Tivoli® Storage Manager
for Sun Solaris

IBM

Version 6.1

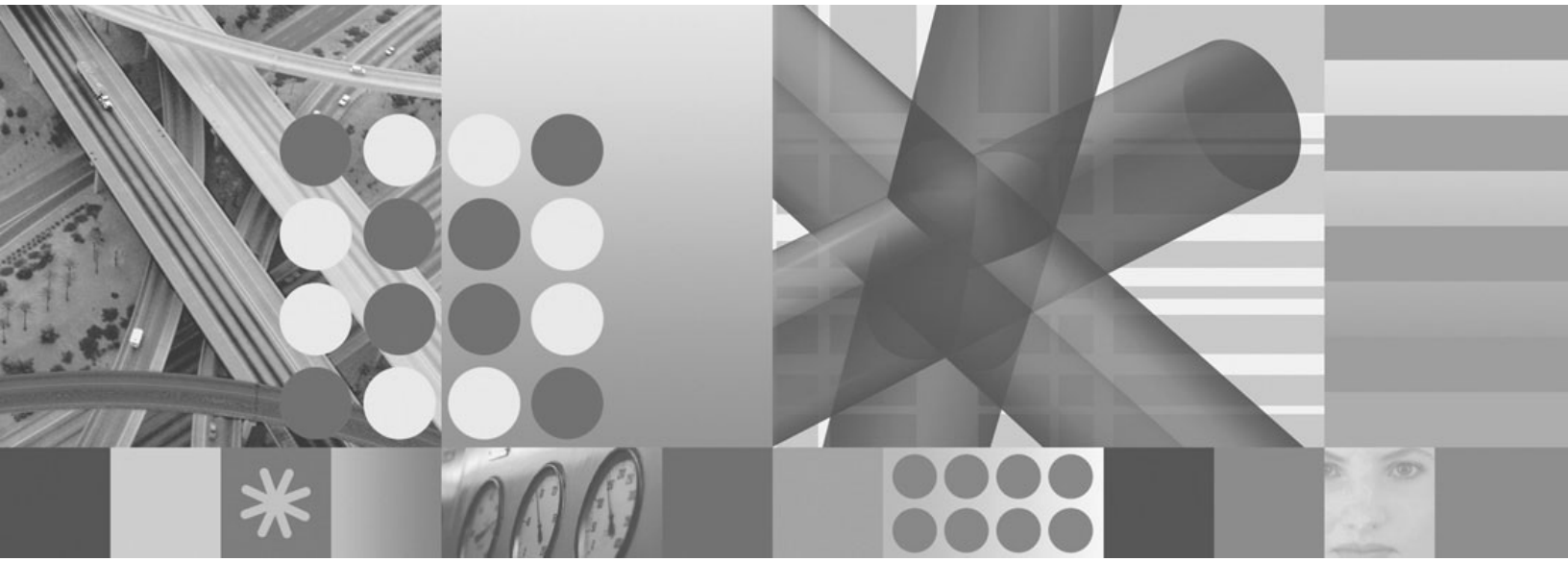
Installation Guide

GC23-9784-01

Tivoli® Storage Manager
for Sun Solaris

IBM

Version 6.1



Installation Guide

GC23-9784-01

Note
Before using this information and the product it supports, read the information in "Notices" on page 57.

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

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Preface

This publication contains installation and configuration instructions for the Tivoli® Storage Manager server and client API, server languages, and other Tivoli Storage Manager components.

Instructions for installing the Tivoli Storage Manager license, device driver, storage agent, and the Integrated Solutions Console and Administration Center are in this publication. Details about configuring reporting and monitoring are also included.

Who should read this guide

This publication is intended for a system administrator installing and configuring Tivoli Storage Manager Version 6.1.

If you are upgrading an existing server to Tivoli Storage Manager Version 6.1, see the *Server Upgrade Guide*.

Publications

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

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

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

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

Tivoli Storage Manager publications

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

Table 1. Tivoli Storage Manager server publications

Publication title	Order number
IBM Tivoli Storage Manager Messages	GC23-9787
IBM Tivoli Storage Manager Performance Tuning Guide	GC23-9788
IBM Tivoli Storage Manager Problem Determination Guide	GC23-9789
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

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Table 1. Tivoli Storage Manager server publications (continued)

Publication title	Order number
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 for System Backup and Recovery Installation and User's Guide	SC32-6543

Table 2. 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 3. 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 for HSM for Windows Administration Guide	SC23-9795
IBM Tivoli Storage Manager Using the Application Program Interface	SC23-9793
Program Directory for IBM Tivoli Storage Manager z/OS Edition Backup-Archive Client	GI11-8912
Program Directory for IBM Tivoli Storage Manager z/OS Edition Application Program Interface	GI11-8911

Table 4. Tivoli Storage Manager Data Protection publications

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

Support information

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

Getting technical training

Information about Tivoli technical training courses is available online.

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

Searching knowledge bases

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

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

Searching the Internet

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

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

- IBM technotes
- IBM downloads

- IBM Redbooks®

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

Using IBM Support Assistant

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

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

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

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

Finding product fixes

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

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

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

Getting e-mail notification of product fixes

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

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

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

Contacting IBM Software Support

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

Before you contact IBM Software Support, follow these steps:

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

Then see "Submit the problem to IBM Software Support" on page x for information on contacting IBM Software Support.

Setting up a software maintenance contract

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

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

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

Determine the business impact

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

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.

Describe the problem and gather background information

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

To save time, know the answers to these questions:

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

Submit the problem to IBM Software Support

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

Online

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

By phone

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

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

New for IBM Tivoli Storage Manager Version 6.1

Tivoli Storage Manager Version 6.1 includes many new features. Changes that affect Tivoli Storage Manager installation, packaging, and configuration are described in this section.

New for the server in Version 6.1.2

Server fix pack 6.1.2 contains several new features. This section summarizes changes that have been made to Tivoli Storage Manager that affect the installation process.

The following features are new for Tivoli Storage Manager in Version 6.1.2:

Administration Center packaging
With Tivoli Storage Manager Version 6.1.2, the Administration Center is packaged on its own DVD instead of with the other Tivoli Storage Manager components. See Chapter 5, "Installing and configuring the Administration Center," on page 41 to install and configure the Administration Center.

Licensing changes
Following the release of Tivoli Storage Manager Version 6.1.2, Tivoli Storage Manager Version 6.1.0 will no longer be available for download or purchase. Due to this unique circumstance, certain 6.1.2 packages will be available with a license module. See the following information for details on how this situation affects your environment.

Existing Version 6.1.0 and 6.1.1 users
If you have installed Version 6.1.0 and are using a Version 6.1.0 license, you can download the 6.1.2 package from the Service FTP site: ftp://ftp.software.ibm.com/storage/tivoli-storage-management/. You can install the 6.1.2 package using the instructions in Chapter 7, "Installing a Tivoli Storage Manager fix pack," on page 51.

Version 5 users
If you have not yet installed a version of the V6.1 server, when you upgrade, you must upgrade directly to Version 6.1.2. Version 6.1.2 is available with a license module from Passport Advantage or from your Tivoli Storage Manager sales representative. You can upgrade from V5 to V6.1.2 using the instructions in the *Server Upgrade Guide*.

New users
Version 6.1.2 is available from Passport Advantage or from your Tivoli Storage Manager sales representative. You can install Version 6.1.2 using the instructions in Chapter 2, "Installing Tivoli Storage Manager," on page 11.

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New for the server in Version 6.1.0

This section summarizes changes that have been made to Tivoli Storage Manager that affect the installation process.

The following features are new for Tivoli Storage Manager in Version 6.1.0:

Graphical user interfaces

With Tivoli Storage Manager Version 6.1.0, there are now graphical user interfaces used for installing and configuring Tivoli Storage Manager. These are consistent across the Windows, AIX®, Linux®, and UNIX platforms.

Server database

The Tivoli Storage Manager Version 6.1.0 server integrates enterprise-class, IBM DB2 database technology that performs database management functions for the server database.

DB2 Version 9.5 is installed during the installation of a Tivoli Storage Manager Version 6.1.0 server and other components. Advantages include full-function SQL queries and elimination of the need for offline audits of the database.

Reporting and monitoring feature

The reporting and monitoring feature uses a combination of the Tivoli Common Reporting tool, IBM Tivoli Monitoring, and the Tivoli Data Warehouse to offer you reports and real time monitoring information about Tivoli Storage Manager servers and client activity.

Tivoli Storage Manager supports reporting on historical data as well as real-time data by allowing you to create a Tivoli Storage Manager monitoring agent instance on an IBM Tivoli Monitoring server.

Installing the Tivoli Storage Manager reporting and monitoring feature directly on a Tivoli Storage Manager Sun Solaris server is not supported.

Chapter 1. Planning to install IBM Tivoli Storage Manager

Install the Tivoli Storage Manager server component on the computer that manages storage devices and the Tivoli Storage Manager client code on every workstation that will transfer data to Tivoli Storage Manager server-managed storage.

Tivoli Storage Manager server maintenance releases, client software, and publications are available from the Tivoli Storage Manager Web site at http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html.

What you should know first

Before installing IBM Tivoli Storage Manager for the first time, be familiar with your operating systems, storage devices, communication protocols, and system configurations.

If you are upgrading an existing Tivoli Storage Manager server to Tivoli Storage Manager Version 6.1, see the *Server Upgrade Guide*.

If you are upgrading an existing Tivoli Storage Manager Version 6.1 server to a later level of Version 6.1, see Chapter 7, "Installing a Tivoli Storage Manager fix pack," on page 51.

Before you install IBM Tivoli Storage Manager for the first time, familiarize yourself with the following items:

- The operating system that is running on the Tivoli Storage Manager server workstation.
- The operating systems that are running on any Tivoli Storage Manager client workstations.
- Storage devices that will be available to Tivoli Storage Manager.
- Communication protocols that are installed on your clients and servers.

Restriction: You can install and run the Version 6.1 server on a system that already has DB2 installed on it, whether DB2 was installed by itself or as part of some other application, with some restrictions. For details, see "Compatibility of the Tivoli Storage Manager server with other DB2 products on the system" on page 4.

Users who are experienced DB2 administrators can choose to perform advanced SQL queries and use DB2 tools to monitor the database. However, do *not* use DB2 tools to change DB2 configuration settings from those that are that are preset by Tivoli Storage Manager, or alter the DB2 environment for Tivoli Storage Manager in other ways, such as with other products. The Tivoli Storage Manager Version 6.1 server has been built and tested extensively using the data definition language (DDL) and database configuration that Tivoli Storage Manager deploys.

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Installable components

The Tivoli Storage Manager server, client API, and licenses are required components. Other, optional components are also available with Tivoli Storage Manager.

You can install the following components for Tivoli Storage Manager Version 6.1:

- Tivoli Storage Manager server
- Tivoli Storage Manager server languages
- Tivoli Storage Manager licenses
- Tivoli Storage Manager device driver
- Tivoli Storage Manager storage agent
- Tivoli Storage Manager Administration Center

Table 5 describes all the installable components.

Table 5. Tivoli Storage Manager installable components

Tivoli Storage Manager component:	**Description:**	**Additional information:**
Server (REQUIRED)	Includes the Tivoli Storage Manager database, client API, and tools to help you configure and manage Tivoli Storage Manager.	Refer to the Tivoli Storage Manager server overview in the *Administrator's Guide*.
Language pack (OPTIONAL)	Each language pack (one for each language) contains language-specific information for the server.	See "Server language locales" on page 17.
Licenses (REQUIRED)	Includes support for all Tivoli Storage Manager licensed features. After you install this package, you must configure the licenses you have purchased.	Refer to the chapter on managing server operations in the *Administrator's Guide*.
Device driver (OPTIONAL)	Extends Tivoli Storage Manager media management capability.	The Tivoli Storage Manager device driver is generally preferred for use with the Tivoli Storage Manager server. Refer to the chapter on adding devices in the *Administrator's Guide*. A list of devices supported by this driver is available from the Tivoli Storage Manager Web site, at http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html
Storage agent (OPTIONAL)	Installs the component that allows client systems to write data directly to, or read data directly from, storage devices attached to a SAN.	Refer to the *Storage Agent User's Guide*.

Table 5. Tivoli Storage Manager installable components (continued)

Tivoli Storage Manager component:	Description:	Additional information:
Administration Center (OPTIONAL)	Installs the following components automatically to help you configure and manage Tivoli Storage Manager: • Integrated Solutions Console • eWAS • Tivoli Common Reporting • TCR BIRT Reports **Note:** The Administration Center is on a separate DVD.	Refer to "Administration Center system requirements" on page 41.

System requirements

The Tivoli Storage Manager server can require a large amount of memory, network bandwidth, and processor resources. In many cases, the server performs best when other applications are not installed on the same system.

Hardware requirements

Table 6 describes the minimum hardware requirements that are needed for a Sun system. For more details about planning disk space, see "Capacity planning" on page 5.

Table 6. Hardware requirements

Type of hardware	Hardware requirements
Hardware	One of the following processors required: • Sun Ultra SPARC-based (sun4u architecture) • Sun Ultra SPARC-based processors (sun4v architecture) • x86_64-based processors (AMD64 or EM64T architecture
Disk space	The following list is the minimum disk space for Sun Ultra SPARC-based processors (sun4u and sun4v architecture) and for x86_64-based processors (AMD64 or EM64T architecture) for the respective directories and logs: • 5 MB for the /var directory • 10 MB for the /opt directory if you create mount points • 2 GB for the /opt/tivoli/tsm directory if you create mount points • 200 MB for the /tmp directory • 300 MB for the /usr directory • 300 MB in the home directory Additional disk space might be required for database and log files. The size of the database depends on the number of client files to be stored and the method by which the server manages them.
Memory	At least 2 GB. A minimum of 4 GB for production servers. 8 GB is optimal.

Software requirements

Table 7 describes the minimum software requirements needed for your Sun system.

Table 7. Software requirements

Type of software	Minimum software requirements
Operating System	You need one of the following systems: • Sun Solaris 10 or later, running in 64-bit mode on a Sun Ultra Sparc system with sun4u architecture • Sun Solaris 10 or later, running in 64-bit mode on a system with AMD64 or EM64T architecture
Communication protocol	TCP/IP
Devices and drivers	If you have an IBM 3570, 3590 or Ultrium tape library or drive, install the most current device driver ***before*** you install Tivoli Storage Manager Version 6.1. You can locate the device drivers at ftp://ftp.software.ibm.com/storage/devdrvr/

See "Solaris zones" on page 15 to create a Solaris Zone and install Tivoli Storage Manager in that zone.

Compatibility of the Tivoli Storage Manager server with other DB2 products on the system

You can install other products that deploy and use DB2 products on the same system as the Tivoli Storage Manager V6.1 server on AIX, HP-UX, Linux, and Sun Solaris platforms, with some limitations.

To install and use other products that use a DB2 product on the same system as the Tivoli Storage Manager server, ensure that the following criteria are met:

- The other products that use a DB2 product must be using DB2 version 9 or later. DB2 products introduced product encapsulation and segregation support beginning with version 9. With this support, you can run multiple copies of DB2 products, at different code levels, on the same system. For details, see the information about multiple DB2 copies: http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp?topic=/com.ibm.db2.luw.admin.dbobj.doc/doc/r0024057.html
- When you install different DB2 products on the system that has the Tivoli Storage Manager server, ensure that the user IDs, fence user IDs, installation location, other directories, and related information that you specify are different from all the IDs and locations that you used for the Tivoli Storage Manager server installation and configuration. If you used the dsmicfgx wizard or dsmupgdx wizard to configure or upgrade the server, these are values that you entered when running the wizard. If you used the manual configuration or upgrade procedures, review the procedures that you used if necessary, to recall the values that were used for the server.
- Carefully consider the resources and capability of the system compared to the requirements for both the Tivoli Storage Manager server and the other applications that use the DB2 product. To provide sufficient resources for the other DB2 applications, you might need to change the Tivoli Storage Manager server settings so that the server uses less system memory and resources. Similarly, if the workloads for the other DB2 applications compete with the

Tivoli Storage Manager server for processor or memory resources, the performance of the server in handling the expected client workload or other server operations might be adversely affected.

To segregate resources and provide more capability for the tuning and allocation of processor, memory, and other system resources for multiple applications, consider using logical partition (LPAR), workload partition (WPAR), or other virtual machine support. For example, run a DB2 application in its own virtualized machine.

Capacity planning

Planning for Tivoli Storage Manager includes determining the number of client nodes to be managed by the Tivoli Storage Manager server, the backup and recovery needs of those clients, and the number and general size of client data files.

Estimating database space requirements

The size of the database depends on the number of client files to be stored and the method by which the server manages them.

If you can estimate the maximum number of files that might be in server storage at any time, you can estimate the database size from the following information:

- Each stored version of a file requires about 600 - 1000 bytes of database space.
- Each cached file, copy storage pool file, and active-data pool file, and deduplicated file requires about an additional 100 - 200 bytes of database space.
- Overhead can require up to 50% in additional space.

In the following example for a single client, the computations are probable maximums. In addition, the numbers are not based on using file aggregation. In general, aggregation of small files reduces the required database space. Assume the following numbers for a Tivoli Storage Manager system:

Versions of files

Backed up files
Up to 500,000 client files might be backed up. Storage policies call for keeping up to three copies of backed up files:

```
500,000 files x 3 copies = 1,500,000 files
```

Archived files
Up to 100,000 files might be archived copies of client files.

Space-managed files
Up to 200,000 files migrated from client workstations might be in server storage.

Note: File aggregation does not affect space-managed files.

At 1000 bytes per file, the space required for these files is:

```
(1 500,000 + 100,000 + 200,000) x 1000 = 1.8GB
```

Cached, copy storage pool, active-data pool files, and deduplicated files

Cached copies
Caching is enabled in a 5 GB disk storage pool. The high and low migration thresholds of the pool are 90% and 70%. Thus, 20% of the disk pool, or 1 GB, is occupied by cached files.

If the average file size is about 10 KB, about 100,000 files are in cache at any one time.

```
100,000 files x 200 bytes = 19MB
```

Copy storage pool files

All primary storage pools are backed up to the copy storage pool:

```
(1,500,000 + 100,000 + 200,000) x 200 bytes = 343MB
```

Active-data pool files

All the active client-backup data in primary storage pools is copied to the active-data pool. Assume that 500,000 versions of the 1 500 000 backup files in the primary storage pool are active.

```
500,000 x 200 bytes = 95 MB
```

Deduplicated files

Assume that a deduplicated storage pool contains 50,000 files.

```
50,000 x 200 bytes = 10 MB
```

Therefore, cached files, copy storage pool files, and active-data pool files, and deduplicated storage pool files require about an additional 0.5 GB of database space.

Overhead

About 2.3 GB is required for file versions, cached copies, copy storage pool files, and active-data pool files. Allow up to 50% additional space (or 1.2 GB) for overhead.

The database should then have at least 3.5 GB per client.

During SQL queries of the server, intermediate results are stored in temporary tables that require space in the free portion of the database. Therefore, using SQL queries requires additional database space. The more complicated the queries, the greater the space that is required.

Tip:

- In the preceding examples, the results are estimates. The actual size of the database might differ from the estimate because of factors such as the number of directories and the length of the path and file names. As a best practice, periodically monitor your database and adjust its size as necessary.
- If you cannot estimate the numbers of files, you can roughly estimate the database size as from 1% to 5% of the required server storage space. For example, if you need 100 GB of server storage, your database should be 1 - 5 GB.

Recovery log space requirements

The recovery log space that you require depends on the amount of client activity with the server.

Active log space

Ensuring that the recovery log has enough space is essential for a V6.1 server.

The minimum size of the active log is the default, 2048 MB (2 GB). Under normal server operations, you are likely to need an active log that is larger than the default. The maximum size of the active log is 128 GB The maximum size is 131,072 MB (128 GB). When estimating the size of the active log, ensure that the active log is large enough to handle not only the amount of concurrent activity that the server typically handles, but also higher workloads that can occur occasionally or under unusual conditions. Try to anticipate the greatest amount of workload that the server might need to handle.

For simple backup and archive activity with no data deduplication, 20 GB for the active log is adequate. If you use data deduplication, and if you deduplicate large objects (for example, image backups), use an active log size that is 20% of the database size.

Monitor the space usage and adjust the size of the active log as needed. To change the size of the active log, see the *Administrator's Guide* and search for increasing the active log size.

Active log mirror space

The active log mirror is a copy of the active log that can be used if the active log files cannot be read. There can be only one active log mirror.

Creating a log mirror is optional. If you increase the size of the active log, the log mirror size is increased automatically. Be aware that mirroring the log can affect performance because of the doubled I/O activity that is required to maintain the mirror. The additional space that the log mirror requires is another factor to consider when deciding whether to create a log mirror.

Archive log space

The size of the archive log depends on the number of objects stored by client nodes between full backups of the database.

To recover space, a full backup of the database causes obsolete archive log files to be pruned. The archive log files that are included in a backup are automatically pruned on a full database backup cycle. Therefore, the archive log must be large enough to contain the logs generated since the previous two full backups.

If you perform a full backup of the database every day, the archive log must be large enough to hold the log files for client activity that occurs over two days. Typically 600 - 4000 bytes of log space are used when an object is stored in the server. Therefore you can estimate a starting size for the archive log using the following calculation:

```
objects stored per day x 3000 bytes per object x 2 days
```

For example:

```
5,000,000 objects/day x 3000 bytes/object x 2 days = 30,000,000,000 bytes,
or 30 GB
```

It is important to maintain adequate space for the archive log directory. If the drive or file system where the archive log directory is located becomes full and there is no archive failover log directory, the data remains in the active log directory. This condition can cause the active log to fill up, which causes the server to stop.

Archive failover log space

The archive failover log is used by the server if the archive log directory runs out of space.

Specifying an archive failover log directory can prevent problems that occur if the archive log runs out of space. If both the archive log directory and the drive or file system where the archive failover log directory is located become full, the data remains in the active log directory. This condition can cause the active log to fill up, which causes the server to halt.

Work sheet for planning space for the Tivoli Storage Manager server

You can use the work sheet to help you plan the amount and location of storage needed for the Tivoli Storage Manager server.

Item	Space required	Location
The *instance directory* for the server, which is a directory that contains files specifically for this server instance (the server options file and other server-specific files)		
The database		
Active log		
Archive log		
Optional: Log mirror for the active log		
Optional: Secondary archive log (failover location for archive log)		

Server naming best practices

Coordinating the names for the different items associated with a server instance can make your life easier.

Instance user ID

The instance user ID is used as the basis for other names related to the server instance. The instance user ID is also called the instance owner.

For example: tsminst1

The instance user ID is the user ID that must have ownership or read/write access authority to all directories that you create for the database and the recovery log. If you run the server under the instance user ID, that user ID must also have read/write access to the directories that are used for any **FILE** device classes.

Instance user home directory

The home directory can be created when creating the user ID, by using the option (-m) to create a home directory if it does not exist already. Depending on local settings, the home directory might have the form: `/home/instance_user_ID`

For example: `/home/tsminst1`

Database instance name

The database instance name must be the same as the instance user ID under which you run the server instance.

For example: `tsminst1`

Instance directory

The instance directory can have any name that you want. For easier identification, use a name that ties the directory to the instance name.

You can create the instance directory as a subdirectory of the home directory for the instance user ID. For example: `/home/`*`instance_user_ID`*`/`*`instance_user_ID`*

The following example places the instance directory in the home directory for user ID tsminst1: `/home/tsminst1/tsminst1`

You can also create the directory in another location, for example: `/tsmserver/tsminst1`

Database name

The database name is always TSMDB1, for every server instance. This name cannot be changed.

Server name

The server name is an internal name for Tivoli Storage Manager, and is used for operations that involve communication among multiple Tivoli Storage Manager servers. Examples include server-to-server communication and library sharing. The server name is also used when you add the server to the Administration Center so that it can be managed using that interface.

Use a unique name for each server. For easy identification in the Administration Center (or from a QUERY SERVER command), use a name that reflects the location or purpose of the server.

If you use the wizard, the default name that is suggested is the host name of the system that you are using. You can use a different name that is meaningful in your environment. If you have more than one server on the system and you use the wizard, you can use the default name for only one of the servers. You must enter a unique name for each server.

For example:

PAYROLL
SALES

For more information about server names, see *Tivoli Storage Manager Administrator's Guide*.

Directories for database space and recovery log

The directories can be named according to local practices. For easier identification, consider using names that tie the directories to the server instance.

For example, for the archive log:

```
/tsminst1_archlog
```

Installation directories

Installation directories for the Tivoli Storage Manager server include the server, DB2, device, language, and Administration Center directories. Each one contains several additional directories.

The default directories and their subdirectories are listed here for the server, DB2, devices, languages, and Administration Center:

- **Server directory** (/opt/tivoli/tsm/server/bin), which contains:
  - Server code and licensing
- **Additional server directories**:
  - The command and message help are located in the /opt/tivoli/tsm/server/bin/*lang*/dsmserv.hlp directory, where *lang* is the language you select.
  - Tivoli inventory (/opt/tivoli/tsm/tivinv)
- **DB2 directories**

  The DB2 product that is installed as part of the installation of the Tivoli Storage Manager server has the directory structure as documented in DB2 information sources.

  For more details, you can begin with this information center: http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. From this Web site, you can search using this term: directory structure. Many of the directories that are listed in the information center topics contain vital information about the DB2 instance, the database, and configuration. Protect these directories and files as you do the server directories.
- **Device directories**
  - /usr/kernel/drv/
  - /usr/kernel/drv/sparcv9 for SPARC architecture
  - /usr/kernel/drv/amd64 for x86_64 architecture
- **Language directory**

  Language-dependent portions of the program are located here:

  /opt/tivoli/tsm/server/bin/*lang*, where *lang* is the language you select.

  You can use U.S. English, German, French, Italian, Spanish, Brazilian Portuguese, Korean, Japanese, traditional Chinese, simplified Chinese, Chinese GBK, Chinese Big5, and Russian.
- **Administration Center directories**

  The Administration Center directory (/opt/tivoli/tsm/AC) contains the following directories:
  - WebSphere (/opt/tivoli/tsm/AC/ISCW61)
  - Integrated Solutions Console (/opt/tivoli/tsm/AC/ISCW61)
  - Tivoli Common Reporting (/opt/tivoli/tsm/AC/data/database)
  - Administration Center (/opt/tivoli/tsm/AC/ISCW61)

Chapter 2. Installing Tivoli Storage Manager

To install Tivoli Storage Manager 6.1, you can use the graphical installation wizard, the console wizard, or the command line in silent mode.

Using the Tivoli Storage Manager installation software, you can install the following components:

- Tivoli Storage Manager Server

  Tip: The Tivoli Storage Manager client application programming interface (API) is automatically installed when you select the server component.
- Tivoli Storage Manager Server Languages
- Tivoli Storage Manager License
- Tivoli Storage Manager Device Driver
- Tivoli Storage Manager Storage Agent

Important: Log in as the root user. If you do not log in as root, certain key Tivoli Storage Manager functions will not work properly.

1. If you are installing the products using the Tivoli Storage Manager DVD, complete the following steps:

   Insert the Tivoli Storage Manager DVD into a DVD drive. Ensure that the DVD is mounted on directory /dvdrom and change to that directory.
2. If you downloaded the program from Passport Advantage as an executable file, complete the following steps.

   a. Verify that you have enough space to store the installation files when they are extracted from the product package. See the download document for the space requirements:

      Tivoli Storage Manager: http://www.ibm.com/support/docview.wss?uid=swg24018517

      Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24018520

      System Storage™ Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24018523
   b. Change to the directory where you placed the executable file.

      Tip: 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.
   c. Change the file permissions by entering the following command:

      ```
      chmod a+x package_name.bin
      ```

      The *package_name* is typically a name such as `CZ1N1ML`.
   d. Extract the installation files:

      ```
      ./package_name.bin
      ```

      The package is large, so the extraction takes some time.
3. Select one of the following ways of installing Tivoli Storage Manager:

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Installation wizard
"Installing Tivoli Storage Manager using the installation wizard"

Command-line console wizard
"Installing Tivoli Storage Manager using the console installation wizard" on page 13

Silent mode
"Installing Tivoli Storage Manager in silent mode" on page 13

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

Installing Tivoli Storage Manager using the installation wizard

Using the installation wizard is one method of installing Tivoli Storage Manager.

To install Tivoli Storage Manager using the installation wizard, complete the following steps:

1. Select a method to start the installation wizard:
   - To start the wizard without saving your responses, enter the following command:
     ```
     ./install.bin
     ```
   - To start the wizard and save your responses, enter the following command, and specify the -r option:
     ```
     ./install.bin -r /response.rsp
     ```

   The Tivoli Storage Manager installation wizard starts.

   Important: Before installing any Tivoli Storage Manager components, ensure that the LD_LIBRARY_PATH_64 environment variable is *not* set.
2. Select the language for your installation and follow the wizard directions, selecting **Next** to step through the wizard. You must accept the license agreement to proceed.

   Select the components that you want to install (server, languages, licenses, device driver, storage agent). There is no default so you must make a selection or you will receive an error message and be returned to the components' page.

   The Tivoli Storage Manager client application programming interface (API) and DB2 Version 9.5, fix pack 2, are automatically installed when you select the server component.

At the end of the installation, a message is displayed on the summary page that Tivoli Storage Manager 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:

```
/var/tivoli/tsm
```

To continue on and configure Tivoli Storage Manager, see Chapter 3, "Taking the first steps after you install Tivoli Storage Manager," on page 19.

Installing Tivoli Storage Manager using the console installation wizard

Using the console installation wizard is one method of installing Tivoli Storage Manager.

To install Tivoli Storage Manager using the console installation wizard, complete the following steps:

1. To start the wizard without saving your responses, enter the following command:

   ```
   ./install.bin -i console
   ```

   To start the wizard and save your responses, enter the following command, and specify the -r option:

   ```
   ./install.bin -i console -r /response.rsp
   ```

   Important: Before installing any Tivoli Storage Manager components, ensure that the LD_LIBRARY_PATH_64 environment variable is *not* set.

2. Select the language for your installation and follow the wizard directions, selecting **Next** to step through the wizard. You must accept the license agreement to proceed.

   Select the components that you want to install (server, languages, licenses, device driver, storage agent). There is no default so you must make a selection or you will receive an error message and be returned to the components' page.

   The Tivoli Storage Manager client application programming interface (API) and DB2 Version 9.5, fix pack 2, are automatically installed when you select the server component.

At the end of the installation, a message is displayed on the summary page that Tivoli Storage Manager 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:

```
/var/tivoli/tsm
```

To continue on and configure Tivoli Storage Manager, see Chapter 3, "Taking the first steps after you install Tivoli Storage Manager," on page 19.

Installing Tivoli Storage Manager in silent mode

Running an installation in the background is one method of installing Tivoli Storage Manager.

To install Tivoli Storage Manager in silent mode, select one of the following options and enter the following commands:

Restriction:

You must include LICENSE_ACCEPTED=true or the installation fails.

Changing the installation directory (the USER_INSTALL_DIR variable) is not supported.

Before installing any Tivoli Storage Manager components, ensure that the LD_LIBRARY_PATH_64 environment variable is not set.

- To start the silent installation and include all of the Tivoli Storage Manager components, enter the following command on a single line:

```
./install.bin -i silent -DLICENSE_ACCEPTED=true
-DINSTALL_SERVER=1
-DINSTALL_LICENSE=1 -DINSTALL_DEVICES=1
-DINSTALL_STAGENT=1
```

You can install the following server language-packs during the silent installation, using these variables:

- INSTALL_GERMAN
- INSTALL_SPANISH
- INSTALL_FRENCH
- INSTALL_ITALIAN
- INSTALL_BRPORTUGUESE
- INSTALL_KOREAN
- INSTALL_JAPANESE
- INSTALL_RUSSIAN
- INSTALL_SCHINESE
- INSTALL_TCHINESE
- INSTALL_ENGLISHUTF8
- INSTALL_GERMANUTF8
- INSTALL_SPANISHUTF8
- INSTALL_FRENCHUTF8
- INSTALL_ITALIANUTF8
- INSTALL_PTBUTF8
- INSTALL_KOREANUTF8
- INSTALL_JAPANESEUTF8
- INSTALL_SCHINESEUTF8
- INSTALL_RUSSIANUTF8
- INSTALL_TCHINESEUTF8
- INSTALL_BIG5CH

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

```
./install.bin -i silent -DLICENSE_ACCEPTED=true
-DINSTALL_SERVER=1
-DINSTALL_GERMAN=1 -DINSTALL_LICENSE=1
```

- To use an existing response file, enter the following command:

  ```
  ./install.bin -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. The response file contains variables that you selected during a prior installation, using the GUI or console wizard.

  If you include LICENSE_ACCEPTED=true in the response file manually, then issue this command:

  ```
  ./install.bin -i silent -f response_file
  ```

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

Remember: If you previously installed a server, ensure that you select the same directory when you install a language pack, license, or device driver. 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 Tivoli Storage Manager was 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:

/var/tivoli/tsm

To continue on and configure Tivoli Storage Manager, see Chapter 3, "Taking the first steps after you install Tivoli Storage Manager," on page 19.

Solaris zones

The Tivoli Storage Manager server supports the Solaris Zone feature available with Solaris Version 10. There are two different types of supported zones: global and local.

The global zone is the default zone on a Solaris host system and controls system resources. Local zones can be created and controlled from the global zone, and they run processes in isolation on the same host system.

To install the Tivoli Storage Manager server to either the global zone or a local zone, log in to the zone you want to install the server to, and complete the normal installation process for your system. You can install the server to more than one zone by completing each installation separately. The Tivoli Storage Manager server is installed only to the current zone.

Refer to the chapter on using devices in the *Administrator's Guide* for information on installing the Tivoli Storage Manager device driver to a Solaris zone.

For more information on Solaris zones, see your Solaris system administration documentation.

Creating a Solaris zone

To install a Tivoli Storage Manager server to a Solaris zone, the zone must have write access to the /usr, /opt, /var, and /tmp directories. A default zone will not have write access to the /usr directory.

The Tivoli Storage Manager server installation process requires a Solaris local zone to have write permissions for the /usr, /opt, /var and /tmp directories when creating the local zone from the global zone. By default, a local zone has write permission to /opt, /var and /tmp directories but it does not have a write permission for /usr directory. In order to install Tivoli Storage Manager Version 6.1 to a local zone on the Solaris platform, this zone should be configured with write access to /usr directory.

Complete the following procedure to create a basic local zone with write access to the /usr directory.

1. From the global zone, create a zone directory:

   ```
   # mkdir -m 700 /zones/sunshade1
   ```

2. Configure the zone:

   ```
   # zonecfg -z sunshade1
   ```

```
sunshade1: No such zone configured
Use 'create' to begin configuring a new zone.
zonecfg:sunshade1> create
zonecfg:sunshade1> set zonepath=/zones/sunshade1
zonecfg:sunshade1> set autoboot=true
zonecfg:sunshade1> remove inherit-pkg-dir dir=/usr
zonecfg:sunshade1> add net
zonecfg:sunshade1:net> set address=9.11.100.1
zonecfg:sunshade1:net> set physical=bnx0
zonecfg:sunshade1:net> end
zonecfg:sunshade1> add attr
zonecfg:sunshade1:net> set name=comment
zonecfg:sunshade1:net> set type=string
zonecfg:sunshade1:net> set value="This is sunshade1..."
zonecfg:sunshade1:net> end
zonecfg:sunshade1> verify
zonecfg:sunshade1> commit
zonecfg:sunshade1>exit
```

3. Verify the zone:

```
# zoneadm list -cv
```

```
  ID NAME         STATUS  PATH                  BRAND    IP
   0 global        running  /                    native   shared
   - sunshade1     configured /zones/sunshade1   native   shared
```

```
# zonecfg -z sunshade1 info
```

```
zonename: sunshade1
zonepath: /zones/sunshade1
brand: native
autoboot: false
bootargs:
pool:
limitpriv:
scheduling-class:
ip-type: shared
inherit-pkg-dir:
        dir: /lib
inherit-pkg-dir:
        dir: /platform
inherit-pkg-dir:
        dir: /sbin
net:
        address: 9.11.100.1
        physical: bnx0
attr:
        name: comment
        type: string
        value: "This is sunshade1..."
```

4. Install the zone:

```
# zoneadm -z sunshade1 install
```

5. Start the zone:

```
# zoneadm -z sunshade1 boot
```

```
# zoneadm list -cv
```

```
  ID NAME         STATUS  PATH                  BRAND    IP
   0 global        running  /                    native   shared
   - sunshade1     configured /zones/sunshade1   native   shared
```

6. Configure the zone for the network:

```
# zlogin -C sunshade1 # -- configure zone for the network
```

After a local zone is created for Tivoli Storage Manager Version 6.1, the Tivoli Storage Manager server, storage agent and device driver packages can be installed to the zone. You can install and run the server, storage agent and device driver in local zones using the same process to install and run them in global zones.

Server language locales

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

You can use the following languages:

Table 8. Server languages for Solaris

Language	LANGUAGE option value
Chinese, Simplified	zh
	zh_CN.UTF-8
Chinese, Traditional	zh_TW
	zh_TW.BIG5
	zh_TW.UTF-8
English	en_US.ISO8859-1
	en_US.UTF-8
French	fr_FR.ISO8859-1
	fr_FR.UTF-8
German	de_DE.ISO8859-1
	de_DE.UTF-8
Italian	it_IT.ISO8859-1
	it_IT.UTF-8
Japanese	ja
	ja_JP.UTF-8
Korean	ko
	ko_KR.UTF-8
Portuguese, Brazilian	pt_BR.ISO8859-1
	pt_BR.UTF-8
Russian	ru_RU.ISO8859-5
	ru_RU.UTF-8
Spanish	es_ES.ISO8859-1
	es_ES.UTF-8
Table note: Refer to the *Administrator's Reference* for further information on setting the LANGUAGE option.	

Restriction: For Administration Center users, some characters might not display properly if the Web browser version is not the same language as the server. If this problem occurs, use a browser version that uses the same language as the server.

Installing a language package

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

To enable support for a given locale, complete one of the following tasks:

- 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 it_IT.ISO8859-1 locale, set the LANGUAGE option to it_IT.ISO8859-1. See "Server language locales" on page 17.

  If the locale successfully initializes, it controls the date, time, and number formatting for the server. If the locale does not successfully initialize, the server uses the U.S. English message files and the date, time, and number format.

  If an administrative client connects to the server and specifies a locale that is different from the one that is specified at the server, the server tries to initialize that specified locale for returning messages to the client.
- Set the LC_MESSAGES environment variable to match the value that is set in the server options file. For example, to set the environment variable for Italian, enter the following:

  ```
  export LC_MESSAGES=it_IT
  ```

  If the locale successfully initializes, it controls the date, time, and number formatting for the server. If the locale does not successfully initialize, the server uses the U.S. English message files and the date, time, and number format.

Modifying kernel parameter values

Update the kernel configuration parameters before configuring Tivoli Storage Manager to avoid operational issues when using the server.

Before you begin, review details about kernel parameter tuning for Tivoli Storage Manager here: http://www.ibm.com/support/docview.wss?uid=swg27015156.

The DB2OSCONF utility makes recommendations for kernel parameter values based on the size of a system. The recommended values should be able to accommodate most workloads. You must run the DB2OSCONF utility after installing Tivoli Storage Manager. A reboot of your workstation might be necessary.

To retrieve the list of currently supported options, issue the following command:

```
db2osconf -h:
```

The supported options appear:

```
-c                      # Client only ---> remove
-f                      # Compare to current
-h                      # Help screen
-l                      # List current
-m   <mem in GB>        # Specify memory in GB
-n   <num CPUs>         # Specify number of CPUs
-p   <perf level>       # Msg Q performance level (0-3)
-s   <scale factor>     # Scale factor (1-3)
-t   <threads>          # Number of threads
```

For more details, you can begin with this information center: http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. From this Web site, you can search for the DB2OSCONF utility, and find more about parameter descriptions and examples.

Chapter 3. Taking the first steps after you install Tivoli Storage Manager

After installing Tivoli Storage Manager Version 6.1, prepare for the configuration. Then, either use the configuration wizard to configure the Tivoli Storage Manager instance or configure the instance manually.

Configure the Tivoli Storage Manager server instance by completing the following steps:

1. Reset kernel values by issuing the DB2OSCONF utility. See "Modifying kernel parameter values" on page 18.
2. Create the directories and user ID for the server instance. See "Creating the directories and the user ID for the server instance" on page 20.
3. Configure a Tivoli Storage Manager instance. Select one of the following options:
   - Use the Tivoli Storage Manager configuration wizard on your local system. See "Configuring Tivoli Storage Manager using the configuration wizard" on page 22.
   - Use the Tivoli Storage Manager configuration wizard in the Administration Center. See "Configuring Tivoli Storage Manager using the Administration Center" on page 22.
   - Manually configure the new Tivoli Storage Manager instance. See "Configuring the server instance manually" on page 23. Complete the following steps during a manual configuration.
     a. Set up your directories and create the Tivoli Storage Manager instance. See "Creating the server instance" on page 23.
     b. Create a new server options file by copying the sample file in order to set up communications between the server and clients. See "Configuring server and client communications" on page 24..
     c. Issue the DSMSERV FORMAT command to format the database. See "Formatting the database and log" on page 27.
     d. Configure your system for database backup. See "Preparing the database manager for backup" on page 27.
4. Start the Tivoli Storage Manager server instance. See "Starting the server instance" on page 29.
5. Register your license. See "Registering licenses" on page 31.
6. Prepare your system for database backups. See "Preparing the system for database backups" on page 32.
7. Monitor the server. See "Monitoring the server" on page 33.

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Creating the directories and the user ID for the server instance

Create the directories that the Tivoli Storage Manager server instance needs for database and recovery logs, and create the user ID for the Tivoli Storage Manager server instance.

Review the information about planning space for the server before completing this task.

1. Create directories that the server requires. You need unique, empty directories for each of the items shown in the following table. Create the database directories, the active log directory, and the archive log directory on different physical volumes. See the planning information for details.

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which is a directory that will contain files specifically for this server instance (the server options file and other server-specific files)	`mkdir /home/tsminst1/tsminst1` **Tip:** For this example, the instance directory is created in the home directory for the instance owner ID, tsminst1. You can place it in other locations.	

The database directories	`mkdir /tsmdb001`
	`mkdir /tsmdb002`
	`mkdir /tsmdb003`
	`mkdir /tsmdb004`	

Active log directory	`mkdir /tsmlog`	
Archive log directory	`mkdir /tsmarchlog`	
Optional: Directory for the log mirror for the active log	`mkdir /tsmlogmirror`	
Optional: Secondary archive log directory (failover location for archive log)	`mkdir /tsmarchlogfailover`	

2. Create the user ID that will own the server instance. You use this user ID when you create the server instance in a later step.

   Create a user ID and group that will be the owner of the Tivoli Storage Manager server instance.

   a. Create the user ID and group.

      Restriction: The user ID and group name must comply with the following rules:

      - In the user ID, only lowercase letters (a-z), numerals (0-9), and the underscore character (_) can be used. The user ID must be 8 characters or less, and cannot start with *ibm*, *sql*, *sys*, or a numeral.
      - In the group name, only lowercase letters (a-z), numerals (0-9), and the underscore character (_) can be used. The group name must be 8 characters or less, and cannot start with *ibm*, *sql*, or a numeral.

For example, create user ID `tsminst1` in group `tsmsrvrs`. The following examples show how to create this user ID and group using operating system commands.

```
# groupadd tsmsrvrs
# useradd -d /export/home/tsminst1 -m -g tsmsrvrs
     -s /bin/ksh tsminst1
# passwd tsminst1
```

b. Log off, then log in to your system, using the new user ID and password. Use telnet so that you are prompted for the password and can change it if necessary.

c. If a configuration profile does not exist for the user ID, create the file. For example, create a `.profile` file if you are using the Korn shell (ksh).

d. For all directories that were created for the server instance, ensure that the user ID that owns the server instance has access. The directories to check include the instance directory and all database and log directories. Change the owner of the directories that were created to the user ID for the server instance.

e. Log off the new user ID.

Configuring the server instance

After you have installed Tivoli Storage Manager Version 6.1 and prepared for the configuration, configure the Tivoli Storage Manager server instance.

Configure a Tivoli Storage Manager server instance by selecting one of the following options:

- Use the Tivoli Storage Manager configuration wizard on your local system. See "Configuring Tivoli Storage Manager using the configuration wizard" on page 22.
- Use the Tivoli Storage Manager configuration wizard in the Administration Center. See "Configuring Tivoli Storage Manager using the Administration Center" on page 22.
- Manually configure the new Tivoli Storage Manager instance. See "Configuring the server instance manually" on page 23. Complete the following steps during a manual configuration.
  1. Set up your directories and create the Tivoli Storage Manager instance. See "Creating the server instance" on page 23.
  2. Create a new server options file by copying the sample file in order to set up communications between the server and clients. See "Configuring server and client communications" on page 24..
  3. Issue the DSMSERV FORMAT command to format the database. See "Formatting the database and log" on page 27.
  4. Configure your system for database backup. See "Preparing the database manager for backup" on page 27.

Configuring Tivoli Storage Manager using the configuration wizard

The wizard offers a guided approach to configuring a server. By using the wizard, you can avoid some configuration steps that are complex when done manually. Start the wizard on the system where you installed the Version 6.1 server program.

Before beginning the configuration wizard, you must complete all preceding steps to prepare for the configuration, including installing the Version 6.1 server program, creating the database and log directories, and creating the directories and user ID for the server instance.

1. Ensure that the following requirements are met:

   - The system where you installed the Version 6.1 server program must have the X Window client. You must also be running an X Window server on your desktop.
   - The system must have one of the following protocols enabled. Ensure that the port that the protocol uses is not blocked by a firewall.
     - Secure shell (SSH). Ensure that the port is set to the default value, 22.
     - Remote shell (RSH).
     - Remote Execution Protocol (REXEC).
   - You must be able to log in to the Version 6.1 system with the user ID that you created for the server instance, using the SSH, RSH, or REXEC protocol. When using the wizard, you must provide this user ID and password to access that system.

2. To start the local version of the wizard:

   Open the dsmicfgx program in the `/opt/tivoli/tsm/server/bin` directory. This wizard can only be run as a root user.

   Follow the instructions to complete the configuration. The wizard can be stopped and restarted, but the server will not be operational until the entire configuration process is complete.

Configuring Tivoli Storage Manager using the Administration Center

The Administration Center wizard offers a guided approach to configuring a server. By using this wizard, you can avoid some configuration steps that are complex when done manually.

Before beginning the configuration wizard, you must complete all preceding steps to prepare for the configuration, including installing the Version 6.1 server program, creating the database and log directories, and creating the directories and user ID for the server instance.

1. Ensure that the following requirements are met:

   - The system must have one of the following protocols enabled. Ensure that the port that the protocol uses is not blocked by a firewall.
     - Secure shell (SSH). Ensure that the port is set to the default value, 22.
     - Remote shell (RSH).
     - Remote Execution Protocol (REXEC).

- You must be able to log in to the Version 6.1 system with the user ID that you created for the server instance, using the SSH, RSH, or REXEC protocol. When using the wizard, you must provide this user ID and password to access that system.

2. Start the Administration Center by entering the following address in a supported Web browser:

   ```
   https://machine_name:9043/ibm/console
   ```

   Tip: The machine_name is the network name or IP address of the workstation on which you installed the Administration Center. The default Web administration port (HTTPS) is 9043.
3. Log in, using the Integrated Solutions Console user ID and password you created during the installation. After you successfully log in, the Integrated Solutions Console welcome page is displayed. Expand the Tivoli Storage Manager folder in the Work Items list and click **Getting Started** to display the Tivoli Storage Manager welcome page. This page provides instructions for using the Administration Center.
4. Go to **Tivoli Storage Manager** → **Manage Servers** and use the menu to find the Create Server Instance wizard.
5. After you open the Create Server Instance wizard, a list of tasks for setting up a Tivoli Storage Manager server instance displays. Click **Next** to continue.
6. Enter the TCP/IP server address and system administrator's (root user ID) logon credentials, and click **Next**.
7. Specify the instance and server configuration information, using the wizard to guide you.
8. Verify the settings on the Summary page. After you have verified the information, click **Finish**. The Tivoli Storage Manager instance is configured in steps as indicated in the progress bar on the following page.

After the configuration is finished, the wizard exits to the Manage Servers page where you can find your new server.

Configuring the server instance manually

After installing Tivoli Storage Manager Version 6.1, you can configure Tivoli Storage Manager manually instead of using the configuration wizard.

Creating the server instance

Create a Tivoli Storage Manager instance by issuing the db2icrt command.

You can have one or more server instances on one workstation.

Important: Before you run the db2icrt command, ensure the following items:

- The home directory for the user (/home/tsminst1) exists. If there is no home directory, you must create it.

  The instance directory, which can be in the home directory, stores the following files for the server instance:

  – The server options file, `dsmserv.opt`
  – The `dsmserv.v6lock` file

- Device configuration file, if the DEVCONFIG server option does not specify a fully qualified name
- Volume history file, if the VOLUMEHISTORY server option does not specify a fully qualified name
- Volumes for **DEVTYPE=FILE** storage pools, if the directory for the device class is not fully specified, or not fully qualified
- User exits
- Trace output (if not fully qualified)

- A file called .profile exists in the home directory (/home/tsminst1), even if this .profile file is empty. The .profile file is owned by the instance user ID.

1. Log in using the root user ID and create a Tivoli Storage Manager instance. The name of the instance must be the same name as the user that owns the instance. Use the db2icrt command and enter the command on one line:

   ```
   # /opt/tivoli/tsm/db2/instance/db2icrt -a SERVER -u
   instance_name instance_name
   ```

   For example, if your user ID for this instance is tsminst1, use the following command to create the instance. Place it all on one line.

   ```
   # /opt/tivoli/tsm/db2/instance/db2icrt -a SERVER
   -u tsminst1 tsminst1
   ```

   Remember: From this point on, use this new user ID when configuring your Tivoli Storage Manager server. Log out of the root user ID and log in under the new instance-user ID.
2. Change the default directory for the database to be the same as the instance directory for the server. If you have multiple servers, log in under the instance ID for each server. Issue this command:

   ```
   $ db2 update dbm cfg using dftdbpath instance_directory
   ```

   For example:

   ```
   $ db2 update dbm cfg using dftdbpath /home/tsminst1/tsminst1
   ```
3. Create a new server options file. See "Configuring server and client communications."

Configuring server and client communications

A default sample server options file, dsmserv.opt.smp, is created during Tivoli Storage Manager installation in the /opt/tivoli/tsm/server/bin directory. You must set up communications between the server and clients by creating a new server options file. To do so, copy the sample file to the directory for the server instance.

Ensure that you have a server instance directory, for example `/home/tsminst1/instance1`, and copy the sample file to this directory. Name the new file `dsmserv.opt` and edit the options. Complete this set-up before you initialize the server database (see "Formatting the database and log" on page 27. Each sample or default entry in the sample options file is a comment, a line beginning with an asterisk (*). Options are not case-sensitive and one or more blank spaces are allowed between keywords and values.

When editing the options file, follow these guidelines:

- Remove the asterisk at the beginning of the line to activate an option.
- Begin entering the options in any column.
- Enter only one option per line, and the option must be on only one line.

- If you make multiple entries for a keyword, the Tivoli Storage Manager server uses the last entry.

If you change the server options file, you must restart the server for the changes to take effect. See the *Administrator's Reference* for a description of all server options.

You can specify one or more of the following communication methods:

- Shared memory
- TCP/IP Version 4 or Version 6
- Simple network management protocol (SNMP) DPI®

  Note: This is not supported on Sun Solaris x86_64.

TCP/IP options:

Select from a range of TCP/IP options for the Tivoli Storage Manager server or retain the default.

The following is an example of a list of TCP/IP options you can use to set up your system.

```
commmethod        tcpip
  tcpport         1500
  tcpwindowsize   0
  tcpnodelay      yes
```

Tip: You can use TCP/IP Version 4, Version 6, or both.

TCPPORT
The server TCP/IP port address. The default value is 1500.

TCPWINDOWSIZE
Specifies the size of the TCP/IP buffer that is used when sending or receiving data. The window size that is used in a session is the smaller of the server and client window sizes. Larger window sizes use additional memory but can improve performance.

You can specify an integer from zero to 64. To use the default window size for the operating system, specify zero.

TCPNODELAY
Specifies whether or not the server sends small messages or lets TCP/IP buffer the messages. Sending small messages can improve throughput but increases the number of packets sent over the network. Specify YES to send small messages or NO to let TCP/IP buffer them. The default is YES.

TCPADMINPORT
Specifies the port number on which the server TCP/IP communication driver is to wait for requests other than client sessions. The default value is 1500.

Shared memory options:

You can use shared memory communications between clients and servers on the same system. To use shared memory, TCP/IP Version 4 must be installed on the system. This is the default communication method.

The following example shows a shared memory setting:

```
commmethod     sharedmem
   shmport     1510
```

In this example, SHMPORT specifies the TCP/IP port address of a server when using shared memory. Use the SHMPORT option to specify a different TCP/IP port. The default port address is 1510.

The maximum number of concurrent shared memory sessions is based on available system resources. Each shared memory session uses one shared memory region of up to 4 MB, and four IPCS message queues, depending on the Tivoli Storage Manager client level.

Ensure that you have run the DB2OSCONF utility so that the maximum number of message queues (MSGMNI) is correct.

If the server and client are not run under the same user ID, then the server must be root. This prevents shared memory communication errors.

SNMP DPI subagent options:

Tivoli Storage Manager implements a simple network management protocol (SNMP) subagent. You can configure the SNMP subagent to send traps to an SNMP manager, such as NetView®, and to provide support for a Management Information Base (MIB).

For details about configuring SNMP for use with Tivoli Storage Manager, see the *Administrator's Guide*.

The subagent communicates with the snmp daemon, which in turn communicates with a management application. The snmp daemon must support the DPI protocol. The subagent process is separate from the Tivoli Storage Manager server process, but the subagent gets its information from a server options file. When the SNMP management application is enabled, it can get information and messages from servers.

Use the following list of SNMP DPI options as an example of a SNMP setting. You must specify the COMMMETHOD option. For details about the other options, see the *Administrator's Reference*.

```
commmethod                    snmp
   snmpheartbeatinterval      5
   snmpmessagecategory        severity
```

Formatting the database and log

Use the DSMSERV FORMAT command to initialize a server instance. No other server activity is allowed while initializing the database and recovery log.

After you have completed setting up server communications, you are ready to initialize the database. Do not place the directories on file systems that might run out of space. If certain directories (for example, the archive log) become unavailable or full, the server stops. See the *Administrator's Reference*.

Before you issue the DSMSERV FORMAT command, log on to the system as the instance owner that you created. See "Creating the server instance" on page 23 if you have not yet created a server instance. If you are running under something other than the English regional locale, the DB2CODEPAGE system environment variable must be set before you issue the DSMSERV FORMAT command. Set it to DB2CODEPAGE=819:

```
db2set -i tsminst1 DB2CODEPAGE=819
```

Example: Format a database

```
dsmserv format dbdir=/tsm/db
activelogdir=/tsm/activelog archlogdir=/tsm/archlog
```

Preparing the database manager for backup

To back up the data in the database to Tivoli Storage Manager, you must enable the database manager and configure the Tivoli Storage Manager application programming interface (API).

If you use the Tivoli Storage Manager Server Instance Configuration wizard to create a Tivoli Storage Manager server instance, you do not need to complete these steps. If you are configuring an instance manually, complete the following steps before issuing either the BACKUP DB or the RESTORE DB commands.

In the following commands, the examples use `tsminst1` for the server instance user ID and `/home/tsminst1/tsminst1` for the Tivoli Storage Manager server instance directory. Replace these values with your actual values in the commands.

1. Set the DSMI_ api environment-variable configuration for the database instance:
   a. Log in using the `tsminst1` user ID.
   b. When user `tsminst1` is logged in, ensure that the DB2 environment is properly initialized. The DB2 environment is initialized by running the `/home/tsminst1/sqllib/db2profile` script, which normally runs automatically from the user ID's profile. If `/home/tsminst1/.profile` does not run the db2profile script, add the following lines to `/home/tsminst1/.profile`:

      ```
      if [ -f /home/tsminst1/sqllib/db2profile ]; then
            . /home/tsminst1/sqllib/db2profile
        fi
      ```

   c. Add or update the following lines to the userprofile file in the `/home/tsminst1/sqllib` directory:

      ```
      export DSMI_CONFIG=/home/tsminst1/tsminst1/tsmdbmgr.opt
      export DSMI_DIR=/opt/tivoli/tsm/client/api/bin64
      export DSMI_LOG=/home/tsminst1/tsminst1
      ```

2. Log out and log in again as tsminst1, or issue this command:

   ```
   . ~/.profile
   ```

3. Create a file called `tsmdbmgr.opt` in the `/home/tsminst1/tsminst1` directory and add the following line:

```
SERVERNAME TSMDBMGR_TSMINST1
```

4. Add the following lines to the Tivoli Storage Manager API dsm.sys configuration file. The dsm.sys configuration file is in the following default location:

   ```
   /opt/tivoli/tsm/client/api/bin64/dsm.sys
   ```

   Avoid placing the server name, TSMDBMGR_TSMINST1, first in dsm.sys because it should not be the system-wide default. In this example, the added lines are after the stanza for server_a.

   ```
   Servername server_a
   COMMMethod TCPip
   TCPPort 1500
   TCPServeraddress node.domain.company.COM


   servername TSMDBMGR_TSMINST1
   commmethod tcpip
   tcpserveraddr localhost
   tcpport 1500
   passwordaccess generate
   passworddir /home/tsminst1/tsminst1
   errorlogname /home/tsminst1/tsminst1/tsmdbmgr.log
   nodename $$_TSMDBMGR_$$
   ```

5. Stop and start the database instance:
   a. Stop DB2:

      ```
      db2stop
      ```

   b. Start DB2:

      ```
      db2start
      ```

6. Set the API password:
   a. Ensure that the Tivoli Storage Manager server is started. See "Starting the server instance" on page 29 for the details.
   b. Log in using the root user ID.
   c. Source the database manager by running the following command.

      Important: Switch to the Korn shell (/bin/ksh) before running the following command.

      ```
      . /home/tsminst1/sqllib/db2profile
      ```

   d. Change the API password, using this command:

      ```
      /home/tsminst1/sqllib/adsm/dsmapipw
      ```

   e. When prompted by the dsmapipw command, specify `TSMDBMGR` as both the original and new password.
   f. Enter this operating system command:

      ```
      rm /home/tsminst1/tsminst1/tsmdbmgr.log
      ```

Starting the server instance

Verify that the server instance is correctly set up by starting the Tivoli Storage Manager instance. You can start the server when logged in to the system with the user ID you created for this instance. You can also start the server when logged in as the root user.

Before you start a Tivoli Storage Manager server instance, ensure you have created the dsmserv.opt file and put the parameters for this instance in that file. See "Configuring server and client communications" on page 24 if you have not yet created a dsmserv.opt file.

Remember: Starting the server is an operating system-level operation and has certain restrictions. If you do not have the permissions to use the dsmserv program, you can't start it. If you do not have authority to read/write files in the instance directory, you can't start that instance of the server.

Starting the server from the user ID that owns the server instance

The user ID that owns the server instance has a user profile that enables it to run the server with the necessary permissions.

To start a Tivoli Storage Manager server instance, complete the following steps:

1. Run the user profile (db2profile) before starting the server if you do not have one.

   Attention: If you are logged in as the instance user, the db2profile already copied to .profile when you defined the instance.

   If you are not logged in as an instance user and that profile did not run, you should do this step manually. A .profile is not automatically created.

   ```
   # . /home/tsminst1/sqllib/db2profile
   ```
2. Change to the instance directory you want to use.

   ```
   # cd instance_directory
   ```

   where *instance_directory* is the name of your Tivoli Storage Manager instance directory.
3. Start the server instance by issuing the following command:

   ```
   # /opt/tivoli/tsm/server/bin/dsmserv
   ```

   Note: The command runs in the foreground so that you can set an administrator ID and connect to the server instance.

The name for the instance of the Tivoli Storage Manager server is tsminst1. To start tsminst1, verify that you are in the home directory that you set up for the server instance and enter the following command

```
# . ~/sqllib/db2profile
# /opt/tivoli/tsm/server/bin/dsmserv
```

To start the server in the background, enter the following command:

```
# /opt/tivoli/tsm/server/bin/dsmserv -q &
```

To view the output from a server that is started with a command like this, see the nohup.out file.

Starting the server from the root user ID

With some setup, you can start the server from the root user ID. You can run the server using either the root user ID or the user ID that owns the server instance.

To start a Tivoli Storage Manager server instance from the root user ID, do the following steps:

1. If you plan to run the server using the root user ID, add the root user ID to the primary group of the user ID that owns the instance.
2. Change the `.profile` file for the root user to run the `db2profile` script for the instance user ID, using the following command. For example, if the instance name is tsminst1, then the root user ID must run `/home/tsminst1/sqllib/db2profile` to set the database environment variables and library.

   ```
   # . ~tsminst1/sqllib/db2profile
   ```

   Restriction: If you are running a Bourne shell, be sure to enter the fully qualified home directory for the instance user ID.

   ```
   # . <home_directory>/sqllib/db2profile
   ```

   where *home_directory* is the fully qualified home directory for the instance user ID.
3. Change to the instance directory. For example, for the server instance named tsminst1:

   ```
   # cd /home/tsminst1/tsminst1
   ```
4. Start the server instance.
   - To start the tsminst1 server using the root user ID and run it as the instance owner, use the -u option.

     ```
     # nohup /opt/tivoli/tsm/server/bin/dsmserv -u tsminst1 -q &
     ```

     With this command, the server program runs in the background.
   - To start the tsminst1 server using the root user ID and run it as the root user ID, issue the following command. If the root user ID is a member of the instance-user ID's primary group, the root user ID has authority to start the database manager.

     ```
     # /opt/tivoli/tsm/server/bin/dsmserv
     ```

     Important: The database and log files are written by the instance user ID, not the root user ID. Ensure that the permissions on the database and log directories allow read and write access by the instance user ID.

Automatically starting servers

You can automatically start servers at system startup. Use the `rc.dsmserv` script, which is provided for this purpose.

The `rc.dsmserv` script is located in `/opt/tivoli/tsm/server/bin`.

Tip: If you used the configuration wizard, you had the choice of starting the configured server automatically when the system is restarted. If you selected that choice, the startup of the server was added to the `/etc/inittab` file.

For each server that you want to automatically start, add an entry to the /etc/inittab file to run the rc.dsmserv script.

- Set the run level to the value that corresponds to multiuser mode, with networking enabled. Typically, the run level to use is 2, 3, or 5, depending on the operating system and its configuration. Consult documentation for your operating system for details on run levels.
- On the rc.dsmserv command, specify the instance owner name with the -u option, and the location of the server instance directory with the -i option.

Verify correct syntax for the entry by consulting documentation for your operating system.

For example, if the instance owner is tsminst1 and the server instance directory is /home/tsminst1/tsminst1, add the following entry to /etc/inittab, on one line:

```
tsm1:2:once:/opt/tivoli/tsm/server/bin/rc.dsmserv -u tsminst1
   -i /home/tsminst1/tsminst1 -q >/dev/console 2>&1
```

In this example, the ID for the process is tsm1, and the run level is set to 2.

If you have more than one server instance that you want to run, add an entry for each server instance. For example, if you have instance owner IDs tsminst1 and tsminst2, and instance directories /home/tsminst1/tsminst1 and /home/tsminst2/tsminst2, add the following entries to /etc/inittab. Each entry is on one line.

```
tsm1:2:once:/opt/tivoli/tsm/server/bin/rc.dsmserv -u tsminst1
   -i /home/tsminst1/tsminst1 -q >/dev/console 2>&1
tsm2:2:once:/opt/tivoli/tsm/server/bin/rc.dsmserv -u tsminst2
   -i /home/tsminst2/tsminst2 -q >/dev/console 2>&1
```

Stopping the server

You can stop the server without warning if an unexpected problem requires you to return control to the operating system. To avoid losing administrative and client node connections, stop the server only after current sessions have completed or been canceled.

To stop the server, issue the following command from the Tivoli Storage Manager command prompt:

```
halt
```

.

The server console stops.

Registering licenses

Immediately register any Tivoli Storage Manager licensed functions that you purchase so you do not lose any data after you start server operations, such as backing up your data. Use the REGISTER LICENSE command for this task.

Preparing the system for database backups

To prepare the system for automatic and manual database backups, you must specify the device class to be used.

Before you begin the setup, ensure that you have defined a tape or file device class. See the defining device classes section of the *Administrator's Guide*.

To set up your system for database backups, issue the SET DBRECOVERY command to specify a device class to be used for the backups. You can also change the device class to be used for database backups with the SET DBRECOVERY command.

Perform the following setup procedure:

1. If you did not use the configuration wizard (`dsmicfgx`) to configure the server, ensure that you have completed the steps to manually configure the system for database backups.
2. Select the device class to be used for backups of the database. Issue the following command from a IBM Tivoli Storage Manager administrative command line.

   ```
   set dbrecovery device_class_name
   ```

   The device class that you specify is used by the database manager for database backups. If you do not specify a device class with the SET DBRECOVERY command, the backup fails.

For example, to specify that the DBBACK device class is to be used, issue this command:

```
set dbrecovery dbback
```

When you are ready to back up your database, see the *Administrator's Reference*.

Running multiple server instances on a single system

It is possible to create more than one server instance on your system. Each server instance has its own instance directory, and database and log directories.

The set of files for one instance of the server are stored separately from those used by another server instance on the same system. Use the steps in "Creating the server instance" on page 23 for each new instance, including creating the new instance user.

To manage the system memory that is used by each server, use the DBMEMPERCENT server option to limit the percentage of system memory that can be used by the database manager of each server. If all servers are equally important, use the same value for each server. If one server is a production server and other servers are test servers, set the value for the production server to a higher value than the test servers.

Monitoring the server

When you start using server in production operation, monitor the space used by the server to ensure that the amount of space is adequate. Make adjustments as needed.

1. Monitor the active log, to ensure that the size is correct for the workload that is handled by the server instance.

   When the server workload is up to its typical expected level, and the space that is used by the active log is 80 - 90% of the space that is available to the active log directory, you might need to increase the amount of space. Whether you need to increase the space depends on the types of transactions in the server's workload, because transaction characteristics affect how the active log space is used.

   The following transaction characteristics can affect the space usage in the active log:

   - The number and size of files in backup operations
     - Clients such as file servers that back up large numbers of small files can cause large numbers of transactions that complete during a short period of time. The transactions might use a large amount of space in the active log, but for a short period of time.
     - Clients such as a mail server or a database server that back up large chunks of data in few transactions can cause small numbers of transactions that take a long time to complete. The transactions might use a small amount of space in the active log, but for a long period of time.
   - Network connection types
     - Backup operations that occur over fast network connections cause transactions that complete more quickly. The transactions use space in the active log for a shorter period of time.
     - Backup operations that occur over relatively slower connections cause transactions that take a longer time to complete. The transactions use space in the active log for a longer period of time.

   If the server is handling transactions with a wide variety of characteristics, the space that is used for the active log might go up and down by a large amount over time. For such a server, you might need to ensure that the active log typically has a smaller percentage of its space used. The extra space allows the active log to grow for transactions that take a very long time to complete, for example.

2. Monitor the archive log to ensure that space is always available.

   Remember: If the archive log becomes full, and the failover archive log becomes full, the active log can become full and the server will stop. The goal is to make enough space available to the archive log so that it never uses all its available space.
   You are likely to notice the following pattern:

   a. Initially, the archive log grows rapidly as typical client-backup operations occur.
   b. Database backups occur regularly, either as scheduled or done manually.
   c. After at least two, full database backups occur, log pruning occurs automatically. The space used by the archive log decreases when the pruning occurs.
   d. Normal client operations continue, and the archive log grows again.

e. Database backups occur regularly, and log pruning occurs as often as full database backups occur.

With this pattern, the archive log grows initially, then decreases, then might grow again. Over a period of time, as normal operations continue, the amount of space used by the archive log should reach a relatively constant level.

If the archive log continues to grow, consider taking one or both of these actions:

- Add space to the archive log. This might mean moving the archive log to a different file system.

  For information about moving the archive log, see the *Tivoli Storage Manager Administrator's Guide*.
- Increase the frequency of full database backups, so that log pruning occurs more frequently.

3. If you defined a directory for the failover archive log, determine whether any logs get stored in that directory during normal operations. If the failover log space is being used, consider increasing the size of the archive log. The goal is that the failover archive log is used only under unusual conditions, not in normal operation.

Chapter 4. Collecting, reporting, and monitoring data

IBM Tivoli Storage Manager supports reporting on historical data as well as real-time data using an AIX, Linux, or Windows IBM Tivoli Monitoring server.

Installing the Tivoli Storage Manager reporting and monitoring feature directly on a Tivoli Storage Manager Solaris server is not supported. But you can create a monitoring agent instance for the server on an AIX, Linux, or Windows IBM Tivoli Monitoring server to enable collecting and reporting of historical data and real-time monitoring.

Creating and configuring a monitoring agent on a Windows Tivoli Monitoring server

To collect and view historical reporting information or monitor real-time information, you must manually create and configure a Tivoli Storage Manager monitoring agent instance on a Tivoli Monitoring server.

Create and configure an instance of the Tivoli Storage Manager monitoring agent on a Tivoli Monitoring server. Use the following method for each Tivoli Storage Manager server that you want to monitor:

1. On the Tivoli Monitoring server, click **Start** → **All Programs** → **IBM Tivoli Monitoring** → **Manage Tivoli Monitoring Services**.
2. In the Manage Tivoli Enterprise Monitoring Services - TEMS Mode window, double-click **Monitoring Agent for Tivoli Storage Manager.**
3. In the Input window, enter the instance name and click **OK**.
4. In the Agent Configuration window, complete the following fields for the Tivoli Storage Manager server to be monitored:
   a. In the **Server Address** field, enter the server address.
   b. In the **Port Number** field, enter the port number that is used to communicate with the server.
   c. In the **Administrator** field, enter the Tivoli Storage Manager administrator ID that is used to access the server.
   d. In the **Administrator Password** field, enter the password, twice for the Tivoli Storage Manager administrator ID.
   e. Click **OK** to save the settings.

      The Manage Tivoli Enterprise Monitoring Services page opens with the new monitoring agent instance. **Task/Subsystem** has the unique instance name for the agent that you configured.
5. Start the monitoring agent instance by completing one of the following tasks:
   - In the Manage Tivoli Enterprise Monitoring Services window, select the monitoring agent that you want to start and click the green light icon in the tool bar at the top of the window.
   - If you do not have the tool bar enabled, double-click the monitoring agent instance in the list. This toggles the **service/application** field to **Stopped** or **Started** status.

If you plan to use the Administration Center to view historical reporting, after configuring the monitoring agent instance, configure the data source next.

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Related tasks

"Configuring a data source for historical reporting and monitoring" on page 39
To view historical reports using the Administration Center, after creating a Tivoli Storage Manager monitoring agent instance, configure the data source.

Creating and configuring a monitoring agent using the Candle® Manage program

In order to collect and view historical reporting information or monitor real-time information, you must manually create and configure a Tivoli Storage Manager monitoring agent instance on a Tivoli Monitoring server using the Candle Manage program.

Create and configure an instance of the Tivoli Storage Manager monitoring agent on a Tivoli Monitoring server. Use the following method for each Tivoli Storage Manager server that you want to monitor:

1. Run the Candle Manage program using the following command:
   ```
   /opt/IBM/ITM/bin/CandleManage
   ```
2. In the Manage Tivoli Enterprise Monitoring Services window, click **Actions** → **Configure** to create a new instance of the monitoring agent.
3. In the Manage Application Instances window, click **Add instance**.
4. In the Input window, enter the instance name and click **OK**.
5. In the Agent Configuration window, complete the following fields for the Tivoli Storage Manager server to be monitored:
   a. In the **Server Address** field, enter the server address.
   b. In the **Port Number** field, enter the port number that is used to communicate with the server.
   c. In the **Administrator** field, enter the administrator ID that is used to access the server.
   d. In the **Administrator Password** field, enter the password, twice for the Tivoli Storage Manager administrator ID.
   e. Click **OK** to save the settings.

      The Manage Tivoli Enterprise Monitoring Services page opens with the new monitoring agent instance. **Task/Subsystem** has the unique instance name for the agent that you configured.
6. In the Manage Tivoli Enterprise Monitoring Services window, to start the monitoring agent instance, complete one of the following tasks:
   - Select the monitoring agent that you want to start and click the green light icon in the tool bar at the top of the window.
   - If you do not have the tool bar enabled, double-click the monitoring agent instance in the list. This toggles the **service** or **application** value to **Stopped** or **Started** status.

If you plan to use the Administration Center to view historical reporting, after configuring the monitoring agent instance, configure the data source next.

Related tasks

"Configuring a data source for historical reporting and monitoring" on page 39
To view historical reports using the Administration Center, after creating a Tivoli Storage Manager monitoring agent instance, configure the data source.

Creating and configuring a monitoring agent using the command line

In order to collect and view historical reporting information or monitor real-time information, you must manually create and configure a Tivoli Storage Manager monitoring agent instance on a Tivoli Monitoring server.

The term, *reporting agent*, that is displayed in the following examples is synonymous with the monitoring agent.

Create and configure an instance of the Tivoli Storage Manager monitoring agent on a Tivoli Monitoring server. Use the following method for each Tivoli Storage Manager server that you want to monitor:

1. Run the following command from the `/opt/Tivoli/TSM/Reporting/itm/bin` directory, where /opt/Tivoli/TSM/Reporting/ is the default directory where you installed the monitoring agent on the IBM Tivoli Monitoring server:

   ```
   itmcmd config -A -t sk
   ```

   The command returns the following instruction:

   ```
   Enter the instance name
   ```

2. Enter a name for the monitoring agent instance, for example:

   ```
   myinstance
   ```

   The command returns the following question:

   ```
   Edit "Monitoring Agent for Tivoli Storage Manager" settings?
   [ 1=Yes, 2=No ] (default is: 1): ss2.storage.tucson.ibm.com
   ```

3. Enter 1. The command returns the following question:

   ```
   Edit 'TSM Server Connection Information' settings? [ 1=Yes, 2=No ] (default is: 1):
   ```

4. Enter 1. The command returns the following prompt for your input:

   ```
   Server Address (default is: ):
   Port Number (default is: 1500):
   TSM Administrator (default is: ):
   TSM Administrator Password (default is: ):
   ```

5. Enter the following values for the Tivoli Storage Manager server to be monitored:
   a. For the `Server Address`, enter the server address.
   b. For the `Port Number`, accept the default or enter another port number.
   c. For the `administrator ID`, enter the Tivoli Storage Manager administrator ID to access the server.
   d. For the `administrator Password`, enter the password for the Tivoli Storage Manager administrator ID.

   The command returns the following question:

   ```
   Will this agent connect to a TEMS?
   [1=YES, 2=NO] (Default is: 1):
   ```

6. Enter 1. The command returns the following prompts, for your input:

```
TEMS Host Name (Default is: sysback):
Network Protocol [ip, sna, ip.pipe or ip.spipe] (Default is: ip.pipe):
     Now choose the next protocol number from one of these:
     - ip
     - sna
     - ip.spipe
     - 0 for none
Network Protocol 2 (Default is: 0):
IP.PIPE Port Number (Default is: 1918):
Enter name of KDC_PARTITION (Default is: null):
```

7. Enter a protocol name or enter the default `ip.pipe`. The command returns the following information:

```
Configure connection for a secondary TEMS? [1=YES, 2=NO] (Default is: 2):
```

8. To have this monitoring agent connect to another Tivoli Enterprise monitoring server, enter 1. Otherwise, go to step 10

   If you entered 1 to connect to another server, the command returns the following information:

```
Enter Optional Primary Network Name or 0 for "none" (Default is: 0):
```

9. Enter a network name or 0. If you do not enter a value, no optional primary network name is created. The command returns the following information:

```
Agent configuration completed...
```

10. Enter the following command to start the monitoring agent instance that you configured in step 3 on page 37.

```
# itmcmd agent -o myinstance start sk
```

    If successful, the command returns the following information:

```
Starting Reporting Agent for Tivoli Storage Manager
 Agent Started Successfully
```

    If there is a problem with the monitoring agent instance starting, the command returns the following information:

```
Starting Reporting Agent for Tivoli Storage Manager ...
KCIIN0198E Unable to start agent. Please, check log file.
# exit
```

If you plan to use the Administration Center to view historical reporting, after configuring the monitoring agent instance, configure the data source next.

Related tasks

"Configuring a data source for historical reporting and monitoring" on page 39
To view historical reports using the Administration Center, after creating a Tivoli Storage Manager monitoring agent instance, configure the data source.

Configuring a data source for historical reporting and monitoring

To view historical reports using the Administration Center, after creating a Tivoli Storage Manager monitoring agent instance, configure the data source.

You must configure the data sources for historical reporting. Configuring a data source for one report propagates throughout all the historical reports that are available through the Administration Center. To configure a data source for a monitoring agent instance, complete the following steps:

1. To access the Administration Center, start the Integrated Solutions Console (ISC) by running the following command from a command line:

   ```
   cd tsm_home/AC/ISCW61/profiles/TsmAC/bin
   startServer.sh tsmServer
   ```

   where *tsm_home* is the default directory where you installed the Administration Center.
2. To open the ISC window, open a Web browser and enter the following address:

   ```
   https://localhost:port/ibm/console
   ```

   where *port* is the port number that is specified when you installed the Tivoli Monitoring server. The default is 9044.

   If you are using a remote system, you can access the ISC by entering the IP address or fully qualified host name of the remote system. You might have to authenticate to the remote system if there is a firewall that exists.
3. In the ISC window, complete the following fields:
   a. In the **User ID** field, enter the ISC user ID that was defined when you installed the Tivoli Storage Manager Administration Center.
   b. In the **Password** field, enter the ISC password you defined for the user ID and click **Log in**.
4. On the left side of the window, click **Tivoli Common Reporting → Work with Reports**.
5. After the Tivoli Common Reporting window opens, click **Tivoli Products → Tivoli Storage Manager → Client Reports** or **Server Reports**.
6. Right-click one of the reports and select **Data Sources**.
7. Select the first data source and click **Edit**.
8. The Edit Data Source window opens. The fields are populated with the following values:
   a. In the **Name** field, DB2 WAREHOUS is the name for the IBM Tivoli Data Warehouse data source.
   b. In the **User ID** field, `itmuser` is the user ID.
   c. In the **Password** field, enter the password that you defined for the user ID.
   d. The **JDBC Driver** and the **JDBC URL** fields contain the information that matches your JDBC information. Click **Save**.
9. The Reports window opens. To test the data, select a report and click **HTML** or **PDF**.
10. Depending on the report you have selected to test, fill in the fields indicating the data that the report should contain.
11. Click **Run**. The selected report is displayed.
12. Click **Log out** to end the session.

Chapter 5. Installing and configuring the Administration Center

Use the Administration Center to administer Tivoli Storage Manager and the reporting and monitoring feature from a supported browser anywhere in your network.

The time required to install the Integrated Solutions Console and Administration Center depends on the speed of your processor and the memory in your machine. Use the following steps to install the Integrated Solutions Console and Administration Center.

1. Install your Tivoli Storage Manager Version 6.1 servers. See Chapter 2, "Installing Tivoli Storage Manager," on page 11. Give each server a unique name.
2. Download and install the Administration Center. See "Installing the Administration Center" on page 42.
3. Start your Tivoli Storage Manager Version 6.1 server. See "Starting the server instance" on page 29.
4. Verify the Administration Center installation. See "Verifying your installation" on page 45.
5. Define your ISC users. See "Defining ISC users to the Administration Center" on page 46.
6. Add connections for the Tivoli Storage Manager servers you want to manage.

For more details about the Administration Center, see http://www.ibm.com/support/.

Administration Center system requirements

The Tivoli Storage Manager server can require a large amount of memory, network bandwidth, and processor resources. In many cases, the server performs best when other applications are not installed on the same system. If the system meets the combined requirements for the server and the Administration Center, it can support both applications.

If you plan to use the Administration Center to manage an environment with a large number of servers or administrators, consider installing the Administration Center on a separate system.

For Administration Center system requirements, see the following Web site: http://www.ibm.com/support/docview.wss?uid=swg21328445.

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Installing the Administration Center

To install the Administration Center , you can use the graphical installation wizard, the console wizard, or the command line in silent mode.

Using the Administration Center installation software, you can install the following component:

- Tivoli Storage Manager Administration Center

1. If you are installing the Administration Center using the DVD, complete the following steps:

   Insert the Tivoli Storage Manager Administration Center DVD into a DVD drive. Ensure that the DVD is mounted on directory /dvdrom and change to that directory.
2. If you are installing the Administration Center from the Tivoli Storage Manager FTP downloads site, obtain the package file here: ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/admincenter/. Change to the directory where you placed the executable file and complete the following steps:

   Tip: 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.

   a. Change file permissions by entering the following command:

      ```
      chmod a+x 6.1.x.x-TIV-TSMAC-platform.bin
      ```

      where *platform* denotes the architecture that the Administration Center is to be installed on.
   b. Run the following command to extract the installation files:

      ```
      ./6.1.x.x-TIV-TSMAC-platform.bin
      ```
3. Select one of the following ways of installing the Administration Center:

   Installation wizard
   "Installing the Administration Center using the installation wizard"

   Command-line console wizard
   "Installing the Administration Center using the console installation wizard" on page 43

   Silent mode
   "Installing the Administration Center in silent mode" on page 44

Installing the Administration Center using the installation wizard

Using the installation wizard is one method of installing the Administration Center.

To install the Administration Center using the installation wizard, complete the following steps:

1. Select a method to start the installation wizard:
   - To start the wizard without saving your responses, enter the following command:

     ```
     ./install.bin
     ```

- To start the wizard and save your responses, enter the following command, and specify the -r option:

  ```
  ./install.bin -r /response.rsp
  ```

The Administration Center installation wizard starts.

Important: Before installing the Administration Center, ensure that the LD_LIBRARY_PATH_64 environment variable is *not* set.

2. Select the language for your installation and follow the wizard directions, selecting **Next** to step through the wizard. You must accept the license agreement to proceed. Select the Administration Center component. There is no default so you must make a selection or you will receive an error message and be returned to the component page.

   When you select the Administration Center component, you are prompted for an Integrated Solutions Console user name and password. The default Integrated Solutions Console user name is iscadmin and you must specify a password for this ID, or for a new ID you create. You will use these later to log onto the Integrated Solutions Console and Administration Center.

   Restriction: Save the user name and password or you are unable to uninstall the Administration Center.
   You can create additional Integrated Solutions Console user IDs and passwords for any other administrators who will access the Administration Center.

At the end of the installation, a message is displayed on the summary page that the Administration Center 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:

```
/var/tivoli/tsm
```

Installing the Administration Center using the console installation wizard

Using the console installation wizard is one method of installing the Administration Center.

To install the Administration Center using the console installation wizard, complete the following steps:

1. To start the wizard without saving your responses, enter the following command:

   ```
   ./install.bin -i console
   ```

   To start the wizard and save your responses, enter the following command, and specify the -r option:

   ```
   ./install.bin -i console -r /response.rsp
   ```

   Important: Before installing the Administration Center, ensure that the LD_LIBRARY_PATH_64 environment variable is *not* set.

2. Select the language for your installation and follow the prompts. You must accept the license agreement to proceed. Select the Administration Center component. There is no default so you must make a selection or you will receive an error message and be returned to the component page.

   After you select the Administration Center component, you are prompted for an Integrated Solutions Console user name and password. The default

Integrated Solutions Console user name is iscadmin and you must specify a password for this ID, or for a new ID you create. You will use these later to log onto the Integrated Solutions Console and Administration Center.

Restriction: Save the user name and password or you are unable to uninstall the Administration Center.
You can create additional Integrated Solutions Console user IDs and passwords for any other administrators who will access the Administration Center.

At the end of the installation, a message is displayed on the summary page that the Administration Center 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:

```
/var/tivoli/tsm
```

Installing the Administration Center in silent mode

Running an installation in the background is one method of installing the Administration Center.

To install the Administration Center in silent mode, select one of the following options and enter the following commands:

Restriction:

You must include LICENSE_ACCEPTED=true or the installation fails.

WAS_PW=password is not encrypted and ISC_PASSWORD=B9B0D3E5F0D6D3DDEECADCE5 is encrypted.

Before installing the Administration Center, ensure that the LD_LIBRARY_PATH_64 environment variable is *not* set.

- To start the silent installation, enter the following command on a single line:

```
./install.bin -i silent -DLICENSE_ACCEPTED=true
-DINSTALL_ADMINCENTER=1
```

  Enter either these variables:

```
-DIAGLOBAL_WASUserID=iscadmin
-DISC_PASSWORD=B9B0D3E5F0D6D3DDEECADCE5
-DIAGLOBAL_WASPort=9043
```

  Or these variables:

```
-DWAS_USER=user_name -DWAS_PW=password
-DWAS_PORT=port
```

- To use an existing response file, enter the following command:

```
./install.bin -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 Administration Center installation process. The response file contains variables that you selected during a prior installation, using the GUI or console wizard.

  If you include LICENSE_ACCEPTED=true in the response file manually, then issue this command:

```
./install.bin -i silent -f response_file
```

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

At the end of the installation, a message is displayed on the summary page that Tivoli Storage Manager was 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:

/var/tivoli/tsm

Verifying your installation

After installing the Administration Center, complete several procedures to verify your installation.

Complete the following steps:

1. Enter the following address in a supported Web browser: https://*workstation_name*:9043/ibm/console. The *workstation_name* is the network name or IP address of the workstation on which you installed the Administration Center. The default Web administration port (HTTPS) is 9043.
2. To get started, log in, using the Integrated Solutions Console user ID and password that you created during the Administration Center installation. Save this password in a safe location because you need it not only to log in but also to uninstall the Administration Center.
3. After you successfully log in, the Integrated Solutions Console welcome page is displayed. Expand the Tivoli Storage Manager folder in the **Work Items** list and click **Getting Started** to display the Tivoli Storage Manager welcome page. This page provides instructions for using the Administration Center.

Automatically starting the Administration Center

Complete several steps so that the Administration Center automatically starts.

To enable the automatic start during system startup of the Administration Center WebSphere server, perform the following steps:

1. Log in with the root user ID.
2. Change to the *install_directory*/AC/products/tsm/bin directory.
3. Run the following script:

```
setTSMUnixLinks.sh
```

The symbolic links that will allow the WebSphere server to restart after the system is rebooted are now set.

Before uninstalling the Administration Center, ensure that you remove the WebSphere server automatic-restart. Complete the following steps:

1. Log in with the root user ID.
2. Change to the *install_directory*/AC/products/tsm/bin directory.
3. Run the following script:

```
setTSMUnixLinks.sh uninstall
```

Starting and stopping the Integrated Solutions Console server

The Integrated Solutions Console server is automatically started after a successful installation. If you shut down the system after the initial installation, any Integrated Solutions Console servers that were started will be stopped.

Use the command line to start and stop Integrated Solutions Console servers.

When you start and stop the Integrated Solutions Console using the command line, the variables in the commands have these meanings:

- *tsm_home* is the root directory for your Tivoli Storage Manager installation.
  The default for *tsm_home* is /opt/tivoli/tsm.
- *iscadmin* is the administrator user ID for the Administration Center.
- *iscpass* is the password for the administrator.

First, change to the *tsm_home*/AC/ISCW61/profiles/TsmAC/bin subdirectory in the Tivoli Storage Manager installation directory. Then, start or stop the Integrated Solutions Console server by issuing one of the following commands.

- To **start** an Integrated Solutions Console server, issue this command:
  ```
  startServer.sh tsmServer
  ```
- To **stop** an Integrated Solutions Console server, issue one of the following commands:
  - `stopServer.sh tsmServer -username iscadmin -password iscpass`
  - You are prompted to enter the user ID and the password:
    ```
    stopServer.sh tsmServer
    ```

Defining ISC users to the Administration Center

You can create a separate Integrated Solutions Console user ID for each Tivoli Storage Manager Version 6.1 administrator, or for a group of administrators.

Creating separate ISC administrator IDs can help you control access for administrators who manage different servers or who have different privilege classes. After logging in using their IDs, they can use their Tivoli Storage Manager administrator name and password to manage connections for the servers they manage.

1. In the navigation tree, expand **Users and Groups**.
2. Click **Manage Users**.
3. Click **Create**.
4. Click **Group Membership**.
5. Select **Group name**, then click **Search**.
6. Add TSM_AdminCenter to the Current groups list.
7. Click **Close**.
8. Complete the form and click **Create**.

Chapter 6. Upgrading the Administration Center

To administer Tivoli Storage Manager Version 6.1 servers, you must install or upgrade to the Administration Center Version 6.1.

The Administration Center provides wizards to help guide you through common configuration tasks. The Administration Center is installed as an IBM Integrated Solutions Console component. The Integrated Solutions Console lets you install components provided by multiple IBM applications, and access them from a single interface.

There has been a significant change in the technologies on which the Administration Center is built. As a consequence, you must manually complete the upgrade from an earlier version of the Administration Center to Version 6.1. You must define your Integrated Solutions Console user IDs to the new Administration Center. In addition, you must provide credentials for each of the Tivoli Storage Manager servers.

Note: The Administration Center Version 6.1 is only compatible with the Integrated Solutions Console Advanced Edition Version 7.1. If you currently have downlevel versions of the Administration Center and Integrated Solutions Console installed, you must upgrade both.

Overview of upgrade and coexistence

Upgrading involves collecting the configuration information from a previous version of the Administration Center and duplicating it in the new version. Coexistence involves running the Administration Center V6.1 on the same machine at the same time as you run the previous version.

To support coexistence, you need to provide non-default port assignments. For upgrade scenarios involving the possibility of rolling back to the previous version, you can choose to have the same port definitions and run either one version or the other.

If your disk space permits, having the two versions of the Administration Center coexist is the recommended upgrade strategy. It lets users have a functioning Administration Center during the time that it takes for the upgrade to complete. It also ensures that the configuration of the previous Administration Center is still accessible during the upgrade procedure.

Upgrade does not uninstall the previous version, which is still functional. After the upgrade completes successfully, you can uninstall the previous Administration Center using its documented process.

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Upgrade procedure

Use the upgrade procedure to upgrade from a previous version of the Tivoli Storage Manager Administration Center to the Administration Center Version 6.1.

1. If the current version of Administration Center is to be uninstalled, first obtain information about users and server credentials, then save the tsmservers.xml file which is located in the install directory on the Administration Center.
2. Install Administration Center Version 6.1. Note the following items:
   - ISC user IDs are not recreated in the new Administration Center.
   - The Tivoli Storage Manager server's database file and tsmservers.xml are copied from the earlier Administration Center.
   - Tivoli Storage Manager server credentials are not recreated in the new Administration Center.
3. Manually duplicate the user configuration of your earlier Administration Center. You start with a clean slate and build up a new environment for Version 6.1:
   a. Obtain the information about users and server credentials from the earlier Administration Center.
   b. Define each ISC user previously defined to the earlier Administration Center.
   c. Define to each ISC user its set of Tivoli Storage Manager server connections.
4. Uninstall the earlier Administration Center.

Obtaining information about ISC users

In the previous version of the Administration Center, you can use the Settings tab of the Integrated Solutions Console (ISC) to view information for users. The ISC help for the tab assists you when navigating the tab and its pages.

To obtain information about the defined Integrated Solutions Console user IDs, follow this procedure:

1. Expand the **Console Settings** item in the navigation tree.
2. Click **User and Group Management**.
3. In the Search drop-down list, click **Users**.
4. In the Search by drop-down list table, click uid.
5. In the Search entry field, enter *.
6. Click **Search**. The table is filled with all known ISC user IDs. Capture this information for later use.
7. Determine the password for each of these IDs.

Defining ISC users to the Administration Center

You can create a separate Integrated Solutions Console user ID for each Tivoli Storage Manager Version 6.1 administrator, or for a group of administrators.

Creating separate ISC administrator IDs can help you control access for administrators who manage different servers or who have different privilege classes. After logging in using their IDs, they can use their Tivoli Storage Manager administrator name and password to manage connections for the servers they manage.

1. In the navigation tree, expand **Users and Groups**.

2. Click **Manage Users**.
3. Click **Create**.
4. Click **Group Membership**.
5. Select **Group name**, then click **Search**.
6. Add TSM_AdminCenter to the Current groups list.
7. Click **Close**.
8. Complete the form and click **Create**.

Server connections to the Administration Center

A Manage Servers section is new to the ISC navigation tree of the Version 6.1 Administration Center. When you open this section, you are presented with a table of servers defined to the Administration Center for your ISC user ID.

From the Manage Servers section, you can quickly provide server connection information to the Administration Center. To facilitate this configuration step, the table of servers contains an action that lets you upload to the Administration Center an XML file that contains connection information and, optionally, a set of credentials for each Tivoli Storage Manager server.

This action can be used as an alternative method for defining the Tivoli Storage Manager servers of the earlier Administration Center to the Version 6.1 Administration Center. If you chose not to have the two versions of the Administration Center coexist, you can upload the tsmservers.xml file saved from the previous Administration Center. This operation makes the servers known to the Version 6.1 Administration Center, but the server credentials must be provided for each server. Optionally, you can choose to edit the tsmserver.xml file and add Tivoli Storage Manager server credentials to the connections of the user that is performing the file upload operation. Refer to the Administration Center help for more information on uploading a connections file.

If you choose to have the two versions of the Administration Center coexist, the installation of the Version 6.1 Administration Center copies the tsmservers.xml file from the earlier Administration Center. You do not need to use the upload action in this case. The Tivoli Storage Manager servers are known to the Version 6.1 Administration Center, but the server credentials must be provided for each server.

For both scenarios, the server connections for each ISC user ID do not include Tivoli Storage Manager server credentials. Such a connection is considered to be an incomplete or partial server connection by the Version 6.1 Administration Center. In the Manage Servers section, the table of servers defined to the Administration Center contains a column that indicates if a server connection contains Tivoli Storage Manager server credentials.

You can handle the partial server connections in two ways. You can either leave the connections in the partial state. When the ISC user later attempts to use a partial server connection, the user is prompted to complete the server connection information. Or, you can use the Change Password action of the Manage Servers table to display a form that lets you quickly define Tivoli Storage Manager server credentials for one or more server connections.

In general, partial server connections result in the display of the Incomplete Server Connection form. However, there are cases when the form cannot be displayed. In these cases, an error message is displayed indicating that the use should complete

the server connection by performing a detailed action. For example, the table of libraries attempts to obtain information about all the libraries across a set of servers. The user cannot be presented with the form for each server that has the issue.

ANRW0017E The server connection currently does not include the credentials required to access the server.
Explanation
An administrative session could not be started with the server because the server connection does not contain an administrator ID and password. The Administration Center will continue to deny access attempts to the server until a valid administrator ID and password are provided.
Administrator response
To complete the server connection information for this server: In the navigation tree, click Manage Servers. Select the server from the list of servers. Click Select Action > Modify Server Connection.

Chapter 7. Installing a Tivoli Storage Manager fix pack

Tivoli Storage Manager maintenance updates, also referred to as fix packs, bring your server up to the current maintenance level. The Tivoli Storage Manager server must not be running during maintenance updates.

To install a fix pack or interim fix to the server, you must have the Tivoli Storage Manager license package installed. The license package is provided with the purchase of a Version 6.1.0 base release.

To see a list of the latest maintenance and download fixes, visit this Web site: http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html. For information about obtaining a Version 6.1 license package, click the ″How to buy″ link.

For information about supported platforms and system requirements, see this page: http://www.ibm.com/software/tivoli/products/storage-mgr/platforms.html.

To install a 6.1.x.x fix pack or interim fix, log in as the root user and complete the following steps.

Attention: In order to preserve your server instances and database, do not uninstall your previous version of Tivoli Storage Manager.

1. Obtain the package file for the fix pack or interim fix you want to install from the Tivoli Storage Manager FTP downloads site: ftp://ftp.software.ibm.com/storage/tivoli-storage-management/.
2. Change to the directory where you placed the executable file and complete the following steps:

   Tip: 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.

   a. Change file permissions by entering the following command:

      ```
      chmod a+x 6.1.x.x-TIV-TSMALL-platform.bin
      ```

      where *platform* denotes the architecture that Tivoli Storage Manager is to be installed on.

   b. Run the following command to extract the installation files:

      ```
      ./6.1.x.x-TIV-TSMALL-platform.bin
      ```

3. Ensure that you have backed up your Tivoli Storage Manager database. See the *Administrator's Guide* for more details.
4. Halt the server before installing a fix pack or interim fix.
5. Select one of the following ways of installing Tivoli Storage Manager:

   Installation wizard
   “Installing Tivoli Storage Manager using the installation wizard” on page 12

   Command-line console wizard
   “Installing Tivoli Storage Manager using the console installation wizard” on page 13

   Silent mode
   “Installing Tivoli Storage Manager in silent mode” on page 13

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Chapter 8. Uninstalling Tivoli Storage Manager

You can use the following procedures to uninstall Tivoli Storage Manager. Before you remove Tivoli Storage Manager, there are several steps to complete to ensure that you do not lose your backup and archive data.

Complete the following steps before you uninstall Tivoli Storage Manager:

- Complete a full database backup.
- Save a copy of the volume history and device configuration files.
- Store the output volumes in a safe location.

Important: Uninstalling Tivoli Storage Manager removes all components of the Tivoli Storage Manager server Version 6.1. It is not possible to uninstall a single component of the product by itself. For example, you cannot uninstall only the Tivoli Storage Manager Administration Center and leave the Tivoli Storage Manager server.

To uninstall Tivoli Storage Manager, complete the following steps:

1. Change to the following subdirectory in the `/opt/tivoli/tsm/_uninst` directory:

   ```
   cd _uninst
   ```

2. Use one of the following methods to uninstall Tivoli Storage Manager:
   - To use the installation wizard (GUI) to uninstall Tivoli Storage Manager, issue this command:

     ```
     ./Uninstall_Tivoli_Storage_Manager
     ```

     Tip: Ensure that you have your Administration Center user name and password to uninstall the Administration Center.
   - To use the console to uninstall Tivoli Storage Manager, issue this command:

     ```
     ./Uninstall_Tivoli_Storage_Manager -i console
     ```

     Tip: Ensure that you have your Administration Center user name and password to uninstall the Administration Center. The uninstallation closes if your user name and password are invalid, and you must start over.
   - To silently uninstall Tivoli Storage Manager, issue this command:

     ```
     ./Uninstall_Tivoli_Storage_Manager -i silent
     ```

     Restriction: The user name and password for the Administration Center are already stored and you do not need to provide them again. If they are no longer valid, however, the uninstallation closes and you must uninstall the Administration Center using the GUI or console method. The user name and password might be invalid if you installed other components or if you changed the password for the Administration Center.
3. Follow the prompts to uninstall Tivoli Storage Manager.
4. You see a message that the Tivoli Storage Manager uninstallation was successful.

See Chapter 2, “Installing Tivoli Storage Manager,” on page 11 for Tivoli Storage Manager Version 6.1 installation steps to reinstall the components.

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Uninstalling and reinstalling Tivoli Storage Manager

If you plan to reinstall Tivoli Storage Manager, there are a number of steps to take to preserve your server instance names and database directories. During an uninstallation, any server instances you had set up are removed, but the database catalogs for those instances still exist.

To uninstall and reinstall Tivoli Storage Manager complete the following steps:

1. Make a list of your current server instances before proceeding to the uninstallation. Run the following command:

   ```
   # /opt/tivoli/tsm/db2/instance/db2ilist
   ```

2. Run the following command for every server instance:

   ```
   db2 attach to instance_name
   db2 get dbm cfg show detail
   db2 detach
   ```

   Keep a record of the database path for each instance.

3. Uninstall Tivoli Storage Manager. See Chapter 8, "Uninstalling Tivoli Storage Manager," on page 53.
4. Reinstall Tivoli Storage Manager. See Chapter 2, "Installing Tivoli Storage Manager," on page 11.
5. Recreate your server instances. See "Creating the server instance" on page 23.
6. Catalog the database. Log in to each server instance as the instance user, one at a time, and issue the following commands:

   ```
   db2 catalog database tsmdb1
   db2 attach to instance_name
   db2 update dbm cfg using dftdbpath instance_directory
   db2 detach
   ```

7. Verify that Tivoli Storage Manager recognizes the server instance by listing your directories. Your home directory will appear if you didn't change it. Your instance directory will appear if you used the configuration wizard. Issue this command:

   ```
   db2 list database directory
   ```

   If you see TSMDB1 listed, you can start the server.

Appendix. Accessibility features for Tivoli Storage Manager

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. The major accessibility features of Tivoli Storage Manager are described in this topic.

Accessibility features

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

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

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

Keyboard navigation

Tivoli Storage Manager follows Sun Solaris operating-system conventions for keyboard navigation and access.

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/.

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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 Version 6.1 information center:
http://publib.boulder.ibm.com/infocenter/tsminfo/v6

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