Tivoli® Storage Manager
for HP-UX
Version 6.2

Installation Guide

IBM®

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Contents

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, and the
storage agent 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 5, "Upgrading from Tivoli Storage Manager Version 6.1," on page 43.

If you are upgrading an existing Tivoli Storage Manager Version 6.2 server to a
later level of Version 6.2, see Chapter 6, "Installing a Tivoli Storage Manager server
fix pack," on page 49.

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

Table 2. Tivoli Storage Manager server publications

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

Table 3. Tivoli Storage Manager storage agent publications

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

Table 4. Tivoli Storage Manager client publications

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

Table 5. Tivoli Storage Manager Data Protection publications

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

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). 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:

Administration Center not supported

The Administration Center is a Web-based interface for centrally configuring and managing Tivoli Storage Manager servers. The Administration Center provides wizards to help guide you through common configuration tasks. Properties notebooks allow you to modify settings and perform advanced management tasks.

In Tivoli Storage Manager Version 6.2, the Administration Center cannot be installed on HP-UX, but it can be used to manage HP-UX servers. For Administration Center system requirements, see the following Web site: http://www.ibm.com/support/docview.wss?uid=swg21410467.

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).

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 5, "Upgrading from Tivoli Storage Manager Version 6.1," on page 43.

If you are upgrading an existing Tivoli Storage Manager Version 6.2 server to a later level of Version 6.2, see Chapter 6, "Installing a Tivoli Storage Manager server fix pack," on page 49.

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

Remember: The Administration Center is not supported with Tivoli Storage Manager 6.2 and cannot be installed on HP-UX, but it can be used to manage HP-UX servers. For Administration Center system requirements, see the following Web site: http://www.ibm.com/support/docview.wss?uid=swg21410467.

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 *Administrator's Guide*.
Language pack (optional)	Each language pack (one for each language) contains language-specific information for the server.	See "Server language locales" on page 17.
Licenses (required)	Includes support for all Tivoli Storage Manager licensed features. After you install this package, you must configure the licenses you have purchased.	Refer to the chapter on managing server operations in the *Administrator's Guide*.
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 *Administrator's Guide*. A list of devices supported by this driver is available from the Tivoli Storage Manager Web site, at http://www.ibm.com/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)	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. **Remember:** The IBM Tivoli Storage Manager for Storage Area Networks is a separately licensed product.	Refer to the *Storage Agent User's Guide*.

System requirements

To install Tivoli Storage Manager server on an HP-UX system, it is necessary to have a minimum level of hardware and software, including a communication method and the most current device driver.

Hardware requirements

Table 7 describes the minimum hardware requirements that are needed for your HP-UX system. For more details about planning disk space, see "Capacity planning" on page 5.

Table 7. Hardware requirements

Type of hardware	Hardware requirements
Hardware	A 64-bit Itanium® system.
Disk space	The following minimum disk space: • 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 • 2 GB for the /opt directory • 600 MB for the /tmp directory • 300 MB for the /usr directory • 2 GB in the home directory 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. 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.

Table 7. Hardware requirements (continued)

Type of hardware	Hardware requirements
Memory	• 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 that are needed for your HP-UX system.

Table 8. Software requirements

Type of software	Minimum software requirements
Operating System	The HP Itanium system must have operating system 11 iv2 (11.23.0505) or 11 iv3 (11.31) with the most current maintenance levels installed. 11 iV2 with: • May 2005 Base Quality (QPKBASE) bundle • May 2005 Applications Quality (QPKAPPS) bundle • PHCO_38637 - libc cumulative patch 11 iV3 with: • PHCO_38658 - libc cumulative patch The latest available service patches for the operating system have to be applied. Older levels without patches do not work with the device drivers that Tivoli Storage Manager uses. The HP maxfiles parameter specifies the number of files a process is allowed to open at any given time. The default value for HP is 60. However, this value is low and can cause server problems. To ensure proper server operation, increase the maxfiles value to at least 512.
Communication protocol	A communication method that is installed and activated (shared memory is the default).
Devices and drivers	• A DVD device that is available for the installation process, if you are installing from DVD media. • The most current device driver. This driver must be installed *before* you install Tivoli Storage Manager. You can locate the device drivers at ftp://ftp.software.ibm.com/storage/devdrvr/.

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

    Archived files

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

    Space-managed files

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

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

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

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

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

    Cached copies

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

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

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

    Copy storage pool files

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

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

    Active-data pool files

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

        `500,000 x 200 bytes = 95 MB`

    Deduplicated files

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

        `50,000 x 200 bytes = 10 MB`

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

Overhead

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

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

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

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

Recovery log space requirements

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

Active log space

Ensuring that the recovery log has enough space is essential for a V6.2 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 *instance directory* for the server, which is a directory that contains files specifically for this server instance (the server options file and other server-specific files)		
The database		
Active log		
Archive log		
Optional: Log mirror for the active log		
Optional: Secondary archive log (failover location for archive log)		

Server naming best practices

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

Instance user ID

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

For example: tsminst1

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

Instance user home directory

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

For example: /home/tsminst1

Database instance name

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

For example: tsminst1

Instance directory

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

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

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

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

Database name

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

Server name

The server name is an internal name for Tivoli Storage Manager, and is used for operations that involve communication among multiple Tivoli Storage Manager servers. Examples include server-to-server communication and library sharing.

Use a unique name for each server. For easy identification 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, and languages:
- **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**
  - /opt/tivoli/tsm/devices/bin
- **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.

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:

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

   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
     ```

   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.

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 21.

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
   ```

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 21.

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.

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_PTBUTF8
  - INSTALL_KOREANUTF8
  - INSTALL_JAPANESEUTF8
  - INSTALL_SCHINESEUTF8
  - INSTALL_RUSSIANUTF8
  - INSTALL_TCHINESEUTF8
  - INSTALL_BIG5CH

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

  ```
  ./install.bin -i silent -DLICENSE_ACCEPTED=true
  -DINSTALL_SERVER=1
  -DINSTALL_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 21.

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 HP-UX

Language	LANGUAGE option value
Chinese, Simplified	zh_CN.hp15CN
	zh_CN.utf8
Chinese, Traditional	zh_TW.big5
	zh_TW.eucTW
	zh_TW.utf8
English	en_US.iso88591
	en_US.utf8
French	fr_FR.iso88591
	fr_FR.utf8
German	de_DE.iso88591
	de_DE.utf8
Italian	it_IT.iso88591
	it_IT.utf8

Table 9. Server languages for HP-UX (continued)

Language	LANGUAGE option value
Japanese	ja_JP.eucJP
	ja_JP.utf8
Korean	ko_KR.eucKR
	ko_KR.utf8
Portuguese, Brazilian	pt_PT.iso88591
	pt_PT.utf8
Russian	ru_RU.iso88595
	ru_RU.utf8
Spanish	es_ES.iso88591
	es_ES.utf8
Notes: Refer to the *Administrator's Reference* for further information on setting the LANGUAGE option.	

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.iso88591 locale, set the LANGUAGE option to it_IT.iso88591. See "Server language locales" on page 17.

- 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 18.
2. Create the directories and user ID for the server instance. See "Creating the directories and the user ID for the server instance."
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 23.
   - Manually configure the new Tivoli Storage Manager instance. See "Configuring the server instance manually" on page 24. 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 24.
     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 25..
     c. Issue the DSMSERV FORMAT command to format the database. See "Formatting the database and log" on page 28.
     d. Configure your system for database backup. See "Preparing the database manager for backup" on page 28.
4. Start the Tivoli Storage Manager server instance. See "Starting the server instance" on page 30.
5. Register your license. See "Registering licenses" on page 33.
6. Prepare your system for database backups. See "Preparing the system for database backups" on page 33.
7. Monitor the server. See "Monitoring the server" on page 34.

Creating the directories and the user ID for the server instance

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

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

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

Item	Example commands for creating the directories	Your directories

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

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

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

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

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

> a. Create the user ID and group.

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

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

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

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

```
# groupadd tsmsrvrs
# useradd -d /home/tsminst1 -m -G tsmsrvrs -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."

- Manually configure the new Tivoli Storage Manager instance. See "Configuring the server instance manually" on page 24. 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 24.

    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 25..

    3. Issue the DSMSERV FORMAT command to format the database. See "Formatting the database and log" on page 28.

    4. Configure your system for database backup. See "Preparing the database manager for backup" on page 28.

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 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 28. 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®

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.

TCPPORT

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

TCPWINDOWSIZE

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

You can specify an integer from 0 to 2048. 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.

SSLTCPPORT

(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:

```
commmethod      sharedmem
   shmport      1510
```

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

Note: The IBM Tivoli Storage Manager server supports a maximum of twenty-five concurrent shared memory sessions.

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 COMMMETHOD option. For details about the other options, see the *Administrator's Reference*.

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

Formatting the database and log

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

After you have completed setting up server communications, you are ready to initialize the database. Do not place the directories on file systems that might run out of space. If certain directories (for example, the archive log) become unavailable or full, the server stops. See "Capacity planning" on page 5 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 24 if you have not yet created a server instance. If you are running under something other than the English regional locale, the DB2CODEPAGE system environment variable must be set before you issue the DSMSERV FORMAT command. Set it to DB2CODEPAGE=819:

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

Example: Format a database

Enter the following command on one line.

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

Preparing the database manager for backup

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

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

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/sqllib/db2profile` script, which normally runs automatically from the user ID's profile. If /home/tsminst1/.profile does not run the db2profile script, add the following lines to /home/tsminst1/.profile:

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

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

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

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

```
. ~/.profile
```

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

```
SERVERNAME TSMDBMGR_TSMINST1
```

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

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

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

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


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

5. Stop and start the database instance:

a. Stop DB2:

```
db2stop
```

b. Start DB2:

```
db2start
```

6. Set the API password:

a. Ensure that the Tivoli Storage Manager server is started. See "Starting the server instance" on page 30 for the details.

b. Log in using the root user ID.

c. Source the database manager by running the following command.

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

d. Change the API password, using this command:

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

e. When prompted by the dsmapipw command, specify TSMDBMGR as both the original and new password.

f. Enter this operating system command:

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

Starting the server instance

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

Before you start a Tivoli Storage Manager server instance, ensure 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 25 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/sqllib/db2profile`

2. Change to the instance directory you want to use.

   `# cd instance_directory`

   where *instance_directory* is the name of your Tivoli Storage Manager instance directory.

3. Start the server instance by issuing the following command:

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

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

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

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

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

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

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

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

   `# . ~tsminst1/sqllib/db2profile`

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

   `# . <home_directory>/sqllib/db2profile`

   where *home_directory* is the fully qualified home directory for the instance user ID.

3. Change to the instance directory. For example, for the server instance named tsminst1:

```
# cd /home/tsminst1/tsminst1
```

4. Start the server instance.

  - To start the tsminst1 server using the root user ID and run it as the instance owner, use the -u option.

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

    With this command, the server program runs in the background.

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

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

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

Automatically starting servers

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

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

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

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

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

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

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

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

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

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

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

Stopping the server

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

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

```
halt
```

The server console stops.

Registering licenses

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

Preparing the system for database backups

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

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

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

Perform the following setup procedure:

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

   ```
   set dbrecovery device_class_name
   ```

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

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

```
set dbrecovery dbback
```

When you are ready to back up your database, see the 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 24 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 HP-UX 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 HPUX 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 41

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 HPUX 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 41

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 HPUX 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:

   a. For the Server Address, enter the server address.

   b. For the Port Number, accept the default or enter another port number.

   c. For the administrator ID, enter the Tivoli Storage Manager administrator ID to access the server.

   d. For the administrator Password, enter the password for the Tivoli Storage Manager administrator ID.

   The command returns the following question:

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

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

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

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

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

8. To have this reporting and monitoring agent connect to another Tivoli Enterprise monitoring server, enter 1. Otherwise, go to step 10 on page 41

   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 40.

```
# 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.

Remember: The Administration Center is not supported on HP-UX systems. In Tivoli Storage Manager Version 6.2, the Administration Center cannot be installed on HP-UX, but it can be used to view HP-UX historical data. For Administration Center system requirements, see the following Web site: http://www.ibm.com/support/docview.wss?uid=swg21410467.

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. 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 34 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 6, "Installing a Tivoli Storage Manager server fix pack," on page 49.

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 45

Silent mode
> "Upgrading Tivoli Storage Manager in silent mode" on page 46

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 30. 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 5, "Upgrading from Tivoli Storage Manager Version 6.1," on page 43 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.

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 5, "Upgrading from Tivoli Storage Manager Version 6.1," on page 43 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
```

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.

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.

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_PTBUTF8
– 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 6. 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 7. 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 7, "Uninstalling Tivoli Storage Manager," on page 51.
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 24.

   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:
• 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 54 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

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.
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.

Table 11. InstallAnywhere exit codes (continued)

Code	Description
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. System resource requirements

Semaphores, shared memory, and processes are three HP-UX system resources IBM Tivoli Storage Manager uses that might require special configuration and tuning.

Estimating required semaphore resources

IBM Tivoli Storage Manager uses semaphore resources to control its internal operations.

To estimate the total number of semaphores that the server may need, use the following formula:

```
semaphores = 60 + (2 x maxSessions)
```

Where *maxSessions* is the maximum number of concurrent client sessions.

For example, if you expect to have up to 15 client sessions active at the same time, Tivoli Storage Manager needs approximately 90 semaphores.

Note: If you have other applications that use semaphores, you must account for their requirements also when adjusting your kernel configuration.

After you have estimated the number of semaphores, ensure that your kernel configuration contains the correct value. See "Viewing and modifying the kernel configuration" on page 58 for details.

Estimating required process resources

IBM Tivoli Storage Manager uses standard HP-UX processes for concurrent server operations.

To estimate the total number of processes that the server may need, you can use the following formula:

```
processes = 60 + (2 x maxSessions)
```

Where *maxSessions* is the maximum number of concurrent client sessions.

For example, assume that you will have up to 15 client sessions active at the same time. You can calculate that IBM Tivoli Storage Manager needs approximately 90 processes to control its internal operations. You will also need to account for all of the other HP-UX processes that might be running concurrently on your system when computing the total requirements for your HP-UX kernel resources.

After you have estimated the required number of processes, ensure that your kernel configuration contains the correct value. See "Viewing and modifying the kernel configuration" on page 58 for details.

Estimating required number of threads per process

The HP-UX default setting for the maximum number of threads allowed in each process is 64 threads.

When Tivoli Storage Manager is running a high workload or participating in LAN-free data movement, this setting might be too low. To prevent thread creation errors in the Tivoli Storage Manager server, increase the HP-UX maximum number of threads per process to 500.

See "Viewing and modifying the kernel configuration" for details.

Viewing and modifying the kernel configuration

To view or modify your existing kernel configuration, use either the SAM utility program on HP-UX Version 11iv2 or System Management Homepage (SMH) on HP-UX Version 11iv3, or edit the configuration file directly. Base the kernel values on the recommendations of the DB2OSCONF utility.

Start either SAM or SMH, then select:
1. Kernel Configuration
2. Configurable Parameters

A list of parameters, whose values you can change, is displayed. The list includes:
- **semmns** The maximum number of semaphores
- **shmmax** The maximum amount of available shared memory
- **nproc** The maximum number of processes
- **max_thread_proc** The maximum number of threads allowed in each process

See your HP-UX documentation for details about changing configurable kernel parameters.

Appendix C. 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.

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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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