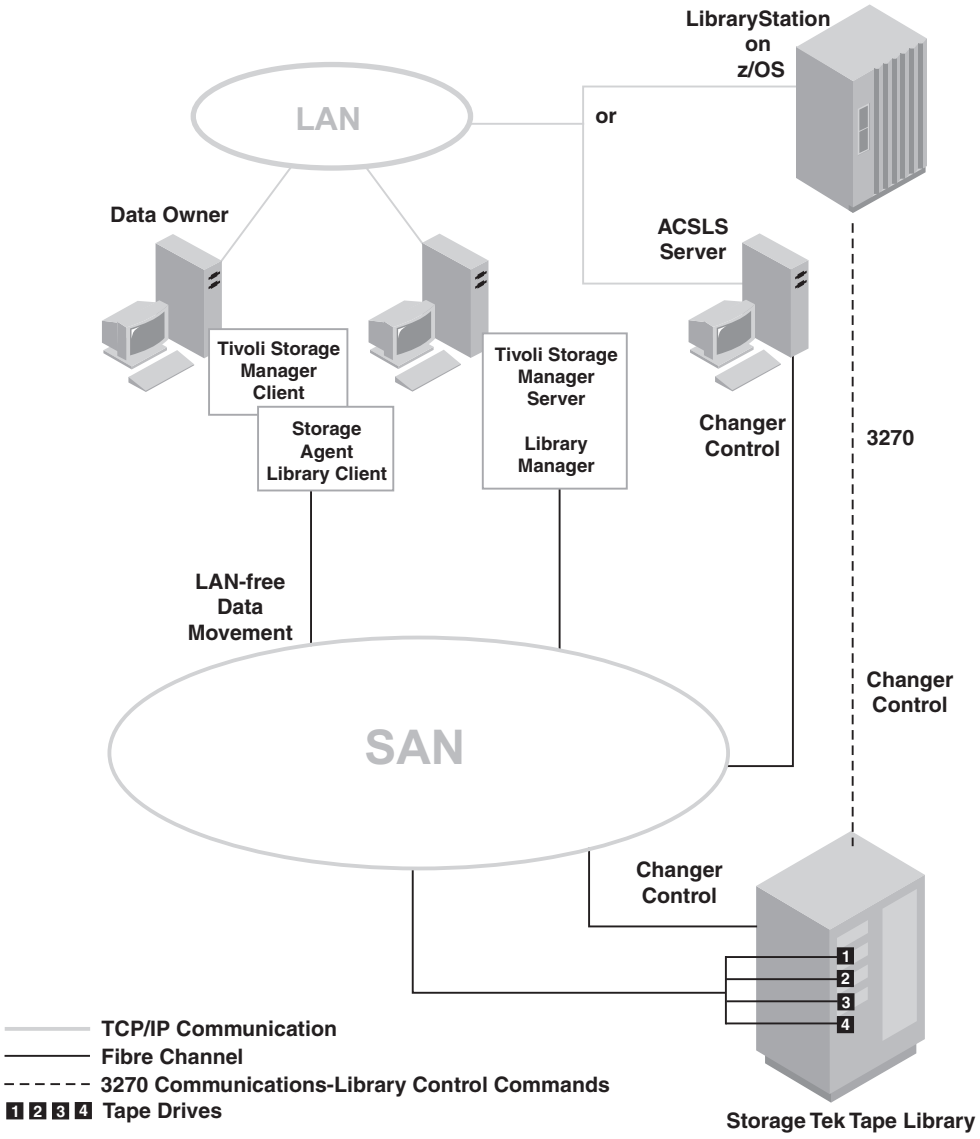


Figure 6. ACSLS library environment

For detailed information about ACSLS, refer to the appropriate Sun StorageTek documentation. For detailed information about an external library manager, such as IRMM, refer to the product's documentation.

If you currently have data associated with the Tivoli Storage Manager ACSLS library type and want to take advantage of LAN-free, you need to consider coexistence and migration issues.

If you stored data using external library support for ACSLS library access and plan to migrate to a native Tivoli Storage Manager library sharing environment, see the *Administrator's Guide*.

Related concepts

"ACSLS legacy data migration and coexistence" on page 65

System requirements

Tivoli Storage Manager for Storage Area Networks requires specific levels of hardware and software.

TCP/IP

TCP/IP is required for communication among the Tivoli Storage Manager server, the client, and the storage agent.

The Tivoli Storage Manager storage agent can use TCP/IP Version 6 (IPv6) as its communications protocol. IPv6 is interoperable with TCP/IP Version 4. You can specify either IPv4 or both IPv4 and IPv6 as the value of the COMMMETHOD option before starting the server, the backup-archive client, or the storage agent. The same port numbers are used by the server, the backup-archive client, and storage agent for both IPv4 and IPv6.

The server and storage agent use COMMMETHOD V6TCPIP to specify support for both IPv4 and IPv6 simultaneously, depending on the protocols configured on the system on which the server or storage agent are running. As in prior releases, COMMMETHOD TCPIP specifies that only IPv4 is used. When configuring the storage agent using the DSMSTA SETSTORAGESERVER command, use addresses that correspond to the communications method used by the backup-archive client. The backup-archive client supports either IPv4 (COMMMETHOD TCPIP) or IPv6 (COMMMETHOD V6TCPIP), but not both at the same time. Other client components (CAD, Web Client) use COMMMETHOD V6TCPIP to support both IPv4 and IPv6 simultaneously.

IPv6 address formats are acceptable for all functions that support IPv6. However, if you use IPv6 addresses for the Shared Memory Protocol function, which does not support IPv6, communications will fail. Continue to use IPv4 for Shared Memory Protocol.

Microsoft Management Console (MMC) snapin

If you are using the Microsoft Management Console (MMC) snapin, the storage agent system must have Microsoft Internet Explorer Version 5 or later installed.

Server licensing and compatibility

You must have an AIX, HP-UX, Linux, Sun Solaris, or Windows, Tivoli Storage Manager server that has a license for LAN-free operations.

To ensure compatibility between the storage agent and the server, check the Web site for Tivoli Storage Manager storage agent and server compatibility at http://www.ibm.com/support/docview.wss?uid=swg21302789.

To download the latest interim fix, see the IBM Tivoli Storage Manager for Storage Area Networks support Web site at http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html.

Clients and API

To perform LAN-free data movement, you must install a Tivoli Storage Manager backup-archive client or a Tivoli Storage Manager Date Protection application client on client systems.

- For information about LAN-free requirements for data-protection clients, see the Tivoli Storage Manager data-protection documentation.
- For information about supported versions of the backup-archive client and client API, check the Web site at http://www.ibm.com/support/entdocview.wss?rs=663&context=SSGSG7&q=5.1+os%2F390+supported+windows+clients+and+tsm&uid=swg21053218.
- You can download the latest software levels from the Tivoli Storage Manager for Storage Area Networks support Web site at http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html. The client API is packaged with the backup-archive client.

File sharing software

If you are sharing disk storage, IBM General Parallel File System, Tivoli SANergy, or IBM TotalStorage SAN File System must be installed. Tivoli SANergy is included with the storage-agent media.

Use of the Tivoli SANergy components included with the Tivoli Storage Manager for Storage Area Networks product is limited to use to enable LAN-free backup and restore to disk in conjunction with your licensed use of the Tivoli Storage Manager for Storage Area Networks product.

If you are sharing only tape devices, file-sharing software is not required.

Encryption support

Encryption provides security and protects sensitive data on tape media. With Tivoli Storage Manager for Storage Area Networks, you can use encryption with the following drives:

- IBM and HP LTO-4
- IBM 3592 generation 2 and generation 3
- Sun StorageTek T10000B

With Tivoli Storage Manager for Storage Area Networks, you can also use client-side encryption and the Tivoli Storage Manager automatically-generated password.

When LTO-4 encryption is enabled, Tivoli Storage Manager manages data encryption and decryption according to specifications set when defining the LTO device class. To enable drive encryption with IBM LTO-4, you must have the IBM RMSS Ultrium device driver installed. IBM LTO-4 SCSI drives do not support encryption.

Concurrent access to volumes in storage pools associated with the FILE device type

Concurrent access improves restore performance by allowing two or more client sessions, two or more storage agents, or a combination of client sessions and storage agents to access the same volume at the same time. Multiple client sessions and storage agents can read a FILE volume concurrently. In addition, one client session or storage agent can write to the volume while it is being read. To take advantage of concurrent access to FILE volumes, both the storage agent and the Tivoli Storage Manager server must be at version 5.5.0 or later.

LAN-free access to storage pools containing client-side deduplicated data

Only V6.2 storage agents can use LAN-free data movement to access storage pools that contain data that was deduplicated by clients. V6.1 storage agents or earlier cannot use LAN-free data movement to access these storage pools.

Using a V6.1 storage agent or earlier to access a storage pool that contains client-side deduplicated data causes restore operations and retrieve operations to go over the LAN. See Table 6.

Table 6. Paths for data movement

	Storage pool contains only client-side deduplicated data	Storage pool contains a mixture of client-side and server-side deduplicated data	Storage pool contains only server-side deduplicated data
V6.1 or earlier storage agent	Over the LAN	Over the LAN	LAN-free
V6.2 storage agent	LAN-free	LAN-free	LAN-free

V6.2 backup-archive clients are compatible with V6.2 storage agents, and provide LAN-free access to storage pools that contain client-side deduplicated data.

As part of the planning process, decide whether you want to use LAN-free data movement and whether you want to use client-side data deduplication, server-side deduplication, or both. If you decide to use LAN-free data movement and both client-side and server-side data deduplication, take one of the following steps:

- For V6.1 or earlier storage agents, store client-side deduplicated data in a separate storage pool. Restore and retrieve deduplicated data from this storage pool over the LAN. Use LAN-free data movement to restore and retrieve data from storage pools that contain data that was deduplicated only by the server.
- Upgrade to V6.2 storage agents. Upgrading to V6.2 storage agents provides LAN-free access to any storage pool that contains client-side deduplicated data, server-side deduplicated data, or both.

Related information

IBM General Parallel File System

Tivoli SANergy

TotalStorage SAN File System

Obtaining system configuration information for clients and servers

To be more efficient, obtain client- and server-system information before installing and configuring the storage agent.

Client-system and server-system configuration work sheets

Work sheets help organize the information that you need to configure the storage agent for LAN-free data movement.

Client-system information

Client-system information includes information about storage agents, client communication protocols and ports, and devices.

Storage agent properties

Type of information	Description	Use this column to record the values for your environment
Storage agent name	The name for the storage agent (for example, storagnt)	
Storage agent password	The password for the storage agent (for example, fun4me)	
TCP/IP address	The TCP/IP address of the storage agent (for example, agent.example.com)	
TCP/IP port	The TCP/IP port of the client system	

Client properties

Type of information	Description	Use this column to record the values for your environment...
LAN-free communications protocol	The communications protocol between the client and the storage agent. The following protocols are available. Use the value in parentheses as the value of the client LANFREECOMMMETHOD option. • TCP/IP Version 4 (TCPIP) • TCP/IP Version 4 or Version 6 (V6TCPIP) • Shared Memory (SHAREDMEM) • Named Pipes (NAMEDPIPES) Named Pipes is the default, and there is a default name the client uses to contact the storage agent.	
LAN-free port	The TCP/IP port that is used for LAN-free data movement. Use this value as the value of the client LANFREETCPPORT option.	
Tip: For details about the LANFREECOMMMETHOD option, see the *Backup-Archive Clients Installation and User's Guide*.		

Device information

Table 7. External library environment

Type of information	Description	Use this column to record the values for your environment...
Executable file location	The fully qualified path to the external-library-manager executable file for each storage agent to which Tivoli Storage Manager sends media-access requests.	
Library name	A 1- through 32-character name of your choosing.	

Table 8. ACSLS, 3494, or SCSI tape-library sharing environment

Type of information	Description	Use this column to record the value or values for your environment...
Device name	The name of each tape drive for which you will define a path	

Table 9. Shared disk environment

Type of information	Description	Use this column to record the value for your environment...
Local path name	The name of the local path to the network-mounted file system (for example, `/shareddisk`)	

Related tasks

"Obtaining device information" on page 19

Server-system information

Server-system information includes information that the storage agent needs to communicate with the Tivoli Storage Manager server. You also need information about devices and client nodes.

To verify server information, use the QUERY STATUS command. You can issue the command from a Tivoli Storage Manager administrative command-line client.

Server properties

Type of information	Description	Use this column to record the values for your environment
Name	The name of the server (for example, tsmsrver)	
Password	The password for the server (for example, not4u)	
TCP/IP address	The TCP/IP address for the server. (for example, tsmsrver.example.com)	
TCP/IP port	The TCP/IP port for the server (for example, 1502)	

Device information

Table 10. External library environment

Type of information	Description	Use this column to record the values for your environment...
Executable file location	The fully qualified path to the external-library-manager executable file for each storage agent to which Tivoli Storage Manager can send media access requests	
Library name	A 1- through 32-character name of your choosing	

Table 11. ACSLS, 3494, or SCSI library environment

Type of information	Description	Use this column to record the values for your environment...
Library name	The name of an ACSLS, 3494, or SCSI library	
Library device name	The device name for an ACSLS, 3494, or SCSI library, which you use when you define the path	
Device name	The name of each tape drive for which you will define a path	

Table 12. Shared disk environment

Type of information	Description	Use this column to record the value for your environment...
Local path name	The name of the local path to the network-mounted file system (for example, `/shareddisk`)	

Client node information

Type of information	Description	Use this column to record the values for your environment...
Client node names	The names of the client nodes on which you will install and configure the storage agent. You need this information when you register the nodes, set the policy for them, and place any needed restrictions on them.	

Related tasks

"Obtaining device information" on page 19

"Verifying and updating client node information" on page 21

Obtaining device information

You can obtain tape-device and disk-device information from the system where the storage agent is installed. You use the device information from the storage agent when defining paths for the server that functions as the library manager.

Obtaining tape-device information

You can use the TSMDLST command to display the device names needed to define paths between the SAN devices, the storage agent, and the Tivoli Storage Manager server.

Before beginning this procedure:

- Ensure that the correct device driver is installed on Windows Server 2003, Windows Server 2003 R2, Windows Server 2008, or Windows Server 2008 R2. The following table lists device driver names.

	32–bit	64–bit
Windows Server 2003 and Windows Server 2003 R2	TSMSCSI.SYS	TSMSCSI.SYS64
Windows Server 2008 and Windows Server 2008 R2	TSMSCSI.SYS	TSMSCSI.SYS64

- If you have not added the storage agent path to the search path, you must first change to the directory where the storage agent program resides. By default, the path is `c:\program files\tivoli\tsm\storageagent`.

To obtain tape-device information:

1. Ensure that the device driver is running. If the device driver is not running, the command gives results that might be incorrect.
2. Enter TSMDLST at an MS-DOS command prompt. If you do not specify any parameters, the command displays a summary of device information for the local computer. Results display in the following format:

```
Computer Name:      DATAOWNER
TSM Device Driver:  Running

TSM Device Name  ID   LUN  Bus  Port   TSM Device Type  Device Identifier
------------------------------------------------------------------------------
mt8.2.0.1        8    0    0    1      3570             IBM     03570B12        422C
lb8.3.0.1        8    1    0    1      LIBRARY          IBM     03570B12        422C
mt8.4.0.1        9    0    0    1      3570             IBM     03570B12        422C
f:\              0    0    0    0      REMOVABLEFILE     n/a
```

   To issue the DEFINE PATH and UPDATE PATH commands on the server, you need the names in the column labeled TSM Device Name.

Related reference

"TSMDLST (Display information about devices)" on page 75

Verifying permissions for disk devices

Without appropriate permissions, the backup will not be LAN-free. If your environment includes a FILE library and a UNIX-based Tivoli Storage Manager server, such as AIX or Sun Solaris, the storage agent must have access to the volumes in the FILE library.

To verify that the appropriate permissions are available:

1. Log on to the UNIX server as the root user.
2. Change (CD) to the shared directory.
3. Create a file called prm_test. For example: touch /sharedir/prm_test
4. Log off the UNIX server.
5. Log on to the Windows client account that will start the storage agent.
6. Open a DOS command window.
7. Change to the mapped share directory.
8. Attempt to write to the prm_test file, for example,

   ```
   echo "testing 123 testing 123" > \\192.168.1.10\\sharedir\prm_test"
   ```

If the write is successful, the permission settings are correct and you start defining paths from storage agents to drives. If the permissions are not correct, an Access Denied message is issued. If you receive the Access Denied message, you can set permissions using Samba. If you are using NFS, configure NFS to allow write access from the account that is starting the storage agent.

Related tasks

"Defining paths from the storage agent to drives" on page 39

Setting permissions using Samba

To set the permissions, you must configure Samba so that the user account that is starting the storage agent has root access.

The following example explains how to configure Samba 2.2.2. Other versions of Samba might require different configuration steps.

1. Set the Samba share directory read-only parameter to NO.
2. Set the Samba guest **ok** parameter to NO.
3. Use a username map file that maps a Windows login name to an existing UNIX name. Create a file called `user.map` and place it in the `/usr/local/samba/bin` directory on the UNIX server.

   Tip: Previous versions of Samba might install in the `/opt` directory.
4. Add the following line to the `user.map` file, where *admin* represents the user account that is starting the storage agent:

   ```
   root = root administrator admin
   ```
5. Add the following line to the global section of the Samba smb.conf file:

   ```
   username map = /usr/local/samba/bin/user.map
   ```
6. To test whether the permission settings, perform the permission-testing procedure.

Configuring TSMSCSI.EXE for Windows Server 2003 and Windows Server 2008

When you are using non-IBM devices and running Tivoli Storage Manager on Windows Server 2003, Windows Server 2003 R2, Windows Server 2008, or Windows Server 2008 R2, you must install an IBM Tivoli Storage Manager driver. You must also manually update the controlling driver for each device that you want to control with TSMSCSI.EXE.

Remember: You do not need to configure TSMSCSI.EXE for IBM devices.

TSMSCSI.EXE is included in the storage agent package. The following table lists device driver names.

	32–bit	64–bit
Windows Server 2003 and Windows Server 2003 R2	TSMSCSI.SYS	TSMSCSI.SYS64
Windows Server 2008 and Windows Server 2008 R2	TSMSCSI.SYS	TSMSCSI.SYS64

On the Windows Server 2003 and the Windows Server 2008, devices are automatically controlled by the default Windows device driver.

To configure devices for TSMSCSI.EXE:

1. From the Device Manager Console, right-click on the device and select **Properties**. To see the driver that is currently controlling your device, select the driver tab and **Driver File Details**.
2. Right-click the device and select **Update Driver** or select **Action** → **Update Driver**. The Hardware Update wizard displays.
3. From a list or specific location (Advanced), select **Install**.
4. Click **Next**.
5. Select **Don't search. I will choose to install**.
6. Click **Next**.
7. In the Hardware Installation panel, click **Continue Anyway**.
8. Verify that the device has been configured correctly for TSMSCSI.EXE.
   a. Right-click the device and select **Properties**.
   b. Select the driver tab and driver details.

Verifying and updating client node information

Configuring LAN-free data movement requires registration and policy information about client nodes. You can also restrict when a client node uses a LAN-free path.

To verify client node information:

1. Identify the client node or nodes that will use the storage agent. In a typical environment, a storage agent is used only by the client node residing on the same system as the storage agent. However, you can configure two or more client nodes to use the same storage agent.
2. Verify that the nodes are registered. If they are not, you need to register them. For details, see the *Administrator's Guide*.
3. Verify the policy information for the nodes. The copy group for backup and archive must point to a storage pool that has a LAN-free path for a particular

storage agent. You define drive LAN-free paths and make them available for the storage pool. To view the destinations that are capable of LAN-free data movement, you can issue the VALIDATE LANFREE command on the server. For details about this command, see the *Administrator's Reference*.

4. After you verify the registration and policy information for the nodes, you can place restrictions on when a node can use the LAN-free path. The node attributes **DATAWRITEPATH** and **DATAREADPATH** determine the restriction placed on the node:
   - To use only the LAN-free path on backup and archive operations, specify **DATAWRITEPATH** .

     Important: Backup and archive operations can fail if the LAN-free path is unavailable.
   - To use the LAN path on restore and retrieve operations, specify **DATAREADPATH** .

   For more information about commands and their attributes, see the *Administrator's Reference*.

Related tasks

"Configuring multiple clients to use the same storage agent" on page 66

"Using LAN and LAN-free paths in the same backup operation" on page 67

Chapter 3. Installing and configuring tape-library and file-device-sharing environments

The destination for LAN-free data can be tape media or sequential-access disk media. Configuration requirements vary depending upon the type of environment.

Before beginning this procedure:

- Make sure that you understand the overall installation and configuration process, which takes place on different systems at different times.
- Be sure that you have the information recorded in the configuration-information work sheets.

The major installation and configuration steps are:

1. "Establishing network connections"
2. "Installing and configuring software on client systems" on page 24
3. "Defining the storage agent and configuring devices on the server" on page 35
4. "Defining paths from the storage agent to drives" on page 39
5. "Verifying the LAN-free configuration" on page 41
6. "Verifying LAN-free data movement" on page 42

Related tasks

"Setting up LAN-free data movement using the Administration Center wizard" on page 43

Related reference

"Obtaining system configuration information for clients and servers" on page 15

Establishing network connections

Tivoli Storage Manager for Storage Area Networks requires specific levels and models of hardware and software. You must ensure that your system meets these requirements.

To establish network connections:

1. Attach the server system and the client systems to the LAN and to the SAN along with appropriate storage devices.
2. Optional: If you are planning to use a storage agent with disk media, install IBM General Parallel File System, Tivoli SANergy, or IBM TotalStorage SAN File System on the applicable systems. Tivoli SANergy is included with the storage agent media.

   Restriction: Use of the Tivoli SANergy components that are included with the IBM Tivoli Storage Manager media is limited. You can use Tivoli SANergy components only for LAN-free backup and restore-to-disk operations in conjunction with your licensed use of the IBM Tivoli Storage Manager for Storage Area Networks product.

   For details about TivoliSANergy, see the *IBM Tivoli SANergy Administrator's Guide*. For details levels and models of hardware and software, see http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html.

© Copyright IBM Corp. 2000, 2010

Related concepts

"File device sharing using Tivoli SANergy" on page 9

Related information

Tivoli Storage Manager for Storage Area Networks support

IBM General Parallel File System

Tivoli SANergy

TotalStorage SAN File System

Installing and configuring software on client systems

You install storage agents and backup-archive or IBM Tivoli Storage Manager Data Protection clients on client systems. If you install a Data Protection application client, you must also install the Tivoli Storage Manager API.

Complete the following tasks to install and configure the software:

1. "Installing and configuring the client"
2. *Only Data Protection application clients:* "Installing and configuring the API" on page 26
3. "Installing the storage agent" on page 27
4. "Configuring the storage agent" on page 34

Related concepts

"Communications between the client, storage agent, and Tivoli Storage Manager server" on page 4

Related tasks

"Verifying and updating client node information" on page 21

Installing and configuring the client

The client can be an IBM Tivoli Storage Manager backup-archive client or a Tivoli Storage Manager Data Protection application client.

Before beginning this procedure:

- Verify that the client system meets the prerequisites for client software. To ensure software compatibility, check the Web site for Tivoli Storage Manager storage agent and backup-archive client compatibility. You can download the latest software levels from the Tivoli Storage Manager product support Web site.

  For details about installing a backup-archive client, see the *Backup-Archive Clients Installation and User's Guide*. For details about installing a Data Protection application client, see the *Data Protection Installation and User's Guides*.
- Be sure that you have the information recorded in the configuration-information work sheets.
- Ensure that client nodes are registered and configured on the server. To register client nodes, use the REGISTER NODE or UPDATE NODE command.

Remember: If multiple clients are using LAN-free data movement, install or upgrade the client software on each client system.

To install and configure the client, complete the following steps:

1. Install or upgrade the backup-archive client software or Data Protection application-client software.

2. Using the information that you collected in the configuration-information work sheets, modify the following file:

   `dsm.opt` client options file

   Tip: The file can be located in one of several places, such as the installation directory, or in a location pointed to by an environment variable.

   Specify the communication method to be used between the client and server.

Table 13. Communications methods

To use this communication method...	Install this software...	To connect to these Tivoli Storage Manager servers...
TCP/IP	TCP/IP (Standard with supported platforms)	AIX, HP-UX, Linux x86_64, Linux on System Z, Linux on POWER®, Solaris, Windows Server 2003, Windows Server 2003 R2, Windows Server 2008, Windows Server 2008 R2
Shared memory	TCP/IP (Standard with supported platforms)	Windows Server 2003, Window Server 2003 R2, Windows Server 2008, Windows Server 2008 R2
Named pipes	Named Pipes (Standard with supported Windows platforms)	Windows Server 2003, Windows Server 2003 R2, Windows Server 2008, Windows Server 2008 R2

   For example:

```
commmethod tcpip
tcpserveraddress tsmsrver.example.com
tcpport 1502
```

   The example uses a TCPPORT of 1502. However, the default TCPPORT is 1500.

   Keep the file open for the next step.

3. Add the following options to the same stanza in the same file that you edited in step 2. These options specify that the client uses SAN-attached devices, when the path is available, during backup, restore, archive, and retrieve processing.

```
enablelanfree yes
lanfreecommmethod tcpip
lanfreetcpserveraddress agent.example.com
lanfreetcpport 1500
```

   or

```
enablelanfree yes
lanfreecommmethod SharedMem
lanfreeshmport 1510
```

   or

```
lanfreecommmethod namedpipes
lanfreeport \\hostname\\pipename
```

If you installed a Data Protection application client, you must install and configure the API.

Related concepts

"Communications between the client, storage agent, and Tivoli Storage Manager server" on page 4

Related tasks

"Verifying and updating client node information" on page 21

Related reference

"Client-system and server-system configuration work sheets" on page 16

Related information

Tivoli Storage Manager for Storage Area Networks support

Storage agent and client compatibility with Tivoli Storage Manager servers

Tivoli Storage Manager support

Installing and configuring the API

If you are using an IBM Tivoli Storage Manager Data Protection application client, you must install and configure the Tivoli Storage Manager API.

Before beginning this procedure, verify that the client system meets the prerequisites for the application programming interface (API) software. You can download the latest software levels from the Tivoli Storage Manager product support Web site.

For details about installing the API software, see the *Backup-Archive Clients Installation and User's Guide*.

Remember: If multiple Data Protection application clients are using LAN-free data movement, configure the API on each client system.

Complete the following steps:

1. Install the API.
2. Download the latest Tivoli Storage Manager Windows backup-archive client and the associated `bat` file from the product support Web site.
3. Run the `bat` file to extract the files, and follow the directions to begin the installation procedure.
4. In the Setup Type window, click **Custom**.
5. In the Select Components window, click **Client Files** → **Change**.
6. Select **API Client Runtime Files** and clear the check boxes for the other components.

   Tip: If you are upgrading the API, ensure that the installation directory that you specify is the same directory in which the existing API resides.

Related reference

"Client-system and server-system configuration work sheets" on page 16

Related information

Tivoli Storage Manager for Storage Area Networks support

Storage agent and client compatibility with Tivoli Storage Manager servers

Tivoli Storage Manager support

Installing the storage agent

The storage agent must be installed on a client system that has connections to storage resources on the SAN. To install the storage agent, you can use the GUI installation wizard, the console wizard, or the command line in silent mode.

Related tasks

"Configuring TSMSCSI.EXE for Windows Server 2003 and Windows Server 2008" on page 21

Related reference

"DSMSTA SETSTORAGESERVER command" on page 73

Installing the storage agent using the GUI installation wizard

You can use the GUI installation wizard to install the storage agent.

Before beginning this procedure:

- Verify that your system meets the hardware and software requirements.
- Be sure that you have the information recorded in the configuration-information work sheets.
- Close all active Tivoli Storage Manager products. Installation stops if an active Tivoli Storage Manager process is detected. If the installation stops, close all active Tivoli Storage Manager products and try installing the storage agent again.

Tip: To reduce workload and processing time and to optimize LAN-free performance, do not install the storage agent and the Tivoli Storage Manager server on the same system.

To install or upgrade the storage agent:

1. Access the installation files:
   - If you are installing the storage agent using the Tivoli Storage Manager DVD, log on as an administrator. Insert the Tivoli Storage Manager server DVD. Use Windows® Explorer to go to the DVD drive, double-click the DVD, and then double-click install.exe
   - If you downloaded the program from Passport Advantage as an executable file:
     a. Verify that you have enough space to store the installation files when they are extracted from the product package. For space requirements, see the Passport Advantage download document.

        Tip: In the next step, the files are extracted to the current directory. Ensure that the executable file is in the directory where you want the extracted files to be located.

     b. Change to the directory where you placed the executable file.

        Either double-click the executable file, or enter the following command on the command line to extract the installation files:

        ```
        package_name.exe
        ```

        The *package_name* is typically a name such as CZ1XWML.exe. The package is large, so the extraction can take some time.
2. Select a method to start the installation wizard:
   - To start the wizard and save your responses:
     – Enter the following command, and specify the -r option:

```
install.exe -r c:\response.rsp
```

- To start the wizard without saving your responses:
  - Double-click the install.exe file or enter the following command:

    ```
    install.exe
    ```

3. Select the language for your installation and follow the wizard directions, clicking **Next** to step through the wizard.

   Select the storage agent component. There is no default, so you must make a selection. Otherwise, you receive an error message and are returned to the components page.

   If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver.

At the end of the installation, a message is displayed on the summary page that the storage agent successfully installed and a summary is provided. If there were any errors during the installation, another summary page lists the errors and directs you to an error log file. Fix the errors before continuing. The installation log is stored in the following location:

The directory that was chosen for installation. Check the files log.txt and logs.zip.

The default installation directory is:

```
c:\program files\tivoli\tsm\storageagent
```

GSKit is automatically installed when you install the storage agent component. Message catalogs are included with the language packages.

After you install the storage agent and before you customize it for your use, go to the Tivoli Storage Manager support Web site: http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html. Click **Downloads** and apply any applicable fixes.

Related reference

"System requirements" on page 13

Related information

Tivoli Storage Manager for Storage Area Networks support

Passport Advantage download document

Installing the storage agent using the console installation wizard

You can use the console installation wizard to install the storage agent.

Before beginning this procedure:

- Verify that your system meets the hardware and software requirements.
- Be sure that you have the information recorded in the configuration-information work sheets.
- Close all active Tivoli Storage Manager products. Installation stops if an active Tivoli Storage Manager process is detected. If the installation stops, close all active Tivoli Storage Manager products and try installing the storage agent again.

Tip: To reduce workload and processing time and to optimize LAN-free performance, do not install the storage agent and the Tivoli Storage Manager server on the same system.

To install or upgrade the storage agent:

1. Access the installation files:
   - If you are installing the storage agent using the Tivoli Storage Manager DVD, log on as an administrator. Insert the Tivoli Storage Manager server DVD. Use Windows® Explorer to go to the DVD drive, double-click the DVD, and then double-click install.exe
   - If you downloaded the program from Passport Advantage as an executable file:
     a. Verify that you have enough space to store the installation files when they are extracted from the product package. For space requirements, see the Passport Advantage download document.

        Tip: In the next step, the files are extracted to the current directory. Ensure that the executable file is in the directory where you want the extracted files to be located.
     b. Change to the directory where you placed the executable file.

        Either double-click the executable file, or enter the following command on the command line to extract the installation files:

        ```
        package_name.exe
        ```

        The *package_name* is typically a name such as CZ1XWML.exe. The package is large, so the extraction can take some time.
2. Start the wizard:
   - To start the wizard and save your responses:
     – Enter the following command and specify the -r option:

       ```
       install.exe -i console -r c:\response.rsp
       ```
   - To start the wizard without saving your responses, enter the following command:
     – `install.exe -i console`
3. Select the language for your installation and follow the wizard directions, clicking **Next** to step through the wizard.

   Select the storage agent component. There is no default, so you must make a selection. Otherwise, you receive an error message and are returned to the components page.

   If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver.

At the end of the installation, a message is displayed on the summary page that the storage agent successfully installed and a summary is provided. If there were any errors during the installation, another summary page lists the errors and directs you to an error log file. Fix the errors before continuing. The installation log is stored in the following location:

The directory that was chosen for installation. Check the files log.txt and logs.zip.

The default installation directory is:

```
c:\program files\tivoli\tsm\storageagent
```

GSKit is automatically installed when you install the storage agent component. Message catalogs are included with the language packages.

After you install the storage agent and before you customize it for your use, go to the Tivoli Storage Manager support Web site: http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html. Click **Downloads** and apply any applicable fixes.

Related reference

"System requirements" on page 13

Related information

Tivoli Storage Manager for Storage Area Networks support

Passport Advantage download document

Installing the storage agent in silent mode

You can install the storage agent in silent mode.

Before beginning this procedure:

- Verify that your system meets the hardware and software requirements.
- Be sure that you have the information recorded in the configuration-information work sheets.
- Close all active Tivoli Storage Manager products. Installation stops if an active Tivoli Storage Manager process is detected. If the installation stops, close all active Tivoli Storage Manager products and try installing the storage agent again.

Tip: To reduce workload and processing time and to optimize LAN-free performance, do not install the storage agent and the Tivoli Storage Manager server on the same system.

To install or upgrade the storage agent:

1. Access the installation files:
   - If you are installing the storage agent using the Tivoli Storage Manager DVD, log on as an administrator. Insert the Tivoli Storage Manager server DVD. Use Windows® Explorer to go to the DVD drive, double-click the DVD, and then double-click install.exe
   - If you downloaded the program from Passport Advantage as an executable file:
     a. Verify that you have enough space to store the installation files when they are extracted from the product package. For space requirements, see the Passport Advantage download document.

        Tip: In the next step, the files are extracted to the current directory. Ensure that the executable file is in the directory where you want the extracted files to be located.

     b. Change to the directory where you placed the executable file.

        Either double-click the executable file, or enter the following command on the command line to extract the installation files:

        ```
        package_name.exe
        ```

        The *package_name* is typically a name such as CZ1XWML.exe. The package is large, so the extraction can take some time.
2. Choose one of the following methods:

Tip: To receive a return code from the silent installation, you can run it using a batch script.

- To start the silent installation and include the storage agent, server languages, licenses, and device driver, enter the following command on a single line:

```
install.exe -i silent
-DLICENSE_ACCEPTED=true
-DUSER_INSTALL_DIR=install_dir
-DINSTALL_STAGENT=1
-DINSTALL_SERVER_LANGUAGES=1
-DINSTALL_DEVICES=1
```

  Restrictions:

  – You must include LICENSE_ACCEPTED=true or the installation fails.

  Use the following variables to install the server language packages:

  – INSTALL_GERMAN
  – INSTALL_SPANISH
  – INSTALL_FRENCH
  – INSTALL_ITALIAN
  – INSTALL_BRPORTUGUESE
  – INSTALL_KOREAN
  – INSTALL_JAPANESE
  – INSTALL_RUSSIAN
  – INSTALL_SCHINESE
  – INSTALL_TCHINESE

  For example, to install the German language pack, enter the following command:

```
install.exe -i silent
-DLICENSE_ACCEPTED=true
-DUSER_INSTALL_DIR=install_dir
-DINSTALL_STAGENT=1
-DINSTALL_SERVER_LANGUAGES=1
-DINSTALL_GERMAN=1
-DINSTALL_LICENSE=1
```

- A response file contains variables that you selected during a prior installation, using the GUI or console wizard. To use an existing response file, enter the following command:

```
install.exe -i silent -DLICENSE_ACCEPTED=true -f response_file
```

  where the *response_file* is the full directory path to a file that you previously created in the Tivoli Storage Manager installation process.

  If you include LICENSE_ACCEPTED=true in the response file manually, enter the following command:

```
install.exe -i silent -f response_file
```

  You might see a difference between response files, depending on whether you used a GUI or console installation mode.

  Remember: If you previously installed a storage agent, select the same directory if you return to install a device driver. Check the path in this registry: `HKEY_LOCAL_MACHINE\SOFTWARE\IBM\ADSM\CurrentVersion`. If the value for *Path* is set, you must select that same path to install other components.

At the end of the installation, a message is displayed on the summary page that the storage agent successfully installed and a summary is provided. If there were any errors during the installation, another summary page lists the errors and directs you to an error log file. Fix the errors before continuing. The installation log is stored in the following location:

The directory that was chosen for installation. Check the files log.txt and logs.zip.

The default installation directory is:

```
c:\program files\tivoli\tsm\storageagent
```

GSKit is automatically installed when you install the storage agent component. Message catalogs are included with the language packages.

After you install the storage agent and before you customize it for your use, go to the Tivoli Storage Manager support Web site: http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html. Click **Downloads** and apply any applicable fixes.

Related reference

"System requirements" on page 13

Related information

Tivoli Storage Manager for Storage Area Networks support

Passport Advantage download document

Installing silently using a batch script:

To receive a return code from the silent installation, run it using a batch script.

To see the progress of the installation, create a batch script by completing the following steps:

1. Create a file and name it `install.bat`. The file name must end with .bat, not .bat.txt.
2. Choose an installation option, with or without a response file, and enter the command into the install.bat file. Save it. For example:

   ```
   install.exe -i silent -DLICENSE_ACCEPTED=true -f response_file
   ```

3. Open a command prompt to run the batch file. Issue this command:

   ```
   install.bat
   ```

4. After the installation is complete, issue the following command to retrieve the return code:

   ```
   echo %ERRORLEVEL%
   ```

If any errors occurred during the installation, a summary page lists the errors and directs you to an error log file. Fix the errors before continuing. The installation log is stored in the directory that was chosen for the installation. Check the files log.txt and logs.zip.

Using non-English locales

Translations for the IBM Tivoli Storage Manager server allow the storage agent to display messages in languages other than U.S. English. Translations also allow for the use of locale conventions for date, time, and number formatting.

Language options:

IBM Tivoli Storage Manager provides many language options that you can use to display storage agent messages.

You can use the following languages:

Table 14. Server languages for Windows

Language	LANGUAGE option value
Chinese, Simplified	chs
Chinese, Traditional	cht
English	ameng
French	fra
German	deu
Italian	ita
Japanese	jpn
Korean	kor
Portuguese, Brazilian	ptb
Russian	rus
Spanish	esp
Notes: Refer to the *Administrator's Reference* for further information on setting the LANGUAGE option.	

Tivoli Storage Manager Console language support

With the Microsoft Management Console (MMC) snap-in, you can manage Tivoli Storage Manager Windows and non-Windows resources across the network. To use the Tivoli Storage Manager Management Console with Windows 2003 or later, install the Version 1.2 or later MMC package. Tivoli Storage Manager includes only the American English version of the MMC package, which is installed automatically with the Tivoli Storage Manager server. To enable other language support for the Tivoli Storage Manager Console, you must install the appropriate language version of MMC.

Installing a language package:

If you install a language package, the IBM Tivoli Storage Manager storage agent displays messages in languages other than U.S. English. Installation packages are provided with Tivoli Storage Manager.

To enable support for a given locale, set the LANGUAGE option in the server options file to the name of the locale that you want to use. For example, to use the ita locale, set the LANGUAGE option to ita.

Related tasks

"Language options"

Configuring the storage agent

After the installation completes, you must configure the storage agent to ensure communication with the backup-archive client and the IBM Tivoli Storage Manager server.

To configure the storage agent:

1. Issue the DEFINE SERVER command on the Tivoli Storage Manager server to point the server to the storage agent.
2. Ensure that the DEVCONFIG option is specified in the storage agent options file `dsmsta.opt`:

   For example, for a device configuration file named `devconfig.out`, edit the `dsmsta.opt` file by typing the following line:

   ```
   DEVCONFIG devconfig.out
   ```

   The device configuration file can be located in:

   ```
   c:\program files\tivoli\tsm\storageagent
   ```
3. Use the information that you collected in the configuration-information work sheets to issue the DSMSTA SETSTORAGESERVER command. For example:

   ```
   dsmsta setstorageserver myname=storagnt mypassword=fun4me
   myhladdress=agent.example.com
   servername=tsmsrver serverpassword=not4u
   hladdress=tsmsrver.example.com lladdress=1502
   ```

   The HLADDRESS must match the TCPSERVERADDRESS located in the dsm.sys file on the Tivoli Storage Manager client. When configuring the storage agent using the DSMSTA SETSTORAGESERVER command, use addresses that correspond to the communications method used by the backup-archive client. With the backup-archive client, you can use either IPv4 (**COMMMETHOD TCPIP**) or IPv6 (**COMMMETHOD V6TCPIP**), but not both at the same time. The command DSMSTA SETSTORAGESERVER generates the following lines in the device configuration file for the storage agent:

   ```
   set staname storagnt
   set stapassword xxxxxxx
   set stahladdress agent.example.com
   define server tsmsrver serverpassword=xxxxxxxxxxx
    hladdress=tsmsrver.example.com lladdress=1502
   ```

   The passwords (shown as *xxxxxxxxxxx*) are encrypted in the file.

   The command also generates the following line in the dsmsta.opt file:

   ```
   SERVERNAME tsmsrver
   ```

Related reference

"Client-system and server-system configuration work sheets" on page 16

"The storage agent options file" on page 70

"DSMSTA SETSTORAGESERVER command" on page 73

"The device configuration file for the storage agent" on page 69

Related information

Tivoli Storage Manager for Storage Area Networks support

Storage agent and client compatibility with Tivoli Storage Manager servers

Tivoli Storage Manager support

Defining the storage agent and configuring devices on the server

To set up LAN-free communications on the Tivoli Storage Manager server, you must set up server-to-server communication, define storage agents to the server, configure SAN drives, set the LAN-free destination storage pool, and confirm node registration and configuration.

Before beginning this procedure, be sure that you have the information recorded in the configuration-information work sheets.

Note: The Tivoli Storage Manager server console (Microsoft Management Console) provides a snapin that contains a storage agent configuration wizard. This wizard performs all of the manual steps listed here and allows you to skip to "Setting the LAN-free destination" on page 38. For additional information, see the Tivoli Storage Manager server console online help.

Perform these tasks to define the storage agent and configure devices on the server:

1. "Setting up server-to-server communication"
2. "Defining storage agents to the Tivoli Storage Manager server" on page 36
3. "Configuring SAN drives" on page 36
4. "Setting the LAN-free destination" on page 38
5. "Confirming client node registration and configuration" on page 38

Related reference

"Obtaining system configuration information for clients and servers" on page 15

Setting up server-to-server communication

Server-to-server communication is required for Tivoli Storage Manager servers and storage agents to share library devices on a SAN.

To set up server-to-server communication, issue the following commands on the Tivoli Storage Manager server. Replace the example values with values from the configuration-information work sheet.

```
set servername tsmsrver
set serverpassword not4u
set serverhladdress tsmsrver.example.com
set serverlladdress 1502
```

These commands establish the server's name, password, TCP/IP address, and port.

Verify that the password has been set for the server by issuing the QUERY STATUS command from a Tivoli Storage Manager administrative command line. The value of the Server Password Set field in the command output must equal YES.

Defining storage agents to the Tivoli Storage Manager server

For each client that will use LAN-free data transfer, you must define the client's storage agent to the server as if the storage agent is another server.

To define the storage agent, issue the DEFINE SERVER command from the Tivoli Storage Manager server (library manager or library client) that will manage the client's data. Use the same name and password that you specified for the storage agent when you installed it on the client system.

```
define server storagnt serverpassword=fun4me
hladdress=agent.tucson.ibm.com lladdress=1500
```

If the library to be used for LAN-free data movement is a Tivoli Storage Manager shared library and the data manager server is a library client, then you must define the storage agent to the library manager as well as the library client. The storage agent needs to be able to contact the library manager directly when making mount requests. If the storage agent is only defined to the library client, it will attempt to use information from the library client to define itself to the library manager. If the storage agent is unable to define itself to the library manager, then you must define the storage agent manually using the DEFINE SERVER command issued from the library manager.

To verify that the storage agent is defined to the library manager, issue the following command from the library manager server:

```
query server server_name format=detailed
```

Important: If the library manager server is different than the library client server that hosts the storage agent, define the storage agent as a server on both the library manager server and the library client server.

Configuring SAN drives

Drive-configuration requirements vary depending on whether you are using tape devices or disk devices.

Configuring tape drives

Configuration requirements vary depending on whether you are connecting the storage agent to a library manager or to a library client.

- To connect the storage agent to a library manager:
  1. Define a shared ACSLS, SCSI, or 3494 library using the SHARED=YES option.
  2. Define paths to the library using the DEFINE PATH command on the server.
  3. Define drives that are associated with the library.
  4. Define paths to the drives using the DEFINE PATH command on the server.
  5. Define the device class.
  6. Define the storage pool.

  When using a shared ACSLS library, the library manager must be a Tivoli Storage Manager server on AIX, HP-UX, Linux, Solaris, or Windows.

  Running the DSMMAXSG utility increases the maximum transfer length for Host Bus Adapters (HBAs) and, consequently, the block size used by the Tivoli Storage Manager server for writing data to and getting data from certain types of tape drives. With this utility, the maximum supported block size is 256 KB. Depending on your system environment, the increase in block size could

improve the rate at which Tivoli Storage Manager processes data for backups and restores and for archives and retrieves. However, the utility does not affect the generation of backup sets.

The only supported tape drives are those that are attached to SCSI or Fibre Channel HBAs and that have the following device types:

- 3570
- 3590
- 3592
- 8MM_SAIT
- DLT
- DTF
- ECARTRIDGE
- LTO

Normally, the DSMMAXSG utility runs automatically as part of the Tivoli Storage Manager server and storage agent installation. However, if you install a new HBA on your system after server or storage agent installation or if you install a new version of an existing HBA device driver that resets the value of the maximum transfer size, you must run the utility manually in order to take advantage of the larger block size. To run the utility, enter the command:

```
dsmmaxsg
```

When you run this utility, it modifies one registry key for every HBA driver on your system. The name of the key is MaximumSGList.

Important: If data is backed up or archived to tape using the 256 KB block size, the tape cannot be appended to or read from using an HBA that does not support the 256 KB block size. For example, if you use a 256 KB Windows system for backing up client data to the Tivoli Storage Manager server, you cannot restore the data using a Windows system that supports a different transfer length. You need to install an HBA that supports 256 KB transfers.

- To connect the storage agent to a library client:
  1. On the library manager, complete step 1 on page 36 through step 5 on page 36.
  2. On the library client:
     a. Define a shared ACSLS, SCSI, or 3494 library using a library type of shared (LIBTYPE=SHARED).
     b. Define the device class.
     c. Define the storage pool.

Configuring disk drives

A FILE (sequential-access disk) device class is required for disk drives.

To configure disk drives:

1. Configure server-to-server communication.
2. Define a device class of DEVTYPE=FILE and SHARED=YES. Tivoli Storage Manager automatically defines a new FILE library and also defines drives corresponding to the mount limit for the FILE device class. The FILE library name is the same as the device class name. Each drive uses the library name with a numeric suffix. If the mount limit is changed, the number of drives also changes.

Each session gets exclusive access to a file volume. To optimize performance, match the mount limit to the number of volumes.

Setting the LAN-free destination

The destination for data must be a LAN-free capable storage pool

To set a LAN-free destination:

1. Define a copy group with its destination being the LAN-free capable storage pool that you created when you configured the SAN drives. For example:

   ```
   define copygroup sandirect sandirectpolicy sandirectdefmft
   type=backup destination=storage_pool_name
   ```

   Note: If you are using a hierarchical storage management (HSM) client configured for LAN-free data movement, set the management class (not the copy group) to a LAN-free capable storage pool.
2. Activate the policy set. For example:

   ```
   activate policyset sandirect sandirectpolicy
   ```

For details about changing policy for clients that can use SAN drives, see the *Administrator's Guide*. For details about commands, see the *Administrator's Reference*.

Remember: If you decide not to use the default management class for the SAN drives, you need to create a new management class. Clients that use SAN drives need an include statement to bind their files to the new management class. For details about the include-exclude list, see the *Backup-Archive Clients Installation and User's Guide*.

Confirming client node registration and configuration

Client nodes must be registered and configured for LAN-free backups.

To verify that node settings are correct, issue the following command:

```
query node node_name format=detailed
```

If node settings are not correct, issue the UPDATE NODE command to adjust the settings. If the node was not registered and configured for LAN-free backups, register the node with the REGISTER NODE command.

To improve performance of your LAN and SAN resources for LAN-free data movement, you can control the path that data transfers take for each LAN-free capable client. Use the REGISTER NODE and UPDATE NODE commands to specify whether data read/write operations use the LAN path only, the LAN-free path only, or either path.

If the node belongs to a multi-threaded client and there are drives available, the **MAXNUMMP** parameter might restrict the number of drives that are available for the storage agent to use on behalf of the client. Specify the **MAXNUMMP** parameter on the REGISTER NODE or UPDATE NODE command.

For more information about commands, see the *Administrator's Reference*.

Defining paths from the storage agent to drives

Paths allow a client, by means of a storage agent, access to the library drives that are available to the Tivoli Storage Manager server. Path-definition requirements depend on the type of device that you are using.

Remember: If your environment is using disk devices, verify that the storage agent has root authority access to the file system, configuration, and test-system access permissions.

The result of completing this step is shown in Figure 7.

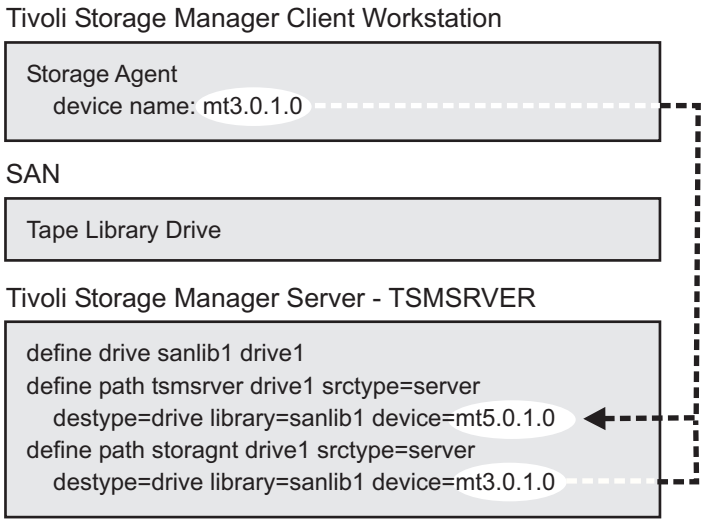


Figure 7. Device information

Before you begin defining paths to your SAN drives, consider the following guidelines:

- If you have not already done so, obtain the names of your tape or disk devices. If you are configuring tape devices, review the device names. The name of a tape device as known to the server will probably not match the name of the same tape device as known to the storage agent.
- You must define paths on the library manager from the storage agent to each drive that the storage agent will access. In addition, you must define a path from the library manager to each drive so that the storage agent can use the drive.

Related tasks

"Obtaining device information" on page 19

Defining paths for tape devices

You must define paths on the Tivoli Storage Manager server using the device names as identified by the storage agent on each client system.

To define paths, issue the DEFINE PATH command on the Tivoli Storage Manager server designated as the library manager. For example:

```
define path storagnt drive1 srctype=server desttype=drive
 library=sanlib1 device=mt3.0.1.0
```

Be sure that the device names are what the storage agent identifies on each client system. For the same tape device, the device name as known to the server will probably not match the device name as known to the storage agent. Failures can occur if incorrect device information is provided in the DEFINE PATH command. For details about this command, see the *Administrator's Reference*.
Depending on the operating system of the Tivoli Storage Manager server, there might not be a quick way to confirm which device names on the storage agent correspond to device names on the Tivoli Storage Manager server without using a trial-and-error method.
To confirm device names, work with one online drive at a time, and cycle through the storage agent device names until you can run a successful backup. The server cannot validate path information that is provided on the server for use by the storage agent.
When defining paths on the server, you can specify `AUTODETECT=YES` to automatically update the serial number for a drive or library in the database. The updated serial number is the same serial number that the drive reports to Tivoli Storage Manager. After completing a backup to verify LAN-free configuration, you can issue the QUERY DRIVE command to determine the device name from the storage agent.

For a review of the results of the steps that you have just completed, see:

Figure 7 on page 39

Related tasks

"Verifying the LAN-free configuration" on page 41

Defining paths for disk devices

You must define paths on the Tivoli Storage Manager server using the disk device names as seen by the storage agent on each client system.

For example, suppose the directory d:\tsmdata\server1 is available on SAN hardware. On the storage agent, the directory is accessed through SANergy as `\\192.168.1.10\tsmdata\server1`. Issue the DEFINE PATH command to create the path for this scenario.

In the following example, `disklib1` represents the destination file drive in the disk library named `disklib`:

```
define path storagnt disklib1 srctype=server desttype=drive library=disklib
device=file directory=\\192.168.1.10\d\tsmdata\server1\fs1,\\192.168.1.10\
tsmdata\server1
```

Recommendation: Make each directory correspond to a file system on a separate physical drive. The server cannot validate PATH information that is provided on the server for use by the storage agent. Failures can occur if incorrect device information is provided in the DEFINE PATH command.

If you specify multiple directories for the device class associated with the FILE library, you must specify the same number of directories for each path to the FILE library. To keep the device class and path synchronized, do not change or move existing directories on the server that the storage agent is using. Adding directories is permitted. Specifying a mismatched number of directories can cause a runtime failure. For more information, see the *Administrator's Guide*.

To help ensure that your configuration is valid for sharing the FILE library between the server and storage agent, use a universal naming convention (UNC) name. A UNC name lets you associate the directory with a particular physical drive. If the storage agent lacks permission to access remote storage, the storage agent will experience mount failures.

The account associated with the storage agent service must be either an account within the local administrator's group or an account within the domain administrator's group. If the account is in the local administrator's group, the user ID and password must match that of an account with permissions to access storage, as provided by the system that administers the remote share. For example, if a SAMBA server is providing access to remote storage, the user ID and password in the SAMBA configuration must match that of the local administrator user ID and password associated with the storage agent service.

In the following example, the DEFINE DEVCLASS command establishes the shared file system in the directory accessed by the server as `D:\FILEDIR\DIR1`. However, the storage agent uses UNC name `\\192.168.1.10\FILEDIR\DIR1`:

```
define devclass file devtype=file shared=yes mountlimit=1 directory=d:\filedir\dir1

define path sta1 file1 srctype=server desttype=drive library=file1
   device=file directory=\\192.168.1.10\d\filedir\dir1
```

The system with TCP/IP address 192.168.1.10 is sharing the same directory using FILEDIR as the shared name. Also, the storage agent service has an account that can access this storage. You can replace 192.168.1.10 with a symbolic name. For example: `example.yourcompany.com`.

For details about the DEFINE PATH command, see the *Administrator's Reference*.

Verifying the LAN-free configuration

To ensure LAN-free data movement, you must verify that the hardware and software components are configured correctly.

Before beginning this procedure, verify that the server is online and running.

To verify LAN-free configuration:

1. Start the storage agent:
   a. Restart the client system.
   b. Open the Tivoli Storage Manager Console and click the storage agent icon.
   c. Click the **Start** icon.

   When the storage agent starts, it contacts all available shared libraries, including those libraries that do not have a defined path. As a result, a delay might occur during startup processing. The storage agent also determines if the Tivoli Storage Manager server is a library client or library manager. If the server is a library client, the storage agent attempts to define itself to the library manager if it is not known to the library manager.

2. Specify the DISPLAYLFINFO=YES option in your server options file. Doing so allows the accounting records and summary table entries to report the storage agent name.

   Important: This option might cause existing outboard automation that relies on the summary table or accounting records to fail to recognize some activities for a given client. Before setting this option, consider how this outcome might affect your environment.
3. To determine which destinations for a node are capable of LAN-free data movement, issue the VALIDATE LANFREE command. The output of this command also provides explanations about destinations that are not LAN-free capable. Use this information to correct your configuration before proceeding to the next step.
4. Run a backup operation from the client.
5. If you receive a message indicating that the backup failed, verify the following:
   - The Tivoli Storage Manager server is running. If the Tivoli Storage Manager server is not running, the storage agent will not start.
   - The client, storage agent, and server are communicating with each other as expected.
   - The device driver on the storage agent is running.
   - The paths to the drives are correctly defined.
   - All drives in a library have defined paths from the server.

   If you retry the backup operation after the first failure, the client attempts to use the LAN connection for data movement. To force LAN-free data movement, stop and restart the client.

Verifying LAN-free data movement

Messages and backup reports can indicate whether LAN-free operations are successful. You can also use the QUERY SESSION and QUERY ACTLOG commands to verify LAN-free operations.

Use one or more of the following methods to determine whether the data movement was LAN-free:

- When data transfers on a LAN-free path, the following message displays informing you that the client is starting a session with the storage agent and that LAN-free data movement occurred:

  ANR0415I Session *session_number* proxied by *storage_agent_name* for node *your_node_name*
- View the backup report issued when backup processing completes. If LAN-free data movement occurred, the number of LAN-free bytes that are transferred is greater than zero.
- Verify that the proper sessions have been established and that LAN-free data movement is occurring:
  1. Using a Tivoli Storage Manager administrative command-line client, log in to the storage agent and the Tivoli Storage Manager server.
  2. Issue the QUERY SESSION command for the node that is running the LAN-free backup. In the command output, look for information about bytes sent and bytes received. If LAN-free data movement is occurring:
     – Querying a session on the storage agent shows bytes received for the node increasing to the total amount of data being backed up.

– Querying a session on the Tivoli Storage Manager server shows a very small number of bytes of metadata received for the same node.

If the node's session has these characteristics, the data movement is LAN-free.

Tip: During a failover when the storage agent is sending data directly to the server by proxy because it cannot store the data directly, the session statistics on the server show a much higher byte count.

- Issue either of the following QUERY ACTLOG commands on the server to which the client is connected:
  - `query actlog search=`*`storage_agent_name`* `msgno=8337`
  - `query actlog search=`*`storage_agent_name`*

  If the query locates entries in the activity log that relate to the storage agent, the client is using LAN-free data transfer.

Setting up LAN-free data movement using the Administration Center wizard

To set up LAN-free data movement on the server in tape-library and file-device-sharing environments, you can use the Enable LAN-free Data Movement wizard in the Administration Center.

1. Install or upgrade the client: “Installing and configuring the client” on page 24
2. *Only Data Protection application clients:* “Installing and configuring the API” on page 26
3. Specify the DEVCONFIG option in the storage agent options file and issue the DSMSTA SETSTORAGESERVER command to initialize the storage agent and to update the device configuration file and the storage agent options file. For details, see “Configuring the storage agent” on page 34.
4. “Verifying the LAN-free configuration” on page 41
5. “Verifying LAN-free data movement” on page 42

Chapter 4. Installing and configuring external-library environments

An external library is controlled by software acquired from another vendor, such as Sun StorageTek ACSLS software. To use the drives in the external library, the Tivoli Storage Manager server (storage agent) acts as a client application to the software.

Before beginning this procedure:

- Make sure that you understand the overall installation and configuration process because it takes place on different systems at different times.
- Be sure that you have the information recorded in the configuration-information work sheets.
- Obtain an external library manager capable of exploiting the external library interface, for example, IBM Enterprise Removable Media Manager (eRMM). For details about interfaces, see the *Administrator's Guide*.
- You can use the Sun StorageTek LibraryStation to manage the environment instead of ACSLS.

  Restriction: If you plan to use ACSLS, a Tivoli Storage Manager server defined as a library manager requires installation of the latest version of Sun StorageTek Library Attach software.

The major installation and configuration steps are:

1. "Establishing network connections"
2. "Installing and configuring software on client systems" on page 46
3. "Defining the storage agent and configuring devices on the server" on page 57
4. "Verifying the LAN-free configuration" on page 60
5. "Verifying LAN-free data movement" on page 61

Related concepts

"External Libraries" on page 11

Related reference

"Obtaining system configuration information for clients and servers" on page 15

Establishing network connections

Tivoli Storage Manager for Storage Area Networks requires specific levels and models of hardware and software. You must ensure that your system meets these requirements.

To establish network connections, attach the server system and the client systems to the LAN and to the SAN along with appropriate storage devices. For details levels and models of hardware and software, see http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html.

© Copyright IBM Corp. 2000, 2010

Installing and configuring software on client systems

You install storage agents and backup-archive or IBM Tivoli Storage Manager Data Protection clients on client systems. If you install a Data Protection application client, you must also install the Tivoli Storage Manager API.

Complete the following tasks to install and configure the software:

1. "Installing and configuring the client"
2. *Only Data Protection application clients:* "Installing and configuring the API" on page 48
3. "Installing the storage agent" on page 49
4. "Configuring the storage agent" on page 56

Related concepts

"Communications between the client, storage agent, and Tivoli Storage Manager server" on page 4

Related tasks

"Verifying and updating client node information" on page 21

Installing and configuring the client

The client can be an IBM Tivoli Storage Manager backup-archive client or a Tivoli Storage Manager Data Protection application client.

Before beginning this procedure:

- Verify that the client system meets the prerequisites for client software. To ensure software compatibility, check the Web site for Tivoli Storage Manager storage agent and backup-archive client compatibility. You can download the latest software levels from the Tivoli Storage Manager product support Web site.

  For details about installing a backup-archive client, see the *Backup-Archive Clients Installation and User's Guide*. For details about installing a Data Protection application client, see the *Data Protection Installation and User's Guides*.
- Be sure that you have the information recorded in the configuration-information work sheets.
- Ensure that client nodes are registered and configured on the server. To register client nodes, use the REGISTER NODE or UPDATE NODE command.

Remember: If multiple clients are using LAN-free data movement, install or upgrade the client software on each client system.

To install and configure the client, complete the following steps:

1. Install or upgrade the backup-archive client software or Data Protection application-client software.
2. Using the information that you collected in the configuration-information work sheets, modify the following file:

   `dsm.opt` client options file

   Tip: The file can be located in one of several places, such as the installation directory, or in a location pointed to by an environment variable.

   Specify the communication method to be used between the client and server.

Table 15. Communications methods

To use this communication method...	Install this software...	To connect to these Tivoli Storage Manager servers...
TCP/IP	TCP/IP (Standard with supported platforms)	AIX, HP-UX, Linux x86_64, Linux on System Z, Linux on POWER, Solaris, Windows Server 2003, Windows Server 2003 R2, Windows Server 2008, Windows Server 2008 R2
Shared memory	TCP/IP (Standard with supported platforms)	Windows Server 2003, Window Server 2003 R2, Windows Server 2008, Windows Server 2008 R2
Named pipes	Named Pipes (Standard with supported Windows platforms)	Windows Server 2003, Windows Server 2003 R2, Windows Server 2008, Windows Server 2008 R2

For example:

```
commmethod tcpip
tcpserveraddress tsmsrver.example.com
tcpport 1502
```

The example uses a TCPPORT of 1502. However, the default TCPPORT is 1500.

Keep the file open for the next step.

3. Add the following options to the same stanza in the same file that you edited in step 2 on page 46. These options specify that the client uses SAN-attached devices, when the path is available, during backup, restore, archive, and retrieve processing.

```
enablelanfree yes
lanfreecommmethod tcpip
lanfreetcpserveraddress agent.example.com
lanfreetcpport 1500
```

or

```
enablelanfree yes
lanfreecommmethod SharedMem
lanfreeshmport 1510
```

or

```
lanfreecommmethod namedpipes
lanfreeport \\hostname\\pipename
```

If you installed a Data Protection application client, you must install and configure the API.

Related concepts

"Communications between the client, storage agent, and Tivoli Storage Manager server" on page 4

Related tasks

"Verifying and updating client node information" on page 21

Related reference

"Client-system and server-system configuration work sheets" on page 16

Related information

Tivoli Storage Manager for Storage Area Networks support

Storage agent and client compatibility with Tivoli Storage Manager servers

Tivoli Storage Manager support

Installing and configuring the API

If you are using an IBM Tivoli Storage Manager Data Protection application client, you must install and configure the Tivoli Storage Manager API.

Before beginning this procedure, verify that the client system meets the prerequisites for the application programming interface (API) software. You can download the latest software levels from the Tivoli Storage Manager product support Web site.

For details about installing the API software, see the *Backup-Archive Clients Installation and User's Guide*.

Remember: If multiple Data Protection application clients are using LAN-free data movement, configure the API on each client system.

Complete the following steps:

1. Install the API.
2. Download the latest Tivoli Storage Manager Windows backup-archive client and the associated `bat` file from the product support Web site.
3. Run the `bat` file to extract the files, and follow the directions to begin the installation procedure.
4. In the Setup Type window, click **Custom**.
5. In the Select Components window, click **Client Files** → **Change**.
6. Select **API Client Runtime Files** and clear the check boxes for the other components.

   Tip: If you are upgrading the API, ensure that the installation directory that you specify is the same directory in which the existing API resides.

Related reference

"Client-system and server-system configuration work sheets" on page 16

Related information

Tivoli Storage Manager for Storage Area Networks support

Storage agent and client compatibility with Tivoli Storage Manager servers

Tivoli Storage Manager support

Installing the storage agent

The storage agent must be installed on a client system that has connections to storage resources on the SAN. To install the storage agent, you can use the GUI installation wizard, the console wizard, or the command line in silent mode.

Related reference

"DSMSTA SETSTORAGESERVER command" on page 73

Installing the storage agent using the GUI installation wizard

You can use the GUI installation wizard to install the storage agent.

Before beginning this procedure:

- Verify that your system meets the hardware and software requirements.
- Be sure that you have the information recorded in the configuration-information work sheets.
- Close all active Tivoli Storage Manager products. Installation stops if an active Tivoli Storage Manager process is detected. If the installation stops, close all active Tivoli Storage Manager products and try installing the storage agent again.

Tip: To reduce workload and processing time and to optimize LAN-free performance, do not install the storage agent and the Tivoli Storage Manager server on the same system.

To install or upgrade the storage agent:

1. Access the installation files:
   - If you are installing the storage agent using the Tivoli Storage Manager DVD, log on as an administrator. Insert the Tivoli Storage Manager server DVD. Use Windows® Explorer to go to the DVD drive, double-click the DVD, and then double-click install.exe
   - If you downloaded the program from Passport Advantage as an executable file:
     a. Verify that you have enough space to store the installation files when they are extracted from the product package. For space requirements, see the Passport Advantage download document.

        Tip: In the next step, the files are extracted to the current directory. Ensure that the executable file is in the directory where you want the extracted files to be located.

     b. Change to the directory where you placed the executable file.

        Either double-click the executable file, or enter the following command on the command line to extract the installation files:

        ```
        package_name.exe
        ```

        The *package_name* is typically a name such as CZ1XWML.exe. The package is large, so the extraction can take some time.
2. Select a method to start the installation wizard:
   - To start the wizard and save your responses:
     – Enter the following command, and specify the -r option:

       ```
       install.exe -r c:\response.rsp
       ```
   - To start the wizard without saving your responses:
     – Double-click the install.exe file or enter the following command:

```
install.exe
```

3. Select the language for your installation and follow the wizard directions, clicking **Next** to step through the wizard.

   Select the storage agent component. There is no default, so you must make a selection. Otherwise, you receive an error message and are returned to the components page.

   If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver.

At the end of the installation, a message is displayed on the summary page that the storage agent successfully installed and a summary is provided. If there were any errors during the installation, another summary page lists the errors and directs you to an error log file. Fix the errors before continuing. The installation log is stored in the following location:

The directory that was chosen for installation. Check the files log.txt and logs.zip.

The default installation directory is:

```
c:\program files\tivoli\tsm\storageagent
```

GSKit is automatically installed when you install the storage agent component. Message catalogs are included with the language packages.

After you install the storage agent and before you customize it for your use, go to the Tivoli Storage Manager support Web site: http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html. Click **Downloads** and apply any applicable fixes.

Related reference

"System requirements" on page 13

Related information

Tivoli Storage Manager for Storage Area Networks support

Passport Advantage download document

Installing the storage agent using the console installation wizard

You can use the console installation wizard to install the storage agent.

Before beginning this procedure:

- Verify that your system meets the hardware and software requirements.
- Be sure that you have the information recorded in the configuration-information work sheets.
- Close all active Tivoli Storage Manager products. Installation stops if an active Tivoli Storage Manager process is detected. If the installation stops, close all active Tivoli Storage Manager products and try installing the storage agent again.

Tip: To reduce workload and processing time and to optimize LAN-free performance, do not install the storage agent and the Tivoli Storage Manager server on the same system.

To install or upgrade the storage agent:

1. Access the installation files:

- If you are installing the storage agent using the Tivoli Storage Manager DVD, log on as an administrator. Insert the Tivoli Storage Manager server DVD. Use Windows® Explorer to go to the DVD drive, double-click the DVD, and then double-click install.exe
- If you downloaded the program from Passport Advantage as an executable file:
  a. Verify that you have enough space to store the installation files when they are extracted from the product package. For space requirements, see the Passport Advantage download document.

     Tip: In the next step, the files are extracted to the current directory. Ensure that the executable file is in the directory where you want the extracted files to be located.
  b. Change to the directory where you placed the executable file.

     Either double-click the executable file, or enter the following command on the command line to extract the installation files:

     ```
     package_name.exe
     ```

     The *package_name* is typically a name such as CZ1XWML.exe. The package is large, so the extraction can take some time.

2. Start the wizard:
   - To start the wizard and save your responses:
     – Enter the following command and specify the -r option:

       ```
       install.exe -i console -r c:\response.rsp
       ```
   - To start the wizard without saving your responses, enter the following command:
     – `install.exe -i console`
3. Select the language for your installation and follow the wizard directions, clicking **Next** to step through the wizard.

   Select the storage agent component. There is no default, so you must make a selection. Otherwise, you receive an error message and are returned to the components page.

   If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver.

At the end of the installation, a message is displayed on the summary page that the storage agent successfully installed and a summary is provided. If there were any errors during the installation, another summary page lists the errors and directs you to an error log file. Fix the errors before continuing. The installation log is stored in the following location:

The directory that was chosen for installation. Check the files log.txt and logs.zip.

The default installation directory is:

```
c:\program files\tivoli\tsm\storageagent
```

GSKit is automatically installed when you install the storage agent component. Message catalogs are included with the language packages.

After you install the storage agent and before you customize it for your use, go to the Tivoli Storage Manager support Web site: http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html. Click **Downloads** and apply any applicable fixes.

Related reference

"System requirements" on page 13

Related information

Tivoli Storage Manager for Storage Area Networks support

Passport Advantage download document

Installing the storage agent in silent mode

You can install the storage agent in silent mode.

Before beginning this procedure:

- Verify that your system meets the hardware and software requirements.
- Be sure that you have the information recorded in the configuration-information work sheets.
- Close all active Tivoli Storage Manager products. Installation stops if an active Tivoli Storage Manager process is detected. If the installation stops, close all active Tivoli Storage Manager products and try installing the storage agent again.

Tip: To reduce workload and processing time and to optimize LAN-free performance, do not install the storage agent and the Tivoli Storage Manager server on the same system.

To install or upgrade the storage agent:

1. Access the installation files:
   - If you are installing the storage agent using the Tivoli Storage Manager DVD, log on as an administrator. Insert the Tivoli Storage Manager server DVD. Use Windows® Explorer to go to the DVD drive, double-click the DVD, and then double-click install.exe
   - If you downloaded the program from Passport Advantage as an executable file:
     a. Verify that you have enough space to store the installation files when they are extracted from the product package. For space requirements, see the Passport Advantage download document.

        Tip: In the next step, the files are extracted to the current directory. Ensure that the executable file is in the directory where you want the extracted files to be located.

     b. Change to the directory where you placed the executable file.

        Either double-click the executable file, or enter the following command on the command line to extract the installation files:

        ```
        package_name.exe
        ```

        The *package_name* is typically a name such as CZ1XWML.exe. The package is large, so the extraction can take some time.
2. Choose one of the following methods:

Tip: To receive a return code from the silent installation, you can run it using a batch script.

- To start the silent installation and include the storage agent, server languages, licenses, and device driver, enter the following command on a single line:

```
install.exe -i silent
-DLICENSE_ACCEPTED=true
-DUSER_INSTALL_DIR=install_dir
-DINSTALL_STAGENT=1
-DINSTALL_SERVER_LANGUAGES=1
-DINSTALL_DEVICES=1
```

  Restrictions:

  – You must include LICENSE_ACCEPTED=true or the installation fails.

  Use the following variables to install the server language packages:

  – INSTALL_GERMAN
  – INSTALL_SPANISH
  – INSTALL_FRENCH
  – INSTALL_ITALIAN
  – INSTALL_BRPORTUGUESE
  – INSTALL_KOREAN
  – INSTALL_JAPANESE
  – INSTALL_RUSSIAN
  – INSTALL_SCHINESE
  – INSTALL_TCHINESE

  For example, to install the German language pack, enter the following command:

```
install.exe -i silent
-DLICENSE_ACCEPTED=true
-DUSER_INSTALL_DIR=install_dir
-DINSTALL_STAGENT=1
-DINSTALL_SERVER_LANGUAGES=1
-DINSTALL_GERMAN=1
-DINSTALL_LICENSE=1
```

- A response file contains variables that you selected during a prior installation, using the GUI or console wizard. To use an existing response file, enter the following command:

```
install.exe -i silent -DLICENSE_ACCEPTED=true -f response_file
```

  where the *response_file* is the full directory path to a file that you previously created in the Tivoli Storage Manager installation process.

  If you include LICENSE_ACCEPTED=true in the response file manually, enter the following command:

```
install.exe -i silent -f response_file
```

  You might see a difference between response files, depending on whether you used a GUI or console installation mode.

  Remember: If you previously installed a storage agent, select the same directory if you return to install a device driver. Check the path in this registry: `HKEY_LOCAL_MACHINE\SOFTWARE\IBM\ADSM\CurrentVersion`. If the value for *Path* is set, you must select that same path to install other components.

At the end of the installation, a message is displayed on the summary page that the storage agent successfully installed and a summary is provided. If there were any errors during the installation, another summary page lists the errors and directs you to an error log file. Fix the errors before continuing. The installation log is stored in the following location:

The directory that was chosen for installation. Check the files log.txt and logs.zip.

The default installation directory is:

```
c:\program files\tivoli\tsm\storageagent
```

GSKit is automatically installed when you install the storage agent component. Message catalogs are included with the language packages.

After you install the storage agent and before you customize it for your use, go to the Tivoli Storage Manager support Web site: http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html. Click **Downloads** and apply any applicable fixes.

Related reference

"System requirements" on page 13

Related information

Tivoli Storage Manager for Storage Area Networks support

Passport Advantage download document

Installing silently using a batch script:

To receive a return code from the silent installation, run it using a batch script.

To see the progress of the installation, create a batch script by completing the following steps:

1. Create a file and name it `install.bat`. The file name must end with .bat, not .bat.txt.
2. Choose an installation option, with or without a response file, and enter the command into the install.bat file. Save it. For example:

   ```
   install.exe -i silent -DLICENSE_ACCEPTED=true -f response_file
   ```

3. Open a command prompt to run the batch file. Issue this command:

   ```
   install.bat
   ```

4. After the installation is complete, issue the following command to retrieve the return code:

   ```
   echo %ERRORLEVEL%
   ```

If any errors occurred during the installation, a summary page lists the errors and directs you to an error log file. Fix the errors before continuing. The installation log is stored in the directory that was chosen for the installation. Check the files log.txt and logs.zip.

Using non-English locales

Translations for the IBM Tivoli Storage Manager server allow the storage agent to display messages in languages other than U.S. English. Translations also allow for the use of locale conventions for date, time, and number formatting.

Language options:

IBM Tivoli Storage Manager provides many language options that you can use to display storage agent messages.

You can use the following languages:

Table 16. Server languages for Windows

Language	LANGUAGE option value
Chinese, Simplified	chs
Chinese, Traditional	cht
English	ameng
French	fra
German	deu
Italian	ita
Japanese	jpn
Korean	kor
Portuguese, Brazilian	ptb
Russian	rus
Spanish	esp
Notes: Refer to the *Administrator's Reference* for further information on setting the LANGUAGE option.	

Tivoli Storage Manager Console language support

With the Microsoft Management Console (MMC) snap-in, you can manage Tivoli Storage Manager Windows and non-Windows resources across the network. To use the Tivoli Storage Manager Management Console with Windows 2003 or later, install the Version 1.2 or later MMC package. Tivoli Storage Manager includes only the American English version of the MMC package, which is installed automatically with the Tivoli Storage Manager server. To enable other language support for the Tivoli Storage Manager Console, you must install the appropriate language version of MMC.

Installing a language package:

If you install a language package, the IBM Tivoli Storage Manager storage agent displays messages in languages other than U.S. English. Installation packages are provided with Tivoli Storage Manager.

To enable support for a given locale, set the LANGUAGE option in the server options file to the name of the locale that you want to use. For example, to use the ita locale, set the LANGUAGE option to ita.

Related tasks

"Language options"

Configuring the storage agent

After the installation completes, you must configure the storage agent to ensure communication with the backup-archive client and the IBM Tivoli Storage Manager server.

To configure the storage agent:

1. Issue the DEFINE SERVER command on the Tivoli Storage Manager server to point the server to the storage agent.
2. Ensure that the DEVCONFIG option is specified in the storage agent options file `dsmsta.opt`:

   For example, for a device configuration file named `devconfig.out`, edit the `dsmsta.opt` file by typing the following line:

   ```
   DEVCONFIG devconfig.out
   ```

   The device configuration file can be located in:

   ```
   c:\program files\tivoli\tsm\storageagent
   ```
3. Use the information that you collected in the configuration-information work sheets to issue the DSMSTA SETSTORAGESERVER command. For example:

   ```
   dsmsta setstorageserver myname=storagnt mypassword=fun4me
   myhladdress=agent.example.com
   servername=tsmsrver serverpassword=not4u
   hladdress=tsmsrver.example.com lladdress=1502
   ```

   The HLADDRESS must match the TCPSERVERADDRESS located in the dsm.sys file on the Tivoli Storage Manager client. When configuring the storage agent using the DSMSTA SETSTORAGESERVER command, use addresses that correspond to the communications method used by the backup-archive client. With the backup-archive client, you can use either IPv4 (**COMMMETHOD TCPIP**) or IPv6 (**COMMMETHOD V6TCPIP**), but not both at the same time. The command DSMSTA SETSTORAGESERVER generates the following lines in the device configuration file for the storage agent:

   ```
   set staname storagnt
   set stapassword xxxxxxx
   set stahladdress agent.example.com
   define server tsmsrver serverpassword=xxxxxxxxxxx
    hladdress=tsmsrver.example.com lladdress=1502
   ```

   The passwords (shown as *xxxxxxxxxxx*) are encrypted in the file.

   The command also generates the following line in the dsmsta.opt file:

   ```
   SERVERNAME tsmsrver
   ```

Related reference

"Client-system and server-system configuration work sheets" on page 16
"The storage agent options file" on page 70
"DSMSTA SETSTORAGESERVER command" on page 73
"The device configuration file for the storage agent" on page 69

Related information

Tivoli Storage Manager for Storage Area Networks support

Storage agent and client compatibility with Tivoli Storage Manager servers

Tivoli Storage Manager support

Defining the storage agent and configuring devices on the server

To set up LAN-free communications on the Tivoli Storage Manager server, you need to set up server-to-server communication, define the client's storage agent to the server, and configure the paths to the library.

Before beginning this procedure, be sure that you have the information recorded in the configuration-information work sheets.

Perform these tasks to define the storage agent and configure devices on the server:

1. "Setting up server-to-server communication"
2. "Installing an external media manager"
3. "Defining storage agents to the Tivoli Storage Manager server" on page 58
4. "Configuring a path to the library manager" on page 58
5. "Defining paths for ACSLS" on page 59
6. "Setting the LAN-free destination" on page 59
7. "Confirming client node registration and configuration" on page 60

Setting up server-to-server communication

Server-to-server communication is required for Tivoli Storage Manager servers and storage agents to share library devices on a SAN

To set up server-to-server communication, issue the following commands on the Tivoli Storage Manager server. Replace the values in the example with values from the configuration-information work sheet.

```
set servername tsmsrver
set serverpassword not4u
set serverhladdress tsmsrver.example.com
set serverlladdress 1502
set crossdefine on
```

These commands establish the server's name, password, TCP/IP address, and port. They also allow other servers to define a connection on this server.

Verify that the password has been set for the server by issuing the QUERY STATUS command from a Tivoli Storage Manager administrative command line. The value of the Server Password Set field in the command output must be YES.

For details about server-to-server communication, see the *Administrator's Guide*.

Installing an external media manager

If you are using an ACSLS-managed external library, install middleware (for example, IBM Enterprise Removable Media Manager) that enables an external library. For installation information, see the product's documentation.

Defining storage agents to the Tivoli Storage Manager server

For each client the will use LAN-free data transfer, define a storage agent to the server as if the storage agent is another server.

To define the storage agent, issue the DEFINE SERVER command from the Tivoli Storage Manager server that will manage the client's data. Use the same name and password that you specified for the storage agent when you installed it on the client system, for example,

```
define server storagnt serverpassword=fun4me
   hladdress=agent.tucson.ibm.com lladdress=1500 validateprotocol=all
```

The **VALIDATEPROTOCOL** parameter in the example is optional. This parameter specifies whether a cyclic redundancy check will be performed to validate data on all metadata transferred between the storage agent and the Tivoli Storage Manager server.
For details about data validation, see the *Administrator's Guide*. For details about the DEFINE SERVER command, see the *Administrator's Reference*.

You must also define the storage agent to the library manager. The storage agent needs to be able to contact the library manager directly when making mount requests. If the storage agent is only defined to the library client, it will attempt to use information from the client to define itself to the library manager. If the storage agent is unable to define itself to the library manager, then you must define the storage agent manually using the DEFINE SERVER command issued from the library manager, for example,

```
define server storagnt serverpassword=fun4me
   hladdress=agent.tucson.ibm.com lladdress=1500
```

Configuring a path to the library manager

Configure a path to the library manager.

The procedure for configuring a path to the library manager depends on whether you are using a shared ACSLS library manager or an ACSLS-managed external library.

- If you are using a shared ACSLS library manager, configure a path to the library manager:
  1. Define a library type of ACSLS. For example:
     ```
     define library libmgr1 libtype=ACSLS shared=YES
     primarymanager=tsmsrvr
     ```
  2. Define a path from the server to the library manager. For example:
     ```
     define path tsmsrver libmgr1 srctype=server desttype=library
     ```
  3. Define a device class with a device type of SERVER. For example:
     ```
     define devclass device_class_name library=libmgr1
      devtype=server servername=tsmsrvr
     ```
  4. Define the storage pool. For example:
     ```
     define stgpool pool_name device_class_name pooltype=primary
     ```
- If you are using an ACSLS-managed external library, configure a path to the external library manager.
  1. Define a library type of EXTERNAL. For example:
     ```
     define library stk-lib libtype=external
     ```

If a library name remains constant but the library type changes from EXTERNAL to shared ACSLS, stop and restart the storage agent to register this change.

2. Define a path from the server to the external media manager. For example:

```
define path tsmsrver stk-lib srctype=server desttype=library
 externalmanager=path_name
```

   In the example, the path provided for the external manager depends on the operating system on which Tivoli Storage Manager server runs.

3. Define a device class with a device type of ECARTRIDGE. For example:

```
define devclass device_class_name library=library_name
 devtype=ecartridge format=drive
```

4. Define the storage pool. For example:

```
define stgpool pool_name device_class_name pooltype=primary
```

Defining paths for ACSLS

If you are using a shared ACSLS library manager, you must define a path from the storage agent to the library manager. If you are using an ACSLS-managed external library, you must define a path from the storage agent to the external manager.

- To define a path for a shared ACSLS library manager, use the DEFINE PATH command. For example:

```
define path storagnt libmgr1 srctype=server desttype=library
```

- To define a path for an ACSLS-managed external library, use the DEFINE PATH command and define a path to the external media manager. For example:

```
define path storagnt stk-lib srctype=server desttype=library
  externalmediamanager=path_name
```

For details about the DEFINE PATH command, see the *Administrator's Reference*.

Setting the LAN-free destination

The destination for data must be a LAN-free capable storage pool.

To set a LAN-free destination:

1. Define a copy group with its destination being the LAN-free capable storage pool (You created this storage pool as part of the procedure of configuring a path to the library manager.) For example,

```
define copygroup sandirect sandirectpolicy sandirectdefmft
   type=backup destination=storage_pool_name
```

2. Activate the policy set, for example,

```
activate policyset sandirect sandirectpolicy
```

For details about changing policy for clients that can use SAN drives, see the *Administrator's Guide*. For details about the commands, see the *Administrator's Reference*.

Remember:

- If you decide not to use the default management class for the SAN drives, create a new management class. Clients that use the SAN drives need an include statement to bind their files to this new management class.

  For details about the include-exclude list, see the *Backup-Archive Clients Installation and User's Guide*.

- With a hierarchical storage management (HSM) client configured for LAN-free data movement, the management class (not the copy group) is set to a LAN-free capable storage pool.

Related tasks

"Configuring a path to the library manager" on page 58

Confirming client node registration and configuration

Client nodes must be registered and configured for LAN-free backups.

To verify that node settings are correct, issue the following command:

```
query node node_name format=detailed
```

If node settings are not correct, issue the UPDATE NODE command to adjust settings for the node. If the node has not been registered and configured for LAN-free backups, register the node with the REGISTER NODE command.

To help tune the use of your LAN and SAN resources for LAN-free data movement, you can control the path that data transfers take for clients that have LAN-free data movement capability. For each client, you can select whether data read/write operations use the LAN path, the LAN-free path, or either path. You can specify these settings with the REGISTER NODE and UPDATE NODE commands.

If the node belongs to a multi-threaded client and there are drives available, the MAXNUMMP parameter might restrict the number of drives that are available for the storage agent to use on behalf of the client. Specify the MAXNUMMP parameter on the REGISTER NODE or UPDATE NODE command.

For details about commands, see the *Administrator's Reference*.

Verifying the LAN-free configuration

To ensure LAN-free data movement, you must verify that the hardware and software components are configured correctly.

Verifying the LAN-free configuration

Before beginning this procedure, ensure that the correct device driver is installed if you using non-IBM devices and if you are running Tivoli Storage Manager on Windows Server 2003, Windows Server 2003 R2, Windows Server 2008, or Windows Server 2008 R2:

	32–bit	64–bit
Windows Server 2003 and Windows Server 2003 R2	TSMSCSI.SYS	TSMSCSI.SYS64
Windows Server 2008 and Windows Server 2008 R2	TSMSCSI.SYS	TSMSCSI.SYS64

To verify the LAN-free configuration:

1. Start the storage agent:
   a. Restart the client system.
   b. Open the Tivoli Storage Manager Console and click the storage agent icon.

c. Click the **Start** icon.

2. Run a backup operation from the client.
3. Log in to the Tivoli Storage Manager server and storage agent using a Tivoli Storage Manager administrative command-line client.
4. To verify that the backup is LAN-free and the proper sessions have been established, issue the QUERY SESSION command. In the command output, look for information about bytes sent and bytes received. If LAN-free data movement is occurring:
   - Querying a session on the storage agent shows bytes received for the node increasing to the total amount of data being backed up.
   - Querying a session on the Tivoli Storage Manager server shows a very small number of bytes (metadata) received for the same node.

   If the node's session has these characteristics, and you receive a message stating that the backup was successful, you configured your system correctly.

   There are several ways to use the QUERY SESSION command. If the process is running in the foreground, you can issue the command on the storage agent console. Alternatively, you can use a command-line client to connect to the storage agent on the administration port of the storage agent. Use the same administrator ID and password for this command as you use on the server.
5. If you receive a message saying that the backup has failed, ensure that the following conditions exist:
   - The Tivoli Storage Manager server is running. If the Tivoli Storage Manager server is not running, the storage agent will not start.
   - The client, storage agent, and server are communicating with each other as expected.
   - The device driver on the storage agent is running.
   - The mount and message is displayed on the storage agent console.

   If you retry the backup operation after the first failure, the client attempts to use the LAN connection for data movement. To force LAN-free data movement, stop and restart the client.

Verifying LAN-free data movement

Messages and backup reports can indicate whether LAN-free operations are successful. You can also use the QUERY SESSION and QUERY ACTLOG commands to verify LAN-free operations.

Determining whether the data movement was LAN-free

Messages and backup reports can indicate whether LAN-free operations are successful. You can also use the QUERY SESSION and QUERY ACTLOG commands to verify LAN-free operations.

To determine whether data movement is LAN-free, use one or both of the following methods:

- Monitor the QUERY SESSION output against the node that is running the LAN-free backup. Verify that the proper sessions have been established:
  1. Log in to the Tivoli Storage Manager server and storage agent using a Tivoli Storage Manager administrative command-line client.

2. To verify that the backup is LAN-free and the proper sessions have been established, issue the QUERY SESSION command. In the command output, look for information about bytes sent and bytes received. If LAN-free data movement is occurring:
   - Querying a session on the storage agent shows bytes received for the node increasing to the total amount of data being backed up.
   - Querying a session on the Tivoli Storage Manager server shows a very small number of bytes (metadata) received for the same node.

   If the node's session shows these characteristics, the data movement is LAN-free.

   Remember: During a failover where the storage agent is sending data directly to the server by proxy because it cannot store the data directly, the QUERY SESSION statistics on the server show a much higher byte count.

- Issue either of the following QUERY ACTLOG commands on the server to which the client is connected:

  ```
  query actlog search=storage_agent_name msgno=8337
  query actlog search=storage_agent_name
  ```

  If the query locates entries in the activity log that relate to the storage agent, the client is using LAN-free data transfer.

Appendix A. Starting and stopping the storage agent

You can configure the storage agent to start automatically when the system restarts. You can also start and stop the storage agent manually.

Automating the storage agent startup

The storage agent configuration wizard lets you run the storage agent in background mode as a Windows service.

You can choose a logon account for the Tivoli Storage Manager storage agent service and specify whether the service starts manually or automatically. If you specify automatic start up, Windows starts the storage agent each time the system is rebooted.

To access the storage agent configuration wizard, use the Tivoli Storage Manager Console.

Manually starting and stopping the storage agent

You can start and stop the storage agent from the storage agent directory. You can also use an administrative client to issue commands supported by the storage agent.

To start the storage agent:

1. Restart the client system.
2. Open the Tivoli Storage Manager Console and click the **Storage Agent** icon.
3. Click **Start**.
4. From the operating system command line, change to the storage agent directory (the default is c:\program files\tivoli\tsm\storageagent) and issue the DSMSTA command.

To stop the storage agent:

1. Open the Tivoli Storage Manager Console and click the **Storage Agent** icon.
2. Click **Stop**.

In most cases it is not necessary to halt and restart a LAN-free storage agent to pick up changes from the data manager server. However, restarting the storage agent might be necessary if an attempt was made to change storage pool, library, device class, or drive information while LAN-free data movement was in process.

The effects on LAN-free storage pools resulting from an attempted change are not critical enough to create serious problems. The storage agent keeps a list of storage pools, libraries, and device classes in memory to determine potential LAN-free destinations. Target volume selection occurs on the data manager server.

Certain storage pool attributes can result in failed requests rather than the LAN failover by the storage agent. If the storage agent accurately identifies a LAN-free destination, the LAN-free operation will probably be successful. However, if the storage agent inaccurately identifies a LAN-free destination and the server is unable to process the request, the operation has advanced beyond the point when

© Copyright IBM Corp. 2000, 2010

LAN failover occurs, and the storage agent request does not succeed. If this occurs, stop and restart the storage agent, and then retry the operation.

Appendix B. Customizing the storage agent environment

You can customize the storage agent for specialized tasks.

ACSLS legacy data migration and coexistence

If StorageTek Automated Cartridge System Library Software (ACSLS) shared-library support is not possible in your configuration, data migration is required.

If your environment consists of Tivoli Storage Manager storage pools associated with an ACSLS library type and an ECARTRIDGE device type, the library can be updated with the SHARED=YES option to enable LAN-free data movement. However, if your environment consists of Tivoli Storage Manager storage pools associated with an ACSLS library type and a GENERICTAPE device type, data migration is required rather than coexistence because Tivoli Storage Manager ACSLS shared library support cannot co-exist with external library support.

Data migration of ACSLS to external library support is necessary only when Tivoli Storage Manager ACSLS shared library support is not possible in your configuration. The only situation where ACSLS shared library support is not possible is when your environment does not contain a Tivoli Storage Manager server installed on AIX, Solaris, or Windows to serve as the library manager. Migrate the existing data from existing (old) storage pools to new storage pools associated with the appropriate policy, device class, and library definitions. Migration of data also allows the entire environment to be LAN-free, providing better performance and better utilization of tape drives and media.

Figure 8 on page 66 displays the normal migration path from an old storage pool containing the data associated with the ACSLS library type to a new storage pool associated with an EXTERNAL library type and an ECARTRIDGE device class.

© Copyright IBM Corp. 2000, 2010

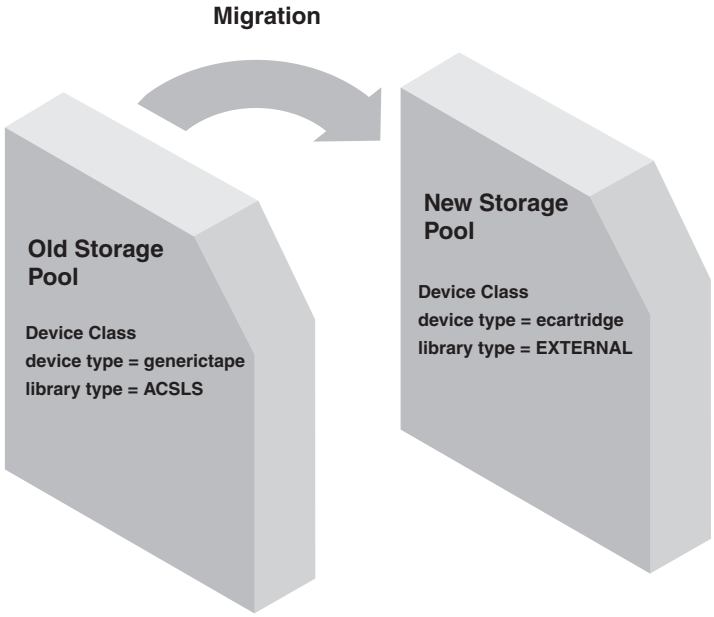


Figure 8. Legacy ACSLS data migration

Two methods to migrate data are:

- Use the IBM Tivoli Storage Manager server MOVE DATA command. This method allows the legacy ACSLS data to move to a new storage pool without moving any expired files in the aggregates. For more information, see the *Administrator's Guide*.
- Use the IBM Tivoli Storage Manager server storage pool reclamation function. This method works by reclaiming the active files from the legacy ACSLS storage pools. Reclamation processing, however, is very resource intensive and should be performed during periods of little activity on the server. For more information, see the *Administrator's Guide*.

For detailed information about how to migrate from an external library environment to a shared ACSLS library environment, see the *Administrator's Guide*.

Related concepts

"External Libraries" on page 11

Configuring multiple clients to use the same storage agent

You can configure two or more clients to use the same storage agent.

To configure clients:

- If the clients reside on the same system as the storage agent, set the appropriate options and values in the `dsm.opt` file.
- If the clients do not reside on the same system as the storage agent, set the following options with the appropriate values:
  - LANFREECOMMMETHOD TCPIP
  - LANFREETCPSERVERADDRESS

    Specify the TCP/IP address of the system where the storage agent is installed.
  - LANFREETCPPORT

    Specify the same TCP/IP port address as specified by the TCPPORT option in the storage agent options file `dsmsta.opt`.

Using LAN and LAN-free paths in the same backup operation

During a single client backup operation, you can send some of the data over a LAN-free path and some of the data over a LAN path.

Before beginning this procedure:

- Ensure that the values for the **DATAWRITEPATH** and **DATAREADPATH** in client node definition are set to ANY. Use the server command REGISTER NODE or UPDATE NODE to set the parameter values.
- Ensure that the active policy set of the domain to which the client is registered has at least two management classes. One of the management classes must point to a destination storage pool that is enabled for LAN-free data movement. The other management class must point to a destination storage pool that is not enabled for LAN-free data movement.
- Ensure that ENABLELANFREE=YES is set in the following file:

  dsm.opt

To send data over LAN and LAN-free paths in the same backup operation:

Specify client INCLUDE statements that bind data that requires the LAN-free path to the management class that uses a LAN-free-enabled storage pool. Specify separate client INCLUDE statements that bind data that requires the LAN path to a management class that does not use a LAN-free enabled storage pool. The INDLUDE statements are located the following file:

dsm.opt

Tip: If the default management class for the policy set does not specify a LAN-free-enabled storage pool, you can omit the INCLUDE statement for the LAN data path. You can omit the INCLUDE statement because the data that is not bound by an INCLUDE statement is bound to the default and sent over the LAN.

Appendix C. Storage agent commands and configuration files

Use files and commands to administer and configure the storage agent and devices.

The device configuration file for the storage agent

The device configuration file for the storage agent includes information about the storage agent and about the Tivoli Storage Manager server with which the storage agent communicates and that is managing the SAN-attached libraries and drives that the storage agent uses.

The file is typically named devconfig and is located with the storage agent program:

c:\program files\tivoli\tsm\storageagent

The DSMSTA SETSTORAGESERVER command normally generates the contents of the file, and you can also use the command to add information to the file.

Typical contents of the device configuration file are as follows:

```
set staname storagnt
set stapassword fun4me
set stahladdress agent.example.com
define server tsmsrver serverpassword=not4u
  hladdress=tsmsrver.example.com lladdress=1502
```

In this example, storagnt is the name of the storage agent and tsmsrver is the name of the Tivoli Storage Manager server.

Properties

SET STANAME
Sets the name of the storage agent. The name must be the same as the name that was used to define the storage agent as a server to the Tivoli Storage Manager server.

SET STAPASSWORD
Sets the password of the storage agent. The password must be the same as the password that was used when defining the storage agent as a server to the Tivoli Storage Manager server. The password is encrypted.

SET STAHLADDRESS
Sets the TCP/IP address of the storage agent.

DEFINE SERVER
Define the Tivoli Storage Manager server with which the storage agent communicates.

© Copyright IBM Corp. 2000, 2010

The storage agent options file

The storage agent options file contains the name of the server with which the storage agent communicates, along with other options. Normally, you do not need to make any changes to the options file unless your Tivoli Storage Manager server changes.

The options file for the storage agent is named dsmsta.opt. The dsmsta.opt file is located where the storage agent program was installed. The default path is:

c:\program files\tivoli\tsm\storageagent

For detailed information about these options, see the *Administrator's Reference*.

For detailed information about the COMMMETHOD and LANFREECOMMMETHOD options, see the *Backup-Archive Clients Installation and User's Guide*.

Required options

Note: Uppercase letters indicate allowed abbreviations.

DEVCONFig *file_name*
The name of the device configuration file for the storage agent. A typical name for the file is devconfig.

SERVERName *server_name*
The name of the Tivoli Storage Manager server with which the storage agent communicates. The DSMSTA SETSTORAGESERVER command inserts this option.

TCPPort *number*

Specifies the port number on which the server TCP/IP communication driver is to wait for requests for client sessions.

Using different port numbers for the options TCPPORT and TCPADMINPORT enables you to create one set of firewall rules for client sessions and another set for other session types (administrative sessions, server-to-server sessions, SNMP subagent sessions, storage agent sessions, library client sessions, managed server sessions, and event server sessions). If the two port numbers are different, separate threads will be used to service client sessions and the other session types. If you allow the two options to use the same port number (by default or by explicitly setting them to the same port number), a single server thread will be used to service all session requests.

Additional options

ADMINONClientport
Specifies whether or not the TCPPORT can be used by administrative sessions. You can specify one of the following values:

- **YES** (default)

  If the option is set to YES, or if the TCPPORT and TCPADMINPORT are the same value (the default), then the administrative sessions can use the TCPPORT.
- **NO**

If the option is set to NO, and if the TCPADMINPORT value is different than the TCPPORT value, then administrative sessions cannot use TCPPORT.

CHECKTAPEPOS
Specifies whether the Tivoli Storage Manager server validates the position of data blocks on tape. The CHECKTAPEPOS option applies only to operations using tape drives. It does not apply to non-tape, sequential-access device classes such as FILE or OPTICAL. If the server information about position does not match the position detected by the drive, an error message is displayed, the transaction is rolled back, and the data is not committed to the database.

The default is YES.

COMMTimeout *seconds*
Specifies the maximum number of seconds that the server waits for an expected client message during an operation that causes a database update. The default value is 60. The minimum value is 1. If the length of time exceeds this time-out, the server ends the session with the client. You may want to increase the time-out value to prevent clients from timing out. Clients may time out if there is a heavy network load in your environment or when they are backing up large files.

IDLETimeout *minutes*
Specifies the maximum number of minutes that a client session can be idle before the server cancels the session. The default value is 15 minutes. The minimum value is 1 minute. You may want to increase the time-out value to prevent clients from timing out if there is a heavy network load in your environment. Note, however, that a large number of idle sessions could prevent other users from connecting to the server.

MAXSessions *number_of_sessions*
Specifies the maximum number of simultaneous client sessions that can connect with the server. The default value is 25 client sessions. The minimum value is 2 client sessions. The maximum value is limited only by available virtual memory size or communication resources.

MSGSTACKTRACE *on | off*
Specifies that a list of functions will be shown on the server console, and will also be directed to the activity log after specific messages have been issued. The output will help the Tivoli Storage Manager service team to diagnose specific problems quicker. It is recommended that this option be set to ON.

RESOURCETimeout *minutes*
Specifies the maximum number of minutes that a storage agent waits for a resource on the server. The default value is 60 minutes. The minimum value is 1 minute.

For database resources and sessions on the storage agent, the Tivoli Storage Manager resource monitor picks the shortest time-out value to start a recovery process.

In contrast, in the case of library sharing, the resource monitor picks the longest time for both the library manager and library client to recover. For more efficient management of shared library resources, consider setting resource time-outs at the same limit for all participants in a shared configuration. In any case of error recovery, Tivoli Storage Manager always defers to the longest timeout limit.

You should also specify this option in the server options file. The server uses this option to monitor some of the storage agent sessions and resources and will cancel sessions based on the value you specify.

Important: If this option is specified in the server options file, that value will override the value specified in the storage agent's options file.

SANDISCOVERY

Specifies whether the Tivoli Storage Manager SAN discovery function is enabled. When set to ON, the storage agent will perform SAN discovery in the following instances:

- During storage agent initialization
- When the device path has been changed and there is a conflict between the device serial number and the device path provided by the server

SANDISCOVERY ON is the default value for 32-bit Microsoft Windows.

Other available options include:

OFF

Disables the SAN discovery function but does not take the device path offline. Set the SANDISCOVERY option to OFF if the HBA used by the storage agent does not support SAN device mapping.

SANDISCOVERY OFF is the default value for AIX, Linux, HP-UX, Sun Solaris, and 64-bit Microsoft Windows.

UNSCANNEDPATHOFF

Disables the SAN discovery function and takes the device path offline if the server is unable to open it.

Using SAN discovery, the storage agent can automatically correct the device's special file name if it has been changed. If the HBA used by the storage agent does not support SAN device mapping, you should set the SANDISCOVERY option to OFF.

For information about Tivoli Storage Manager supported HBAs for SAN device mapping, see the Tivoli Storage Manager for Storage Area Networks support site at http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html.

The storage agent does not require persistent binding with the SAN discovery function enabled.

STAMaxpooledsessions *number*

Specifies the number of individual sessions that are allowed to start and stop between the storage agent and the Tivoli Storage Manager server. The range of values is 0 - 150, with a default of 25. Each session is governed by the IDLETIMEOUT option and is stopped when the timeout value is exceeded. If the storage agent needs more sessions than specified, additional sessions are allowed. Although the default value is typically sufficient, setting this option with a low number can adversely affect performance. Be aware that if the storage agent has multiple client sessions, increasing the value of this option will help support these sessions.

TCPADMINPORT *number*

Specifies the port number on which the server TCP/IP communication driver is to wait for requests for sessions other than client sessions. This includes administrative sessions, server-to-server sessions, SNMP subagent

sessions, storage agent sessions, library client sessions, managed server sessions, and event server sessions. The default is the value of TCPPORT.

Using different port numbers for the options TCPPORT and TCPADMINPORT enables you to create one set of firewall rules for client sessions and another set for the other session types listed above. By using the **SESSIONINITIATION** parameter of REGISTER NODE and UPDATE NODE, you can close the port specified by TCPPORT at the firewall, and specify nodes whose scheduled sessions will be started from the server. If the two port numbers are different, separate threads will be used to service client sessions and the session types. If you allow the two options to use the same port number (by default or by explicitly setting them to the same port number), a single server thread will be used to service all session requests.

Client sessions that attempt to use the port specified by TCPADMINPORT will be terminated (if TCPPORT and TCPADMINPORT specify different ports). Administrative sessions are allowed on either port, (unless the ADMINONCLIENTPORT option is set to NO) but by default will use the port specified by TCPADMINPORT.

THROUGHPUTDatathreshold *kilobytes_per_second*
Specifies the throughput that client sessions must achieve to prevent cancellation after THROUGHPUTTIMETHRESHOL *minutes* have elapsed. The default value of 0 prevents examining client sessions for insufficient throughput. Throughput is computed by adding send and receive byte counts and dividing by the length of the session. The length does not include time spent waiting for media mounts and starts at the time a client sends data to the server for storage. The minimum value is 0; the maximum is 99999999.

THROUGHPUTTimethreshold *minutes*
Specifies the threshold for examining client sessions and cancelling them if the data throughput threshold is not met (see THROUGHPUTDATATHRESHOLD). This threshold does not include time spent waiting for media mounts. The time threshold starts when a client begins sending data to the server for storage (as opposed to setup or session housekeeping data). The default value of 200 prevents examining client sessions for low throughput. The minimum value is 0; the maximum is 99999999.

USELARGEBUFFERS *yes | no*
Specifies that large buffers are used for client-server communications. The default of YES specifies that large buffers are used; NO specifies that they are not used.

DSMSTA SETSTORAGESERVER command

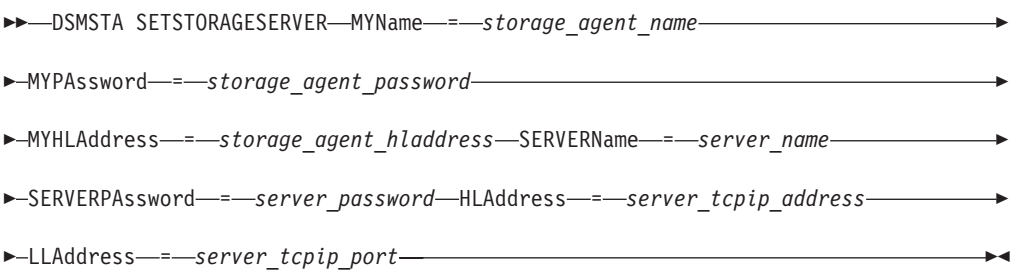
Use the DSMSTA SETSTORAGESERVER command to initialize the storage agent and add communication information to the device configuration file and the storage agent options file dsmsta.opt.

Use this utility on the client system where the storage agent has been installed.

This utility does not remove any previous entries in the files. It appends information to the existing files. The option DEVCONFIG, which sets a name for the device configuration file, must be in the dsmsta.opt file for the command to work. See “Examples” on page 75.

When configuring the storage agent using the DSMSTA SETSTORAGESERVER command, use addresses that correspond to the communications method used by the backup-archive client. The backup-archive client supports either IPv4 (**COMMMETHOD TCPIP**) or IPv6 (**COMMMETHOD V6TCPIP**), but not both at the same time.

Syntax



Parameters

All parameters are required. Allowed abbreviations for the options are shown in uppercase letters.

MYName
Specifies the name of the storage agent. This name appears in the SET STANAME command that is inserted into the device configuration file.

You must use the same name when you define the storage agent as a server to the Tivoli Storage Manager server.

MYPAssword
Specifies the password of the storage agent. This value is encrypted and used in the SET STAPASSWORD command that is inserted into the device configuration file.

You must use the same password when you define the storage agent as a server to the Tivoli Storage Manager server.

MYHLAddress
Specifies the TCP/IP address of the storage agent. This value is used internally in the SET STAHLADDRESS command that is inserted into the device configuration file.

SERVERName
Specifies the name of the Tivoli Storage Manager server. This name appears in theDEFINE SERVER command that is inserted into the device configuration file.

SERVERPAssword
Specifies the password of the server. This value is encrypted and appears in the **SERVERPASSWORD** parameter of the DEFINE SERVER command that is inserted into the device configuration file.

HLAddress
Specifies the TCP/IP address of the server. This value is used in the **HLADDRESS** parameter of the DEFINE SERVER command.

LLAddress
Specifies the TCP/IP port on which to access the server. This value is used in the **LLADDRESS** parameter of the DEFINE SERVER command.

Examples

Issue the DSMSTA SETSTORAGESERVER command with the following information:

- Storage agent
  - Name: storagnt
  - Password: fun4me
  - TCP/IP address: agent.example.com
- Tivoli Storage Manager server
  - Name: tsmsrver
  - Password: not4u
  - TCP/IP address: tsmsrver.example.com
  - TCP/IP port: 1502

The command is:

```
dsmsta setstorageserver myname=storagnt mypassword=fun4me
myhladdress=agent.example.com
servername=tsmsrver serverpassword=not4u
   hladdress=tsmsrver.example.com lladdress=1502
```

The command generates the following lines in the device configuration file for the storage agent:

```
set staname storagnt
set stapassword xxxxx
set stahladdress agent.example.com
define server tsmsrver serverpassword=xxxxxxxx
  hladdress=tsmsrver.example.com lladdress=1502
```

The passwords (shown as *xxxxxxxx*) are encrypted in the file.

The command also generates the following line in the dsmsta.opt file for the storage agent:

```
servername tsmsrver
```

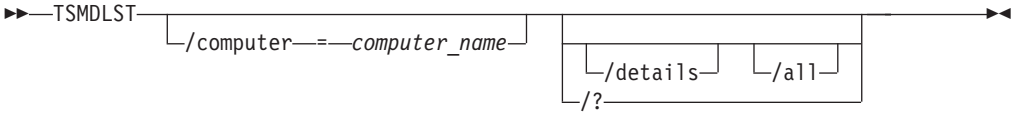
Related tasks

"Installing the storage agent" on page 27

"Installing the storage agent" on page 49

TSMDLST (Display information about devices)

Use the TSMDLST command to display information about devices.



Parameters

/computer=*computer_name*
Specifies the name of the computer for which devices will be listed. The default is the local system.

/details
Display details on devices in the list. By default, a summary is shown.

/all
Display information on all types of devices. By default, only tape drives and tape libraries are included in the results.

/? Display information about the command and its parameters.

Example: Display information about devices

Display information about tape devices and tape libraries for a local system DATAOWNER.

```
tsmdlst
```

```
Computer Name: DATAOWNER
TSM Device Driver: TSMScsi - Not Running

TSM Name   ID LUN Bus Port SSN WWN TSM Type Driver Device Identifier
------------------------------------------------------------------------------
lb0.0.0.3   0  0   0   3   MPC02200242 - LIBRARY n/a STK L700 0318
mt1.0.0.3   1  0   0   3   5700GU002742 - ECART n/a STK T9840D 1.42
mt10.0.0.3 10  0   0   3   HU171200NG - LTO NATIVE HP Ultrium 4-SCSI H49W
lb10.1.0.3 10  1   0   3   DEC91503HW - LIBRARY NATIVE HP MSL G3 Series 4.74
mt11.0.0.3 11  0   0   3   1310000876 - LTO IBM IBM ULTRIUM-TD4 85V3
```

Appendix D. Accessibility features for Tivoli Storage Manager

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully.

Accessibility features

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

- Keyboard-only operation
- Interfaces that are commonly used by screen readers
- Keys that are discernible by touch but do not activate just by touching them
- Industry-standard devices for ports and connectors
- The attachment of alternative input and output devices
- User documentation provided in HTML and PDF format. Descriptive text is provided for all documentation images.

The Tivoli Storage Manager Information Center, and its related publications, are accessibility-enabled.

Keyboard navigation

The Tivoli Storage Manager for Windows Console follows Microsoft conventions for all keyboard navigation and access. Drag and Drop support is managed using the Microsoft Windows Accessibility option known as MouseKeys. For more information about MouseKeys and other Windows accessibility options, please refer to the Windows Online Help (keyword: MouseKeys).

Vendor software

Tivoli Storage Manager includes certain vendor software that is not covered under the IBM license agreement. IBM makes no representation about the accessibility features of these products. Contact the vendor for the accessibility information about its products.

Related accessibility information

You can view the publications for Tivoli Storage Manager in Adobe® Portable Document Format (PDF) using the Adobe Acrobat Reader. You can access these or any of the other documentation PDFs at the IBM Publications Center at http://www.ibm.com/shop/publications/order/.

IBM and accessibility

See the IBM Human Ability and Accessibility Center for more information about the commitment that IBM has to accessibility: http://www.ibm.com/able.

© Copyright IBM Corp. 2000, 2010

Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

For license inquiries regarding double-byte character set (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

Intellectual Property Licensing
Legal and Intellectual Property Law
IBM Japan Ltd
1623-14, Shimotsuruma, Yamato-shi
Kanagawa 242-8502 Japan

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:
INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

© Copyright IBM Corp. 2000, 2010

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation
2Z4A/101
11400 Burnet Road
Austin, TX 78758
U.S.A.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this information and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement, or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. The sample programs are provided "AS IS", without warranty of any kind. IBM shall not be liable for any damages arising out of your use of the sample programs. Each copy or any portion of these sample programs or any derivative work, must include a

copyright notice as follows: © (your company name) (year). Portions of this code are derived from IBM Corp. Sample Programs. © Copyright IBM Corp. _enter the year or years_.

If you are viewing this information in softcopy, the photographs and color illustrations may not appear.

Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at http://www.ibm.com/legal/copytrade.shtml.

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.

Microsoft and Windows are trademarks of Microsoft Corporation in the United States, other countries, or both.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Glossary

A glossary is available with terms and definitions for the IBM Tivoli Storage Manager server and related products.

The glossary is located in the Tivoli Storage Manager information center: http://publib.boulder.ibm.com/infocenter/tsminfo/v6r2

© Copyright IBM Corp. 2000, 2010

Index

A

accessibility features 77
ACSLS support
  data migration and coexistence issues 65
  installing external library environments (ACSLS-managed) 45
  library sharing 11
administrative command
  components xv
  positional parameters
    optional xvi
    required xvi
API (Application Programming Interface)
  external library environments 48
  tape library and file-device-sharing environments 26
Application Programming Interface (API)
  external library environments 48
  tape library and file device-sharing environments 26

B

backup, LAN and LAN-free concurrent 67

C

client node information, recommendations for gathering 21
client work sheets for configuration information 16
COMMMETHOD communications option 13
concurrent access to FILE volumes 13
configuration information work sheets 16, 17
customer support
  contact xiii

D

deduplicated data, access to client-side 13
descriptions of options 70
device configuration file 69
disk device
  file-sharing software 23
  server install 35
disk-storage sharing 9
dsm.opt file
  external library environments 46
  tape library and file-device-sharing environments 24
DSMSERV_CONFIG environment variable
  external library environment 49, 50, 52
  tape library and file-device-sharing environments 27, 28, 30
DSMSTA SETSTORAGESERVER
  command syntax and examples 73
  use when configuring the storage agent 34, 56
dsmsta.opt 70
  external library environments 56
  tape library and file-device-sharing 34

E

education
  see Tivoli technical training xi
encryption
  3592 generation 2 and 3 13
  IBM and HP LTO-4 13
  Sun StorageTek T10000B 13
Enterprise Removable Media Manager (eRMM) 11, 45, 57
environments, LAN-free 7
eRMM (Enterprise Removable Media Manager) 11, 45, 57
external library support 11, 65

F

FILE library
  concurrent access to volumes 13
  configuration considerations 9
  disk devices 35
file-sharing software
  IBM General Parallel File System 13, 40
  Tivoli SANergy 9, 13, 40
  TotalStorage SAN File System 13, 40
fixes, obtaining xiii

I

IBM General Parallel File System 13
IBM Software Support
  submitting a problem xv
IBM Support Assistant xii
installation and configuration
  planning for 7
  tape-library and file-device-sharing environments 23
  task overview 23
installing and configuring
  external library environments (ACSLS-managed) 45
  task overview 45
installing silently using a batch file
  external library environment 54
  tape library and file-device-sharing environments 32
installing the storage agent
  external library environment
    GUI installation wizard 49
  tape library and file-device-sharing environments
    console installation wizard 28, 50
    GUI installation wizard 27
    silent mode 30, 52
Internet, searching for problem resolution xii, xiii

K

knowledge bases, searching xii

L

LAN-free data movement
  data backup scenario 3
  description of 1
  guidelines for determining 61

© Copyright IBM Corp. 2000, 2010

LAN-free data movement *(continued)*
SAN-attached device sharing 1
LAN-free environments, types of 7
languages
external library environments
installing a language package 55
options 55
tape library and file-device-sharing environments
installing a language package 33
options 33
library client 7
library manager 7
licensing 13
limit the SAN drives 35, 57

M

Microsoft Management Console (MMC) snapin 13
MMC (Microsoft Management Console) snapin 13
multi-session no-query restore 4

N

network requirements 23, 45
no-query restore 4

O

options file
ADMINONCLIENTPORT 70
CHECKTAPEPOS 71
COMMTIMEOUT 71
DEVCONFIG 70
external library environments 56
IDLETIMEOUT 71
MAXSESSIONS 71
MSGSTACKTRACE 71
RESOURCETIMEOUT 71
SANDISCOVERY 72
SERVERNAME 70
STAMAXPOOLEDSESSIONS 72
tape library and file-device-sharing environments 34
TCPADMINPORT 72
TCPPORT 70
THROUGHPUTDATATHRESHOLD 73
THROUGHPUTTIMETHRESHOLD 73
USELARGEBUFFERS 73

P

paths
external library environments 59
tape library and file-device-sharing environments
disk devices 40
tape devices 40
planning for installation and configuration 7
policy for storage agent 35, 57
problem determination
describing problem for IBM Software Support xiv
determining business impact for IBM Software Support xiv
submitting a problem to IBM Software xv
publications
download ix
order ix
publications *(continued)*
related software xi
search ix
Tivoli Storage Manager x
z/OS xi

S

SANergy Metadata Controller 9
SCSI and 349X library sharing 7
server work sheets for configuration information 17
Software Support
contact xiii
describing problem for IBM Software Support xiv
determining business impact for IBM Software Support xiv
starting the storage agent
automatic 63
manual 63
stopping the storage agent manually 63
storage agent
configuring device access 39
description 1
device configuration file 69
FILE library 9
planning configurations 7
policy considerations 35, 57
starting 41
verify configuration 41
verify LAN-free configuration 60
support information xi
syntax diagram
abbreviations xv
default value xvii
fragments xviii
optional choice xvii
repeatable choice xviii
repeating values xvi
required choices xvii
symbols xvi
using xv
variables xv
syntax diagrams xix
syntax diagrams, reading xv

T

TCP/IP Version 6 and Version 4 13
Tivoli SANergy 9, 13, 40
Tivoli technical training xi
TotalStorage SAN File System 13
training, Tivoli technical xi
tsmdlst 75
TSMSCSI.SYS device driver 19, 21, 60
TSMSCSI.SYS64 device driver 19, 21, 60
typographic conventions xv

U

using
syntax diagram xv

V

verifying LAN-free data movement
external library environments 61
tape library and file-device-sharing environments 42

W

Windows Server 2003 and 2008
configuring TSMSCSI.EXE 21
obtaining tape device information 19
verifying LAN-free in external library environments 60

Program Number: 5608-E01, 5608-E02, 5608-E03, 5608-E07, 5608-E12

Printed in USA

SC23-9553-01