

Tivoli Storage Manager
for Sun Solaris
Version 6.2

Installation Guide



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Note:

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

| This edition applies to Version 6.2 of IBM Tivoli Storage Manager (product number 5608-E01, 5608-E02, 5608-E03,
| 5608-E07, 5608-E12) and to all subsequent releases and modifications until otherwise indicated in new editions or
| technical newsletters. This edition replaces GC23-9784-01.

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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 Tivoli Integrated Portal 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 6.2.

If you are upgrading an existing 5.5.x Tivoli Storage Manager server to Tivoli Storage Manager Version 6.2, see the *Server Upgrade Guide*.

If you are upgrading a Tivoli Storage Manager Version 6.1.x server to Version 6.2, see Chapter 6, “Upgrading from Tivoli Storage Manager Version 6.1,” on page 57.

If you are upgrading an existing Tivoli Storage Manager Version 6.2 server to a later level of Version 6.2, see Chapter 8, “Installing a Tivoli Storage Manager server fix pack,” on page 69.

Publications

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

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

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

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

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

Tivoli Storage Manager publications

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

Table 1. IBM Tivoli Storage Manager troubleshooting and tuning publications

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

Table 2. Tivoli Storage Manager server publications

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

Table 3. Tivoli Storage Manager storage agent publications

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

Table 4. Tivoli Storage Manager client publications

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

Table 5. Tivoli Storage Manager Data Protection publications

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

Support information

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

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

Getting technical training

Information about Tivoli technical training courses is available online.

Go to these Web sites for training information:

Tivoli software training and certification

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

Tivoli Support Technical Exchange

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

Searching knowledge bases

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

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

Searching the Internet

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

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

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

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

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

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

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

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

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

Using IBM Support Assistant

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

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

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

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

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

Finding product fixes

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

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

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

Receiving notification of product fixes

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

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

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

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

Contacting IBM Software Support

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

Before you contact IBM Software Support, follow these steps:

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

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

Setting up a subscription and support contract

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

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

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

Determining the business impact

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

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

Describing the problem and gather background information

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

To save time, know the answers to these questions:

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

Submitting the problem to IBM Software Support

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

Online

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

By phone

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

New for IBM Tivoli Storage Manager Version 6.2

This section summarizes changes that have been made to IBM Tivoli Storage Manager Version 6.2 that affect the Tivoli Storage Manager server, the Administration Center, and the reporting and monitoring feature installation and upgrade from Version 6.1. Any updates that have been made to the information since the previous edition are marked with a vertical bar (|) in the left margin.

The following features are new for Tivoli Storage Manager in Version 6.2:

DB2 version

IBM DB2 Version 9.7 is installed during the installation of a Tivoli Storage Manager Version 6.2 server.

SSL support

GSKit 7 is installed during the installation of a Tivoli Storage Manager Version 6.2 server to enable support for Secure Sockets Layer (SSL).

Tivoli Integrated Portal

The Tivoli Integrated Portal is a new graphical user interface (GUI) that you can install to work with the Tivoli Storage Manager Version 6.2 server. Tivoli Integrated Portal provides all the functions that were available in the Integrated Solutions Console. The Administration Center, Common Reporting, and other applications are integrated into this new user interface. Pre-Version 6.2 Tivoli Storage Manager servers using the Version 6.2 Administration Center cannot support the Version 6.2 features. See Chapter 5, "Installing and configuring the Administration Center," on page 47 to install and configure the Administration Center, or Chapter 7, "Upgrading the Administration Center," on page 63 to upgrade the Administration Center.

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/support/entry/portal/Overview/Software/Tivoli/Tivoli_Storage_Manager.

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 5.5.x Tivoli Storage Manager server to Tivoli Storage Manager Version 6.2, see the *Server Upgrade Guide*.

If you are upgrading a Tivoli Storage Manager Version 6.1.x server to Version 6.2, see Chapter 6, “Upgrading from Tivoli Storage Manager Version 6.1,” on page 57.

If you are upgrading an existing Tivoli Storage Manager Version 6.2 server to a later level of Version 6.2, see Chapter 8, “Installing a Tivoli Storage Manager server fix pack,” on page 69.

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 6.2 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 5.

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 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 6.2 server has been built and tested extensively using the data definition language (DDL) and database configuration that Tivoli Storage Manager deploys.

Installable components

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

You can install the following components for Tivoli Storage Manager 6.2:

- Tivoli Storage Manager server
- Tivoli Storage Manager server languages
- Tivoli Storage Manager licenses
- Tivoli Storage Manager devices
- Tivoli Storage Manager storage agent
- Tivoli Storage Manager Administration Center

Table 6 describes all the installable components.

Table 6. Tivoli Storage Manager installable components

Tivoli Storage Manager component:	Description:	Additional information:
Server (required)	Includes the Tivoli Storage Manager database, client API, GSKit, and tools to help you configure and manage Tivoli Storage Manager.	Refer to the Tivoli Storage Manager server overview in the <i>Administrator's Guide</i> .
Language pack (optional)	Each language pack (one for each language) contains language-specific information for the server.	See "Server language locales" on page 19.
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 <i>Administrator's Guide</i> .
Devices (optional)	Extends Tivoli Storage Manager media management capability.	The Tivoli Storage Manager device driver is preferred for use with the Tivoli Storage Manager server. Refer to the chapter on adding devices in the <i>Administrator's Guide</i> . A list of devices supported by this driver is available from the Tivoli Storage Manager Web site, at http://www.ibm.com/support/entry/portal/Overview/Software/Tivoli/Tivoli_Storage_Manager .

Table 6. Tivoli Storage Manager installable components (continued)

Tivoli Storage Manager component:	Description:	Additional information:
Storage agent (optional)	<p>Installs the component that allows client systems to write data directly to, or read data directly from, storage devices that are attached to a storage area network (SAN). To install a Version 6 storage agent, use the packages located in the server directory.</p> <p>Remember: The IBM Tivoli Storage Manager for Storage Area Networks is a separately licensed product.</p>	Refer to the <i>Storage Agent User's Guide</i> .
Administration Center (optional)	<p>Installs the following components automatically to help you configure and manage Tivoli Storage Manager:</p> <ul style="list-style-type: none"> • Tivoli Integrated Portal • Integrated Solutions Console • WebSphere Application Server • Tivoli Common Reporting • Time scheduling services • IBM HTTP Server • Common Gateway Interface server <p>Optional components are also available.</p> <p>Remember: The Administration Center is on a separate DVD.</p>	Refer to "Administration Center system requirements" on page 47.

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 7 on page 4 describes the minimum hardware requirements that are needed for a Sun system. For more details about planning disk space, see "Capacity planning" on page 6.

Table 7. Hardware requirements

Type of hardware	Hardware requirements
Hardware	<p>One of the following processors required:</p> <ul style="list-style-type: none"> • Sun Ultra SPARC-based processors (sun4u architecture) • Sun Ultra SPARC-based processors (sun4v architecture) • x86_64-based processors (AMD64 or EM64T architecture)
Disk space	<p>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:</p> <ul style="list-style-type: none"> • 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 • 600 MB for the /tmp directory • 300 MB for the /usr directory • 2 GB in the home directory <p>Significant additional disk space is 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. The default active log space is 16 GB, the minimum that is needed for most workloads and configurations. Allocate at least three times the active log space for the archive log (48 GB). Ensure that you have sufficient resources if you are using deduplication or expect a heavy client workload.</p> <p>For optimal performance and to facilitate I/O, specify at least four separate directories or Logical Unit Numbers (LUNs) to be used by the database and logs. This allows I/O to be balanced across multiple directories or mounts.</p>
Memory	<ul style="list-style-type: none"> • 12 GB. • 16 GB if you are using deduplication. • If you plan to run multiple instances, each instance requires the memory listed for one server. Multiply the memory for one server by the number of instances planned for the system.

Software requirements

Table 8 describes the minimum software requirements needed for your Sun system.

Table 8. Software requirements

Type of software	Minimum software requirements
Operating System	<p>You need one of the following systems:</p> <ul style="list-style-type: none"> • Sun Solaris 10 or later, running in 64-bit mode on a Sun Ultra Sparc system with sun4u architecture <ul style="list-style-type: none"> – Patch 118822-25 – If raw devices are used, patch 125100-07 • Sun Solaris 10 or later, running in 64-bit mode on a system with AMD64 or EM64T architecture <ul style="list-style-type: none"> – Patch 127128-11
Communication protocol	TCP/IP

Table 8. Software requirements (continued)

Type of software	Minimum software requirements
Devices and drivers	If you have an IBM 3570, 3590 or Ultrium tape library or drive, install the most current device driver <i>before</i> you install Tivoli Storage Manager Version 6.2. You can locate the device drivers at ftp://ftp.software.ibm.com/storage/devdrv/

See “Solaris zones” on page 17 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 Version 6.2 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/v9r7/index.jsp>.
- 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 Version 6.2 or upgrade the server from Version 5.5, these are values that you entered when running the wizard. If you used the manual configuration for Version 6.2 or upgrade from Version 5.5 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:

$500,000 \text{ files} \times 3 \text{ copies} = 1,500,000 \text{ files}$

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:

$(1,500,000 + 100,000 + 200,000) \times 1000 = 1.8\text{GB}$

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.

$100,000 \text{ files} \times 200 \text{ bytes} = 19\text{MB}$

Copy storage pool files

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

$(1,500,000 + 100,000 + 200,000) \times 200 \text{ bytes} = 343\text{MB}$

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.
 $500,000 \times 200 \text{ bytes} = 95 \text{ MB}$

Deduplicated files

Assume that a deduplicated storage pool contains 50,000 files.
 $50,000 \times 200 \text{ bytes} = 10 \text{ MB}$

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 V6.2 server.

The default size of the active log is 16,384 MB (16 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 131,072 MB (128 GB). The minimum size of the active log is 2048 MB (2 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 <i>instance directory</i> 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: `/tsmsserver/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 other 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 in the /opt/tivoli/tsm/server/bin/dsmserv.hlp directory.
 - 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/v9r7/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

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/ibm/ac) contains the following directories:

- WebSphere (/opt/ibm/ac)
- Tivoli Integrated Portal (/opt/ibm/ac)
- Tivoli Common Reporting (/opt/ibm/ac/products/tcr)
- Administration Center (/opt/ibm/ac/systemApps/isclite.ear/TsmAC.war)

Chapter 2. Installing Tivoli Storage Manager

To install Tivoli Storage Manager 6.2, 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) and GSKit are automatically installed when you select the server component.

- Tivoli Storage Manager Server Languages
- Tivoli Storage Manager License
- Tivoli Storage Manager Devices
- 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=swg24025637>

Tivoli Storage Manager Extended Edition: <http://www.ibm.com/support/docview.wss?uid=swg24025638>

System Storage™ Archive Manager: <http://www.ibm.com/support/docview.wss?uid=swg24025639>

- 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:

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 15

Silent mode

“Installing Tivoli Storage Manager in silent mode” on page 16

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/support/entry/portal/Overview/Software/Tivoli/Tivoli_Storage_Manager. Click **Support and downloads** and apply any applicable fixes.

Configuring the /etc/hosts file

The /etc/hosts file must have the correct format before you start the Tivoli Storage Manager installation.

Ensure that the /etc/hosts file meets the following requirements:

1. Locate the /etc/hosts file on your system. Open it with an editor, and as a root user if you plan on editing it.
2. Ensure that the following lines were not removed. Replace them if they are missing:

```
127.0.0.1 localhost
9.11.153.39 your.server.name workstation
```

where you replace 9.11.153.39 with the IP address of your system and change *your.server.name* to the fully qualified host name for your system. Include the name of your workstation after the full qualified host name.

3. Save the host file.

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
```

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

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. Then, 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 receive an error message and are returned to

the components' page. The Tivoli Storage Manager client application programming interface (API), DB2 Version 9.7, and GSKit 7 are automatically installed when you select the server component.

Attention: If you are installing on a remote system using an X display, and the local system does not have an X Window System server running, the installation might fail. If this happens, ensure that the DISPLAY environment variable is *not* set and restart the installation.

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 log for a new server installation is stored in the following location:

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

After you install a new Tivoli Storage Manager server, you must configure it. See Chapter 3, "Taking the first steps after you install Tivoli Storage Manager," on page 23.

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. Then, 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 receive an error message and are returned to the components' page. The Tivoli Storage Manager client application programming interface (API), DB2 Version 9.7, and GSKit 7 are automatically installed when you select the server component.

Attention: If you are installing on a remote system using an X display, and the local system does not have an X Window System server running, the installation might fail. If this happens, ensure that the DISPLAY environment variable is *not* set and restart the installation.

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 log for a new server installation is stored in the following location:

/var/tivoli/tsm

After you install a new Tivoli Storage Manager server, you must configure it. See Chapter 3, “Taking the first steps after you install Tivoli Storage Manager,” on page 23.

Installing Tivoli Storage Manager in silent mode

Using silent mode is one method of installing Tivoli Storage Manager.

Restriction: The following restrictions apply:

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 either create a new response file or use an existing one for the silent installation, select one of the following options.

- 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_SERVER_LANGUAGES=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_PTUTF8
- 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_SERVER_LANGUAGES=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.

Attention: If you are installing on a remote system using an X display, and the local system does not have an X Window System server running, the installation might fail. If this happens, ensure that the `DISPLAY` environment variable is *not* set and restart the installation.

Fix any errors before continuing. See the following log for more information:

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

After you install a new Tivoli Storage Manager server, you must configure it. See Chapter 3, “Taking the first steps after you install Tivoli Storage Manager,” on page 23.

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 6.2 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 6.2, 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 languages shown in the following tables:

Table 9. 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

Table 9. Server languages for Solaris (continued)

Language	LANGUAGE option value
English	AMENG
	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
Notes: Refer to the <i>Administrator's Reference</i> 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 19.

- 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, preview 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. It might be necessary to restart the workstation.

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/v9r7/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 6.2, 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 21.
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 24.
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 26.
 - Use the Tivoli Storage Manager configuration wizard in the Administration Center. See “Configuring Tivoli Storage Manager using the Administration Center” on page 26.
 - Manually configure the new Tivoli Storage Manager instance. See “Configuring the server instance manually” on page 28. 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 28.
 - 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 29..
 - c. Issue the DSMSEV FORMAT command to format the database. See “Formatting the database and log” on page 32.
 - d. Configure your system for database backup. See “Preparing the database manager for backup” on page 32.
4. Start the Tivoli Storage Manager server instance. See “Starting the server instance” on page 34.
5. Register your license. See “Registering licenses” on page 37.
6. Prepare your system for database backups. See “Preparing the system for database backups” on page 37.
7. Monitor the server. See “Monitoring the server” on page 38.

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 <i>instance directory</i> 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)	<code>mkdir /home/tsminst1/tsminst1</code> Tip: For this example, the instance directory is created in the home directory for the instance owner ID, <code>tsminst1</code> . You can place it in other locations.	
The database directories	<code>mkdir /tsmdb001</code> <code>mkdir /tsmdb002</code> <code>mkdir /tsmdb003</code> <code>mkdir /tsmdb004</code>	
Active log directory	<code>mkdir /tsmlog</code>	
Archive log directory	<code>mkdir /tsmarchlog</code>	
Optional: Directory for the log mirror for the active log	<code>mkdir /tsmlogmirror</code>	
Optional: Secondary archive log directory (failover location for archive log)	<code>mkdir /tsmarchlogfailover</code>	

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 Tivoli Storage Manager

After you have installed Tivoli Storage Manager Version 6.2 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 26.
- Use the Tivoli Storage Manager configuration wizard in the Administration Center. See “Configuring Tivoli Storage Manager using the Administration Center” on page 26.
- Manually configure the new Tivoli Storage Manager instance. See “Configuring the server instance manually” on page 28. Complete the following steps during a manual configuration.
 1. Set up the directories and create the Tivoli Storage Manager instance. See “Creating the server instance” on page 28.
 2. Create a new server options file by copying the sample file in order to set up communications between the Tivoli Storage Manager server and clients. See “Configuring server and client communications” on page 29..
 3. Issue the `DSMSERV FORMAT` command to format the database. See “Formatting the database and log” on page 32.
 4. Configure your system for database backup. See “Preparing the database manager for backup” on page 32.

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 Tivoli Storage Manager Version 6.2 server program.

Before beginning the configuration wizard, you must complete all preceding steps to prepare for the configuration, including installing the Version 6.2 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 6.2 server program must have the X Window System client. You must also be running an X Window System 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 6.2 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 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 is not 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 6.2 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 6.2 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 one of the following addresses in a supported Web browser:

`http://workstation_name:port/`

Or:

`https://workstation_name:port/ibm/console`

The *workstation_name* is the network name or IP address of the workstation on which you installed the Administration Center and the *port* is the Web administration HTTP or HTTPS port number.

Attention: Ensure that you are using the same port that was displayed in the summary panel of the wizard after you completed the Administration Center installation. Because of system resources and availability of certain ports on your workstation, this might be a different number from the port you had entered into the wizard in a previous panel. You will not receive any warning messages that you are using an incorrect port, and might even be able to complete some Administration Center tasks with a different port. To save time and resources, ensure that you use the intended port.

The default Web administration port (HTTP) is 16310. The default secure Web administration port (HTTPS) is 16316. If you are using a different port number from the default, the secure port typically appears with 6 as the last number.

Look in the following file if you want to see the port that is being used. In this file, **WC_defaulthost** contains the variable for the HTTP port and **WC_adminhost_secure** contains the variable for the HTTPS port.

`TIP_HOME/properties/TIPPortDef.properties`

where *TIP_HOME* is the root directory for the Tivoli Storage Manager installation.

The default for *TIP_HOME* is `/opt/ibm/ac`.

Tip: If you use `http://workstation_name:16310/` to connect to the Administration Center, you are redirected to the secure port and address (`https://workstation_name:16316/ibm/console`).

To start the Administration Center using the default ports, for example, enter one of the following addresses in a supported Web browser:

`http://workstation_name:16310/`

Or:

`https://workstation_name:16316/ibm/console`

3. Log in, using the Tivoli Integrated Portal user ID and password you created during the installation. After you successfully log in, the Tivoli Integrated Portal 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 6.2, 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, verify 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 32. 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.

Setting 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.

TCPPOINT

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 0 to 64. To use the default window size for the operating system, specify 0.

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.

SSLTCPPOINT

(SSL-only) Specifies the Secure Sockets Layer (SSL) port number on which the server TCP/IP communication driver waits for requests for SSL-enabled sessions for the command-line backup-archive client and the command-line administrative client.

SSLTCPADMINPORT

Specifies the port address on which the server TCP/IP communication driver waits for requests for SSL-enabled sessions for the command-line administrative client.

Setting 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. Shared memory options is the default communication method.

The following example shows a shared memory setting:

```
commethod    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.

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

```
commethod          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 “Capacity planning” on page 6 for more details.

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 28 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
```

Issue the following command to start the database manager:

```
db2start
```

If the database manager does not start after you issue the DSMSERV FORMAT command, you might need to disable the file system mount option NOSUID. If this option is set on the file system that contains the DB2 instance owner directory, or on any file system that contains the DB2 database, active logs, or archive logs, it must be disabled in order to start the system.

Example: Format a database

Enter the following command on one line.

```
dsmserv format dbdir=/tsm/db  
activelogdir=/tsm/active log 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.

Attention: If the database is unusable, the entire Tivoli Storage Manager server is unavailable. If a database is lost and cannot be recovered, it might be difficult or impossible to recover data managed by that server. Therefore, It is critically important to back up the database. However, even without the database, fragments of data or complete files might easily be read from storage pool volumes that are not encrypted. Even if data is not completely recovered, security can be compromised. For this reason, sensitive data should always be encrypted by the Tivoli Storage Manager client or the storage device, unless the storage media is physically secured.

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/sql1lib/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/sql1lib/db2profile ]; then
    . /home/tsminst1/sql1lib/db2profile
fi
```
 - c. Add or update the following lines to the userprofile file in the /home/tsminst1/sql1lib 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 tsmbmgr.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
commethod 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 34 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/sql1lib/db2profile
```

- d. Change the API password, using this command:

```
/home/tsminst1/sql1lib/adsm/dsmapiw
```

- e. When prompted by the dsmapiw 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 that 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 29 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 cannot start it. If you do not have authority to read/write files in the instance directory, you cannot 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 was 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/sql1lib/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:

```
# . ~/sql1lib/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.

Authorizing root users to start the server

In Version 6.2 a user that is not the instance owner must be explicitly granted authority to start a Tivoli Storage Manager server.

In the following example, user ID `tsmuser1` is in the primary group `TSMSRVRS`, and `tsmuser1` is used to create Tivoli Storage Manager server and DB2 instances. The `SYSADM_GROUP` of the instance is `TSMSRVRS` because it is the primary group of user ID `tsmuser1`. User ID `tsmuser2` is also in the primary group `TSMSRVRS`.

It is best to use the instance user ID to start the server. However, if you want to allow another user ID to access the database, you must explicitly grant it authority. Log in as the instance owner, connect to the database, and issue the DB2 GRANT command. For example:

1. Log in from root or as the instance owner.

```
# su - tsmuser1
```
2. Start DB2.

```
$ db2start
```
3. Connect to the `TSMDB1` database.

```
$ db2 connect to tsmdb1
```
4. Grant user `tsmuser2` authority to the database.

```
$ db2 grant dbadm on database to user tsmuser2
```

You can allow the root user to run the server by substituting the user `root` for `tsmuser2`. However, `root` must belong to the `SYSADM_GROUP` group, and must have been granted `DBADM` authority by the instance user.

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/sql1lib/db2profile` to set the database environment variables and library.

```
# . ~tsmInst1/sql1lib/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>/sql1lib/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 tsm1 and tsm2, and instance directories /home/tsm1/tsm1 and /home/tsm2/tsm2, add the following entries to /etc/inittab. Each entry is on one line.

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

When you are ready to back up your database, see the BACKUP DB command in 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.

Multiply the memory and other system requirements for one server by the number of instances planned for the system.

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 28 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. 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.

If you are upgrading from Tivoli Storage Manager Version 6.1 to Version 6.2 and have multiple servers on your system, you only have to run the upgrade wizard once. The upgrade wizard collects the database and variables information for all of your V6.1 server instances. All instances that exist in DB2 Version 9.5 are dropped and recreated in DB2 Version 9.7. The wizard issues the db2 upgrade *db dbname* command for each database. The database environment variables for each instance on your system are also reconfigured during the upgrade process.

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 reporting and monitoring agent on a Windows Tivoli Monitoring server

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

In addition, in order to view historical reporting information you must manually create a data source on the system where you have installed the Administration Center.

Create and configure an instance of the reporting and monitoring agent on the IBM Tivoli Monitoring server, where you installed the Tivoli Storage Manager reporting and monitoring feature.

This agent monitors your Sun Solaris system and stores its historical and real-time information in the Tivoli Data Warehouse. Use the following method for each system 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 reporting and monitoring agent instance. **Task/Subsystem** has the unique instance name for the agent that you configured.

5. Start the reporting and monitoring agent instance by completing one of the following tasks:

- In the Manage Tivoli Enterprise Monitoring Services window, select the reporting and 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 reporting and monitoring agent instance in the list. This toggles the **service/application** field to **Stopped** or **Started** status.
6. Configure the data source for the reporting and monitoring agent instance. This allows you to view the historical reporting.
- “Viewing historical reporting and monitoring data” on page 45

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

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

In addition, in order to view historical reporting information you must manually create a data source on the system where you have installed the Administration Center.

Attention: The IBM Tivoli Monitoring server and the Administration Center do not have to be installed on the same systems, they can be installed on different systems.

Create and configure an instance of the reporting and monitoring agent on the IBM Tivoli Monitoring server, where you installed the Tivoli Storage Manager reporting and monitoring feature.

This agent monitors your Sun Solaris system and stores its historical and real-time information in the Tivoli Data Warehouse. Use the following method for each system 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 reporting and 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 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 reporting and 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 reporting and monitoring agent instance, complete one of the following tasks:
 - Select the reporting and 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.
7. Configure the data source for the reporting and monitoring agent instance. This allows you to view the historical reporting.
 - “Viewing historical reporting and monitoring data” on page 45

Creating and configuring a reporting and monitoring agent using the command line

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

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

In addition, in order to view historical reporting information you must manually create a data source on the system where you have installed the Administration Center.

Attention: The IBM Tivoli Monitoring server and the Administration Center do not have to be installed on the same systems, they can be installed on different systems.

Create and configure an instance of the reporting and monitoring agent on the IBM Tivoli Monitoring server, where you installed the Tivoli Storage Manager reporting and monitoring feature.

This agent monitors your Sun Solaris system and stores its historical and real-time information in the Tivoli Data Warehouse. Use the following method for each system 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 reporting and 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 reporting and 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:
- For the Server Address, enter the server address.
 - For the Port Number, accept the default or enter another port number.
 - For the administrator ID, enter the Tivoli Storage Manager administrator ID to access the server.
 - 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 reporting and monitoring agent connect to another Tivoli Enterprise monitoring server, enter 1. Otherwise, go to step 10 on page 45. 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 reporting and monitoring agent instance that you configured in step 3 on page 44.

```
# 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 reporting and 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
```

11. Configure the data source for the reporting and monitoring agent instance. This allows you to view the historical reporting. The following link provides you with details for configuring your data source.

[“Viewing historical reporting and monitoring data”](#)

Viewing historical reporting and monitoring data

You must configure a data source on the system where you have installed the Administration Center, if you want to view historical data.

After you have created a reporting and monitoring agent instance on a IBM Tivoli Monitoring server and it is collecting and storing historical data into the Tivoli Data Warehouse, you can configure a data source to view the historical data. The data source is configured on the system where you have installed the Administration Center.

To configure a data source to run historical reports against the data from the reporting and monitoring agent instance, complete the following steps on the system where you installed the Administration Center:

Attention: The IBM Tivoli Monitoring server and the Administration Center do not have to be installed on the same systems, they can be installed on different systems.

1. To access the Administration Center, start the Tivoli Integrated Portal by running the following command from a command line on the system where you have installed the Administration Center:

- a. `cd <TIP_home>/profiles/TIPProfile/bin`

- b. `startServer.sh server1 -user <tipuser> -password tippassword`

where *TIP_home* is the default directory on the system where you installed the Administration Center.

2. To open the Tivoli Integrated Portal window, open a Web browser and enter the following address:

```
http://hostname:port
```

where *port* is the port number that is specified when you installed the Tivoli Integrated Portal. The default is 16310.

If you are on a remote system, you can access the Tivoli Integrated Portal 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 **User ID** field, enter the Tivoli Integrated Portal user ID that was defined when you installed the Tivoli Storage Manager Administration Center.
4. In the **Password** field, enter the password you defined for the Tivoli Integrated Portal user ID and click **Log in**.
5. On the left side of the window, click **Tivoli Common Reporting** → **Work with Reports**.
6. After the Tivoli Common Reporting window opens, click **Tivoli Products** → **Tivoli Storage Manager** → **Client Reports** or **Server Reports**.
7. Right-click one of the reports and select **Data Sources**.
8. Select the first data source and click **Edit**.
9. 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 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**.
10. The Reports window opens. To test the data, select a report and click **HTML** or **PDF**.
11. Depending on the report you have selected to test, fill in the fields indicating the data that the report should contain.
12. Click **Run**. The selected report is displayed.
13. 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 Tivoli Integrated Portal and Administration Center depends on the speed of your processor and the memory in your machine. Use the following steps to install the Tivoli Integrated Portal and Administration Center.

If you are upgrading the Administration Center, see Chapter 7, “Upgrading the Administration Center,” on page 63.

1. Install your Tivoli Storage Manager Version 6.2 servers. See Chapter 2, “Installing Tivoli Storage Manager,” on page 13. Give each server a unique name.
2. Start your Tivoli Storage Manager Version 6.2 server. See “Starting the server instance” on page 34.
3. Download and install the Administration Center. See “Installing the Administration Center” on page 48.
4. Verify the Administration Center installation. See “Verifying your installation” on page 52.
5. Define your Tivoli Integrated Portal users. See “Defining Administration Center users to the Tivoli Integrated Portal” on page 54.
6. Add connections for the Tivoli Storage Manager servers that you want to manage. See “Server connections to the Administration Center” on page 66.

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=swg21410467>.

Important: The following platform is supported for Tivoli Integrated Portal Version 1.1.1.2 and the Administration Center for Tivoli Storage Manager Version 6.2:

- Solaris SPARC

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, install the 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 6.2.0.0-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:

```
./6.2.0.0-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 49

Silent mode

“Installing the Administration Center in silent mode” on page 50

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. To start the wizard, enter the following command:

```
./install.bin
```

The Administration Center 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 prompts. You must accept the license agreement to proceed. Select the Administration Center component. Selecting the default option installs the required components for the Administration Center. The advanced option provides additional components that you can select.

After you select the Administration Center component, you are prompted for a Tivoli Integrated Portal user name and password. The default Tivoli Integrated Portal user name is `tipadmin` 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 Tivoli Integrated Portal and Administration Center.

Important: Save the user name and password or you are unable to uninstall the Administration Center.

You can create additional Tivoli Integrated Portal user IDs and passwords for any other administrators who will access the Administration Center.

Attention: If you are installing on a remote system using an X display, and the local system does not have an X Window System server running, the installation might fail. If this happens, ensure that the `DISPLAY` environment variable is *not* set and restart the installation.

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. Ensure that you make a note of the port number listed in the summary panel because it might be different from the one you originally entered in the wizard, depending on port availability and your system requirements. You will need this port to log on to the Administration Center. Using the correct port is essential so that the various Administration Center operations can function properly.

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, enter the following command:

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

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 prompts. You must accept the license agreement to proceed. Select the Administration Center component. Selecting the default option installs the required components for the Administration Center. The advanced option provides additional components that you can select.

After you select the Administration Center component, you are prompted for a Tivoli Integrated Portal user name and password. The default Tivoli Integrated Portal user name is `tipadmin` 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 Tivoli Integrated Portal and Administration Center.

Important: Save the user name and password or you are unable to uninstall the Administration Center.

You can create additional Tivoli Integrated Portal user IDs and passwords for any other administrators who will access the Administration Center.

Attention: If you are installing on a remote system using an X display, and the local system does not have an X Window System server running, the installation might fail. If this happens, ensure that the DISPLAY environment variable is *not* set and restart the installation.

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. Ensure that you make a note of the port number listed in the summary panel because it might be different from the one you originally entered in the wizard, depending on port availability and your system requirements. You will need this port to log on to the Administration Center. Using the correct port is essential so that the various Administration Center operations can function properly.

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

Completing a silent installation is one method of installing the Administration Center.

To start the silent installation, enter the following command on a single line. See the sample response files (`sample_response.txt`) for more details about the variables. These files are located in the Tivoli Storage Manager installation media root directory. Before installing the Administration Center, ensure that the LD_LIBRARY_PATH_64 environment variable is *not* set.

```
install -i silent -f path_name_to_response_file
```

Ensure that you enter the full path name to the sample response file. Update the LICENSE_ACCEPTED variable to accept the Tivoli Integrated Portal Version 1.1.1.2 and Tivoli Storage Manager Administration Center license agreements. If the LICENSE_ACCEPTED variable is anything other than true, the installation ends and no log is produced. By removing the # sign before #LICENSE_ACCEPTED=false and changing false to true #--- you are accepting the Tivoli Integrated Portal Version 1.1.1.2 and Tivoli Storage Manager Administration Center license agreements.

```
LICENSE_ACCEPTED=true
```

Define the installation location. To reuse an instance of Tivoli Integrated Portal, point to its existing installation location. For example:

```
USER_INSTALL_DIR=/opt/IBM/ac
```

Do not define the IAGLOBAL_WUI_HOME, #--- variable unless you are upgrading an existing Tivoli Integrated Portal installation. Comment it out by placing # signs in front of the hyphens: #--- #---.

```
IAGLOBAL_WUI_HOME==/opt/IBM/WebSphere/UpdateInstaller
#----#----
```

If you are upgrading an existing Tivoli Integrated Portal, complete a backup first. After the backup is done, issue the following command:

```
IAGLOBAL_BACKUP_PROCEDURE_DONE=true
```

Select reuse if you want to use an existing Tivoli Integrated Portal location.

```
IAGLOBAL_INSTALL_LOCATION_SELECTION=create|reuse
CHOSEN_INSTALL_SET=default|advanced
ESSServer is (IAGLOBAL_AUTHENTICATION_SVC_SELECTION=YES)
CHOSEN_INSTALL_SET=advanced
IAGLOBAL_AUTHENTICATION_SVC_SELECTION=YES
IAGLOBAL_USER_REGISTRY_LDAP_SELECTED=false
WAS_INFO note
```

The WASPortsCreationAction creates all the ports. The WASPassword variable is not encrypted.

```
IAGLOBAL_WASUserID=tipadmin
IALOCAL_WASPassword=TIP_pw
IAGLOBAL_WC_defaulthost=16310
IAGLOBAL_WC_defaulthost_secure=16311
IAGLOBAL_BOOTSTRAP_ADDRESS=16312
IAGLOBAL_SOAP_CONNECTOR_ADDRESS=16313
IAGLOBAL_WC_adminhost=16315
IAGLOBAL_WC_adminhost_secure=16316
IAGLOBAL_DCS_UNICAST_ADDRESS=16318
IAGLOBAL_ORB_LISTENER_ADDRESS=16320
IAGLOBAL_SAS_SSL_SERVERAUTH_LISTENER_ADDRESS=16321
IAGLOBAL_CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS=16322
IAGLOBAL_CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS=16323
```

The VMM configuration values are FILE_BASED|LDAP. Enter either this variable:

```
IAGLOBAL_DEFAULT_USER_REGISTRY_SELECTION=FILE_BASED
```

Or these variables:

```
IAGLOBAL_USER_REGISTRY_LDAP_SELECTED=true
IAGLOBAL_LDAP_PRIMARY_USER=tipadmin
IALOCAL_LDAP_BIND_PASSWORD=*****
IAGLOBAL_LDAP_BASE_ENTRY="o\=IBM,c\=US"
IAGLOBAL_LDAP_BIND_DN="cn=root"
IAGLOBAL_LDAP_GROUP_ENTITY=Group
IAGLOBAL_LDAP_GROUP_SUFFIX="o\=IBM,c\=US"
IAGLOBAL_LDAP_NAME="rhe1vm1.tivlab.raleigh.ibm.com"
IAGLOBAL_LDAP_ORG_ENTITY=OrgContainer
IAGLOBAL_LDAP_ORG_SUFFIX="o\=IBM,c\=US"
IAGLOBAL_LDAP_PORT=389
IAGLOBAL_LDAP_REPOSITORY_ID=rhe1vm1
IAGLOBAL_LDAP_USER_ENTITY=PersonAccount
IAGLOBAL_LDAP_USER_SUFFIX="o\=IBM,c\=US"
```

| **Attention:** If you are installing on a remote system using an X display, and the
| local system does not have an X Window System server running, the installation
| might fail. If this happens, ensure that the DISPLAY environment variable is *not* set
| and restart the installation.

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. Start the Administration Center by entering one of the following addresses in a supported Web browser:

`http://workstation_name:port/`

Or:

`https://workstation_name:port/ibm/console`

The *workstation_name* is the network name or IP address of the workstation on which you installed the Administration Center and the *port* is the Web administration HTTP or HTTPS port number.

Attention: Ensure that you are using the same port that was displayed in the summary panel of the wizard after you completed the Administration Center installation. Because of system resources and availability of certain ports on your workstation, this might be a different number from the port you had entered into the wizard in a previous panel. You will not receive any warning messages that you are using an incorrect port, and might even be able to complete some Administration Center tasks with a different port. To save time and resources, ensure that you use the intended port.

The default Web administration port (HTTP) is 16310. The default secure Web administration port (HTTPS) is 16316. If you are using a different port number from the default, the secure port typically appears with 6 as the last number.

Look in the following file if you want to see the port that is being used. In this file, **WC_defaulthost** contains the variable for the HTTP port and **WC_adminhost_secure** contains the variable for the HTTPS port.

`TIP_HOME/properties/TIPPortDef.properties`

where *TIP_HOME* is the root directory for the Tivoli Storage Manager installation.

The default for *TIP_HOME* is `/opt/ibm/ac`.

Tip: If you use `http://workstation_name:16310/` to connect to the Administration Center, you are redirected to the secure port and address (`https://workstation_name:16316/ibm/console`).

To start the Administration Center using the default ports, for example, enter one of the following addresses in a supported Web browser:

`http://workstation_name:16310/`

Or:

`https://workstation_name:16316/ibm/console`

2. To get started, log in, using the Tivoli Integrated Portal 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 Tivoli Integrated Portal 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.

The Tivoli Integrated Portal is built on top of a WebSphere Application Server. The WebSphere server must be running or the Tivoli Integrated Portal is not accessible from a browser. To enable the automatic start during system startup of the Administration Center WebSphere server, complete the following steps:

1. Log in with the root user ID.
2. Change to the `/opt/ibm/ac/products/tsm/bin` directory (default).
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 `/opt/ibm/ac/products/tsm/bin` directory (default).
3. Run the following script:

```
setTSMUnixLinks.sh uninstall
```

Starting and stopping the Tivoli Integrated Portal server

The IBM Tivoli Integrated Portal server is automatically started after a successful installation. If you shut down the system after the initial installation, any Tivoli Integrated Portal servers that were started are stopped.

Use the command line to start and stop Tivoli Integrated Portal servers.

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

- `TIP_HOME` is the root directory for the Tivoli Storage Manager installation.

The default for `TIP_HOME` is `/opt/ibm/ac`.

- `tip_admin` is the administrator user ID for the Administration Center.

- `tip_pw` is the password for the administrator.

1. Change to the `TIP_HOME/bin` subdirectory in the Tivoli Storage Manager installation directory.

2. Start or stop the Tivoli Integrated Portal server by issuing one of the following commands:
 - To **start** an Tivoli Integrated Portal server, issue this command:
`startServer.sh server1 -username tip_admin -password tip_pw`
 - To **stop** an Tivoli Integrated Portal server, issue this command:
`stopServer.sh server1 -username tip_admin -password tip_pw`

Defining Administration Center users to the Tivoli Integrated Portal

When you install the 6.2 Administration Center, you must define the users to the Tivoli Integrated Portal.

You can create a separate Tivoli Integrated Portal user ID for each Tivoli Storage Manager administrator, or for a group of administrators. As a best practice, give each Tivoli Storage Manager administrator their own Tivoli Integrated Portal administrator ID. Creating separate Tivoli Integrated Portal administrator IDs can help you control access for administrators who manage different servers, or have different privilege classes. After logging in using this ID, they can use their Tivoli Storage Manager administrator name and password to manage connections for the servers they manage.

Complete the following steps to define Administration Center users to the Tivoli Integrated Portal:

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**. The TSM_AdminCenter group is a shell for you to populate with users. You must manually enter the user credentials.
8. Complete the form and click **Create**.

Uninstalling the Administration Center

Uninstall the Administration Center either by using one of two wizards or in silent mode.

Complete the following steps:

1. If you have the WebSphere server automatic restart set up, ensure that you remove it before uninstalling the Administration Center.
2. Log in with the root user ID.
3. Change to the *install_directory* /products/tsm/bin directory.
4. Run the following script:
`setTSMUnixLinks.sh uninstall`

To uninstall the Administration Center, complete the following steps:

1. Change to the following subdirectory in the /opt/ibm/ac/ directory:
`cd _uninst`
2. Use one of the following methods to uninstall the Administration Center:

- To use the installation wizard (GUI) to uninstall the Administration Center, issue this command:

```
./uninstall
```

Tip: Ensure that you have your Administration Center user name and password to uninstall the Administration Center.

- To use the console to uninstall the Administration Center, issue this command:

```
./uninstall -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 the Administration Center, issue the following command. Sample response files (`uninstall_response.txt`) are available with the Administration Center installation driver. Use one of the sample files to run a silent installation. Ensure that you enter the full path name to the sample response file.

```
./uninstall -i silent -f path_name_to_response_file
```

3. Follow the prompts to uninstall the Administration Center. You see a message that the Administration Center uninstallation was successful.

See Chapter 5, “Installing and configuring the Administration Center,” on page 47 for the installation steps to reinstall the Administration Center.

Chapter 6. Upgrading from Tivoli Storage Manager Version 6.1

You can upgrade directly to Tivoli Storage Manager Version 6.2 from any version of Tivoli Storage Manager Version 6.1. Multiple server instances on a system all use the same installed code, so all the server instances on a system must be upgraded at the same time.

The upgrade process recreates your server instances, recatalogs the databases for each instance, and upgrades each database, using information saved from your previous installation. As a server and database are moved into Tivoli Storage Manager Version 6.2, the validity of the data is checked against constraints that are enforced in the new database.

Tip: If you are upgrading from Tivoli Storage Manager Version 6.1 to Version 6.2 and have multiple servers on your system, you only have to run the upgrade wizard once. See “Running multiple server instances on a single system” on page 38 for more information about running multiple servers.

If you are upgrading a 5.5 Tivoli Storage Manager server to Tivoli Storage Manager Version 6.2, see the *Server Upgrade Guide*.

If you are upgrading an existing Tivoli Storage Manager Version 6.2 server to a later level of Version 6.2, see Chapter 8, “Installing a Tivoli Storage Manager server fix pack,” on page 69.

To return to an earlier version of Tivoli Storage Manager, after an upgrade, you must have a full database backup of that original version and the installation code for the server of that original version.

1. Check the readme file for any special instructions or specific information for your operating system.
2. Plan for system hardware and software requirements. See Chapter 1, “Planning to install IBM Tivoli Storage Manager,” on page 1.

Restriction: You cannot upgrade your server to run on an operating system that is different from the operating system it currently runs on.

3. Back up your V6.1 server database and configuration files.
4. Make a list of your current server instances by running the following command:

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

Keep a record of the database path for each instance. Verify that the database default paths are correct before performing the upgrade.

5. Stop each server instance on the system by issuing this Tivoli Storage Manager command from an administrative command line:
halt
6. Ensure that no server database backup or restore operations are running.
7. Ensure that you have the user ID and password for each server instance because you need these for the upgrade.
8. Install the latest Tivoli Storage Manager server code, using a wizard or silent mode. Using one of the wizards, you are guided to perform the upgrade steps in the correct order and you are prompted for your server instance credentials.

Until the new version is installed and any required licenses are registered again, clients cannot connect to the server. Ensure that the following requirements are met if you use the installation or console installation wizard for the upgrade:

- 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 6.2 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.

If a connection cannot be established using SSH, RSH, or REXEC, manually upgrade the Tivoli Storage Manager server instance from Version 6.1 to 6.2. See <http://www.ibm.com/support/docview.wss?uid=swg27018195> for details.

Use one of the following methods to install the latest server code:

Installation wizard

“Upgrading Tivoli Storage Manager using the installation wizard”

Command-line console wizard

“Upgrading Tivoli Storage Manager using the console installation wizard” on page 59

Silent mode

“Upgrading Tivoli Storage Manager in silent mode” on page 60

The DB2CKUPGRADE script conducts checks and creates logs for each database. These logs contain the results of the DB2CKUPGRADE command for each database. The logs are called:

```
/tmp/db2ckupgrade_<instance_name>_<db_name>.log
```

The wizard automatically corrects some errors in the database during the upgrade to Version 6.2 and DB2 Version 9.7. Other errors might need to be corrected manually. See the *Problem Determination Guide* and search for DB2 log files for more details about database errors. Run the upgrade again after you fix any errors.

9. Verify that the upgrade was successful by starting the server. See “Starting the server instance” on page 34. Perform some basic operations and query information about the system to confirm that all information transferred correctly.

Upgrading Tivoli Storage Manager using the installation wizard

Using the installation wizard is one method of upgrading Tivoli Storage Manager from Version 6.1.

See Chapter 6, “Upgrading from Tivoli Storage Manager Version 6.1,” on page 57 for an overview of the upgrade steps, before starting the upgrade.

To upgrade Tivoli Storage Manager from Version 6.1, 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. Then, 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 receive an error message and are returned to the components' page. The Tivoli Storage Manager client application programming interface (API), DB2 Version 9.7, and GSKit 7 are automatically installed when you select the server component.

Tip: During the upgrade from Tivoli Storage Manager Version 6.1 to Version 6.2, or if you uninstall any version of Tivoli Storage Manager 6.1 or later, including a fix pack, an instance file is created. The instance file is created to help reinstall Tivoli Storage Manager. If this file exists and you start an upgrade, the upgrade might fail because the server instance cannot be created when information is retrieved from the file. Consider removing or temporarily renaming the instance file if you have old information in it, or if you get an error message after adding your credentials to the **Instance user ID** panel of the installation wizard.

You can find the instance file in the following location:

```
/etc/tivoli/tsm/instance.info
```

Attention: If you are installing on a remote system using an X display, and the local system does not have an X Window System server running, the installation might fail. If this happens, ensure that the `DISPLAY` environment variable is *not* set and restart the installation.

At the end of the upgrade, 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 upgrade, 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
```

Upgrading Tivoli Storage Manager using the console installation wizard

Using the console installation wizard is one method of upgrading Tivoli Storage Manager from Version 6.1.

See Chapter 6, “Upgrading from Tivoli Storage Manager Version 6.1,” on page 57 for an overview of the upgrade steps, before starting the upgrade.

To upgrade the Tivoli Storage Manager server from Version 6.1, 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. Then, 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 receive an error message and are returned to the components' page. The Tivoli Storage Manager client application programming interface (API), DB2 Version 9.7, and GSKit 7 are automatically installed when you select the server component.

Tip: During the upgrade from Tivoli Storage Manager Version 6.1 to Version 6.2, or if you uninstall any version of Tivoli Storage Manager 6.1 or later, including a fix pack, an instance file is created. The instance file is created to help reinstall Tivoli Storage Manager. If this file exists and you start an upgrade, the upgrade might fail because the server instance cannot be created when information is retrieved from the file. Consider removing or temporarily renaming the instance file if you have old information in it, or if you get an error message after adding your credentials to the **Instance user ID** panel of the installation wizard.

You can find the instance file in the following location:

```
/etc/tivoli/tsm/instance.info
```

Attention: If you are installing on a remote system using an X display, and the local system does not have an X Window System server running, the installation might fail. If this happens, ensure that the `DISPLAY` environment variable is *not* set and restart the installation.

At the end of the upgrade, 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 upgrade, 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
```

Upgrading Tivoli Storage Manager in silent mode

Using silent mode is one method of upgrading Tivoli Storage Manager from Version 6.1.

See Chapter 6, “Upgrading from Tivoli Storage Manager Version 6.1,” on page 57 for an overview of the upgrade steps, before starting the upgrade.

Restriction: The following restrictions apply:

You must include the `LICENSE_ACCEPTED=true` and `INSTANCE_CRED` variables or the upgrade fails.

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

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

To either create a new response file or use an existing one for the silent upgrade, select one of the following options.

- To start the silent upgrade 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_SERVER_LANGUAGES=1  
-DINSTALL_LICENSE=1 -DINSTALL_DEVICES=1  
-DINSTALL_STAGENT=1  
-DINSTANCE_CRED="instance1 userid1 password1,instance2 userid2 password2"
```

When you add the INSTANCE_CRED variable to the command, enter credentials for each of your server instances and use quotation marks around your credentials. To find the existing server instances, issue this command:

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

You can install the following server language-packs during the silent upgrade, 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_PTUTF8
- INSTALL_KOREANUTF8
- INSTALL_JAPANESEUTF8
- INSTALL_SCHINESEUTF8
- INSTALL_RUSSIANUTF8
- INSTALL_TCHINESEUTF8
- INSTALL_BIG5CH

- 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 upgrade process. The response file contains variables that you selected during a prior upgrade, 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).

| **Attention:** If you are installing on a remote system using an X display, and the
| local system does not have an X Window System server running, the installation
| might fail. If this happens, ensure that the DISPLAY environment variable is *not* set
| and restart the installation.

| Fix any errors before continuing. See the following log for more information:

| `/var/tivoli/tsm`

Chapter 7. Upgrading the Administration Center

To administer IBM Tivoli Storage Manager Version 6.2 and later servers, you must upgrade to the Administration Center Version 6.2.

The IBM Tivoli Integrated Portal is a graphical user interface (GUI) that you can install to work with the Tivoli Storage Manager Version 6.2 server. Tivoli Integrated Portal provides all the functions that were available in the Integrated Solutions Console. With Tivoli Storage Manager Version 6.2, the Administration Center is integrated as part of the Tivoli Integrated Portal instead of the Integrated Solutions Console.

See Chapter 5, “Installing and configuring the Administration Center,” on page 47 if you are installing the Administration Center for the first time.

The Administration Center provides wizards to help guide you through common configuration tasks. The Tivoli Integrated Portal lets you install components provided by multiple IBM applications, and access them from a single interface.

You must manually complete the upgrade from an earlier version of the Administration Center to Version 6.2. You must define your Tivoli Integrated Portal user IDs to the new Administration Center. In addition, you must provide credentials for each of the Tivoli Storage Manager servers.

Restriction: The Administration Center Version 6.2 is only compatible with the Tivoli Integrated Portal Version 1.1.1.2. If you have earlier versions of the Administration Center and Tivoli Integrated Portal installed, you must upgrade both.

The Administration Center can also be installed to a currently existing Tivoli Integrated Portal Version 1.1.1.2. In the panel where you select which directory to install into, there is an option to install to an existing Tivoli Integrated Portal. If you select that option, the panel is automatically filled in with information about any other Tivoli Integrated Portal Version 1.1.1.2 already installed on the system.

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 V6.2 on the same workstation at the same time as you run the previous version.

To support coexistence, provide non-conflicting port assignments. You can choose to have the same port definitions and run only one version or the other, or you can define separate ports and run two versions of the Administration Center concurrently.

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.

The Administration Center Version 6.2 is not compatible with the Integrated Solutions Console. The Integrated Solutions Console was part of the Administration Center for Tivoli Storage Manager Version 6.1.0. You must install the Version 6.2 Administration Center with Tivoli Integrated Portal.

Upgrading procedure for the Administration Center

Use the upgrade procedure to upgrade from a previous version of the IBM Tivoli Storage Manager Administration Center to the Administration Center Version 6.2.

The 6.1 Administration Center is built on the Integrated Solutions Console and the 6.2 Administration Center is built on the Tivoli Integrated Portal. You can either have both versions (6.1 and 6.2) on your workstation at the same time, or uninstall Version 6.1 and then install the Version 6.2 Administration Center.

There are two scenarios for upgrading to the Version 6.2 Administration Center, depending upon which Administration Center version you are using.

- If you are upgrading from a Tivoli Storage Manager Version 5.5 Administration Center, you can locate and save the database file, `tmservers.xml`, for the Tivoli Storage Manager server.
- If you are upgrading from a Tivoli Storage Manager Version 6.1 Administration Center, you can use the Manage Servers section to download a file containing information about the defined Tivoli Storage Manager servers.

To start the upgrade procedure, complete the following steps:

1. Obtain information about the Tivoli Storage Manager servers defined to the previous Administration Center:
 - If the Administration Center is earlier than Version 6.1, save the `tmservers.xml` file that is located in the installation directory of the earlier Administration Center.
 - If you have a Version 6.1 Administration Center, you can download the server definitions to a file. Click **Manage Servers** → **Download Connection File**. For more details on the contents of the file and how to use it, refer to the Manage Servers help section in the Administration Center.
2. Prepare for the installation by collecting your user IDs and server credentials from the earlier Administration Center.
3. Install Administration Center Version 6.2. Note the following restrictions:
 - Integrated Solutions Console user IDs are not recreated in the new Administration Center.
 - Tivoli Storage Manager server credentials are not recreated in the new Administration Center.
4. Manually duplicate the user configuration of your earlier Administration Center. Build up a new environment for Version 6.2:
 - a. Obtain the information about user IDs and server credentials from the earlier Administration Center. You must have the valid Administration Center user ID and password to upgrade the Administration Center.
 - b. Define each Integrated Solutions Console user previously defined to the earlier Administration Center.

- c. Define to each Tivoli Integrated Portal user ID its set of Tivoli Storage Manager server connections.
 - The Tivoli Storage Manager server database file (`tsmservers.xml`) from the Version 5.5 Administration Center can be uploaded.
 - The server definitions file previously downloaded from Version 6.1 can be uploaded. Save the file, then load the server definitions into the Version 6.2 Administration Center by clicking **Action** → **Upload Connection File**.
5. Optional: Uninstall the earlier Administration Center.

Obtaining information about Tivoli Integrated Portal or Integrated Solutions Console users

You can find information about users through the Users and Groups menu item.

Complete the following steps to obtain information about the defined user IDs:

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 user IDs. Capture this information for later use.
7. Determine the password for each of these IDs.

Defining Integrated Solutions Console users to the Version 6.2 Administration Center

When you upgrade to the Version 6.2 Administration Center, you must define the user IDs to the IBM Tivoli Integrated Portal.

You can create a separate Tivoli Integrated Portal user ID for each Tivoli Storage Manager administrator, or for a group of administrators. As a best practice, give each Tivoli Storage Manager administrator their own Tivoli Integrated Portal administrator ID. Creating separate Tivoli Integrated Portal administrator IDs can help you control access for administrators who manage different servers, or have different privilege classes. After logging on using this ID, they can use their Tivoli Storage Manager administrator name and password to manage connections for the servers they manage.

Complete the following steps to define the Integrated Solutions Console user IDs to Tivoli Integrated Portal:

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**. The `TSM_AdminCenter` group is a shell for you to populate with users. You must manually enter the user credentials.
8. Complete the form and click **Create**.

Server connections to the Administration Center

A Manage Servers section is in the Tivoli Integrated Portal navigation tree of the Version 6.2 Administration Center. When you open this section, you are presented with a table of servers defined to the Administration Center for your Integrated Solutions Console or Tivoli Integrated Portal 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 6.2 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 6.2 Administration Center, but the server credentials must be provided for each server. Optionally, you can choose to edit the `tsmservers.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 about uploading a connections file.

If you choose to have the two versions of the Administration Center coexist, the installation of the Version 6.2 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 6.2 Administration Center, but the server credentials must be provided for each server.

For both scenarios, the server connections for each Integrated Solutions Console or Tivoli Integrated Portal 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 6.2 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 Tivoli Integrated Portal 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 user 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 8. Installing a Tivoli Storage Manager server 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 base release.

To see a list of the latest maintenance and download fixes, visit this Web site: http://www.ibm.com/support/entry/portal/Overview/Software/Tivoli/Tivoli_Storage_Manager. Click **Support and downloads** and apply any applicable fixes. For information about obtaining a base license package, click **Warranties and licenses**.

For information about supported platforms and system requirements, go to the same Web site (http://www.ibm.com/support/entry/portal/Overview/Software/Tivoli/Tivoli_Storage_Manager) and click **Server requirements**.

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

Attention: 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/maintenance/server>.
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.x.x.x-TIV-TSMALL-platform.bin
```

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

- b. Issue the following command to extract the installation files:

```
./6.x.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.

Important: After a fix pack is installed, it is not necessary to go through the configuration again. You can stop after completing the installation itself, fix any errors, then restart your servers.

Installation wizard

“Installing Tivoli Storage Manager using the installation wizard” on page 14

Command-line console wizard

“Installing Tivoli Storage Manager using the console installation wizard” on page 15

Silent mode

“Installing Tivoli Storage Manager in silent mode” on page 16

| Fix any errors before continuing. The installation log, `installFixPack.log`, is stored
| in the following location:
| `coi/plan/tmp`

Chapter 9. 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 6.2. It is not possible to uninstall a single component of the product by itself. For example, you cannot uninstall only the Tivoli Storage Manager device driver 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`
 - To use the console to uninstall Tivoli Storage Manager, issue this command:
`./Uninstall_Tivoli_Storage_Manager -i console`
 - To silently uninstall Tivoli Storage Manager, issue this command:
`./Uninstall_Tivoli_Storage_Manager -i silent`
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 13 for Tivoli Storage Manager Version 6.2 installation steps to reinstall the components.

Uninstalling and reinstalling Tivoli Storage Manager

If you plan to manually reinstall Tivoli Storage Manager instead of using the wizard, 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.

If you are using the wizard to upgrade from Tivoli Storage Manager Version 6.1, it is not necessary to complete these steps, the wizard completes them automatically. To manually 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 commands 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 9, “Uninstalling Tivoli Storage Manager,” on page 71.
4. When you uninstall any version of Tivoli Storage Manager 6.1 or later, including a fix pack, an instance file is created. The instance file is created to help reinstall Tivoli Storage Manager. Check this file and use the information when you are prompted for the instance credentials when reinstalling. In silent installation mode, you provide these credentials using the `INSTANCE_CRED` variable.
You can find the instance file in the following location:
`/etc/tivoli/tsm/instance.info`
5. Reinstall Tivoli Storage Manager. See Chapter 2, “Installing Tivoli Storage Manager,” on page 13.
6. Recreate your server instances. See “Creating the server instance” on page 28.

Tip: The installation wizard configures the server instances but you must verify that they exist. If they do not exist, you must manually configure them.

7. 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
```
8. Verify that the server instance was created successfully. Issue this command:
`# /opt/tivoli/tsm/db2/instance/db2ilist`
9. Verify that Tivoli Storage Manager recognizes the server instance by listing your directories. Your home directory appears if you did not change it. Your instance directory does 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 A. Installation log files

If you experience errors during installation, these errors are recorded in several log files that are distributed in various locations.

The following table describes the files that are created when you install or uninstall Tivoli Storage Manager and recommends which files to check when looking for information that might help you troubleshoot problems:

Table 10. Contents of the log.zip file

File Name	Description	Location
The log.txt file contains information about the following Environment Checks: <ul style="list-style-type: none"> • Platform • Version • Architecture • Prerequisites 	Contains installation log files. Review this log file when any installation failures occur.	This file is located in: /var/tivoli/tsm The InstallAnywhere exit codes are in the log.txt file and can also be summoned by command. You can only retrieve the exit codes after the installation wizard is finished installing. The exit codes are for the Tivoli Storage Manager installation and upgrade from Tivoli Storage Manager Version 6.2 installation wizards as well as the Tivoli Storage Manager reporting and monitoring installation wizard. To use the command line, issue the following command: echo \$? See Table 11 on page 74 for all the InstallAnywhere exit codes.
DE_Install.log	Contains information about the Deployment Engine (DE) installation. Review this log file if the DE installation fails.	de/root
db2setup.log	Contains information about the DB2 installation. Review this log file if the DB2 installation fails.	coi/plan/tmp
db2_uninst.log	Contains information about the DB2 uninstallation	coi/plan/logs

Table 10. Contents of the log.zip file (continued)

File Name	Description	Location
DB2.log	Contains information about the installation and uninstallation commands. Return codes can be retrieved from this log file, but not for DB2. If installation or uninstallation completed, the executePackage or remove-package scripts for a component are available.	coi/plan/install or coi/plan/uninstall
Administration Center installation log files	Installation log files. Review these log files if the Administration Center installation or uninstallation fails. For log information about additional Administration Center components, see the <i>Problem Determination Guide</i> .	<ul style="list-style-type: none"> • coi/plan/install/logs • coi/plan/install/MachinePlan_<host_name>/00001_eWAS • coi/plan/install/MachinePlan_<host_name>/00002_TIP • coi/plan/install/MachinePlan_<host_name>/00003_TSM_AdminCenter <p>or</p> <ul style="list-style-type: none"> • <install_root>/_uninst/plan/install/MachinePlan_<host_name>/00001_eWAS • <install_root>/_uninst/plan/install/MachinePlan_<host_name>/00002_TIP • <install_root>/_uninst/plan/install/MachinePlan_<host_name>/00003_TSM_AdminCenter

Table 11. InstallAnywhere exit codes

Code	Description
0	Success: The installation completed successfully without any warnings or errors.
1	The installation completed successfully, but one or more of the actions from the installation sequence caused a warning or a non-fatal error.
-1	One or more of the actions from the installation sequence caused an unrecoverable error.
1000	The installation was canceled by the user.
1001	The installation includes an invalid command-line option.
2000	Unhandled error.
2001	The installation failed the authorization check, might indicate an expired version.
2002	The installation failed a rules check. A rule placed on the installer itself failed.

Table 11. InstallAnywhere exit codes (continued)

Code	Description
2003	An unresolved dependency in silent mode caused the installer to exit.
2004	The installation failed because not enough disk space was detected during the execution of the Install action.
2006	The installation failed because it was launched in a UI mode that is not supported by this installer.
3000	Unhandled error specific to a launcher.
3001	The installation failed due to an error specific to the lax.main.class property.
3002	The installation failed due to an error specific to the lax.main.method property.
3003	The installation was unable to access the method specified in the lax.main.method property.
3004	The installation failed due to an exception error caused by the lax.main.method property.
3005	The installation failed because no value was assigned to the lax.application.name property.
3006	The installation was unable to access the value assigned to the lax.nl.java.launcher.main.class property.
3007	The installation failed due to an error specific to the lax.nl.java.launcher.main.class property.
3008	The installation failed due to an error specific to the lax.nl.java.launcher.main.method property.
3009	The installation was unable to access the method specified in the lax.nl.launcher.java.main.method property.
4000	A component to start Java™ could not be found at the directory specified by the java.home system property.
4001	An incorrect path to the installer jar caused the relauncher to launch incorrectly.

Appendix B. Accessibility features for Tivoli Storage Manager

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

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 information center: <http://publib.boulder.ibm.com/infocenter/tsminfo/v6r2>

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