Tivoli Storage Manager

IBM

Version 6.1

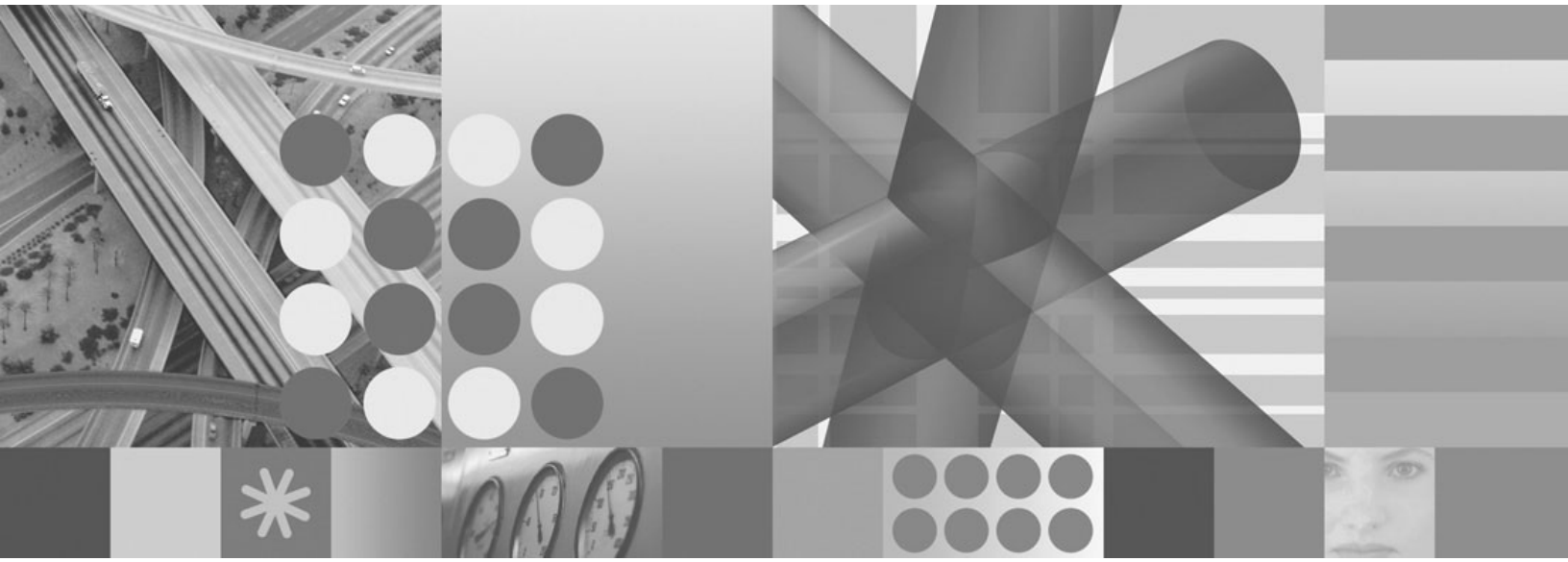
Server Upgrade Guide

SC23-9554-01

Tivoli® Storage Manager

IBM

Version 6.1



Server Upgrade Guide

SC23-9554-01

Note

Before using this information and the product it supports, read the information in "Notices" on page 315.

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

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Preface

This publication provides information about upgrading IBM® Tivoli® Storage Manager servers from one of the supported version 5 levels to version 6.1.

Who should read this guide

This publication is intended for server administrators who are responsible for upgrading Tivoli Storage Manager version 5 servers to version 6.1.

In this publication, it is assumed that you have an understanding of the following areas:

- The operating system and platform that each server runs on
- Typical administrative operations for Tivoli Storage Manager servers that will be upgraded
- Storage that is used by the servers that will be upgraded
- The network that the servers connect to

How to use this guide

To make the best use of this guide, follow the suggested sequence.

1. Read the overview information about the updates to the server: Chapter 1, "Server database updates overview," on page 1.
2. Read the planning information, and the descriptions of the scenarios:
   a. Chapter 2, "Planning the upgrade of the server," on page 11
   b. Chapter 3, "Upgrade scenarios overview," on page 59
3. Select the scenario to use, and plan for the hardware, software, and storage space requirements for your server and environment. A work sheet can be used for space planning: "Work sheet for planning space for the V6.1 server" on page 37
4. Run a test of the upgrade process: "Testing the upgrade process for a server" on page 42. Use the results of the test to refine plans, such as the estimated amount of time that a server will be unavailable because of the upgrade process.
5. Upgrade the server, following the steps in the scenario that you selected.
   - Chapter 4, "Scenario 1: Same system, media method," on page 77
   - Chapter 5, "Scenario 2: Same system, network method," on page 113
   - Chapter 6, "Scenario 3: New system, media method," on page 147
   - Chapter 7, "Scenario 4: New system, network method," on page 189
6. Complete the upgrade process by following the steps in the section, Chapter 9, "Taking the first steps after upgrade," on page 267.

Publications

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

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

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

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

Tivoli Storage Manager publications

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

Table 1. Tivoli Storage Manager server publications

Publication title	Order number
IBM Tivoli Storage Manager Messages	GC23-9787
IBM Tivoli Storage Manager Performance Tuning Guide	GC23-9788
IBM Tivoli Storage Manager Problem Determination Guide	GC23-9789
IBM Tivoli Storage Manager for AIX Installation Guide	GC23-9781
IBM Tivoli Storage Manager for AIX Administrator's Guide	SC23-9769
IBM Tivoli Storage Manager for AIX Administrator's Reference	SC23-9775
IBM Tivoli Storage Manager for HP-UX Installation Guide	GC23-9782
IBM Tivoli Storage Manager for HP-UX Administrator's Guide	SC23-9770
IBM Tivoli Storage Manager for HP-UX Administrator's Reference	SC23-9776
IBM Tivoli Storage Manager for Linux Installation Guide	GC23-9783
IBM Tivoli Storage Manager for Linux Administrator's Guide	SC23-9771
IBM Tivoli Storage Manager for Linux Administrator's Reference	SC23-9777
IBM Tivoli Storage Manager for Sun Solaris Installation Guide	GC23-9784
IBM Tivoli Storage Manager for Sun Solaris Administrator's Guide	SC23-9772
IBM Tivoli Storage Manager for Sun Solaris Administrator's Reference	SC23-9778
IBM Tivoli Storage Manager for Windows Installation Guide	GC23-9785
IBM Tivoli Storage Manager for Windows Administrator's Guide	SC23-9773
IBM Tivoli Storage Manager for Windows Administrator's Reference	SC23-9779
IBM Tivoli Storage Manager Server Upgrade Guide	SC23-9554
IBM Tivoli Storage Manager for System Backup and Recovery Installation and User's Guide	SC32-6543

Table 2. Tivoli Storage Manager storage agent publications

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

Table 3. Tivoli Storage Manager client publications

Publication title	Order number
IBM Tivoli Storage Manager for UNIX and Linux: Backup-Archive Clients Installation and User's Guide	SC23-9791
IBM Tivoli Storage Manager for Windows: Backup-Archive Clients Installation and User's Guide	SC23-9792
IBM Tivoli Storage Manager for Space Management for UNIX and Linux: User's Guide	SC23-9794
IBM Tivoli Storage Manager for HSM for Windows Administration Guide	SC23-9795
IBM Tivoli Storage Manager Using the Application Program Interface	SC23-9793
Program Directory for IBM Tivoli Storage Manager z/OS Edition Backup-Archive Client	GI11-8912
Program Directory for IBM Tivoli Storage Manager z/OS Edition Application Program Interface	GI11-8911

Table 4. Tivoli Storage Manager Data Protection publications

Publication title	Order number
IBM Tivoli Storage Manager for Advanced Copy Services: Data Protection for Snapshot Devices Installation and User's Guide	SC33-8331
IBM Tivoli Storage Manager for Databases: Data Protection for Microsoft SQL Server Installation and User's Guide	SC32-9059
IBM Tivoli Storage Manager for Databases: Data Protection for Oracle for UNIX and Linux Installation and User's Guide	SC32-9064
IBM Tivoli Storage Manager for Databases: Data Protection for Oracle for Windows Installation and User's Guide	SC32-9065
IBM Tivoli Storage Manager for Enterprise Resource Planning: Data Protection for SAP Installation and User's Guide for DB2	SC33-6341
IBM Tivoli Storage Manager for Enterprise Resource Planning: Data Protection for SAP Installation and User's Guide for Oracle	SC33-6340
IBM Tivoli Storage Manager for Mail: Data Protection for Lotus Domino® for UNIX, Linux, and OS/400® Installation and User's Guide	SC32-9056
IBM Tivoli Storage Manager for Mail: Data Protection for Lotus Domino for Windows Installation and User's Guide	SC32-9057
IBM Tivoli Storage Manager for Mail: Data Protection for Microsoft Exchange Server Installation and User's Guide	SC23-9796

Table 4. Tivoli Storage Manager Data Protection publications (continued)

Publication title	Order number
Program Directory for IBM Tivoli Storage Manager for Mail (Data Protection for Lotus Domino)	GI11-8909

Support information

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

Getting technical training

Information about Tivoli technical training courses is available online.

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

Searching knowledge bases

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

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

Searching the Internet

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

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

- IBM technotes
- IBM downloads
- IBM Redbooks®

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

Using IBM Support Assistant

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

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

- Support links
- Education links

- Ability to submit problem management reports

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

Finding product fixes

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

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

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

Getting e-mail notification of product fixes

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

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

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

Contacting IBM Software Support

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

Before you contact IBM Software Support, follow these steps:

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

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

Setting up a software maintenance contract

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

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

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

Determine the business impact

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

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

Describe the problem and gather background information

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

To save time, know the answers to these questions:

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

- Are you currently using a workaround for this problem? If so, be prepared to explain it when you report the problem.

Submit the problem to IBM Software Support

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

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

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

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

New in V6.1

Version 6.1 includes many new features. The most significant change is to the server database, which is the focus of this book.

New for the server in Version 6.1.2

Server fix pack 6.1.2 contains several new features, in addition to fixes for problems.

Enabled functions

Functions that were disabled in Tivoli Storage Manager V6.1.0 and V6.1.1 are now enabled in Version 6.1.2.

Until Tivoli Storage Manager V6.1.2, a database that contained backup sets or tables of contents (TOCs) could not be upgraded to V6. These restrictions no longer exist.

In addition, the following commands have been enabled in Version 6.1.2:

- BACKUP NAS client command if the TOC parameter specifies PREFERRED or YES
- BACKUP NODE if the TOC parameter specifies PREFERRED or YES
- DEFINE BACKUPSET
- GENERATE BACKUPSET
- GENERATE BACKUPSETTOC

Licensing changes

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

Existing Version 6.1.0 and 6.1.1 users
If you have installed version 6.1.0 and are using a version 6.1.0 license, you can download the 6.1.2 package from the Service FTP site. You can install the 6.1.2 package using the instructions in Installing a Tivoli Storage Manager fix pack.

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

New users
Version 6.1.2 is available from Passport Advantage or from your Tivoli Storage Manager sales representative. You can install version 6.1.2 using the instructions in Installing Tivoli Storage Manager.

ACSLS functionality for 64-bit Windows systems

Windows

Tivoli Storage Manager Version 6.1.0 requires the installation of StorageTek Library Attach software to utilize Sun StorageTek Automated Cartridge System Library Software (ACSLS) functions for the Windows operating system.

Support for ACSLS library functions is now available for both 32-bit and 64-bit Windows operating systems in fix pack level 6.1.2.

TSMDLST utility for AIX

AIX

The tsmdlst utility is now available for AIX® beginning in Tivoli Storage Manager fix pack level 6.1.2.

Use the tsmdlst utility to obtain information for AIX operating systems about medium-changer, tape, and optical devices controlled by the Tivoli Storage Manager device driver. With this utility you can obtain usage information, device names, serial numbers, and other device information.

Device support for AIX

AIX

The number of devices per driver is extended for AIX.

The Tivoli Storage Manager device driver can configure 1024 devices for each driver.

PREVIEW parameter for DSMSERV INSERTDB

A **PREVIEW** parameter is available for the DSMSERV INSERTDB utility in Tivoli Storage Manager fix pack level 6.1.2. The DSMSERV INSERTDB utility is used only as part of the process for upgrading a V5 Tivoli Storage Manager server to V6.1.

When you use the **PREVIEW=YES** parameter, the operation includes all the steps of the process, except for the actual insertion of data into the new database.

When you preview the insertion operation, you can quickly verify that the source database is readable. You can also identify any data constraint violations before you run the actual upgrade process for your server.

Related tasks

"Testing the upgrade process for a server" on page 42

Related reference

"DSMSERV INSERTDB (Move a server database into an empty database)" on page 294

Replacement passthru device driver for HP-UX 11i 3 (IA64 only)

HP-UX

The V6.1.2 passthru driver for HP-UX 11i v3 IA64 replaces the V6.1 passthru driver for HP-UX 11i v3 IA64. The passthru driver in V6.1.2 lets you configure 32 LUNs for each port.

If you are using the passthru driver for the V6.1 version level, reconfigure existing devices using the autoconf configuration script after installing the Tivoli Storage Manager server. You must also load the esctl, estape, eschgr, and esdisk drivers into the HP-UX kernel. The passthru driver is packaged as part of the Tivoli Storage Manager server.

SAN discovery support for Linux on zSeries

Linux

Support for SAN discovery functions is now available for the Linux on zSeries operating system beginning in Tivoli Storage Manager fix pack level 6.1.2.

New server option SANDISCOVERYTIMEOUT

AIX HP-UX Linux Solaris

A new server option is available for SAN discovery functions beginning in Tivoli Storage Manager fix pack level 6.1.2.

The SANDISCOVERYTIMEOUT option specifies the amount of time allowed for host bus adapters to respond when they are queried by the SAN discovery process.

New for the server in Version 6.1.0

Tivoli Storage Manager server version 6.1.0 contains many new features and changes.

Disabled functions in 6.1.0 and 6.1.1

Some functions have been disabled in Tivoli Storage Manager 6.1.0 and 6.1.1.

Note: The restrictions described here have been removed in Tivoli Storage Manager V6.1.2. If your server is at the V6.1.0 or V6.1.1 level, migrate to V6.1.2 to enable these functions.

A database containing backup sets or tables of contents (TOCs) cannot be upgraded to V6.1.0 or 6.1.1. The database upgrade utilities check for defined backup sets and existing TOCs. If either exists, the upgrade stops and a message is issued saying that the upgrade is not possible at the time. In addition, any operation on a V6.1 server that tries to create or load a TOC fails.

When support is restored by a future V6.1 fix pack, the database upgrade and all backup set and TOC operations will be fully enabled.

In the meantime, the following commands have been disabled:

- BACKUP NAS client command if the TOC parameter specifies PREFERRED or YES

- BACKUP NODE if the TOC parameter specifies PREFERRED or YES
- DEFINE BACKUPSET
- GENERATE BACKUPSET
- GENERATE BACKUPSETTOC

Changes to the Version 6.1 Administration Center

Many features in the Tivoli Storage Manager Administration Center Version 6.1 are new for previous users.

Updated Integrated Solutions Console

In V6.1, the Administration Center is hosted by the IBM Integrated Solutions Console (ISC) Advanced Edition Version 7.1. After installation of the Integrated Solutions Console installation completes, open a Web browser and enter the following URL, which will display the logon screen for the Integrated Solutions Console: https://*local_host*:9043/ibm/console. This screen indicates a successful installation of the Integrated Solutions Console.

To learn about console updates:

1. Start the ISC.
2. Click **Help** in the ISC banner.
3. In the Help navigation tree, click **Console Updates**.

Windows

WebSphere Windows service

In V6.1, the WebSphere Windows service is named TSM Administration Center - TsmAC.

Identify managing servers

The table of servers that is the hub of the enterprise-management work page has a column that identifies the managing server, if one exists, for each listed server. By sorting or filtering on the column, you can display the set of servers that are managed by a given server.

Hover help for table links

The Administration Center typically displays Tivoli Storage Manager objects in a table. In V6.1, when the cursor hovers over an object image, hover-help text is displayed. The hover help identifies the default action that results when you click the link that is associated with the object.

Links to information about server messages and Administration Center messages

When a problem or issue occurs with the server or Administration Center, you are immediately notified and provided with a brief message about the problem or issue. The message number is also provided. In V6.1, you can obtain detailed information about a message by clicking the link that is associated with the message number. The information is displayed in a new browser window.

Maintenance script enhancements

Tivoli Storage Manager utilizes a maintenance script to perform scheduled maintenance tasks. In V6.1, you can generate a maintenance script in one of two styles: predefined and custom.

A *predefined* maintenance script is one that is generated through a wizard. This script contains standard commands that cannot be altered. A predefined script can only be modified in the wizard.

A *custom* maintenance script is created using the Administration Center maintenance script editor. To have more control of your maintenance tasks, you can modify the commands that you specify. You can also use the editor to update your custom maintenance script.

Client nodes and backup sets enhancements

The redesigned Administration Center displays information about backup sets, client nodes, and client-node groups in one portlet. The design includes search functions that you can use to find and display information more quickly. When you select a client node, a summary panel is displayed with the current operation status, server actions, and client-node actions.

The work item **Client nodes and backup sets** appears in the ISC navigation tree.

Session and process information available in the health monitor

The Administration Center health monitor now includes information about server processes and sessions. The information is also available in the properties notebooks for servers.

Centralized server-connection management

In V6.1, server-connection tasks, such as adding a server connection, changing a password, and creating a server instance, are consolidated in a single location: the **Manage Servers** work item, located in the ISC navigation tree.

With actions available in this work item, you can quickly upload server-connection information to the Administration Center using an XML file. This file can optionally include a set of server credentials for multiple servers. To help create an XML file, you can download a list of server connections, without the credential information.

Changes to management-class activation

In the V6.1, Tivoli Storage Manager no longer activates changes to existing management classes automatically. You must activate the changes manually. Before the changes take effect, they are validated. Results of the validation are displayed. You or another administrator can review them, and then either confirm or cancel the activation.

Because changes are manually activated, you can prepare the management class in advance and activate the changes at an appropriate time.

Data deduplication

Data deduplication is a method of eliminating redundant data in sequential-access disk (FILE) primary, copy, and active-data storage pools. One unique instance of the data is retained on storage media, and redundant data is replaced with a pointer to the unique data copy. The goal of deduplication is to reduce the overall amount of time that is required to retrieve data by letting you store more data on disk, rather than on tape.

Data deduplication in Tivoli Storage Manager is a two-phase process. In the first phase, duplicate data is identified. During the second phase, duplicate data is removed by certain server processes, such as reclamation processing of storage-pool volumes. By default, a duplicate-identification process begins automatically after you define a storage pool for deduplication. (If you specify a duplicate-identification process when you update a storage pool, it also starts automatically.) Because duplication identification requires extra disk I/O and CPU resources, Tivoli Storage Manager lets you control when identification begins as well as the number and duration of processes.

You can deduplicate any type of data except encrypted data. You can deduplicate client backup and archive data, Tivoli Data Protection data, and so on. Tivoli Storage Manager can deduplicate whole files as well as files that are members of an aggregate. You can deduplicate data that has already been stored. No additional backup, archive, or migration is required.

For optimal efficiency when deduplicating, upgrade to the version 6.1 backup-archive client.

Restriction: You can use the data-deduplication feature with Tivoli Storage Manager Extended Edition only.

Storage devices

New device support and other changes to storage devices are available in Tivoli Storage Manager Version 6.1.

ACSLS functionality for Windows systems

Windows

Tivoli Storage Manager Version 6.1.0 requires the installation of StorageTek Library Attach software to utilize Sun StorageTek Automated Cartridge System Library Software (ACSLS) functions for the Windows operating system.

Support for ACSLS library functions is only available on 32-bit Windows operating systems in version 6.1.0.

Passthru device driver for HP-UX 11i v2 and v3 on the IA64 architecture

HP-UX

The HP-UX passthru device driver replaces the Tivoli Storage Manager device driver tsmscsi and is packaged as part of the Tivoli Storage Manager server. The passthru driver can be used with versions 2 and 3 of the HP-UX 11i operating system.

If you are running either of these versions, reconfigure existing devices using the autoconf configuration script after installing Tivoli Storage Manager.

Tips:

- The passthru driver, Tivoli Storage Manager server, and storage agent packages are available in 64-bit mode only.
- In V6.1, the passthru driver lets you configure eight LUNs for each port. The passthru driver in V6.1.2 lets you configure 32 LUNs for each port.

Support for HP and Quantum DAT160 drives and media

AIX | HP-UX | Linux | Solaris | Windows

With Tivoli Storage Manager, you can now use HP and Quantum DAT160 (DDS6) tape drives and media. New recording formats are available for the 4MM device type.

Support for Sun StorageTek T10000 drives, T10000B drives, and T10000 media

With Tivoli Storage Manager, you can now use Sun StorageTek T10000 drives, T10000B drives, and T10000 media. New recording formats are available for the ECARTRIDGE device type. Tivoli Storage Manager supports Volsafe media with the Sun StorageTek T10000 and T10000B drives.

Disaster recovery manager support for active-data pools

To restore your client systems more quickly and efficiently, you can now use active-data pools in your recovery plans and procedures.

Active-data pools are storage pools that contain only active versions of client backup data. Like copy storage pool volumes, disaster recovery manager lets you:

- Specify the names of active-data pool volumes to be managed by the disaster recovery manager.
- Recycle on-site and off-site active-data pool volumes according to server policies and processes.
- Include active-data pool volumes in the scripts, macros, and documentation that is part of the recovery plan file.
- Track and manage active-data pool media as required by your operations.

By default, active-data pools are not eligible for processing at the time of installation. Copy storage pools, on the other hand, are processed at installation time even if you have not explicitly specified a copy storage pool or pools to be managed.

EXPIRE INVENTORY command enhancements

The EXPIRE INVENTORY command is now enhanced with new functionality.

The additional parameters that you can now use are NODE, DOMAIN, TYPE, DURATION, AND RESOURCE. You can use these parameters to target specific client nodes and domains, and also to determine the type of data to be processed. You can use the RESOURCE parameter to specify the number of parallel processes that you want to run within the single EXPIRE INVENTORY process. You can run up to ten threads at one time, but if you are processing one node, only one thread is utilized.

No-query restore changes

The no-query restore (NQR) function and the internal algorithms responsible for NQR were changed to take advantage of DB2 capabilities and to improve performance.

The NQR function has been rewritten to resolve a performance problem encountered when restoring a small number of objects for a client file system with a large number of backup objects spread across a large number of Tivoli Storage Manager server storage pool volumes. NQR performance is now comparable to that of the classic restore under these conditions. NQR now performs a volume determination phase that must be completed before any objects are restored from DISK, FILE, or tape storage volumes.

Server database

Tivoli Storage Manager version 6.1 provides a new server database. Advantages include automatic statistics collection and database reorganization, full-function SQL queries, and elimination of the need for offline audits of the database.

Upgrading to V6.1 requires that data in a current Tivoli Storage Manager server database be extracted and then inserted into the new database structure. Tivoli Storage Manager provides utilities to perform the process.

Support for NetApp SnapMirror to Tape feature

AIX HP-UX Linux Solaris Windows

With Tivoli Storage Manager you can create SnapMirror to Tape images of file systems on NetApp file servers.

SnapMirror to Tape provides an alternative method for backing up very large NetApp file systems. Because this backup method has limitations, use this method when copying very large NetApp file systems to secondary storage for disaster recovery purposes.

Reporting and monitoring feature

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

HP-UX Installing the Tivoli Storage Manager reporting and monitoring feature directly on a Tivoli Storage Manager HP-UX server is not supported. You can monitor and report on HP-UX Tivoli Storage Manager servers by creating a monitoring agent instance for these servers on an AIX, Linux®, or Windows IBM Tivoli Monitoring server.

Solaris Installing the Tivoli Storage Manager reporting and monitoring feature directly on a Tivoli Storage Manager Sun Solaris server is not supported. You can monitor and report on Sun Solaris Tivoli Storage Manager servers by creating a monitoring agent instance for these servers on an AIX, Linux, or Windows IBM Tivoli Monitoring server.

ODBC driver support

Tivoli Storage Manager Version 6.1 uses the DB2® open database connectivity (ODBC) driver to query the database and display the results.

The Tivoli Storage Manager ODBC driver is no longer supported with the server.

Backup sets and client node enhancements

The Administration Center now displays the backup sets, client nodes, and client node groups from one portlet.

You can view all of the client nodes, view them by server, or search for a node from the three available client node tabs. The All Client Nodes tab lists all of the nodes and has a Filter feature to help in your search. The filter works differently than the other table filters in the Administration Center, in that here you do not have to press the Enter key to get results. The search is initiated when you enter a text character in the filter field. As you add characters, the results are filtered even more.

When you select a client node, a summary panel is displayed with the current operation status, server actions, and client node actions. You can also access the Server Actions by right-clicking on the selected row.

The Search tab lets you refine your search parameters to include the server name, the client node name, policy domain name, and other fields that are available.

In the Client Node Groups section, you can find a client node group from the All Client Node Groups tab or from the By Server tab. You can use the filter and the right-click menu on these pages also.

Backup sets are found in the Backup Set Collections section. Search a server by selecting it and clicking **Update Table**.

Chapter 1. Server database updates overview

The Tivoli Storage Manager Version 6.1 introduces a new relational database, based on IBM DB2 technology as the database manager. Learn about this significant change to prepare for the upgrade of your servers.

The server database

The V6.1 server integrates enterprise-class, IBM DB2 database technology that performs database management functions for the server database. An administrator can manage the server database using the Tivoli Storage Manager administrative interfaces.

The Tivoli Storage Manager administrative interfaces have been updated so that an administrator who is accustomed to working with earlier versions of the server can continue to administer the server in much the same way as before. The skills of a database administrator are *not* required to manage the database. Some advantages of the new database manager program are:

Improved server availability

Online, automated reorganization of the database occurs while server operations continue.

Audits on the database are run automatically as needed to ensure consistency. As data is added to the server database, the database manager checks data constraints and data types. The online checks for integrity prevent problems for which offline audits had been needed in earlier releases.

Improved scalability

The server has an improved capacity for concurrent operations, through the larger maximum size for the recovery log.

The maximum number of objects that can be managed by a single server is increased.

Practical database size might be limited by the time that is available to complete operations such as database backup, client backups, and data deduplication.

Complete SQL function

You can obtain information from the server database more easily than before with full-function SQL queries.

The database makes more sophisticated SQL queries on the data possible. If you choose to take advantage of its full capabilities, SQL skills might be required to develop new tools.

Database space for a V6.1 server

The database is stored on the set of directories that you specify. The amount of space that is available to the directories determines the amount of space that is available for the database.

With V6.1, you do not create or track database volumes for the server database. Instead you create and designate directories that the server can use for the database. The database manager that is part of the server automatically manages the space available to the directories as database space.

The database can be distributed across as many as 128 directories. Place the database directories on fast, reliable disks that are configured for random access I/O. Locating each directory on a different file system provides the best performance because the data is striped across the directories. Disable read cache for the database file systems, but enable write cache if the disk subsystem supports it.

The maximum size of the database that IBM formally supports at this time is 1 TB. This maximum size is much larger than for previous versions of the server. A practical size for the database might be limited in your environment by the time that is available to complete operations such as database backup, client backups, and data deduplication (if used).

Recovery log

The recovery log helps ensure that a failure (for example, a system power outage or application error) does not leave the database in an inconsistent state. The recovery log is also essential when you must restore the database.

The recovery log consists of these logs:

- Active log and the optional active log mirror
- Archive log and the optional archive failover log

During the installation process, you designate the directory location and the size of the active log, and the location of the archive logs. The amount of space for the archive logs is not limited, which improves the capacity of the server for concurrent operations compared to previous versions.

The space that you designate for the recovery log is automatically managed by the database manager program. Space is used as needed, up to the capacity of the defined log directories. You do not need to create and format volumes for the recovery log.

Ensuring that the recovery log has enough space is as important for a V6.1 server as for earlier versions of the server. Monitor the space usage for the recovery log to prevent problems.

Active log

The active log contains files that record transactions that are in progress on the server.

The active log stores all the transactions that have not yet been committed. The active log always contains the most recent log records. In case of a failure, the changes that were made but not committed are rolled back, and all committed transactions, which might not have been physically written to disk, are reapplied and committed again.

Active log mirror

The active log mirror is a copy of the active log. All changes made to the active log are also written to the mirrored log. The active log mirror can be used if the active log files cannot be read.

You can have one active log mirror. Having the active log mirror is optional, but can protect the database when a hardware failure occurs on the device where the active log is stored. Place the active log directory and the active log mirror directory on different physical devices.

Mirroring the active log provides another level of protection beyond placing the active log itself on hardware that has high-availability features. Mirroring the active 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.

If you increase the size of the active log, the active log mirror size is increased automatically.

You can create the log mirror during initial configuration of a server. If you use the DSMSERV LOADFORMAT utility instead of the wizard to configure the server, you specify the **MIRRORLOGDIR** parameter. If the active log mirror is not created at that time, you can create it later by specifying the MIRRORLOGDIR option in the server options file.

Archive log and archive failover log

The archive log contains copies of closed log files that were in the active log at an earlier time. The archive log is not needed for normal processing, but is typically needed for recovery of the database.

To provide roll-forward recovery of the database to the current point in time, all logs since the last database backup must be available for the restore operation. For the Tivoli Storage Manager server, the archive log is included in database backups, so that it can be used for roll-forward recovery of the database. The pruning of the archive log files is based on full database backups.

There is no limit to the amount of space that can be used for the archive log.

Archive log files are automatically deleted as part of the full backup processes. Do not delete archive log files manually. Monitor both the active log and the archive log. If the active log is close to filling, check the archive log. If the archive log is full or close to full, run one or more full database backups.

You can designate a secondary archive log location, also called an archive *failover* log directory. The failover directory is used by the server if the archive log directory runs out of space. Specifying an archive failover directory is optional, but

can prevent problems that occur if the archive log runs out of space. If you use an archive failover log directory, place the archive log directory and the archive failover log directory on different physical drives.

Important: Maintain adequate space for the archive log directory, and consider using an archive failover log directory. If the drive or file system where the archive log directory is located becomes full and either there is no archive failover log directory or it also is full, the log files that are ready to be moved to the archive log instead remain in the active log directory. If the active log becomes full, the server stops.

By monitoring the usage of the archive failover log, you can determine whether additional space is needed for the archive log. The goal is to minimize the need to use the archive failover log by ensuring that the archive log has adequate space.

The locations of the archive log and the archive failover log are set during initial configuration. If you use the DSMSERV LOADFORMAT utility instead of the wizard to configure the server, you specify the **ARCHLOGDIR** parameter for the archive log directory, and the **ARCHFAILOVERLOGDIR** parameter for the archive failover log directory. If the archive failover log is not created at initial configuration, you can create it later by specifying the ARCHFAILOVERLOGDIR option in the server options file.

Operation changes

The server delivers significant improvements in operations, including more automated database management.

For details about operations with a V6.1 server, see the *Administrator's Guide* section about managing the database and recovery log.

Database operations

The database manager controls operations for the database, performing automatic tasks that can help keep the database in good condition.

The database manager controls the storage space for the database. The server can use all of the space that is available to the directories that you specify for the database. In V6.1, you do not manage individual volumes for the database, which was necessary in previous versions of the server. When the database needs more space, instead of adding volumes and extending the database, you add more directories (preferably on different physical volumes) to the database space.

Database reorganization occurs automatically. Based on activity, the database manager program selects database tables to analyze, to determine when reorganization is needed for the tables. The database manager then runs reorganization while server operations continue.

As data is added to the server database, the database manager automatically checks data constraints and data types. The online integrity checks prevent problems for which offline audits had been needed in earlier releases.

Monitor the space in use by the server and the space available in the file systems where the directories are located, to ensure that space is always available. Information about database space usage and recovery log usage is available

through the Administration Center and administrative commands, and through the Tivoli Storage Manager reporting and monitoring feature.

Users who are experienced DB2 administrators can choose to issue advanced SQL queries and use DB2 tools to monitor the database. However, do *not* use DB2 tools to change DB2 configuration settings from those that are that are preset by Tivoli Storage Manager, or alter the DB2 environment for Tivoli Storage Manager in other ways. The Tivoli Storage Manager V6.1 server has been built and tested extensively using the data definition language (DDL) and database configuration that Tivoli Storage Manager deploys.

Attention: Making changes to the DDL or database configuration without using Tivoli Storage Manager interfaces can adversely affect performance, damage or destroy the server database, or cause data to become permanently lost. Do not use database tools or interfaces other than those provided or documented by Tivoli Storage Manager to change configuration settings from those that are set by Tivoli Storage Manager at installation. Do not alter the DB2 environment in other ways. If you use database tools or interfaces other than those provided or documented by Tivoli Storage Manager, you must treat the server database as read-only. Do not use other interfaces to make changes to the Tivoli Storage Manager server database.

Database protection and recovery

Database backups are essential to protect all the data that the server manages. You can recover a damaged or lost database by using database backups, together with volume history backups and the recovery log, to restore the database to the latest possible time, or to a specific point in time.

Database backups

Protect the server by using administrative schedules to run database backups regularly, at least once per day. More frequent backups might be needed if the server handles high numbers of client transactions.

You can create full, incremental, and snapshot backups of the server database. You can schedule the backups to run automatically, or perform the backups manually.

The archive log is included in database backups, and is used for roll-forward recovery of the database. At the end of a *full* database backup, space is recovered by the automatic pruning of older archive log files that are no longer needed. The archive log files that are included in a backup are automatically pruned after two more full database backups have been completed.

If space for the recovery log is limited, more frequent full backups of the database might be required so that space is recovered through the automatic pruning operation.

An incremental backup of the database includes all changes to the database since the last full backup. In earlier versions of the server, an incremental backup included changes since the last full *or incremental* backup, and multiple incremental backups might have been needed to restore the database. With V6.1, when you must restore a database you use the last full backup and only the last incremental backup.

Automatic backups are performed by the database manager based on active log space usage since the last database backup and the ratio of space used to total space for the active log. To configure automatic database

backups, during initial configuration of the server you specify a device class that is to be used for these backups. The database backups that are performed by the database manager are either full or incremental backups.

Database mirroring
The database cannot be mirrored through Tivoli Storage Manager in V6.1. Use hardware mirroring instead.

Recovery log mode
The V6.1 server always runs in a mode that is equivalent to the roll-forward mode that was available in earlier versions of the server. If the appropriate recovery log information is available, you can restore the server to the latest time possible, or restore to a specific point in time.

To help ensure that the required log information is available for restoring the database, you can specify that the active log be mirrored to another file system location. For the best availability, locate the mirror on a different physical device.

Files required to restore the database
Both the volume history file and the device configuration file are required to restore the database.

Before V6.1, the volume history file was optional for restoring the database, and if a device configuration file was not available, you could recreate the file. Starting with the V6.1 server, both the volume history file and the device configuration file must be available; the device configuration file cannot be recreated.

Important: Ensure that the server options file includes the following options:

- At least one VOLUMEHISTORY option with the name of a file to be automatically updated when volume history information changes.
- At least one DEVCONFIG option with the name of a file in which to store a backup copy of device configuration information.

Disaster recovery manager
The disaster recovery manager works with the new database and database backup operations. Some of the stanzas in the recovery plan are new or changed to accommodate the changes to the database operations.

Database restoration
The database can be restored to the latest possible time, or to a specific point in time. The volume history file and the device configuration file are required for restoring the database.

You can restore the database to a location that is different from the original location. Using database restore is one way to move a server.

Multiple server instances on a single system

A server instance runs the server program using its unique database, recovery log, and server options. To run multiple server instances on a single system, set up separate database and recovery log directories, and an instance directory for each server to contain the server options file and other files that are needed to run each server instance.

On AIX, HP-UX, Linux, and Solaris systems, each server instance requires a unique user ID that is the instance owner. On Windows systems, the server instances can be owned by the same or different user accounts.

The files for each instance are stored separately from the server program files. As part of server configuration, you create a directory to store the files for the server instance. The following files are stored in the instance directory:

- The server options file, `dsmserv.opt`
- The device configuration file, if the DEVCONFIG server option does not specify a fully qualified name
- The 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
- The `dsmserv.v6lock` file
- User exits
- Trace output (if not fully qualified)

Database and recovery log files are stored in separate directories, not in the instance directory.

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

AIX HP-UX Linux Solaris

For example, to run two server instances, tsminst1 and tsminst2, you might create instance directories such as `/home/tsminst1/tsminst1` and `/home/tsminst2/tsminst2`. In each directory, place the `dsmserv.opt` file for that server. Each `dsmserv.opt` file must specify a different port for the server to use. To automatically start the two server instances, you can use the script, `rc.dsmserv`.

Changes to starting the server

You can automatically start multiple instances of the Tivoli Storage Manager server at system startup.

Startup of server instances (AIX, HP-UX, Linux, Solaris)

AIX HP-UX Linux Solaris

You can automatically start multiple instances of the Tivoli Storage Manager server at system startup (for example, from `/etc/inittab` on an AIX system) without the need for user-configured scripts. Two DSMSERV options and a script make this possible.

Switching user IDs

The *-u userID* option for DSMSERV allows the server to switch user IDs at invocation. This option is primarily intended to be used in `/etc/inittab` for AIX systems, or similar methods on other platforms. Configuration is easier if you can switch to the user ID that is the instance owner at startup.

Changing the current working directory

The *-i instance_dir* option for DSMSERV allows the server to change its current working directory at invocation. This option is primarily intended to allow multiple instances of the Tivoli Storage Manager server to be launched from `/etc/inittab` without the need for user-configured scripts.

Setting up the environment using a script

A script, `/opt/tivoli/tsm/server/bin/rc.dsmserv`, is provided for use on AIX, HP-UX, Linux, and Solaris systems. The script sets up environment variables and changes the library path to resolve libraries that are required by Tivoli Storage Manager. The library path is the variable:

AIX LIBPATH

Linux LD_LIBRARY_PATH

Invoke the script from the system startup location, for example `/etc/inittab` on an AIX system.

Related tasks

"Starting the server on AIX, HP-UX, Linux, and Sun Solaris systems" on page 267

Startup of server instances (Windows)

Windows

You can automatically start multiple instances of the Tivoli Storage Manager server at system startup by configuring the options for the server as a service.

You can set the start mode and options for the server service so that the server starts at system startup.

When the server is started as a service, the service for the corresponding database manager is also automatically started. The service for the database manager is named as a DB2 service, and its name includes the name of the server instance. For example, the database-manager service for the Server1 server instance has the name: `DB2 - DB2TSM1 - SERVER1`

When you stop the service for the server, the service for the database manager is *not* automatically stopped. If you intend to stop both the server and its database manager, you must stop the service for the database manager separately.

Related concepts

Appendix D, “Services associated with the Tivoli Storage Manager server,” on page 311

Related tasks

“Starting the server on Windows systems” on page 270

Files and environment changes

Locations and names of some files are changing from previous versions.

AIX **Installation location**

The location of the files for the Tivoli Storage Manager server and device driver is changed from `/usr` to `/opt`.

The location of the files for the Tivoli Storage Manager storage agent is also changed from `/usr` to `/opt`.

AIX HP-UX Linux Solaris **Log files location**

During installation, logs are written in `/var/tivoli/tsm`. Logs and trace for the configuration and upgrade wizards are also written to this location.

AIX HP-UX Linux Solaris **File set names**

File sets have been merged and the names changed. Except for messages, the server is contained in `tivoli.tsm.server`.

Environment variables

- The DSMSERV_DIR variable is no longer valid. The Tivoli Storage Manager server automatically determines the directory in which it resides, and looks for necessary exits, loadable modules, and message files relative to that directory. On Windows, the program uses registry entries.
- The DSMSERV_CONFIG variable is not needed, but can be used for compatibility with previous versions of Tivoli Storage Manager.

Important: When you use the upgrade utilities for a V5 server, environment variables still must be set for the utilities. See “Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems” on page 240 for the details.

Related tasks

“Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems” on page 240

Administrative command changes

With the new database manager, you still manage the database using Tivoli Storage Manager commands. Tasks for administering the database are different, so changes to the server include new, changed, and deleted administrative commands.

Some server options and utilities also change.

Related reference

“Command and option changes” on page 45

Chapter 2. Planning the upgrade of the server

Planning for the upgrade to V6.1 is very important because in addition to installing the new code, you must move the contents of your server database into the new database.

Moving data from an original V5 server database to the V6.1 database uses a large percentage of a system's processor and requires a high amount of I/O activity.

In your planning, consider testing the upgrade on nonproduction systems. Testing gives you information about how long the upgrade of the server database will take, which will help you to plan for the time that the server will be unavailable. Some databases might take much longer than others to upgrade.

Testing also gives you more information about the size of the new database compared to the original, giving you more precise information about database storage needs.

If you have multiple servers, consider upgrading one server first, to get experience with how the upgrade process will work for your data. Use the results of the first upgrade to plan for upgrading the remaining servers.

The process for upgrading the server to V6.1

Moving from earlier versions of the server to the V6.1 server requires more preparation and planning than previous upgrades. Because of the database program that the server is using, an existing database must be moved into the new database structure by using the upgrade tools that are provided.

Except for the database extraction and insertion processes, the upgrade process is similar to performing disaster recovery for a server. The server's critical files (such as the server option file, and device configuration file) must be available, and devices used for storage pools must be made available to the upgraded server.

The major steps in the upgrade process are:

1. Plan for system hardware and software requirements, and for the upgrade time.

   Use information about the Tivoli Storage Manager upgrade process together with operational requirements for your existing servers to decide how and when to perform the upgrade.

   Prepare new hardware that the upgraded server will use.
2. Back up the server database and configuration files. Perform other preparation steps.
3. Install the server code. Installation tasks include:
   - Installing the new server code, which includes the server itself plus its database manager program, and configuring a user ID for the new server instance.
   - Installing the upgrade utilities package on the system where the existing V5 server is located.
4. Upgrade the database. This task includes preparing the database, and then moving the database. These tasks are performed by using the upgrade utilities or the upgrade wizard.

The upgrade utilities or upgrade wizard extracts data from an existing database and inserts the data into a new V6.1 database. Media or the network can be used for the data movement.

As a database is moved into the new database structure, the validity of the data is checked against constraints that are enforced in the new database. The upgrade tools automatically correct some errors in the database. Other errors might need to be corrected manually.

If you use the wizard, you are guided to perform the upgrade steps in the correct order. If you are performing the upgrade manually using utilities from a command line, follow the procedure carefully.

5. Verify the upgrade by performing basic operations and querying information about the system to confirm that all information transferred correctly.

Review the information that compares the methods for performing the upgrade, and the descriptions of the upgrade scenarios, to help you decide how to perform the upgrade process for your servers.

Related tasks

Chapter 3, "Upgrade scenarios overview," on page 59

Comparison of upgrading on an existing system and a new system

Upgrading the V6.1 server on an existing system requires that the system be unavailable for production use during installation and when the data is moved into the new database. Moving the server to a new system when upgrading to the V6.1 server gives you more flexibility in how to perform the upgrade, but with some additional costs.

The following table gives some items to consider when deciding how to perform the upgrade for a server.

Item	Upgrade on an existing system	Upgrade on a new system
System hardware	Additional resources (disk space, memory, and possibly processor capacity) are required on the existing system.	A new system that meets requirements, in addition to the existing system, is required. You must upgrade to a new system if the existing server is on one of the platforms that are not supported for V6.1.
Software	Software on the system must meet requirements for V6.1. The V6.1 server cannot coexist with other versions on the same system.	Software on the new system must meet requirements for V6.1. Software on the original V5 system must meet requirements for the upgrade utilities (upgrade utilities requirements are the same as for a V5.5 server).

Item	Upgrade on an existing system	Upgrade on a new system
V5 server availability	All V5 server instances on the system are unavailable after the V6.1 server program is installed. Data managed by a server instance cannot be accessed until the upgrade process is complete for that server instance. To revert to using the V5 server, you must reinstall the same level of the V5 server program as before, and restore the V5 database from a backup that was made before the upgrade process.	You can stage the upgrade of multiple servers, because the V5 server program can be left on the original system. After the database extraction completes, the V5.5 server on the original system can be restarted. However, if you restart the V5.5 server for production operations after database extraction, you must carefully plan how you will complete the upgrade process to avoid data loss. Check the Tivoli Storage Manager wiki for information and discussion about hybrid upgrade methods to use, including export and import operations, and important tips about how to avoid data loss. A V5.3 or V5.4 server on the original system can be restarted, but its database must be restored first (using the database backup that was made before the upgrade process).
Database movement method	The database can be moved with a local-host network connection, or can be moved by using disk or external media.	You must have either a network connection between the existing and the new systems, or a device and media available to store the extracted database.
Storage devices and storage pools	Existing attached devices can be used. You must change ownership or permissions for all disk space that is used for storage pools (device types of FILE or DISK). The user ID that you will create to be the owner of the upgraded server instance must be given ownership or read/write permission to the disk space for storage pools.	The new system must have access to all storage that is used by the original system. Definitions for devices such as FILE device types might need to be changed after the upgrade. You must change ownership or permissions for all disk space that is used for storage pools (device types of FILE or DISK). The user ID that you will create to be the owner of the upgraded server instance must be given ownership or read/write permission to the disk space for storage pools. If the environment includes a storage area network (SAN), zone changes or LUN masking changes might be necessary.
Client and storage agent connections, and library sharing	No changes are necessary.	The network address on clients and storage agents must be updated after the upgrade, or network changes made so that the new system has the same address as the original system. Similarly, if the server is in a library sharing relationship with other servers, network address changes might be necessary after the upgrade.

Related concepts

"Hardware and software requirements for the upgraded server" on page 18

Related tasks

"Estimating total space requirements for the upgrade process and upgraded server" on page 34

Related reference

"Hardware and software requirements for the V5 server system that is being upgraded" on page 16

Comparison of methods for moving data to the V6.1 database

The upgrade utilities are required for moving data from an earlier version of the database into the V6.1 database. You can use the upgrade wizard to run the utilities with guidance.

To move the database, you must install the upgrade utilities package on the system where the original server database is located. The utilities package is available from the FTP downloads site for the Tivoli Storage Manager product. Installing the upgrade utilities package is a separate task from installing the V6.1 server.

You can move the database in two ways:

Media method

You can extract data from the original database to media, and later load the data into the new database. The new database can be located either on the same system or a different system.

The media method can be a good method to choose if you are upgrading to a new physical system for the server, and you cannot have both your old and new systems available at the same time or cannot connect them with a high speed network. It is also a good method to choose if you are not upgrading to a new system, and want the V6.1 server to use the same disk storage space that is used by the V5 server.

Network method

You can simultaneously extract data from the original database and load the data into the new database. The new database can be located either on the same system or on a system connected on the network.

The network method is a good method to choose if you are looking for maximum performance from the upgrade utility, particularly if you are migrating from one physical system to a new system, and the systems are connected by a high speed network. The network method reduces the amount of storage that is required because there are no requirements for disk or tapes to hold the data unloaded from the V5 database.

With either method, the original server cannot be running in production mode while the data is being extracted.

Related concepts

"The DSMUPGRD upgrade utilities" on page 15

Related tasks

"Estimating total space requirements for the upgrade process and upgraded server" on page 34

The DSMUPGRD upgrade utilities

The upgrade utilities prepare and extract data from a version 5.3, 5.4, or 5.5 server database for insertion into an empty version 6.1 server database.

The DSMUPGRD utilities are run on the original database.

The DSMUPGRD PREPAREDB utility upgrades a server database version to V5.5, and performs some cleanup to prepare for the extraction process.

Important: After a V5.3 or V5.4 server database is upgraded to V5.5, the database can no longer be used by a V5.3 or V5.4 server. If you do not want the database on your production server to be upgraded, you can restore the database backup on another system, then upgrade that copy of the database.

The DSMUPGRD EXTRACTDB utility extracts the data from a server database. You can use the utility to either simultaneously extract and insert the data into a new database over a network, or extract the data to media for later insertion into a new database. The data extraction operation can be run with multiple processes.

If a problem occurs during the database preparation or extraction, the DSMUPGRD EXTEND DB and DSMUPGRD EXTEND LOG utilities are available to make more space available for the database or log.

Related reference

"DSMUPGRD QUERYDB (Display information about a V5 database)" on page 284
"DSMUPGRD PREPAREDB (Prepare a V5 database for upgrade)" on page 285
"DSMUPGRD EXTRACTDB (Extract data from a V5 server database)" on page 286
"DSMUPGRD EXTEND DB (Extend the size of the database)" on page 289
"DSMUPGRD EXTEND LOG (Extend the size of the recovery log)" on page 290
"DSMUPGRD UPDATE (Create backup registry entries for a V5 server instance)" on page 291
"DSMSERV INSERTDB (Move a server database into an empty database)" on page 294
"DSMSERV LOADFORMAT (Format a database)" on page 292

Hardware and software requirements for upgrading to the V6.1 server

Use the requirements described here as a starting point. Check the product support site for the latest information.

Restriction: AIX HP-UX Linux Solaris You can install and run the V6.1 server on a system that already has DB2 installed on it, whether DB2 was installed by itself or as part of some other application, with some restrictions. For details, see Compatibility of the Tivoli Storage Manager server with other DB2 products on the system.

Restriction: Windows You cannot install and run the V6.1 server on a system that already has DB2 installed on it, whether DB2 was installed by itself or as part of some other application. The V6.1 server requires the installation and use of the DB2 version that is packaged with the V6.1 server. No other version of DB2 can exist on the system.

The product support site is located at: http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html

Related tasks

"Estimating total space requirements for the upgrade process and upgraded server" on page 34

Hardware and software requirements for the V5 server system that is being upgraded

A V5.3, V5.4, or V5.5 server can be upgraded to V6.1. The upgrade utility package must be installed on the system where the V5 database is located. The V5 system must meet the requirements for running the upgrade utilities, even if you intend to place the upgraded server on a new system.

V5.3 or V5.4 servers might be running on platforms that are not supported by the upgrade utilities. Therefore, you might need to update your system before you begin the upgrade procedure. Use the information in Table 5 to determine whether you are using one of the operating system versions that must upgraded.

Tip: It is not necessary to upgrade a V5.3 or V5.4 server to V5.5 level before upgrading to V6.1 level.

Table 5. Operating system versions that must be upgraded to run the upgrade utilities

Platform	If you are running this version...	You must upgrade to this version (or later) to use the upgrade utilities.
AIX	• IBM AIX 5L™ V5.1 (32 or 64 bit) • AIX V5.2 (32 or 64 bit)	• AIX V5.3 (64 bit only) • AIX V6.1 (64 bit only)
HP-UX	• PA-RISC: HP-UX 11i V1.0 (32 or 64 bit)	• PA-RISC: HP-UX 11i v2 (64 bit) HP-UX 11i v3 (64 bit)
Linux on POWER®	• Red Hat® Enterprise Linux 3 (supported on POWER5™ processors only) • SUSE Linux Enterprise Server 8/UnitedLinux 1.0 (supported only on processors prior to POWER5) • Miracle Linux 4.0 or Asianux 2.0 • GNU C libraries 2.2.5-108	• Red Hat Enterprise Linux 4 • Red Hat Enterprise Linux 5 • SUSE Linux Enterprise Server 9 and 10 • Asianux 2.0 - Red Flag DC 5.0 and Haansoft Linux 2006 or Asianux 3.0 • V2.3.3 or later of the GNU C libraries that are installed on the target system
Linux x86	• Red Hat Enterprise Linux 3 (AS, WS, ES) • SUSE Linux Enterprise Server (SLES) 8 / UnitedLinux 1.0 • V2.2.5-213 of the GNU C libraries	• Red Hat Enterprise Linux 4 • Red Hat Enterprise Linux 5 • SUSE Linux Enterprise Server 9 and 10 • Asianux 2.0 - Red Flag DC 5.0, Miracle Linux 4.0, and Haansoft Linux 2006 or Asianux 3.0 • V2.3.3 or later of the GNU C libraries that are installed on the target system

Table 5. Operating system versions that must be upgraded to run the upgrade utilities (continued)

Platform	If you are running this version...	You must upgrade to this version (or later) to use the upgrade utilities.
Linux x86_64	• Red Hat Enterprise Linux 3 • Red Flag Advanced Server 4.1 • SUSE LINUX Enterprise Server 8 • V2.2.5-213 of the GNU C libraries	• Red Hat Enterprise Linux 4 • Red Hat Enterprise Linux 5 • SUSE Linux Enterprise Server 9 and 10 • Asianux 2.0 - Red Flag DC 5.0, Miracle Linux 4.0, and Haansoft Linux 2006 or Asianux 3.0 • V2.3.3 or later of the GNU C libraries installed on the target machine
Linux zSeries®	• SUSE Linux Enterprise Server 8 / UnitedLinux 1.0 • Version 2.2.5-108 of the GNU C libraries	• Red Hat® Enterprise Linux 4 • Red Hat® Enterprise Linux 5 • SUSE Linux Enterprise Server 9 and 10 • V2.3.3 or later of the GNU C libraries that are installed on the target system
Sun Solaris	• Sun Solaris 8 (64 bit)	• SPARC 64 bit: Sun Solaris 9 Sun Solaris 10 • x86_64: Sun Solaris 9
Microsoft Windows	• Windows 2000 Professional • Windows 2000 Server • Windows 2000 Advanced Server • Windows 2000 Datacenter Server	• Windows Server 2003 (Standard, Enterprise, or Datacenter) Edition • Windows Server 2003 (Standard, Enterprise, or Datacenter) x64 Edition • Windows Server 2008 (Standard, Enterprise, or Datacenter) Edition • Windows Server 2008 (Standard, Enterprise, or Datacenter) x64 Edition

Tip: The system requirements for the upgrade utility are the same as the system requirements for a V5.5 server, because the upgrade utility is based on the V5.5 server code. See system requirements for a V5.5 server at one of the following Web sites. Compare the system on which your V5.3 or V5.4 server is running with the system requirements for a V5.5 server.

AIX http://www.ibm.com/support/docview.wss?rs=663&context=SSGSG7&uid=swg21052220

HP-UX
http://www.ibm.com/support/docview.wss?rs=663&context=SSGSG7&uid=swg21052219

Linux

Linux on POWER: http://www.ibm.com/support/docview.wss?rs=663&context=SSGSG7&uid=swg21108042

Linux x86: http://www.ibm.com/support/docview.wss?rs=663&context=SSGSG7&uid=swg21107360

Linux x86_64: http://www.ibm.com/support/docview.wss?rs=663&context=SSGSG7&uid=swg21204361

Linux zSeries: http://www.ibm.com/support/docview.wss?rs=663&context=SSGSG7&uid=swg21108040

Sun Solaris
http://www.ibm.com/support/docview.wss?rs=663&context=SSGSG7&uid=swg21053216

Windows
http://www.ibm.com/support/docview.wss?rs=663&context=SSGSG7&uid=swg21064234

Hardware and software requirements for the upgraded server

Use the requirements described here as a starting point. Find the latest information about hardware and software requirements on the product support site.

The product support site is located at: http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html

Some platforms that were supported for earlier versions of the server are *not* supported for V6.1. If the server that you want to upgrade is running on one of these platforms, you cannot upgrade your server to V6.1 on the same platform. You must install your V6.1 server on a system that is a specific supported platform, depending on the original platform. See the following table.

Platform for V5 server	Required platform for upgrade to V6.1
HP-UX running on a PA-RISC system	HP-UX running on an Itanium® system
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system
Linux running on a 32-bit x86 system	Linux running on an x86_64 system
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system

Server requirements on AIX systems

AIX

Check that your AIX system meets the requirements.

Hardware requirements

The following table describes the minimum hardware requirements.

For information about estimating the total disk space that is required, see "Estimating total space requirements for the upgrade process and upgraded server" on page 34.

Table 6. Hardware requirements

Type of hardware	Hardware requirements
Hardware	An appropriately configured 64-bit p4, p5, or p6 System p® computer.
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 • 200 MB for the /tmp directory • 300 MB for the /usr directory • 300 MB in the home directory Additional disk space might be required for database and log files. The size of the database depends on the number of client files to be stored and the method by which the server manages them.
Memory	At least 2 GB. A minimum of 4 GB for production servers. 8 GB is optimal.

Software requirements

The following table describes the minimum software requirements.

Table 7. Software requirements

Type of software	Minimum software requirements
Operating System	• AIX 5.3 running in a 64-bit kernel environment with the following additional requirements: – AIX 5.3 Technology Level (TL) 6 and Service Pack (SP™) 2 plus the fix for APAR IZ03063 – Minimum C++ runtime level with the xlC.rte 9.0.0.8 and xlC.aix50.rte 9.0.0.8 filesets. These filesets are included in the June 2008 cumulative fix package for IBM C++ Runtime Environment Components for AIX. • AIX 6.1 running in a 64-bit kernel environment requires the following filesets: – Minimum C++ runtime level with the xlC.rte 9.0.0.8 and xlC.aix61.rte.9.0.0.8 filesets. These filesets are included in the June 2008 cumulative fix package for IBM C++ Runtime Environment Components for AIX.
Web browser	A Web browser to retrieve an online installation package. The following browsers are supported: • Microsoft Internet Explorer 6.0 SP1 • Microsoft Internet Explorer 7.0 • FireFox 1.5 • FireFox 2.0 • FireFox 3.0 • Mozilla 1.7.8 Your browser must support the server code page. If your browser does not support the server code page, the windows might be unreadable. If your browser meets these requirements but does not correctly display a Tivoli Storage Manager Web-based interface, consider using a different browser.

Table 7. Software requirements (continued)

Type of software	Minimum software requirements
Communication protocol	A configured communication method.
Processing	Asynchronous I/O must be enabled.
Drivers	If you have an IBM 3570, IBM 3590, or IBM Ultrium tape library or drive, install the most current device driver ***before*** you install Tivoli Storage Manager 6.1. You can locate the device drivers at ftp://ftp.software.ibm.com/storage/devdrvr/.

Server requirements on HP-UX systems

HP-UX

Check that your HP-UX system meets the requirements.

You cannot run a V6.1 server on a PA-RISC system that is running HP-UX operating system. If the server that you want to upgrade is running on this platform, you cannot upgrade your server to V6.1 on the same platform. You must install your V6.1 server on an Itanium system that is running the HP-UX operating system, and then use the network or media method to upgrade your V5 server to that system.

Hardware requirements

The following table describes the minimum hardware requirements.

For information about estimating the total disk space that is required, see "Estimating total space requirements for the upgrade process and upgraded server" on page 34.

Table 8. 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 • 200 MB for the /tmp directory • 300 MB for the /usr directory • 300 MB in the home directory Additional disk space might be required for database and log files. The size of the database depends on the number of client files to be stored and the method by which the server manages them.
Memory	At least 2 GB. A minimum of 4 GB for production servers. 8 GB is optimal.

Software requirements

The following table describes the minimum software requirements.

System resources such as semaphores and kernel values might require special configuration and tuning. See the information in Appendix B, “HP-UX system resource requirements,” on page 305.

Table 9. Software requirements

Type of software	Minimum software requirements
Operating System	The HP Itanium system must have operating system 11 iv2 or 11 iv3 with the most current maintenance levels installed. If you are using 11 iV2, you must install PHSS_38140. The latest available service patches for the operating system should 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 very 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 must be installed ***before*** you install Tivoli Storage Manager. You can locate the device drivers at ftp://ftp.software.ibm.com/storage/devdrvr/.

Server requirements on Linux systems

Linux

Check that your Linux system meets the requirements.

Some platforms that were supported for earlier versions of the server are *not* supported for V6.1:

- Linux running on an Itanium system (IA64)
- Linux running on a 32-bit x86 system

If the server that you want to upgrade is running on one of these platforms, you cannot upgrade your server to V6.1 on the same platform. You must install your V6.1 server on an x86_64 system that is running the Linux operating system, and then use the network or media method to upgrade your V5 server to that system.

Server requirements for Linux on POWER systems:

The Tivoli Storage Manager server has minimum requirements for hardware and software.

Hardware requirements

The following table describes the minimum hardware requirements.

For information about estimating the total disk space that is required, see “Estimating total space requirements for the upgrade process and upgraded server” on page 34.

If you have an IBM 3590 or Ultrium tape library or drive, install the most current device driver before you install Tivoli Storage Manager. You can locate the device drivers at ftp://ftp.software.ibm.com/storage/devdrvr/.

Table 10. Hardware requirements

Type of hardware	Hardware requirements
Hardware	Linux on POWER IBM system such as one of the systems listed in the following Linux for Power server solution Web site: http://www-03.ibm.com/systems/power/software/linux/about/index.html
Disk space	The following minimum disk space: • 5 MB for the /var directory • 10 MB for the /opt directory if you create mount points • 4 GB for the /opt/tivoli/tsm directory if you create mount points • 200 MB for the /tmp directory • 300 MB for the /usr directory • 300 MB in the home directory Additional disk space might be required for database and log files. The size of the database depends on the number of client files to be stored and the method by which the server manages them.
Memory	At least 2 GB. A minimum of 4 GB for production servers. 8 GB is optimal.

Software requirements

The following table describes the minimum software requirements.

Table 11. Software requirements

Type of software	Minimum software requirements
Operating System	The Tivoli Storage Manager server on Linux on Power (ppc64 architecture) requires one of the following operating systems: • Red Hat Enterprise Linux 5, Update 3 or later • SUSE Linux Enterprise Server 10, Update 2 or later • SUSE Linux Enterprise Server 11 And the following, additional requirement: • Minimum C++ runtime level with the xlC 8.0.0.0 To download the XL C++ runtime, go to this Web site: http://www.ibm.com/software/awdtools/xlcpp/. For more details about this system requirement, you can check the following Web site: http://www.ibm.com/software/data/db2/9/sysreqs.html.
Libraries	GNU C libraries, Version 2.4-31.30 and later. Libaio.so.1 for Red Hat Enterprise Linux and SUSE Linux Enterprise Servers. If you are running SUSE Linux Enterprise Server 11, download the XL C/C++ runtime package V10.1. See the following link for instructions: http://www.ibm.com/support/docview.wss?uid=swg24022673.

Table 11. Software requirements (continued)

Type of software	Minimum software requirements
Communication protocol	• TCP/IP Version 4 or Version 6, which is standard with Linux • Shared memory protocol (with Tivoli Storage Manager Version 6.1 System p client)
Processing	Asynchronous I/O must be enabled.
Web browser	A Web browser to obtain the Linux installation packages. The following browsers are supported: • Microsoft Internet Explorer 6.0 SP1 • Microsoft Internet Explorer 7.0 • FireFox 1.5 • FireFox 2.0 • FireFox 3.0 • Mozilla 1.7.8 Your browser must support the server code page. If your browser does not support the server code page, the windows might be unreadable. If your browser meets these requirements but does not correctly display a Tivoli Storage Manager Web-based interface, consider using a different browser.

Server requirements for Linux on x86_64 systems: Linux

The Tivoli Storage Manager server has minimum requirements for hardware and software.

Hardware requirements

The following table describes the minimum hardware requirements.

For information about estimating the total disk space that is required, see "Estimating total space requirements for the upgrade process and upgraded server" on page 34.

If you have an IBM 3590 or Ultrium tape library or drive, install the most current device driver before you install Tivoli Storage Manager. You can locate the device drivers at ftp://ftp.software.ibm.com/storage/devdrvr/.

Table 12. Hardware requirements

Type of hardware	Hardware requirements
Hardware	An AMD64 or Intel® EMT-64 processor

Table 12. Hardware requirements (continued)

Type of hardware	Hardware requirements
Disk space	The following minimum values for disk space: • 5 MB for the /var directory • 10 MB for the /opt directory if you create mount points • 4 GB for the /opt/tivoli/tsm directory if you create mount points • 200 MB for the /tmp directory • 300 MB for the /usr directory • 300 MB in the home directory Additional disk space might be required for database and log files. The size of the database depends on the number of client files to be stored and the method by which the server manages them.
Memory	At least 2 GB. A minimum of 4 GB for production servers. 8 GB is optimal.

Software requirements

The following table describes the minimum software requirements.

Table 13. Software requirements

Type of software	Minimum software requirements
Operating System	The Tivoli Storage Manager server on Linux x86_64 requires one of the following operating systems: • Red Hat Enterprise Linux 5 • SUSE Linux Enterprise Server 10 • SUSE Linux Enterprise Server 11 • Asianux 3.0
Libraries	GNU C libraries, Version 2.3.3-98.38 or later that is installed on the Tivoli Storage Manager system. For Red Hat Enterprise Linux and SUSE Linux Enterprise Servers: • Libaio.so.1 • Libstdc++so.5
Communication protocol	• TCP/IP Version 4 or Version 6, which is standard with Linux • Shared memory protocol (with Tivoli Storage Manager Version 6.1 Linux x86_64 client)
Processing	Asynchronous I/O must be enabled.

Table 13. Software requirements (continued)

Type of software	Minimum software requirements
Web browser	A Web browser to obtain the Linux installation packages. The following browsers are supported: • Microsoft Internet Explorer 6.0 SP1 • Microsoft Internet Explorer 7.0 • FireFox 1.5 • FireFox 2.0 • FireFox 3.0 • Mozilla 1.7.8 Your browser must support the server code page. If your browser does not support the server code page, the windows might be unreadable. If your browser meets these requirements but does not correctly display a Tivoli Storage Manager Web-based interface, consider using a different browser.

Server requirements for Linux on System z systems: Linux

The Tivoli Storage Manager server has minimum requirements for hardware and software.

Hardware requirements

The following table describes the minimum hardware requirements.

For information about estimating the total disk space that is required, see "Estimating total space requirements for the upgrade process and upgraded server" on page 34.

If you have an IBM 3590 or Ultrium tape library or drive, install the most current device driver before you install Tivoli Storage Manager. You can locate the device drivers at ftp://ftp.software.ibm.com/storage/devdrvr/.

Table 14. Hardware requirements

Type of hardware	Hardware requirements
Hardware	An IBM Linux on System z® 900, IBM Linux on System z 800, or IBM Linux on System z 990 server with either native logical partitions (LPARS) or VM guests. You can use 64-bit LPARs and VM guests. 64-bit LPARS and VM guests are used by the storage agent to perform LAN-free operation.
Disk space	The following minimum values for disk space: • 5 MB for the /var directory • 10 MB for the /opt directory if you create mount points • 4 GB for the /opt/tivoli/tsm directory if you create mount points • 200 MB for the /tmp directory • 300 MB for the /usr directory • 300 MB in the home directory Additional disk space might be required for database and log files. The size of the database depends on the number of client files to be stored and the method by which the server manages them.
Memory	At least 2 GB. A minimum of 4 GB for production servers. 8 GB is optimal.

Software requirements

The following table describes the minimum software requirements.

Table 15. Software requirements

Type of software	Minimum software requirements
Operating System	The Tivoli Storage Manager server on Linux on System z (s390x 64-bit architecture) requires one of the following operating systems: • Red Hat Enterprise Linux 5, Update 3 or later • SUSE Linux Enterprise Server 10, Update 2 or later • SUSE Linux Enterprise Server 11
Library	GNU C library, Version 2.4-31.43.6 is installed on the Tivoli Storage Manager system. For Red Hat Enterprise Linux and SUSE Linux Enterprise Servers: • Libaio.so.1 • Libstdc++so.5
Communication protocol	• TCP/IP Version 4 or Version 6, which is standard with Linux • Shared memory protocol (with Tivoli Storage Manager Version 6.1 Linux on System z client)
Processing	Asynchronous I/O must be enabled.
Web browser	A Web browser to obtain the Linux installation packages. The following browsers are supported: • Microsoft Internet Explorer 6.0 SP1 • Microsoft Internet Explorer 7.0 • FireFox 1.5 • FireFox 2.0 • FireFox 3.0 • Mozilla 1.7.8 Your browser must support the server code page. If your browser does not support the server code page, the windows might be unreadable. If your browser meets these requirements but does not correctly display a Tivoli Storage Manager Web-based interface, consider using a different browser.

Server requirements on Sun Solaris systems

Solaris

Check that your Sun Solaris system meets the requirements.

Hardware requirements

The following table describes the minimum hardware requirements.

For information about estimating the total disk space that is required, see "Estimating total space requirements for the upgrade process and upgraded server" on page 34.

Table 16. Hardware requirements

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

Software requirements

The following table describes the minimum software requirements.

Table 17. Software requirements

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

Solaris Zones: Before installing the server in a zone, ensure that the zone is configured for write access to the `/usr` directory. To install a server in a Solaris Zone, the zone must have write access to the `/usr`, `/opt`, `/var`, and `/tmp` directories. A default zone does not have write access to the `/usr` directory. See Appendix C, “Solaris zones,” on page 307.

Server requirements on Microsoft Windows systems

Windows

Check that your Microsoft Windows system meets the requirements.

You cannot run a V6.1 server on an Itanium system (IA64) that is running the Windows operating system. If the server that you want to upgrade is running on this platform, you cannot upgrade your server to V6.1 on the same platform. You must install your V6.1 server on an x86_64 system that is running the Windows operating system, and then use the network or media method to upgrade your V5 server to that system.

Hardware requirements

The following table describes the minimum hardware requirements.

For information about estimating the total disk space that is required, see "Estimating total space requirements for the upgrade process and upgraded server" on page 34.

Table 18. Hardware requirements

Type of hardware	Hardware requirements
Hardware	Intel Pentium® compatible processor or multiprocessor-based computer
Disk Space	• At least 3 GB of free disk storage (for a typical installation) • 200 MB temporary directory space • 200 MB partition size in the C:\ drive • 300 MB in the instance directory Additional disk space might be required for database and log files. The server is installed in the drive you select, and the database and logs can be installed in another drive.
Memory	At least 2 GB. A minimum of 4 GB for production servers. 8 GB is optimal.

Software requirements

The following table describes the minimum software requirements.

Table 19. Software requirements

Type of software	Minimum software requirements
Operating System	One of the following operating systems: • Microsoft Windows Server 2003: Standard, Enterprise, or Datacenter Edition • Microsoft Windows Server 2003: Standard, Enterprise or Datacenter x64 Edition (64-bit) • Microsoft Windows Storage Server 2003 • Microsoft Windows Storage Server 2003 x64 • Microsoft Windows Server 2008: Standard, Enterprise, or Datacenter Edition • Microsoft Windows Server 2008: Standard, Enterprise, or Datacenter x64 Edition (64-bit)

Table 19. Software requirements (continued)

Type of software	Minimum software requirements
Communication protocol	At least one of the following communication protocols (installed by default with the current Windows operating systems): • Named Pipes • TCP/IP Version 4 or Version 6
Web browser	A Web browser to log in and use the console. The Web browser can be installed on the same or a separate system. The following browsers are supported: • Microsoft Internet Explorer 6.0 SP1 • Microsoft Internet Explorer 7.0 • FireFox 1.5 • FireFox 2.0 • FireFox 3.0 • Mozilla 1.7.8 Your browser must support the server code page. If your browser does not support the server code page, the windows might be unreadable. If your browser meets these requirements but does not correctly display a Tivoli Storage Manager Web-based interface, consider trying a different browser.
System functions	The Windows system functions, such as Device Manager, are supported on the 64-bit Tivoli Storage Manager Console. Normal Windows system functions are available for both the 32-bit and 64-bit server using the Manage Computer function of the Windows system.

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

AIX HP-UX Linux Solaris

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

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

- The other products that use a DB2 product must be using DB2 version 9 or later. DB2 products introduced product encapsulation and segregation support beginning with version 9. With this support, you can run multiple copies of DB2 products, at different code levels, on the same system. For details, see the information about multiple DB2 copies: http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp?topic=/com.ibm.db2.luw.admin.dbobj.doc/doc/r0024057.html
- When you install different DB2 products on the system that has the Tivoli Storage Manager server, ensure that the user IDs, fence user IDs, installation location, other directories, and related information that you specify are different from all the IDs and locations that you used for the Tivoli Storage Manager server installation and configuration. If you used the dsmicfgx wizard or dsmupgdx wizard to configure or upgrade the server, these are values that you

entered when running the wizard. If you used the manual configuration or upgrade procedures, review the procedures that you used if necessary, to recall the values that were used for the server.

- Carefully consider the resources and capability of the system compared to the requirements for both the Tivoli Storage Manager server and the other applications that use the DB2 product. To provide sufficient resources for the other DB2 applications, you might need to change the Tivoli Storage Manager server settings so that the server uses less system memory and resources. Similarly, if the workloads for the other DB2 applications compete with the Tivoli Storage Manager server for processor or memory resources, the performance of the server in handling the expected client workload or other server operations might be adversely affected.

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

Planning space for the upgrade process and the upgraded server

Plan for the space requirements for the upgrade process, and for the server database and recovery log for the upgraded server. Consider the disk storage currently in use for the server, and whether changes in hardware can be timed to coincide with the upgrade of the server.

Space requirements for the V5 server system

Space is required for storing the backup of the server database, which is an important step in preparing for the upgrade process. If you are using the media method for moving the database, you need space for storing the extracted data.

The backup of the server database requires as much space as is used by your V5 database. Store the backup on the form of sequential media that is convenient for you, either tape or disk.

Additional space requirements depend on the method that you choose for moving the data from the V5 database:

Media method
You need media to store the data that will be extracted from the V5 database. The media can be tape, or disk space that is defined as a sequential-access disk device class. The space required for the extracted data is the same as the used space in your database. If your database is safely backed up, and you are certain that you no longer need to run the V5 server, after you extract the data you can optionally release the space used by the V5 database and recovery log.

Network method
You must have the working copy of the V5 database and recovery log on the V5 system. If you are working with a copy of the database that was created for testing the upgrade process, you need enough space to hold the total allocated size of the database; you can use the minimum size for a V5 recovery log.

Related tasks

"Estimating total space requirements for the upgrade process and upgraded server" on page 34

Space requirements for the V6 server system

Before beginning the upgrade process, plan for the space that is required for the database and recovery log. Where you locate the database and recovery log directories is very important to the operation of your server.

You need unique, empty directories for the following items for the upgraded server:

- The database
- The recovery log
  - Active log
  - Archive log
  - Optional: Active log mirror
  - Optional: Secondary archive log (archive failover log)
- 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)

Locate the database and the active log on fast, reliable storage, with high availability characteristics. Ideally, use multiple directories for database space and locate them across as many physical devices or logical unit numbers (LUNs) as there are directories.

Place the database and recovery log directories on separate physical volumes or file systems.

To maintain database integrity, ensure that the storage hardware can withstand failures such as power outages and controller failure. You can improve database performance by using hardware that provides a fast, nonvolatile write cache for both the database and logs.

Related tasks

"Estimating total space requirements for the upgrade process and upgraded server" on page 34

Related information

Tivoli Storage Manager support site

Database space requirements

The amount of database space that is required depends on the size of the original V5 database, and on how much data the server will be managing.

The amount of storage space for the database is managed automatically. The database space can be spread across up to 128 directories. After you specify the directories for the database, the server uses the disk space available to those directories as required.

Plan for 33 - 50% more than the space that is used by the V5 database. (Do not include allocated but unused space for the V5 database in the estimate.) Some databases can grow temporarily during the upgrade process; consider providing up to 80% more than the space that is used by the V5 database.

Estimate the amount of space that the database will require by completing the following steps:

1. Use the `QUERY DB FORMAT=DETAILED` command to determine the number of used database pages in your V5 database.
2. Multiply the number of used database pages by 4096 to get the number of used bytes.
3. Add 33 - 50% to the used bytes to estimate the database space requirements.

Consider testing the upgrade of the database to get a more accurate estimate. Not all databases will grow as much as the suggested 33 - 50% increase in space.

When the server is operating normally, after the upgrade process, some operations might cause occasional large, temporary increases in the amount of space used by the database. Continue to monitor the usage of database space to determine whether the server needs more database space.

For the best efficiency in database operations, anticipate future growth when you set up space for the database. If you underestimate the amount of space that is needed for the database and must add directories later, the database manager might need to perform more database reorganization, which can consume resources on the system. Estimate the requirements for database growth based on the predicted number of additional objects to be stored in server storage. For more information about estimating database space requirements, see the *Administrator's Guide*.

Restriction: You cannot use raw logical volumes for the database. If you want to reuse space on the disk where raw logical volumes were located for an earlier version of the server, you must create file systems on the disk first.

Visit the support site for the latest information and recommendations.

Recovery log space requirements

The amount of recovery log space that is required depends on the amount of client activity with the server.

Use the estimates based on this information as a starting point. After the server is upgraded, monitor the active log and archive log directories to ensure that these directories have enough free space to handle the actual server workload. For more information about estimating recovery log space requirements, see the *Administrator's Guide*.

Active log

The default, minimum size of 2 GB is large enough to complete the upgrade process. When you begin normal operations with the server after the upgrade, you are likely to need an active log that is larger than the default. The maximum size of the active log is 128 GB.

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 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 very large objects (for example, image backups), use an active log size that is 20% of the database size.

Active log mirror

The active log mirror is optional. Provide the same amount of space for the active log mirror as for the active log.

Archive log

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

Remember: A full backup of the database causes obsolete archive log files to be pruned, to recover space. The archive log files that are included in a backup are automatically pruned after two more full database backups have been completed.

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 (secondary log)

If the archive log becomes full, the archive failover log is used. Specifying an archive failover log is useful only if you locate it on a different physical drive or file system than the archive log.

Specifying a failover directory can prevent problems that occur if the archive log runs out of space. If the drive or file system where the archive log directory is located becomes full and either there is no archive failover log directory or it also is full, the log files that are ready to be moved to the archive log instead remain in the active log directory. If the active log becomes full, the server stops.

The directory for the archive failover log can be a remote directory if local disk space is limited. Using a remote directory might be slower than a local disk or directory, but because the directory is used only if the archive log becomes full, the performance is not as important as for the other logs.

For the latest information and recommendations, go to the support site: http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html

Estimating total space requirements for the upgrade process and upgraded server

In addition to the space required for the upgraded server itself, some additional disk space is needed for the upgrade process. For example, if you are upgrading the server on the same system where it is currently located, you need enough space for two copies of the database during the upgrade process.

The space requirements for the upgraded, V6.1 server depend on the size of the V5 database and other factors. See the topics about estimating space requirements about the database and recovery log requirements for more details.

The space requirements for the upgrade process depend on how you move the data from the V5 database to the new database. You can move the data to the new database using the media method or the network method, with the following requirements:

- The media method requires sequential media. The sequential media can be tape or sequential disk device class (**FILE** device type).
- The network method requires a network connection between systems, if you are upgrading on a new system.

Table 20 on page 35 shows basic tips for estimating each item, for each of the main scenarios. For details about sizing the V6.1 database and recovery log, see "Space requirements for the V6 server system" on page 31.

Table 21 on page 36 shows a sample filled-in work sheet for a 100-GB, V5 database that has 80% space utilization, with the assumption that the database increases by 33 - 50 % when upgraded.

Table 20. Tips for estimating space requirements. Select the scenario then read down the column.

Item that requires space	**Type of space**	**Scenario 1:** • **Same system as V5 server** • **Media method**	**Scenario 2:** • **Same system as V5 server** • **Network method**	**Scenario 3:** • **New system** • **Media method**	**Scenario 4:** • **New system** • **Network method**
V5 database: space allocated for the original database	Disk	Space that is allocated for the V5 database	Space that is allocated for the V5 database	0	0
V5 database: final backup copy	Sequential media	Space that is used by the V5 database (based on % utilization)	Space that is used by the V5 database (based on % utilization)	Space that is used by the V5 database (based on % utilization)	Space that is used by the V5 database (based on % utilization)
V5 database: extracted data	Sequential media	Space that is used by the V5 database (based on % utilization)	0	Space that is used by the V5 database (based on % utilization)	0
V5 recovery log	Disk	The amount of space that is allocated for the V5 recovery log	The amount of space that is allocated for the V5 recovery log	0	0
V6.1 database: estimated size	Disk	Space that is used by the V5 database plus 33 - 50% more	Space that is used by the V5 database plus 33 - 50% more	Space that is used by the V5 database plus 33 - 50% more	Space that is used by the V5 database plus 33 - 50% more
V6.1 database: first backup	Sequential media	Same as estimated database size	Same as estimated database size	Same as estimated database size	Same as estimated database size
V6.1 active log directory	Disk	2 GB during the upgrade process. A higher value might be needed for normal use.	2 GB during the upgrade process. A higher value might be needed for normal use.	2 GB during the upgrade process. A higher value might be needed for normal use.	2 GB during the upgrade process. A higher value might be needed for normal use.
V6.1 active log mirror (optional)	Disk	If used, same size as active log	If used, same size as active log	If used, same size as active log	If used, same size as active log
V6.1 archive log directory	Disk	Estimate based on client activity and database backup frequency	Estimate based on client activity and database backup frequency	Estimate based on client activity and database backup frequency	Estimate based on client activity and database backup frequency

Table 21. Sample space estimates for a 100-GB V5 database

Item that requires space	Type of space	Scenario 1: • Same system as V5 server • Media method	Scenario 2: • Same system as V5 server • Network method	Scenario 3: • New system • Media method	Scenario 4: • New system • Network method
V5 database: space allocated for the original database	Disk	100 GB	100 GB	0	0
V5 database: final backup copy	Sequential media	80 GB	80 GB	80 GB	80 GB
V5 database: extracted data	Sequential media	80 GB	0	80 GB	0
V5 recovery log	Disk	12	12	0	0
V6.1 database: estimated size	Disk	106 - 120 GB	106 - 120 GB	106 - 120 GB	106 - 120 GB
V6.1 database: first backup	Sequential media	106 - 120 GB	106 - 120 GB	106 - 120 GB	106 - 120 GB
V6.1 active log directory	Disk	8 GB	8 GB	8 GB	8 GB
V6.1 active log mirror (optional)	Disk	(8 GB)	(8 GB)	(8 GB)	(8 GB)
V6.1 archive log directory	Disk	80 GB	80 GB	80 GB	80 GB
Total disk space required during the upgrade process	Disk	307 - 320 GB (315 - 328 GB)	307 - 320 GB (315 - 328 GB)	195 - 208 GB (203 - 216 GB)	195 - 208 GB (203 - 216 GB)
Total sequential media required during the upgrade process	Sequential media	267 - 280 GB	187 - 200 GB	267 - 280 GB	187 - 200 GB
Total disk space for the V6.1 server after upgrade and cleanup	Disk	195 - 208 GB (203 - 216 GB)	195 - 208 GB (203 - 216 GB)	195 - 208 GB (203 - 216 GB)	195 - 208 GB (203 - 216 GB)

Related concepts

"Space requirements for the V5 server system" on page 30
"Space requirements for the V6 server system" on page 31

Related tasks

Chapter 3, "Upgrade scenarios overview," on page 59

Work sheet for planning space for the V6.1 server

You can use the work sheet to help you plan the amount and location of storage needed for the V6.1 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)		

Estimating the upgrade time

The V5 server is not available for use during upgrade operations. Estimate the upgrade time to help plan for the amount of time that the server will be unavailable. The time that is required to complete the upgrade of a V5 server depends on multiple factors.

The following factors can affect the upgrade time:

- The size of the database being upgraded.
- The number and speed of system processors.
- Storage device configuration.
- The method chosen for moving the data from the V5 database to the V6 database (media or network). The network method for the data movement overlaps the extraction time with the insertion time. Using the network method might help reduce the total time required for the upgrade because of the overlap.
- The type of workload that the server has handled. A workload that consists of large numbers of small files, or files with very long file names, can cause a relatively longer upgrade time.

Review the performance tips for more information.

In benchmark environments in IBM labs, upgrade operations have achieved 5-10 GB per hour when using the network method. This rate is based on the amount of space that is used by the V5 database, not the allocated space for the database. Results are dependent on the configuration. The rate is lower if you use the media method because the data extraction and insertion occur sequentially instead of simultaneously.

When you estimate the amount of time required for the upgrade operations based on the amount of data in the database, the estimate might be higher than needed. The database is organized in a branching structure called a tree, with actual database records stored in the endpoints of the branches, called the leaves of the

tree. The extraction ignores the branches and only extracts information from the leaves. As a result, the amount of data that the extraction utility extracts might be much less than the total amount of space used by the database (the sum of the leaves and the branches). You cannot determine in advance of the extraction operation how much less data might be extracted compared to the space used by the database. Therefore the time that you estimate might be longer than what the operation will require.

Your environment might produce different results than that obtained in the labs. Testing upgrade operations in your environment is especially important for Tivoli Storage Manager servers that support essential systems.

Example: Estimating the upgrade time based on the database size

You can make a rough estimate of the time for the upgrade based on the amount of data in the V5 database.

1. Issue a command to obtain details about the V5 database.
   - If the V5 server is running, issue the command:

     ```
     query db format=detailed
     ```

   - If the V5 server is not running and you have installed the upgrade utilities, use the upgrade utility:

     ```
     dsmupgrd querydb
     ```

   An example of results:

   ```
                     Available Space (MB): 16,384
                  Assigned Capacity (MB): 16,364
                  Maximum Extension (MB): 20
                  Maximum Reduction (MB): 772
                       Page Size (bytes): 4,096
                      Total Usable Pages: 4,189,184
                               Used Pages: 3,214,880
                                 Pct Util: 76.7
                            Max. Pct Util: 76.7
                        Physical Volumes: 8
                       Buffer Pool Pages: 8,192
                  Total Buffer Requests: 4,510
                         Cache Hit Pct.: 94.15
                        Cache Wait Pct.: 0.00
                     Backup in Progress?: No
             Type of Backup In Progress:
           Incrementals Since Last Full: 0
         Changed Since Last Backup (MB): 12,558.12
                     Percentage Changed: 100.00
         Last Complete Backup Date/Time: 07/02/2008 02:24:16 AM
     Estimate of Recoverable Space (MB):
Last Estimate of Recoverable Space (MB):
       Pages Available for Temp Objects: 197,632
       Pages Allocated for Temp Objects: 0
            Pages Used for Temp Objects: 0
   ```

2. Use the results of the query command to calculate the amount of data in the database. Multiply the number of used pages by the page size.

   Using the results in the example, you can calculate the amount of data in this database:

   ```
   3,214,880 used pages × 4096 bytes/page = 13,168,148,480 bytes, or 12.26 GB
   ```

3. Estimate the time required for the upgrade operation by dividing the amount of data by the expected rate.

   For example, using rates of 5 GB/hour and 10 GB/hour:

```
12.26 GB ÷ 5 GB/hour = 2.5 hours
12.26 GB ÷ 10 GB/hour = 1.2 hours
```

Performance tips for the V5 database extraction process

The speed of the extraction process is typically limited by the speed of I/O to the destination for the extracted data.

The length of time that the process runs also depends on the size of the database. The time will be approximately as much as the time required for a full backup of the database.

Performance tips depend on the method that you choose for moving the data from the V5 database:

Media method

If you are extracting the data to tape, use a high-speed tape device.

If you are extracting the data to disk, use a disk device or LUN that is different than the device in use for the V5 database and recovery log.

If both the V5 database and the destination for the extracted data are on a virtualization device (high-end storage controller, or a SAN virtualization device), ensure that the two virtual LUNs are *not* on the same physical disk drive. Ensure that the space in use for the V5 database and the destination for the extracted data are on different physical disk drives within the virtualization device.

If it is not possible to provide different LUNs for the V5 database and the extraction destination, the extraction process will perform more slowly. The slower speed of extraction might be acceptable, depending on the size of the database and your requirements for the upgrade.

Network method

Use a high speed link if you are extracting the data to a different system. For upgrading a database greater than 2 - 3 GB, use at least a 1-Gb Ethernet network.

If you are extracting the database on the same system, no external network connections are required.

Performance tips for inserting data into the V6.1 database

The process for inserting the V5 extracted data into the V6.1 database is the longest-running part of an upgrade process, and is the most sensitive to the configuration of the system.

On a system that meets the minimum requirements, the insertion process will run, but performance might be slow. For better performance, set up the system as described in the following tips.

Processors

The insertion process is designed to exploit multiple processors or cores. The insertion process will typically perform better on a system with a relatively small number of fast processors than on a system with more but slower processors.

Disk storage

The insertion process is designed to exploit high-bandwidth disk storage subsystems. The speed of the process is highly dependent on the disk storage that is used.

For best performance, use multiple LUNs that map to multiple independent disks, or that map to RAID arrays with a large stripe size (for example, 128 KB). Use a different file system on each LUN.

The following table shows an example of good usage of LUNs:

LUN	Usage
1	Active log
2	Archive log
3, 4, 5	Database directories
6	Extracted V5 database (needed only if the media method is used to extract the V5 database to a sequential disk device class)

If the disk storage is supplied by a virtualization device (high-end storage controller, or a SAN virtualization device), ensure that none of the virtual LUNs are on the same physical disk drive. Ensure that the directories in use are on different physical disk drives within the virtualization device.

Planning for upgrading multiple servers and components

If your environment includes multiple servers and storage agents, evaluate the compatibility of the versions being run with an upgraded V6.1 server. Plan to upgrade one server first in a test environment. Then stage the upgrade of additional servers and storage agents.

Components available for installation

In addition to the server, you can choose to install device drivers, language packs, the Administration Center, and the reporting and monitoring feature.

This guide focuses on installing the server itself. For information about installing other components, see the *Installation Guide* for your operating system.

Compatibility with servers and components running at earlier versions

Details about what levels of server, client, storage agent, library manager server, library client servers, configuration manager servers can work together are available from the product support site.

The product support site is located at: http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html

Planning for upgrading multiple servers on a single system

How you upgrade multiple servers that run on a single system depends on whether the servers are to remain on that system, or be moved to a new system. After you install the V6.1 server on a system, you can no longer run any V5 servers on that system.

If the upgraded servers are to remain on the same system, all server instances must be upgraded at the same time. After the point in the upgrade process when you install the V6.1 server program on the system, a V5 server cannot be started on that system. Each V5 server must be upgraded separately before you can start that server again.

If the upgraded servers are to be moved to a new system as part of the upgrade process, you can upgrade the servers independently of one another.

You can use the upgrade wizard, or manually use the upgrade utilities to upgrade the servers.

- If you use the upgrade wizard, run the wizard once for each server instance.

  You can upgrade multiple servers at the same time. Each time that you start the upgrade wizard, you work with a single server, but you can start the wizard in multiple windows at the same time.
- If you use the upgrade utilities manually from a command line, repeat the procedure for upgrading each server instance.

You can begin running one upgraded server instance while other server instances are still being upgraded.

Related concepts

"Comparison of upgrading on an existing system and a new system" on page 12

Planning for upgrading library managers and library clients

To work with a version 6.1 library manager, servers that are library clients must be at version 5.4 or later.

If library client servers are at V5.3 or earlier, you must upgrade the library client servers to at least V5.4 before upgrading the library manager server to V6.1. If library client servers are at V5.4 or later, you can upgrade the server that is the library manager to V6.1 first, then upgrade the library client servers later.

If you are moving a library manager or library clients to new systems for the upgrade to V6.1, consider moving the servers to the new systems before upgrading the servers. By moving the servers first, you can reestablish connectivity to all servers and devices before the upgrade. Then upgrade the library manager, followed by upgrading the library clients.

For the most recent information about supported levels of library clients, go to the following Web site: http://www.ibm.com/support/docview.wss?uid=swg21302789

Planning for upgrading clients

To connect to a V6.1 server, client nodes must be running a version 5.4 or later client program.

Planning for upgrading storage agents

To connect to a V6.1 server, storage agents must be at version 5.4 or later.

If you have storage agents at earlier versions, upgrade them to V5.4 before upgrading the server to V6.1. Verify that LAN-free data movement works as expected before upgrading the server.
For the most recent information about supported levels of storage agents, go to the Web site: http://www.ibm.com/support/docview.wss?uid=swg21302789

Testing the upgrade process for a server

Test the upgrade to ensure a smooth upgrade process. The larger and more complex your environment, the more important testing the upgrade is. Testing can help to plan for the amount of time that the server is unavailable because of the upgrade.

The original server and the V6.1 server cannot both be installed on a system at the same time. To evaluate the V6.1 server, you can install the program on a new system.

To test with a copy of production data, or to test the upgrade process, you can use the upgrade utilities to create a test server. Follow the normal upgrade procedure, but consider these tips:

Minimizing impact to your production server

To avoid affecting your original production server, you *must* install the V6.1 server on a different system. Different versions of the server cannot be run on a system at the same time.

The DSMUPGRD utility must be installed on the system that has your original server, or a copy of your original server. The utility package installs by default in a different location than a normal server, so it can be installed without affecting your production server.

Important: When you run the DSMUPGRD PREPAREDB utility, the utility upgrades the database version to a V5.5 fix pack level. If you do not want the database on your production server to be upgraded to the V5.5 fix pack level, back up the database and use the backup on another system to test the upgrade.

You can extract the production database for the test using either media or the network. The advantage of extracting the database to media is that you can repeatedly load the test database without stopping your production server each time.

Detecting problems in the database

A **PREVIEW** parameter is available for the DSMSERV INSERTDB utility. When you use the **PREVIEW**=**YES** parameter, the operation includes all the steps of the process, except for the actual insertion of data into the new database.

When you preview the insertion operation, you can quickly verify that the source database is readable. You can also identify any data constraint violations before you run the actual upgrade process for your server. Investigate any data constraint violations that are discovered during the preview, so that you can avoid delays when you run the actual upgrade process.

Protecting storage and stored data

Ensure that the storage devices for your production server are not available to the test server. If the test server can detect the devices that your production server uses, it might start operations such as issuing resets on tape drives or unloading tapes.

For example, if your tape drives are connected in a storage area network (SAN), you might need to change the zones in your SAN to prevent the test server from detecting the devices.

For testing, you can use one of the following methods to use a backup copy of the database. The methods are given in outline form. See the detailed procedures for instructions for each step.

Related tasks

Chapter 8, "General procedures for upgrading a server to V6.1," on page 229

Test by extracting data from a separate copy of the server

Either the media method or the network method can be used to move the database.

1. Prepare a test system. This is a different system than the production server, where you must install a separate copy of the V5.3, V5.4, or V5.5 server (the same version as your production server).
2. Back up the database of the production server.
3. Restore the database backup on the test system. Start the server to verify that the restore operation worked.

   Tip: If you are upgrading the server using media, ensure that the device class is valid on the test system. For example, if you will be using a **FILE** device class for the extraction step, ensure that the path for the device class is valid on the test system. The path that is in the server database for the device class must be correct. If necessary, start the server and update the path.

   If you will be using a tape device class for the extraction step, ensure that the device names for the library and drives are correct.
4. From this point, you can use the detailed procedures in one of the following sections to complete your test:

   Chapter 4, "Scenario 1: Same system, media method," on page 77

   Chapter 5, "Scenario 2: Same system, network method," on page 113

Test by extracting data from the production server

This example process uses the media method to move the database to the test system. You follow the steps in the procedures for Chapter 6, "Scenario 3: New system, media method," on page 147, with just a few changes.

With this process, the production server is unavailable for at least the amount of time required to prepare and extract the database. The time is approximately as much as the time required for a full backup of the database.

1. Prepare for the test by backing up the database of the production server. Consider making a second copy of the database backup. For details, see "Scenario 3: Preparing for the upgrade" on page 147.
2. Install the DSMUPGRD utilities on the same system as the production server. For details, see "Installing the upgrade utilities on the original server" on page 235.
3. Prepare the database and extract the data from the database of the production server to media using either the upgrade wizard or commands. For details, see:
   - "Scenario 3: Upgrading the server using the upgrade wizard" on page 160
     a. "Scenario 3, wizard: Installing the V6.1 server" on page 160
     b. "Scenario 3, wizard: Creating the directories and the user ID for the upgraded server instance" on page 164
     c. "Scenario 3: Starting the upgrade wizard" on page 168

After the database extraction is completed, you can pause the process by exiting the wizard while you complete step 4 to restore and restart the production server.

- "Scenario 3: Upgrading the server manually using utilities" on page 169
  a. "Scenario 3: Preparing the database of a V5 server for upgrade" on page 170
  b. "Scenario 3: Extracting the data to media" on page 171

4. After the data is extracted from the production server, resume normal operations by restoring the database backup that you made in step 1 on page 43 to the production server. You can then restart the production server.
5. From this point, continue your test by using the detailed procedures for Scenario 3, using the test system as the new system.
   - If you are using the wizard, restart the wizard if necessary, and continue at the step after the extraction.
   - If you are using commands, follow these steps:
     a. Scenario 3: Installing the V6.1 server
     b. Scenario 3: Creating the directories and the user ID for the upgraded server instance
     c. "Scenario 3: Creating and formatting the new database" on page 180
     d. "Scenario 3: Loading the extracted data into the new database" on page 183

        As part of your testing, you can use the **PREVIEW=YES** parameter on the DSMSERV INSERTDB utility to test the insertion. When you preview the insertion operation, you can quickly verify that the source database is readable. You can also identify any data constraint violations that might prevent an upgraded database from being put into production. When you use this parameter, the operation includes all steps of the process, except for the actual insertion of data into the new database.
     e. "Scenario 3: Configuring the system for database backup" on page 186

Preparing for operational changes

Starting with V6.1, how you back up and monitor the server database changes.

Check the operating procedures, scripts, and administrative schedules that you use for server operations:

- Plan to continue backing up the server database regularly by using administrative schedules, a maintenance script, or your own scripts. Back up the server database at least once per day.

  Review information about how database backups are performed automatically for the V6.1 server. See the section about the database in the *Tivoli Storage Manager Administrator's Guide*.
- Understand how database and recovery log space is used, and how monitoring needs to change.
- Check scripts and administrative schedules. The V6.1 server adds new commands, changes some commands, and deletes some commands that are no longer needed. These changes will affect your automated operations.
- Check SELECT commands that you use regularly. Some parameters and syntax that were previously allowed are not accepted by the database manager program.

- If you use products from independent software vendors to interface with the server, ensure that the products are compatible with the V6.1 server.

Related concepts

"Database protection and recovery" on page 5

"Recovery log" on page 2

"Database operations" on page 4

Related reference

"Command and option changes"

"Changes to the SELECT command" on page 53

Reference information for planning

Information about new, changed, and deleted administrative commands, server options, and server messages can help you plan for the V6.1 upgrade.

Command and option changes

Use the lists of new, changed, and deleted commands and options to help you identify operation changes that are needed for your server.

New server commands, utilities, and options

New commands, utilities, and options are available for the V6.1 server because of changes in database operations and new functions.

"New commands"

"New utilities" on page 46

"New server options" on page 46

New commands

Table 22. New commands

Command	Function	Comparable commands in previous versions
EXTEND DBSPACE	Makes additional storage space available for the server to use for its database. You can have multiple locations for the database storage space. After installation and initial use of DSMSERV FORMAT or DSMSERV LOADFORMAT, you can add more locations for the storage space for the database.	DEFINE DBVOLUME EXTEND DB
IDENTIFY DUPLICATES	Starts or stops processes that identify duplicate data in a storage pool.	None
QUERY DBSPACE	Displays the current locations for the database storage, along with total space, and used space.	QUERY DBVOLUME
SET DBRECOVERY	Sets the device class to use for backup of the server's database. The database manager uses the device class for automatic backups of the database.	DEFINE DBBACKUPTRIGGER
SET DBREPORTMODE	Sets the amount of diagnostic information that is reported for the database.	None
SET DRMACTIVEDATASTGPOOL	Sets the active-data pools that are included in your recovery plans and procedures.	None

New utilities

Table 23. New utilities

Command	Function	Comparable commands in previous versions
DSMSERV DISPLAY DBSPACE	Offline utility to view the current locations for database storage.	DSMSERV DISPLAY DBVOLUMES
DSMSERV DISPLAY LOG	Offline utility to view information about the recovery logs (active log and archive logs).	DSMSERV DISPLAY LOGVOLUMES
DSMSERV INSERTDB	Offline utility used only for inserting data that has been extracted from a V5 server database into an empty V6.1 database.	None
DSMSERV REMOVEDB	Offline utility used only when you are sure that you no longer need a server's database and recovery logs. Use with caution.	None
DSMUPGRD PREPAREDB	Offline utility used only on a V5 server to prepare the database for extraction. After this utility is run, the data can be extracted from the database using the DSMUPGRD EXTRACTDB utility. This is one of the upgrade utilities.	None
DSMUPGRD EXTRACTDB	Offline utility used only on a V5 server to extract the data from the database. The extracted data is inserted into a V6.1 database using the DSMSERV INSERTDB utility. This is one of the upgrade utilities.	None
DSMUPGRD EXTEND DB	Offline utility used only on a V5 server to extend the database when database space is insufficient to successfully complete the upgrade process. This is one of the upgrade utilities.	None
DSMUPGRD EXTEND LOG	Offline utility used only on a V5 server to extend the recovery log when recovery log space is insufficient to successfully complete the upgrade process. This is one of the upgrade utilities.	None
DSMUPGRD QUERYDB	Offline utility used only on a V5 server to display information about the database and recovery log. This is one of the upgrade utilities.	None

New server options

Table 24. New server options. For some options, changes have no effect until the server is restarted.

New server option	Function	Comparable commands or options in previous versions
ACTIVELOGDIR	The new directory for the location where the active log is stored. Use this option to change the location of the active log. The location is originally specified during installation. There is only one location for the active log.	DEFINE LOGVOLUME
ACTIVELOGSIZE	The maximum size of the active log.	EXTEND LOG REDUCE LOG
ARCHFAILOVERLOGDIR	The directory in which the server stores archive log files if they cannot be stored in the archive log location.	None

Table 24. New server options (continued). For some options, changes have no effect until the server is restarted.

New server option	Function	Comparable commands or options in previous versions
ARCHIVELOGDIR	The directory in which the server stores the archive log.	None
DBMEMPERCENT	Sets a limit on the percentage of the system memory that is used for the database.	None
DEDUPREQUIRESBACKUP	Control for backup operations for primary sequential-access storage pools that are set up for deduplication.	None
DISKSTGPOOLMEMSIZE	The size of the cache that the server can use to manage operations for storage pools with the device type of DISK.	None
MIRRORLOGDIR	The directory where the log mirror for the active log is stored.	DEFINE LOGCOPY
AIX, HP-UX, Linux, and Sun Solaris systems: SANDISCOVERYTIMEOUT	The amount of time that is allowed for host bus adapters to respond when they are queried by the SAN discovery process.	None

Updated server commands, utilities, and options

Commands, utilities, and options are updated for V6.1 because of changes in database operations and other new functions.

"Updated commands"
"Updated utilities" on page 49
"Updated server options" on page 50

Updated commands

Table 25. Updated commands

Command	Changes
BACKUP DB	The SET DBRECOVERY command must be run first to set a device class for database backups. An incremental database backup is now a backup of all changes since the last full backup. In earlier versions of the server, an incremental backup was a backup of all changes since either the last full backup or the last incremental backup.
BACKUP NODE RESTORE NODE QUERY NASBACKUP	The commands support creating SnapMirror to Tape images of file systems on NetApp file servers.
BACKUP VOLHISTORY DELETE VOLHISTORY QUERY VOLHISTORY UPDATE VOLHISTORY	Database dump operations are no longer available, therefore database dump volumes do not appear in the volume history. Query output is changed.
DEFINE DEVCLASS UPDATE DEVCLASS	Device formats have been added for some operating systems.

Table 25. Updated commands (continued)

Command	Changes
DEFINE SPACETRIGGER DELETE SPACETRIGGER QUERY SPACETRIGGER UPDATE SPACETRIGGER	The space trigger commands now support space triggers only for storage pools. The database and log space triggers are no longer available.
DEFINE STGPOOL QUERY STGPOOL UPDATE STGPOOL	The storage pool commands support the data deduplication functions.
DEFINE VOLUME	The maximum capacity of a volume in a DISK storage pool is 8 TB.
EXPIRE INVENTORY	Expiration can be run for specific nodes and node groups, or for all nodes in a policy domain. The types of data to be examined for expiration can also be specified.
GRANT AUTHORITY REVOKE AUTHORITY	**ANALYST** privilege class is removed.
HALT	The **QUIESCE** parameter is no longer needed.
MOVE DRMEDIA PREPARE QUERY DRMEDIA QUERY DRMSTATUS	Changes to disaster recovery manager commands allow you to include active-data pools in your recovery plans and procedures.
QUERY DB	Output is changed.
QUERY LOG	Output is changed.
QUERY OPTION	Obsolete options are removed from the output.
QUERY PROCESS	Information about duplicate identification processes is available through this command.
QUERY SESSION	A new field in the output indicates the actions that occurred during the session.
QUERY STATUS	Output is changed. Obsolete options are removed, and the database backup trigger is removed.
SELECT	Some parameters that were previously allowed might cause errors. SQL parameter usage must now conform to usage that is acceptable to the database manager. See "Changes to the SELECT command" on page 53.
SETOPT	Obsolete options are removed.
UPDATE ADMIN	**ANALYST** privilege class is removed.

Updated utilities

Table 26. Updated utilities

Utility	Changes
DSMSERV (starting the server)	New options are available for specifying the owning user ID for the server instance on startup. The new options are also available for other DSMSERV utilities.
DSMSERV FORMAT	Obsolete parameters are removed. New parameters are added to specify the directories for database space, and the maximum size and locations of the recovery log. This utility is used to format a database for installation of a new server.
DSMSERV LOADFORMAT	This utility is used only for formatting a new, completely empty database. An empty database is used only as part of the process of upgrading an earlier version of the server to V6.1. After you format an empty database, you use the DSMSERV INSERTDB utility to insert data that was extracted from the database of an earlier version of the server.
DSMSERV RESTORE DB • Restore a database to its most current state • Restore a database to a point in time	Volume history is now required for restoring the database. All restore operations use roll-forward recovery. The function for restoring individual database volumes was removed. The server no longer manages database volumes.

Updated server options

Table 27. Updated server options

Option	Changes
TXNGROUPMAX	The default value is increased from 256 to 4096. Check whether the server options file has this option: • If the server options file does not include this option, the server automatically uses the new default value. • If the server options file includes a value for the option, the server uses that specified value. If the specified value is less than 4096, consider increasing this value, or removing the option so that the server uses the new default value. Increasing the value or using the new default value can improve the performance for data movement operations such as storage pool migration and storage pool backup. Increasing the value for the TXNGROUPMAX option has no effect on data-movement performance for files that were stored on the server using a lower value for the option.

Deleted server commands, utilities, and options

Some commands, utilities, and options are deleted because their function is no longer needed. In some cases, new commands replace deleted commands.

"Deleted commands"
"Deleted utilities" on page 52
"Deleted server options" on page 52

Deleted commands

Table 28. Deleted commands

Deleted command	Comments
CONVERT ARCHIVE	The operation that this command performed is no longer needed.
DEFINE DBBACKUPTRIGGER DELETE DBBACKUPTRIGGER QUERY DBBACKUPTRIGGER UPDATE DBBACKUPTRIGGER	Ensure that you schedule backups of the database to occur at least once per day.
DEFINE DBCOPY	Database volumes are no longer used.
DEFINE DBVOLUME QUERY DBVOLUME	Space allocation is done automatically in the directory locations specified for the database.
DEFINE LOGCOPY	Instead of log volume copies, you can specify a log mirror to have the active log protected by a mirror copy.

Table 28. Deleted commands (continued)

Deleted command	Comments
DEFINE LOGVOLUME DELETE LOGVOLUME QUERY LOGVOLUME	The database manager automatically manages space in the recovery log directories. For information about the directories that are used for the logs, use the QUERY LOG command.
ESTIMATE DBREORGSTATS	Collecting and resetting database statistics occurs automatically. Database-reorganization operations are done automatically by the database manager as needed.
EXTEND DB	Space allocation is done automatically in the directory locations specified for the database. If the server needs additional space, you can add directory locations by using the EXTEND DBSPACE command.
EXTEND LOG	Server options are available for increasing the size of recovery logs.
QUERY SQLSESSION	The information that this command supplied is no longer in the server database. SQL SELECT settings are replaced by syntax options that are available in a DB2 SELECT command.
REDUCE DB	Space allocation is done automatically in the directory locations specified for the database. You cannot adjust the assigned capacity of the database.
REDUCE LOG	The database manager automatically manages space in the recovery log directories.
RESET BUFPOOL	The BUFPOOLSIZE option has been eliminated, therefore this command is not needed.
RESET DBMAXUTILIZATION RESET LOGCONSUMPTION RESET LOGMAXUTILIZATION	Collecting and resetting database statistics occurs automatically.
SET LOGMODE	Logging mode for the database is now always roll-forward mode.
SET SQLDATETIMEFORMAT SET SQLDISPLAYMODE SET SQLMATHMODE	The commands are replaced by options in the DB2 SELECT command syntax.
UNDO ARCHCONVERSION	The operation that this command performed is no longer needed.
UPDATE ARCHIVE	The operation that this command performed is no longer needed.

Deleted utilities

Table 29. Deleted utilities

Deleted utility	Comments
DSMFMT	Space allocation is done automatically in the directory locations specified for the database.
DSMSERV AUDITDB	Offline database audits are no longer required. As data is added to the server database, the database manager automatically checks data constraints and data types. The online integrity checks prevent problems for which offline audits had been needed in earlier releases.
DSMSERV DISPLAY DBBACKUPVOLUME	Information about volumes used for database backup is available from the volume history file. The volume history file is now required to restore the database.
DSMSERV DISPLAY DBVOLUMES	Use DSMSERV DISPLAY DBSPACE to view information about database space when the server is not running.
DSMSERV DISPLAY LOGVOLUMES	Use DSMSERV DISPLAY LOG to display information about recovery logs including the active log, the mirror for the active log, the failover directory for the archive log, and the overflow location for logs.
DSMSERV DUMPDB	The operation that this utility performed is no longer needed.
DSMSERV EXTEND LOG	This utility is replaced by the following server options: ACTIVELOGSIZE ACTIVELOGDIR MIRRORLOGDIR With these options, you can add recovery log space if the log is full when the server is down.
DSMSERV LOADDB	The operation that this utility performed is no longer needed.
DSMSERV RESTORE DB Restore a single database volume to its most current state Restore a database to a point in time when a volume history file is unavailable	The server does not track individual database volumes in V6.1. The volume history file is required to perform database restore operations.
DSMSERV UNLOADDB	The operation that this utility performed is no longer needed.

Deleted server options

When you start the server, you might receive warning messages about server options that are not supported, but that do not appear in this list of deleted

options. V5 releases tolerated the presence of some server options that were not supported by the server. The V6.1 server flags such options by issuing warning messages. You can ignore the error, or update the server options file and restart the server.

Table 30. Deleted server options

Deleted option	Comments
BUFPOOLSIZE	The server adjusts the value of buffer pool size dynamically.
DBPAGESHADOW	The option is no longer needed.
DBPAGESHADOWFILE	The option is no longer needed.
LOGPOOLSIZE	The server uses its own fixed-size recovery log buffer pool.
LOGWARNFULLPERCENT	The option is no longer needed.
MIRRORREAD MIRRORWRITE	Mirroring of the active log is supported, but not of the database. Provide availability protection for the database by locating the database on devices that have high availability characteristics.
SELFTUNEBUFPOOLSIZE	The server adjusts the buffer pool size dynamically.

Changes to the SELECT command

The SELECT command in previous versions of the server allowed syntax that did not always conform to SQL syntax rules. With V6.1, the server conforms to SQL syntax rules in use by its database manager, the DB2 program. Some examples illustrate changes that you might need to make to SELECT statements that you use.

LIKE predicate for a nested SELECT statement

You cannot use the **LIKE** predicate for a nested SELECT statement. For example, you receive an error if you use the **LIKE** predicate as in this statement:

```
select * from volumeusage where volume_name like (select distinct volume_name
from volumeusage where node_name='node1')
```

Replace such usage with the **in** parameter, as in this statement:

```
select * from volumeusage where volume_name in (select distinct volume_name
from volumeusage where node_name='node1')
```

SELECT statements for time calculation

Labeled duration cannot be compared in a SELECT statement. For example, the following statement results in an SQL error:

```
select * from actlog where (current_time-date_time) seconds <= 60 seconds
```

The following statement is an example of correct usage:

```
select * from actlog where second(current_time-date_time) <= 60
```

The index_keyseq and index_order columns

The system catalog tables SYSCAT.COLUMNS and SYSCAT.TABLES are now processed by the database manager, instead of directly by the Tivoli Storage Manager server. The **INDEX_KEYSEQ** and **INDEX_ORDER** columns are not available. Use the **KEYSEQ** column instead. For information, use the search string `keyseq` in the following information center: http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp.

Access to database objects using the SELECT command

The database objects that can be accessed using the SELECT command are the same as for earlier versions of the server, with some additions for new functions in V6.1.

However, the SYSCAT.COLUMNS and SYSCAT.TABLES catalog tables now include all database objects that are known to the server, including some objects that cannot be accessed through the SELECT command. You receive an error message if a SELECT command includes an attempt to access one of these objects.

Retrieval of information from more than one database table

To retrieve information from more than one table, use a join process. Many types of join processes can be used.

For example, the following command, which worked with earlier versions of the server, no longer works:

```
select entity,activity,sum(bytes),sum(end_time-start_time),sum(affected),sum(failed),sum(mediaw)
from summary where entity in (select node_name from nodes) and
cast((current_timestamp-start_time)hours as decimal)<24 group by entity,activity
```

You can declare names for columns that are retrieved from multiple tables so that a conditional statement can be run with the results that you want from the SELECT command. For example:

```
select entity,activity,sum(bytes),sum(end_time-start_time),sum(affected),sum(failed),sum(mediaw)
from summary su, nodes nd where su.entity=nd.node_name and
cast((current_timestamp-start_time)hours as decimal)<24 group by entity,activity
```

Results of the SELECT command for the DISK device class

Results when you use the SELECT command to get information from the **DEVCLASSES** table have changed slightly in V6.1 for the **DISK** device class.

In previous releases, the `SHARED` field was blank (null) for the **DISK** device class. In V6.1, the `SHARED` field contains the value `NO`. The `SHARED` field does not apply to the **DISK** device class, and the value `NO` can be ignored.

Extra spaces appearing in output

Spaces might appear in output where they did not appear before. If trailing spaces appear in your output, such as in the following **tabschema** output example, you can use the **RTRIM** scalar function to remove them.

```
dsmadmc -errorlogn=errorlog -id=admin -pa=admin -comma -dataonly=y
    'select tabschema,tabname from tables'

SYSCAT  ,ATTRIBUTES
SYSCAT  ,AUDITPOLICIES
SYSCAT  ,AUDITUSE
```

For example, if you are writing scripts for automation and need to strip out the additional spaces, you can use the **RTRIM** scalar function:

```
select rtrim(tabschema) as tabschema, tabname from syscat.tables
```

Data types for arithmetic operations

Changes in how data types for arithmetic operations are handled might require changes to SELECT commands that worked in earlier versions of the server.

For example, the following command causes an arithmetic overflow error because of the **SUM** statement:

```
select node_name,sum(capacity) as capacity,
sum(capacity * (pct_util/100)) as used from filespaces group by node_name
```

To make the command compatible with V6.1, add the **CAST** function to convert the items in the **SUM** statement to decimal data types:

```
select node_name,sum(capacity) as capacity,
sum(cast(capacity as decimal) * cast((pct_util/100) as decimal)) as used from
filespaces group by node_name
```

New and changed server messages

If you have scripts or other automation that use server messages, check the lists of new, changed, and deleted messages for items that you might need to change.

The list is available in the information center: http://publib.boulder.ibm.com/infocenter/tsminfo/v6

The list is also available in the *Tivoli Storage Manager Messages* publication for V6.1.

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.

AIX HP-UX Linux Solaris

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

AIX HP-UX Linux Solaris

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

For example: `tsminst1`

Windows

The database instance name is the name of the server instance as it appears in the registry.

For example: `Server1`

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.

AIX HP-UX Linux Solaris

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`

Windows

You can use a name that includes the name of the server instance as it appears (or will appear) in the registry. Default server instance names have the form Server*x*.

For example: `d:\tsm\server1`

Database name

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

Server name

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

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

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

For example:

AIX HP-UX Linux Solaris

PAYROLL
SALES

Windows

TUCSON_SERVER1
TUCSON_SERVER2

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:

AIX HP-UX Linux Solaris `/tsminst1_archlog`

Windows `f:\server1\archlog`

Chapter 3. Upgrade scenarios overview

You can upgrade the server on the same system or a new system, and use either a media method or a network method to move data from the original server database to the upgraded server database. Descriptions of the scenarios illustrate the order of steps for the different approaches.

Select the scenario that you are interested in from the following table. The scenarios are presented in overview form in this section, to summarize the steps that are performed in each case. When performing the procedure, follow the link from the scenario overview to the detailed procedures.

Scenario	Location of upgraded server	Method for moving data
"Scenario 1 for upgrading the server: same system, media method"	Same system as original server	Media method
"Scenario 2 for upgrading the server: same system, network method" on page 63	Same system as original server	Network method
"Scenario 3 for upgrading the server: new system, media method" on page 67	New system	Media method
"Scenario 4 for upgrading the server: New system, network method" on page 71	New system	Network method

Related concepts

"Comparison of upgrading on an existing system and a new system" on page 12

"Comparison of methods for moving data to the V6.1 database" on page 14

Scenario 1 for upgrading the server: same system, media method

In this scenario, all upgrade tasks are performed on the same system. The database is extracted to media and later inserted into the V6.1 database.

You can use the wizard, or perform the upgrade by manually using the utilities. The wizard offers a guided approach to the upgrade of a server. By using the wizard, you can avoid some configuration steps that are complex when done manually.

Related concepts

"Comparison of upgrading on an existing system and a new system" on page 12

"Comparison of methods for moving data to the V6.1 database" on page 14

Related tasks

Chapter 4, "Scenario 1: Same system, media method," on page 77

Upgrading the server using the wizard

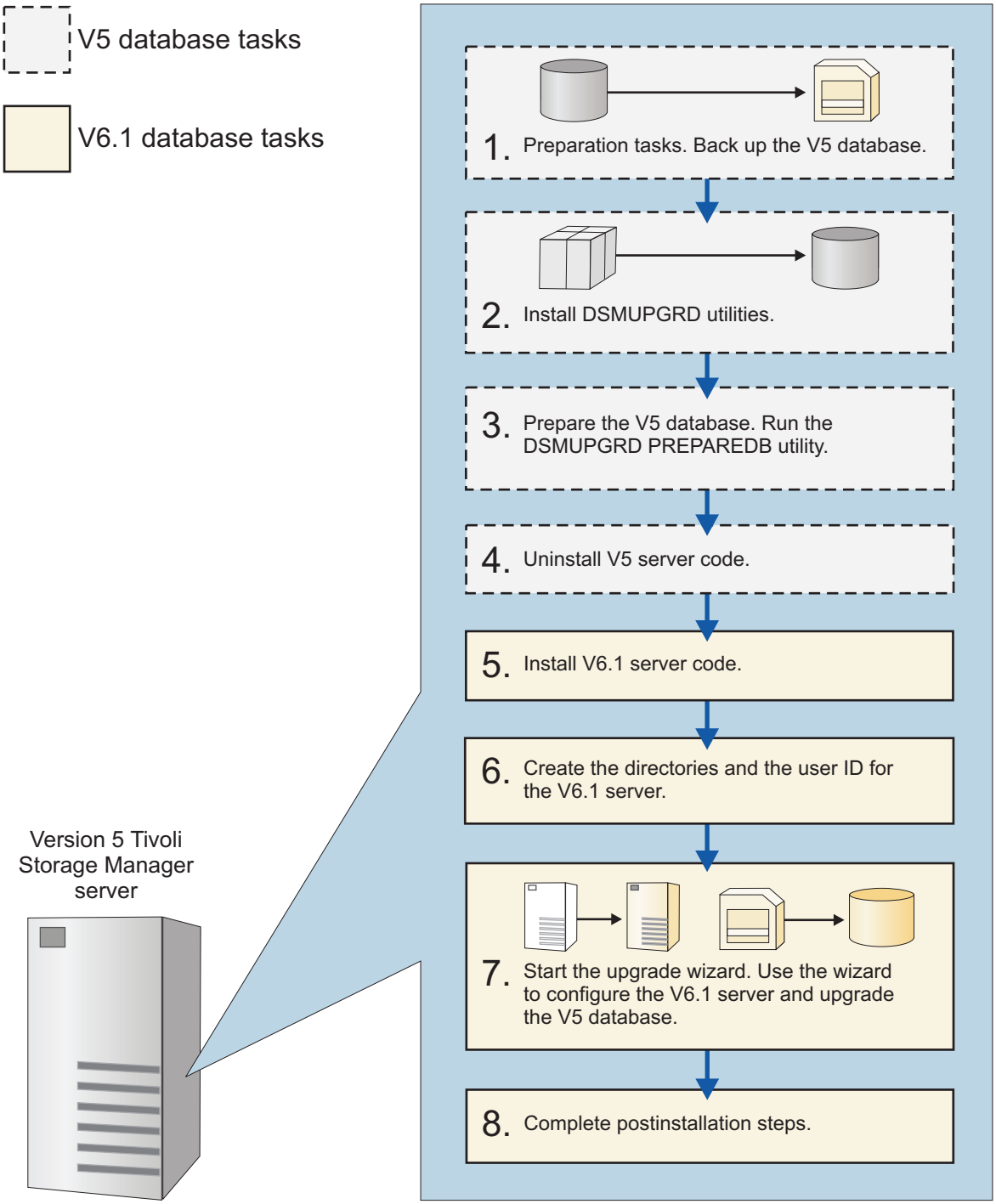

Figure 1. Scenario 1

The following steps are a summary of the procedure for this scenario. If this scenario matches your environment, see the details for the procedure: Chapter 4, "Scenario 1: Same system, media method," on page 77.

1. Perform all preparation tasks, which includes performing a database backup.
2. Install the upgrade utilities package (DSMUPGRD) on the system. The utilities package must be installed whether you are using the upgrade wizard or performing the upgrade with utilities.
3. Prepare the V5 database using the utility DSMUPGRD PREPAREDB.
4. Uninstall the V5 server code.
5. Install the V6.1 server code on the system.
6. Create the directories for the V6.1 database and logs, and the user ID that will own the server instance.
7. Start the upgrade wizard to configure the new server and upgrade the V5 database. With the wizard, you complete the following tasks:
   a. Extract the V5 database to external media.
   b. Create and format an empty database to receive the data.
   c. Insert the data from the media to which it was extracted.
   d. Configure the system for database backup.
8. Complete the post-installation tasks, including backing up the database and verifying the database contents.

Upgrading the server manually using utilities

Upgrade to V6.1 on the same system, media method

Upgrade using the command line and upgrade utilities

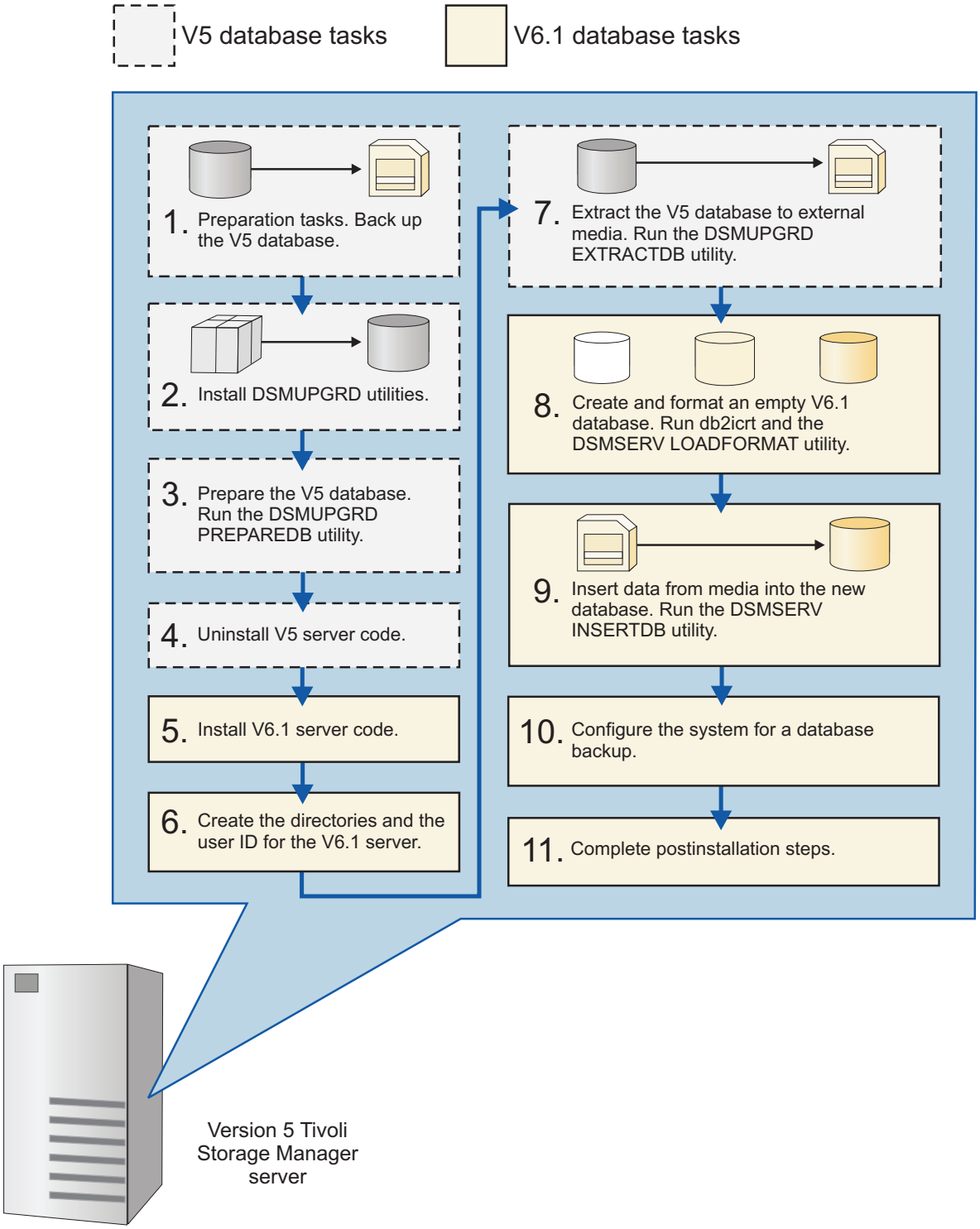

Figure 2. Scenario 1

The following steps are a summary of the procedure for this scenario. If this scenario matches your environment, see the details for the procedure: Chapter 4, “Scenario 1: Same system, media method,” on page 77.

1. Perform all preparation tasks, which includes performing a database backup.
2. Install the upgrade utilities package (DSMUPGRD) on the system. The utilities package must be installed whether you are using the upgrade wizard or performing the upgrade with utilities.
3. Prepare the V5 database using the utility DSMUPGRD PREPAREDB.
4. Uninstall the V5 server code.
5. Install the V6.1 server code on the system.
6. Create the directories for the V6.1 database and logs, and the user ID that will own the server instance.
7. Extract the V5 database to external media using the utility DSMUPGRD EXTRACTDB.
8. Create and format an empty database to receive the data. The database is created with the db2icrt command. The database is formatted using the utility DSMSERV LOADFORMAT.
9. Insert the data from the media to which it was extracted. You must have the manifest file that was created as part of the extraction process.Use the utility DSMSERV INSERTDB.
10. Configure the system for database backup.
11. Complete the post-installation tasks, including backing up the database and verifying the database contents.

Scenario 2 for upgrading the server: same system, network method

In this scenario, all upgrade tasks are performed on the same system. The data is extracted from the original server database and inserted into the new server database at the same time.

You can use the wizard, or perform the upgrade by manually using the utilities. The wizard offers a guided approach to the upgrade of a server. By using the wizard, you can avoid some configuration steps that are complex when done manually.

Related concepts

“Comparison of upgrading on an existing system and a new system” on page 12

“Comparison of methods for moving data to the V6.1 database” on page 14

Related tasks

Chapter 5, “Scenario 2: Same system, network method,” on page 113

Upgrading the server using the wizard

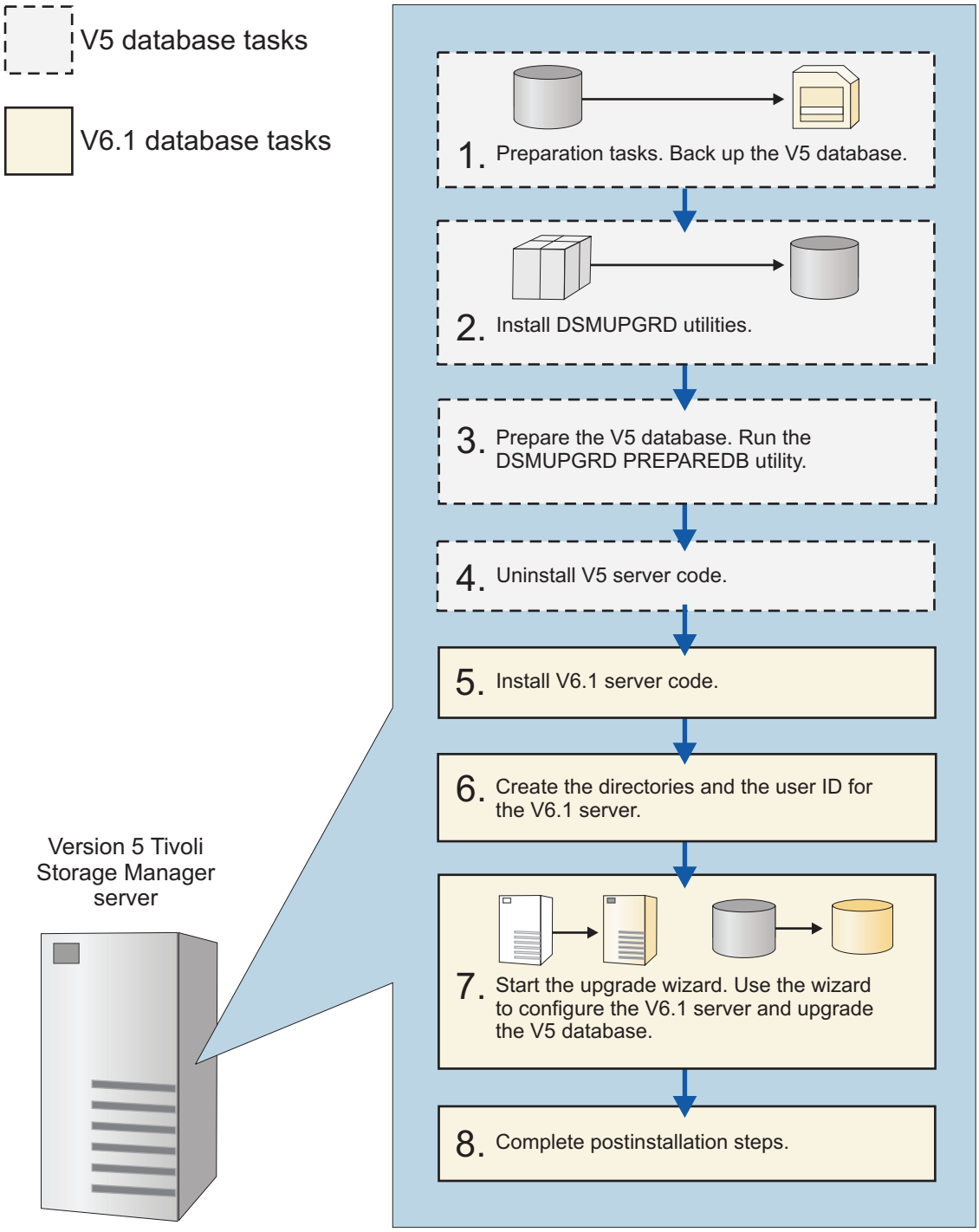

Figure 3. Scenario 2

The following steps are a summary of the procedure for this scenario. If this scenario matches your environment, see the details for the procedure: Chapter 5, “Scenario 2: Same system, network method,” on page 113.

1. Perform all preparation tasks, which includes performing a database backup.
2. Install the upgrade utilities package (DSMUPGRD) on the system. The utilities package must be installed whether you are using the upgrade wizard or performing the upgrade with utilities.
3. Prepare the V5 database using the utility DSMUPGRD PREPAREDB.
4. Uninstall the V5 server code.
5. Install the V6.1 server code on the system.
6. Create the directories for the V6.1 database and logs, and the user ID that will own the server instance.
7. Start the upgrade wizard to configure the new server and upgrade the V5 database. With the wizard, you complete the following tasks:
   a. Create and format an empty database to receive the data.
   b. Move the data from the V5 database to the V6.1 database.
   c. Configure the system for database backup.
8. Complete the post-installation tasks, including backing up the database and verifying the database contents.

Upgrading the server manually using utilities

Upgrade to V6.1 on the same system, network method

Upgrade using the command line and upgrade utilities

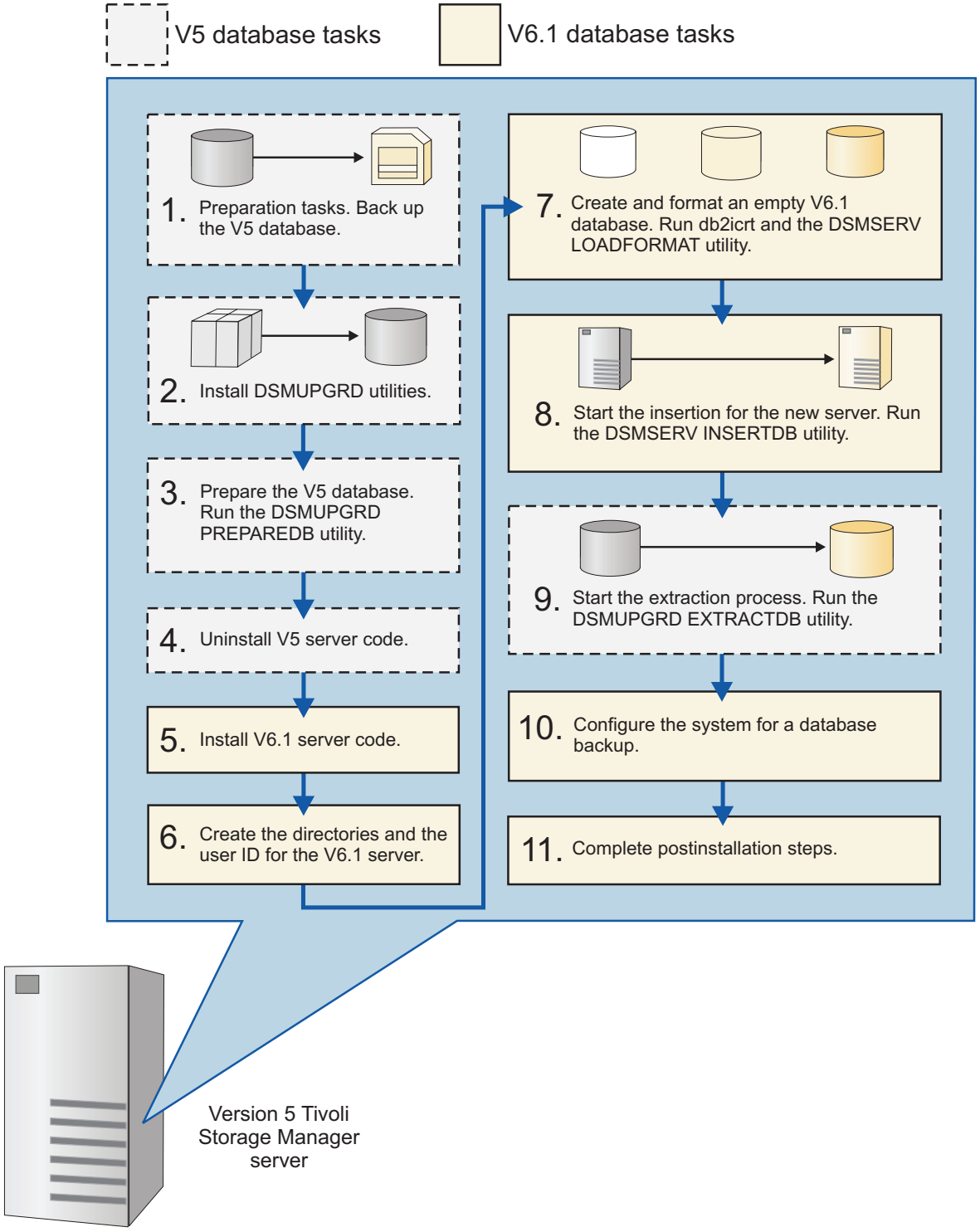

Figure 4. Scenario 2

The following steps are a summary of the procedure for this scenario. If this scenario matches your environment, see the details for the procedure: Chapter 5, “Scenario 2: Same system, network method,” on page 113.

1. Perform all preparation tasks, which includes performing a database backup.
2. Install the upgrade utilities package (DSMUPGRD) on the system. The utilities package must be installed whether you are using the upgrade wizard or performing the upgrade with utilities.
3. Prepare the V5 database using the utility DSMUPGRD PREPAREDB.
4. Uninstall the V5 server code.
5. Install the V6.1 server code on the system.
6. Create the directories for the V6.1 database and logs, and the user ID that will own the server instance.
7. Create and format an empty database to receive the data. The database is created with the db2icrt command. The database is formatted using the utility DSMSERV LOADFORMAT.
8. Start the insertion process for the new server using the utility DSMSERV INSERTDB.
9. Start the extraction process from the V5 database using the utility DSMUPGRD EXTRACTDB.
10. Configure the system for database backup.
11. Complete the post-installation tasks, including backing up the database and verifying the database contents.

Scenario 3 for upgrading the server: new system, media method

In this scenario, some upgrade tasks are performed on the original system and some on the new system. The database is extracted to media and later inserted into the V6.1 database.

You can use the wizard, or perform the upgrade by manually using the utilities. The wizard offers a guided approach to the upgrade of a server. By using the wizard, you can avoid some configuration steps that are complex when done manually.

Related concepts

“Comparison of upgrading on an existing system and a new system” on page 12

“Comparison of methods for moving data to the V6.1 database” on page 14

Related tasks

Chapter 6, “Scenario 3: New system, media method,” on page 147

Upgrading the server using the wizard

Upgrade to V6.1 on a new system, media method

Upgrade using the upgrade wizard

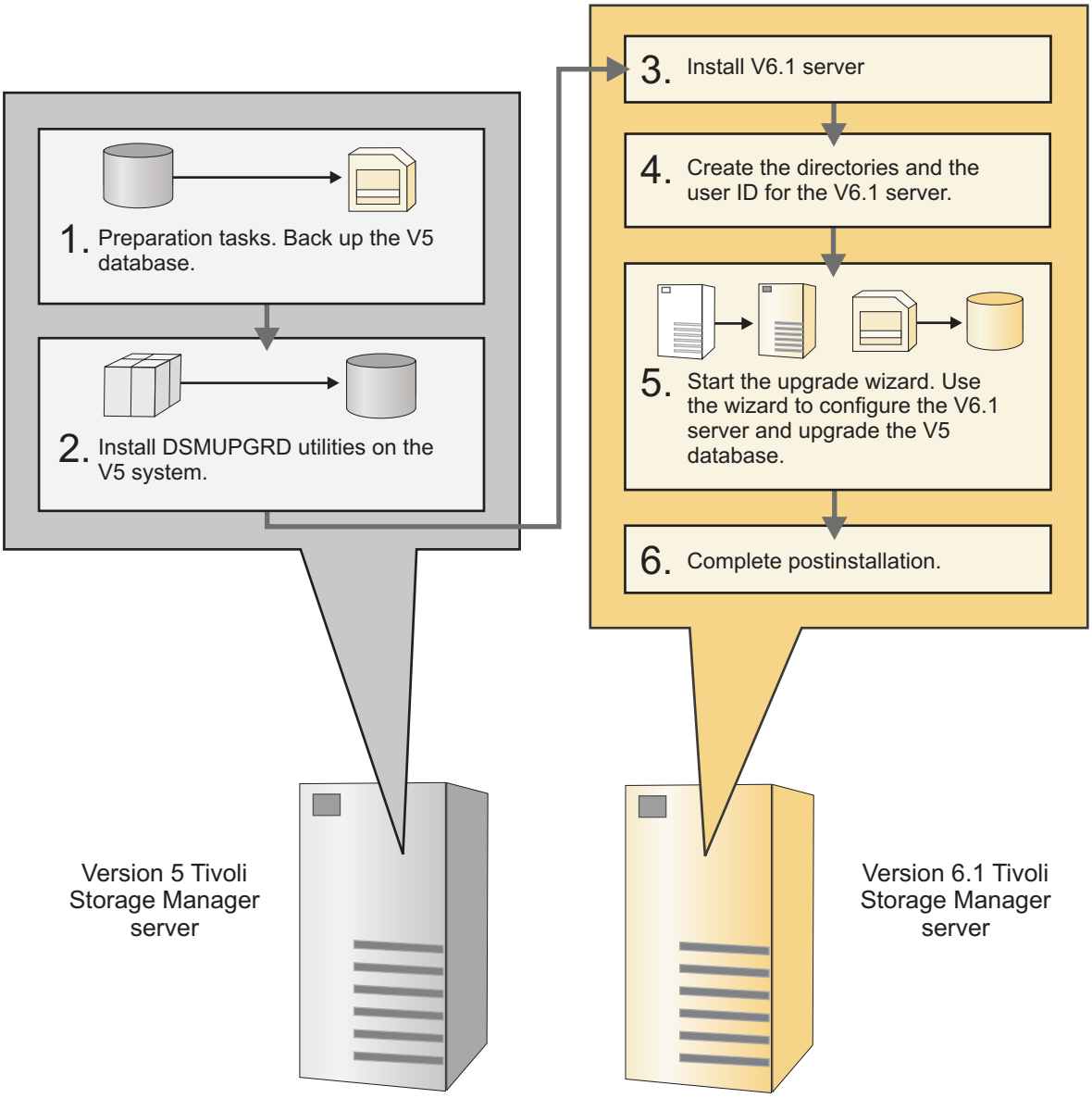

Figure 5. Scenario 3

The following steps are a summary of the procedure for this scenario. If this scenario matches your environment, see the details for the procedure: Chapter 6, "Scenario 3: New system, media method," on page 147.

1. Perform all preparation tasks on the original system. Preparation includes performing a database backup.
2. Install the DSMUPGRD utilities package on the original system. The utilities package must be installed whether you are using the upgrade wizard or performing the upgrade manually with utilities.
3. Install the V6.1 server code on the new system.

4. Create the directories for the V6.1 database and logs, and the user ID that will own the server instance.
5. Start the upgrade wizard to configure the new server and upgrade the V5 database. With the wizard, you complete the following tasks:
   a. On the original system, prepare the V5 database.
   b. On the original system, extract the V5 database to external media.
   c. On the new system, create and format an empty database to receive the data.
   d. On the new system, insert the data from the media to which it was extracted.
   e. Configure the new system for database backup.
6. Complete the post-installation tasks, including backing up the database and verifying the database contents.

Upgrading the server manually using utilities

Upgrade to V6.1 on a new system, media method

Upgrade using the command line and upgrade utilities

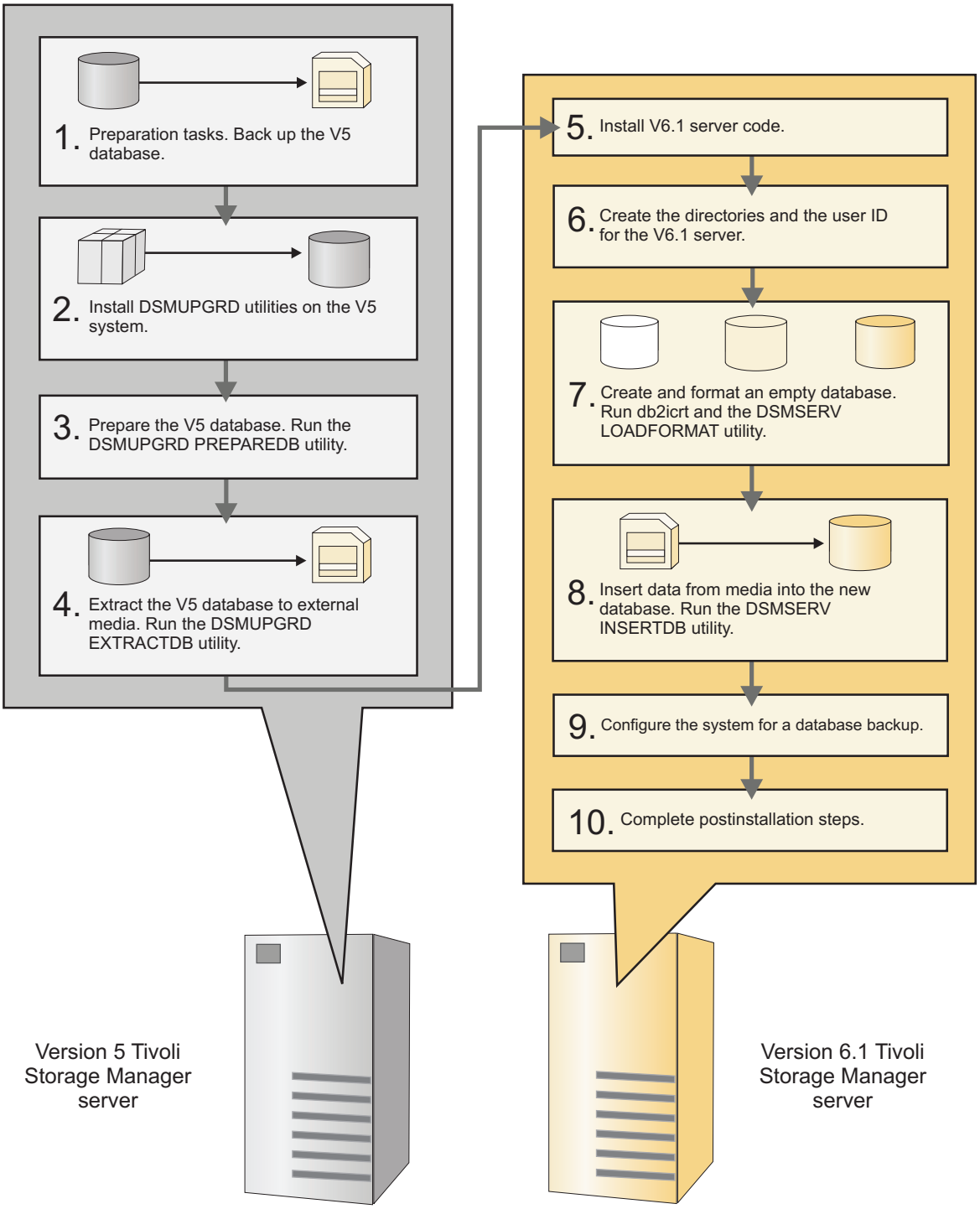

Figure 6. Scenario 3

The following steps are a summary of the procedure for this scenario. If this scenario matches your environment, see the details for the procedure: Chapter 6, “Scenario 3: New system, media method,” on page 147.

1. Perform all preparation tasks on the original system. Preparation includes performing a database backup.
2. Install the DSMUPGRD utilities package on the original system. The utilities package must be installed whether you are using the upgrade wizard or performing the upgrade manually with utilities.
3. On the original system, prepare the V5 database using the utility DSMUPGRD PREPAREDB.
4. On the original system, extract the V5 database to external media using the utility DSMUPGRD EXTRACTDB.
5. Install the V6.1 server code on the new system.
6. Create the directories for the V6.1 database and logs, and the user ID that will own the server instance.
7. On the new system, create and format an empty database to receive the data. The database is created with the db2icrt command. The database is formatted using the utility DSMSERV LOADFORMAT.
8. On the new system, insert the data from the media to which it was extracted. You must have the manifest file that was created as part of the extraction process. Use the utility DSMSERV INSERTDB.
9. Configure the system for database backup.
10. Complete the post-installation tasks, including backing up the database and verifying the database contents.

Scenario 4 for upgrading the server: New system, network method

In this scenario, some upgrade tasks are performed on the original system and some on the new system. The data is extracted from the original server database and sent over the network connection to be inserted into the new server database.

You can use the wizard, or perform the upgrade by manually using the utilities. The wizard offers a guided approach to the upgrade of a server. By using the wizard, you can avoid some configuration steps that are complex when done manually.

Related concepts

“Comparison of upgrading on an existing system and a new system” on page 12

“Comparison of methods for moving data to the V6.1 database” on page 14

Related tasks

Chapter 7, “Scenario 4: New system, network method,” on page 189

Upgrading the server using the wizard

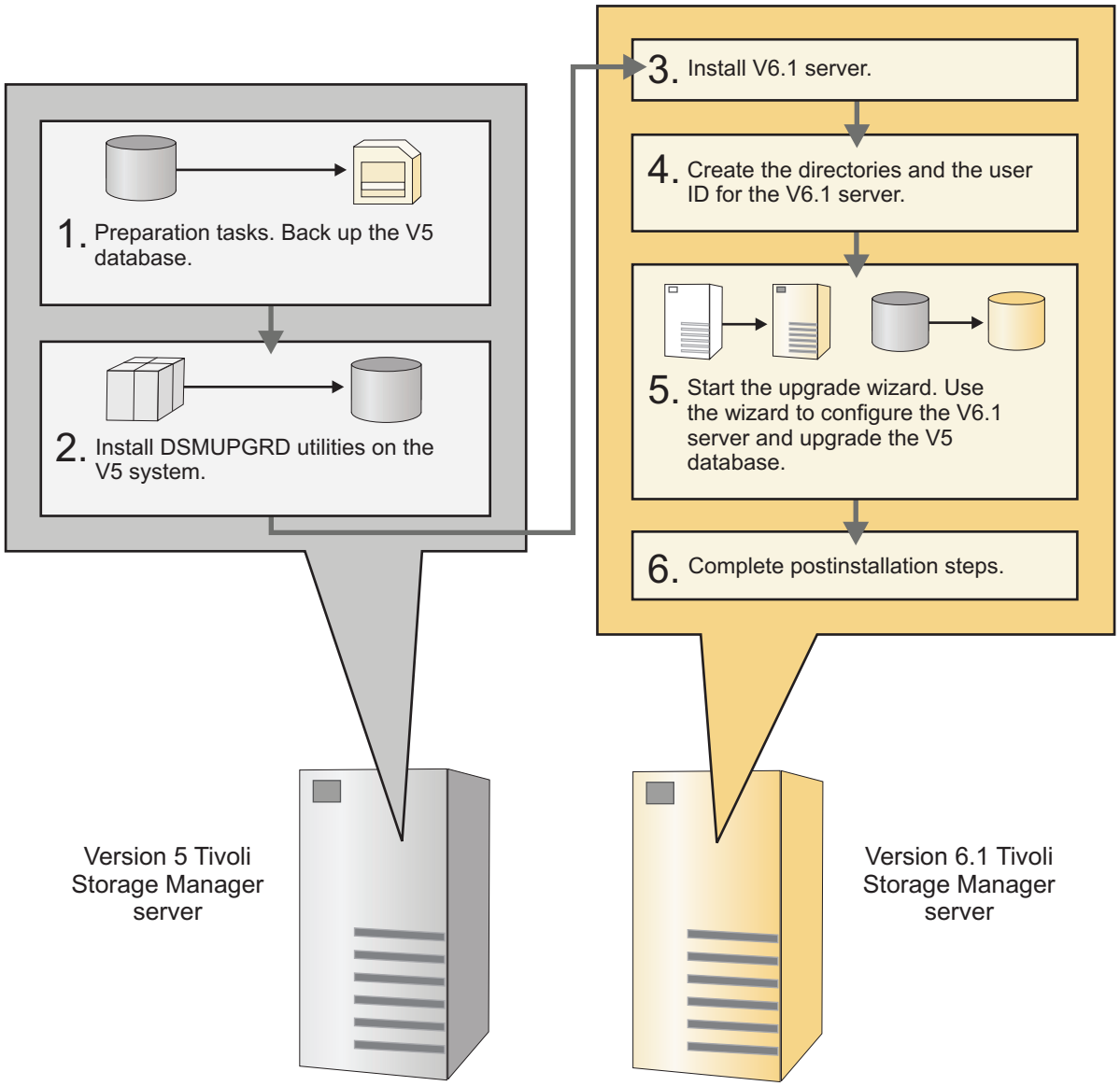

Figure 7. Scenario 4

The following steps are a summary of the procedure for this scenario. If this scenario matches your environment, see the details for the procedure: Chapter 7, "Scenario 4: New system, network method," on page 189.

1. Perform all preparation tasks on the original system. Preparation includes performing a database backup.
2. Install the DSMUPGRD utilities package on the original system. The utilities package must be installed whether you are using the upgrade wizard or performing the upgrade manually with utilities.
3. Install the V6.1 server code on the new system.

4. Create the directories for the V6.1 database and logs, and the user ID that will own the server instance.
5. Start the upgrade wizard to configure the new server and upgrade the V5 database. With the wizard, you complete the following tasks:
   a. On the original system, prepare the V5 database.
   b. On the new system, create and format an empty database to receive the data.
   c. Move the data from the V5 database to the V6.1 database.
   d. Configure the new system for database backup.
6. Complete the post-installation tasks, including backing up the database and verifying the database contents.

Upgrade to V6.1 on a new system, network method

Upgrade using the command line and upgrade utilities

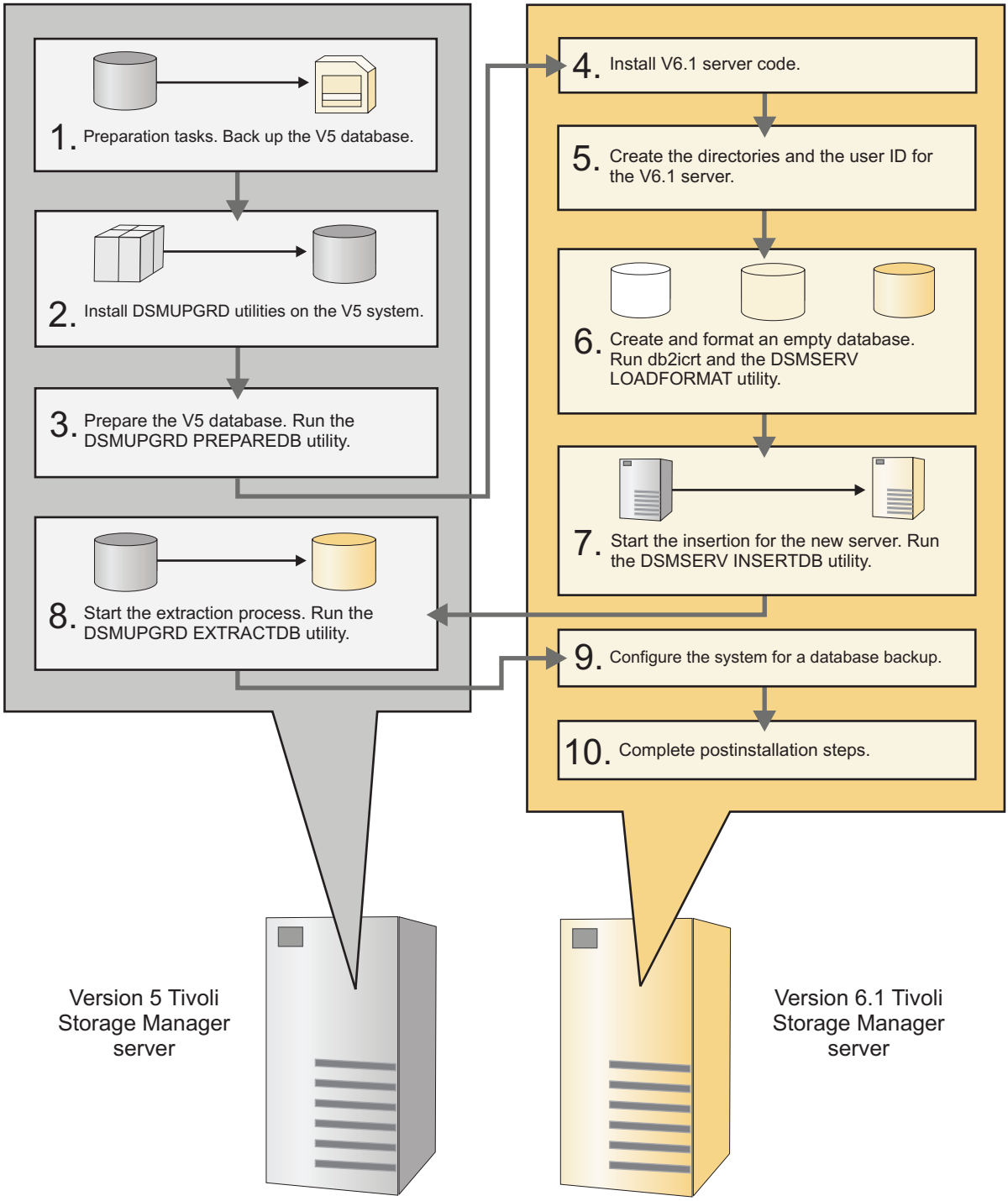

Figure 8. Scenario 4

The following steps are a summary of the procedure for this scenario. If this scenario matches your environment, see the details for the procedure: Chapter 7, "Scenario 4: New system, network method," on page 189.

1. Perform all preparation tasks on the original system. Preparation includes performing a database backup.
2. Install the DSMUPGRD utilities package on the original system. The utilities package must be installed whether you are using the upgrade wizard or performing the upgrade manually with utilities.
3. On the original system, prepare the V5 database using the utility DSMUPGRD PREPAREDB.
4. Install the V6.1 server code on the new system.
5. Create the directories for the V6.1 database and logs, and the user ID that will own the server instance.
6. On the new system, create and format an empty database to receive the data. The database is created with the db2icrt command. The database is formatted using the utility DSMSERV LOADFORMAT.
7. On the new system, start the insertion process for the new server. Use the utility DSMSERV INSERTDB.
8. On the original system, start the extraction process for the V5 database using the utility DSMUPGRD EXTRACTDB.
9. Configure the system for database backup.
10. Complete the post-installation tasks, including backing up the database and verifying the database contents.

Chapter 4. Scenario 1: Same system, media method

Use this procedure if you are upgrading your server on the same system as your V5 server, and you are using the media method to move the data from the V5 database to the V6.1 database.

Perform these tasks to upgrade a server:

1. "Scenario 1: Preparing for the upgrade"
2. "Scenario 1: Installing the upgrade utilities" on page 83
3. "Scenario 1: Preparing the database of a V5 server for upgrade" on page 90
4. "Scenario 1: Uninstalling the V5 program before installing V6.1" on page 91
5. "Scenario 1: Installing the V6.1 server" on page 93
6. "Scenario 1: Creating the directories and the user ID for the upgraded server instance" on page 97
7. Upgrading the server, using one of the following methods:
   - "Scenario 1: Upgrading the server using the upgrade wizard" on page 101
   - "Scenario 1: Upgrading the server manually using utilities" on page 102
8. Completing the upgrade by taking important first steps:
   a. "Verifying access to storage pools on disk" on page 267
   b. "Starting the server instance after the upgrade" on page 267
   c. "Registering licenses" on page 271
   d. "Backing up the database after upgrading the server" on page 271
   e. "Verifying the upgraded server" on page 272
   f. "Updating automation" on page 273
   g. "Monitoring the upgraded server" on page 273

Scenario 1: Preparing for the upgrade

Prepare for the upgrade by checking requirements, preparing the space that is required, backing up the server, and modifying certain server settings.

Follow the preparation steps carefully to protect your server and its data.

Important: It is possible, after the upgrade to V6.1 is complete, that conditions might cause the need to temporarily revert to the previous version of the server. Successfully reverting to the previous version of the server is possible only if you performed all preparation steps. To understand why it is important to perform all preparation steps, review the procedure for reverting an upgraded server to its previous version.

Perform these steps to prepare for the upgrade:

1. "Scenario 1: Checking the prerequisites for the upgrade" on page 78
2. "Scenario 1: Preparing space for the upgrade process" on page 79
3. "Scenario 1: Modifying the server before the upgrade" on page 80
4. "Scenario 1: Disabling sessions" on page 81
5. "Scenario 1: Backing up storage pools and the server database" on page 81
6. "Scenario 1: Backing up configuration information" on page 81

7. "Scenario 1: Stopping the server before installing the upgrade" on page 82

Related tasks

"Reverting from V6.1 to the previous V5 server version" on page 280

Scenario 1: Checking the prerequisites for the upgrade

Check your system against requirements for the server.

1. Ensure that the server that you plan to upgrade is at version 5.3.6 or later.
2. Ensure that the system where the V5 server is located meets the minimum requirements. Use the information in "Hardware and software requirements for the V5 server system that is being upgraded" on page 16 to determine whether you need to update your system before you continue.
3. Ensure that the system where you plan to install the V6.1 server meets requirements. Check the operating system level and the platform against the list of supported operating systems and platforms.

   Restriction: You cannot upgrade your server to run on an operating system that is different from the operating system it currently runs on. For example, you cannot upgrade a server running on an AIX system to a server running on a Linux system.

   Some platforms that were supported for earlier versions of the server are *not* supported for V6.1. If the server that you want to upgrade is running on one of these platforms, you cannot upgrade your server to V6.1 on the same platform. You must install your V6.1 server on a system that is a specific supported platform, depending on the original platform. See the following table.

Platform for V5 server	Required platform for upgrade to V6.1
HP-UX running on a PA-RISC system	HP-UX running on an Itanium system
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system
Linux running on a 32-bit x86 system	Linux running on an x86_64 system
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system

4. Check that the system memory meets the server requirements. If you plan to run multiple instances of the V6.1 server on the system, each instance requires the memory listed for one server. Multiply the memory for one server by the number of instances planned for the system.
5. Ensure that the system has enough disk storage for the database and recovery logs. Review the planning information for requirements and guidance.

   You can take one of two approaches:

   - Ensure that the system has enough disk storage for storing database and recovery logs for both the original server and the new V6.1 server. Both will be stored on disk storage during the upgrade process.
   - After you back up the V5 database and extract the data in the database to media, reconfigure the disk subsystem used for the database storage. Then insert the data to the new database from the media. You must take this approach if you do not have enough disk space for both the original server and the new server.

   If you are adding new hardware for the server, such as new disk storage for the database, have the hardware installed and running.

Related concepts

"Hardware and software requirements for upgrading to the V6.1 server" on page 15

Scenario 1: Preparing space for the upgrade process

Determine the amount and type of space that is required for the upgrade process before beginning the process.

1. Verify that the system has the amount of space that was estimated in the planning step. Use the planning work sheet that you filled in with your information.
2. Ensure that you have space available for storing the database and the manifest file that the extraction process creates.
   a. Identify the device class to which you will extract the original database. The definition must exist in the server database, not just in the device configuration file.

      The device class must be a sequential device class that has volumes or space available. Define a new device class if necessary. The device class type cannot be **NAS** or **CENTERA**.

      Important: You must confirm *now* that the definition that is in the server database for the device class is correct. After you prepare the database for upgrade (by completing the **Prepare Database** phase in the upgrade wizard, or by using the DSMUPGRD PREPAREDB utility), you cannot update this device class definition. For example, check the path for a FILE device class. If you copied the original server to a different system to extract the data, the path might be different on the current system.
   b. Ensure that space or volumes are available in the selected device class. The amount of space that you need is about the same as the current size of the original database.

      Ensure that the instance user ID that you create for the upgraded server has access permission to the location of the extracted data.
   c. Check that the access permissions are correct for the location that you plan to specify for the manifest file.

      The user ID that will run the database preparation and extraction utilities (DSMUPGRD PREPAREDB and DSMUPGRD EXTRACTDB) must have write access to this file. This is typically the root user ID.

      When the data is later inserted into the V6.1 database, the instance user ID that you use for the upgraded server must have access permission for the manifest file.

      The manifest file is typically less than 1 KB.

Related tasks

"Estimating total space requirements for the upgrade process and upgraded server" on page 34

Scenario 1: Modifying the server before the upgrade

A command must be run on the server to prevent one type of problem during the upgrade process. Some modifications to typical server settings are recommended to prepare for the upgrade.

1. From a Tivoli Storage Manager administrative command line, issue the command:

   ```
   convert ussfilespace
   ```

   This command fixes a problem that might exist in older Tivoli Storage Manager databases. If the problem does not exist in your database, the command completes quickly. If the problem exists in your database, the command might take some time to run.

   Important: Do not skip this step. If your database has the problem and you do not run this command now, the DSMUPGRD PREPAREDB utility fails when you run it. You must then restart the V5 server and run the CONVERT USSFILESPACE command before continuing with the upgrade process.
2. Review the steps for reverting to the earlier version of the server in the section, "Reverting from V6.1 to the previous V5 server version" on page 280.

   If for some reason you need to revert to the earlier version after the upgrade to V6.1, the results of the reversion will be better if you understand the steps and prepare for the possibility now.
3. Make the following adjustments to settings on your server and clients. These adjustments must be done to make it possible for you to revert to the original server after the upgrade, if problems occur.
   a. For each sequential-access storage pool, set the **REUSEDELAY** parameter to the number of days during which you want to be able to revert to the original server, if that becomes necessary.

      For example, if you want to be able to revert to the original server for up to 30 days after upgrading to V6.1, set the **REUSEDELAY** parameter to 31 days.
   b. For each copy storage pool, set the **RECLAIM** parameter to 100 (meaning 100%).
   c. If you typically use a DELETE VOLHISTORY command to delete database backups, ensure that the command does not delete database backups for at least the same number of days that you set for the **REUSEDELAY** period for sequential-access storage pools.
   d. For important clients that use the server, check that the value for the schedlogretention client option is set to retain the client schedule log for a long enough time. Update the option for clients if needed.

      The entries in the client schedule log might be useful if the server must revert to the original version. If the retention period for the schedule log is too short, the schedule log information might be deleted too soon.

Scenario 1: Disabling sessions

In preparation for the upgrade, prevent activity on the server by disabling new sessions. Cancel any existing sessions.

The commands in the following procedure are Tivoli Storage Manager administrative commands.

1. Prevent all clients, storage agents, and other servers from starting new sessions with the server. Use the commands:

   ```
   disable sessions client
   disable sessions server
   ```

2. Prevent administrative activity from any user ID other than the administrator ID that is being used to perform the upgrade preparation. Lock out other administrator IDs if necessary:

   ```
   lock admin administrator_name
   ```

3. Check whether any sessions exist, and notify the users that the server is going to be stopped. To check for existing sessions, use the command:

   ```
   query session
   ```

4. Cancel sessions that are still running. Use the command:

   ```
   cancel session
   ```

Scenario 1: Backing up storage pools and the server database

Immediately before upgrading the server, back up primary storage pools to copy storage pools, and perform a full database backup.

1. Back up primary storage pools to copy storage pools using the BACKUP STGPOOL command. If you have been performing regular backups of the storage pools, this step backs up only the data that was added to the primary storage pools since they were last backed up.
2. Back up the database using the following command. Use either a full or snapshot backup type.

   ```
   backup db type=type devclass=device_class_name
   ```

   The device class that you specify must exist and have volumes that are available to it. For example, to perform a snapshot backup of your database to the TAPECLASS device class using scratch volumes, enter:

   ```
   backup db type=dbsnapshot devclass=tapeclass
   ```

   To use specific volumes instead of scratch volumes, specify the volume names in the command.

   Consider making two copies of the backup to protect the backup from media failures.

Scenario 1: Backing up configuration information

Before installing the new version, back up critical files and information for the server. Store the files in a safe place, because they are needed after the installation of the new software version is completed. You also need these files if you must revert to the previous version after the upgrade.

1. Back up device configuration information:

   ```
   backup devconfig filenames=file_name
   ```

2. Back up volume history information:

   ```
   backup volhistory filenames=file_name
   ```

Ensure that the volume history includes information about the database backup that you completed in the preceding steps. For example, issue the command:

```
query volhistory type=dbbackup
```

3. Make copies of these files, which are located in the default directory for the server:

   server options file, typically named `dsmserv.opt`

   `dsmserv.dsk`

4. Optional: Make a copy of the accounting log file, `dsmaccnt.log`.
5. Back up any scripts that have been used to perform daily housekeeping for the server. Examine the scripts for changes that are needed after the upgrade.
6. Store the device configuration file, the volume history file, the server options file, and the other files in a safe place. Select a location that is not on the system that is being upgraded.

Scenario 1: Creating a summary of database contents

Create a summary of the contents of the original database. After the upgrade, you can use the same commands to compare the results and to confirm that the database contents are intact.

Run commands that give a summary of information about your database contents. For example, issue commands that summarize the file spaces being protected, and save the results. See the sample commands for ideas.

Related reference

"Sample commands to run for validation of the database upgrade" on page 297

Scenario 1: Stopping the server before installing the upgrade

Stop all server processes and dismount any tapes that are mounted. Then stop the server.

The commands in the following procedure are Tivoli Storage Manager administrative commands.

1. Cancel sessions if any are still running. Use the command:

   ```
   cancel session
   ```

   Allow time for the sessions to be stopped. Some sessions, such as backup by a backup-archive client, might take some time to stop.

2. Determine whether server processes are running. Either cancel processes, or allow them to complete. Use the commands:

   ```
   query process
   cancel process process_number
   ```

   Allow time for the processes to be stopped. Some processes, such as storage pool migration, might take some time to stop.

3. After all sessions and processes are stopped, determine whether any tapes are mounted. Dismount any tapes that are mounted. Use the commands:

   ```
   query mount
   dismount volume volume_name
   ```

4. Stop the server. Use the command:

   ```
   halt
   ```

Scenario 1: Installing the upgrade utilities

You must install the upgrade utilities on the system. The installation package for the utilities must be downloaded from a Web site.

Use the procedure for your operating system:

- AIX "Scenario 1: Installing the upgrade utilities on AIX systems"
- HP-UX "Scenario 1: Installing the upgrade utilities on HP-UX systems" on page 85
- Linux "Scenario 1: Installing the upgrade utilities on Linux systems" on page 86
- Solaris "Scenario 1: Installing the upgrade utilities on Sun Solaris systems" on page 87
- Windows "Scenario 1: Installing the upgrade utilities on Microsoft Windows systems" on page 89

Related concepts

"The DSMUPGRD upgrade utilities" on page 15

Scenario 1: Installing the upgrade utilities on AIX systems

AIX

Install the upgrade utilities on the system. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package that matches your platform, and download it to a convenient location on the server system. The name of the package has the following form:

      `5.5.x.x-TIV-TSMUPG-AIX.tar.gz`

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Ensure that the system has the following file sets installed:

   `xlC.rte 8.0.0.5`, or later

   `gsksa.rte 7.0.4.11`

   You can use the following commands to check for these file sets:

```
lslpp -L xlC.rte

lslpp -L gsksa.rte
```

If needed, you can obtain the `gsksa.rte` file set from any of the regular V5.5 maintenance packages for the AIX server. The maintenance packages are available on the FTP downloads site: ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server/v5r5/AIX/

4. Extract the contents of the upgrade utilities package. If you downloaded a language package, also extract the contents of that package.
5. Access the System Management Interface Tool (SMIT).
   a. Enter `smitty install_update`
   b. Select **Install and Update Software** → **Install and Update from ALL Available Software**.
6. Select the **INPUT** device. Specify the directory location of the upgrade utilities package on the system.
7. Select **Software to Install**. Press F4 or Esc+4 for the list of available file sets in the directory.
8. Select the file sets for the upgrade utilities, the device driver, and optionally the language pack. The file set for the upgrade utilities is `tivoli.tsmupg.server`. Optional language packs include messages for languages other than U.S. English.
9. Set **COMMIT software updates** to `Yes`. Press F4 or Esc+4.
10. Set **SAVE replaced files** to `No`.
11. Ensure that the default settings for the options in the window for all the selected file sets show `success`.
12. Press Enter, and respond to the `ARE YOU SURE?` question by pressing Enter again. The installation begins.
13. When the installation is complete, exit the SMIT program.
14. Optional: If you installed a language package, ensure that the locale environment variable is set to use it. Enter the following command to set the locale environment variable for messages:

    ```
    export LC_MESSAGES=xxxx
    ```

    where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:
    - The locale is installed on the system.
    - The upgrade utilities support the locale.
    - The language package that you installed for the upgrade utilities matches the locale.
15. After the upgrade utilities are installed, continue at "Scenario 1: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 88.

Scenario 1: Installing the upgrade utilities on HP-UX systems

HP-UX

Install the upgrade utilities on the system. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package that matches your platform, and download it to a convenient location on the server system. The name of the package has the following form:

      `5.5.x.x-TIV-TSMUPG-platform.tar.gz`

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Extract the contents of the upgrade utilities package. For example, from the directory where you saved the download package, issue the command:

   ```
   gzip -dc package_name.tar.gz | tar -xvf -
   ```
4. Install the upgrade utilities and the device driver. Use the source argument (**-s**) to specify the directory where the package was extracted. For example, if the directory is `/tmp/TSM`, issue the command:

   ```
   swinstall -s /tmp/TSM package_name
   ```

   The utilities are installed in the directory `/opt/tivoli/tsm/upgrade/bin`.
5. Optional: Install the language package.
   a. Extract the contents of the package.

      ```
      gzip -d package_name.img.gz
      ```
   b. Install the package. For example, if the directory is `/tmp/TSM`, issue the command:

      ```
      swinstall -s /tmp/TSM/package_name.img package_name
      ```
   c. Enter the following command to set the locale environment variable for messages:

      ```
      export LC_MESSAGES=xxxx
      ```

      where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:
      - The locale is installed on the system.
      - The upgrade utilities support the locale.

- The language package that you installed for the upgrade utilities matches the locale.

6. After the upgrade utilities are installed, continue at "Scenario 1: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 88.

Scenario 1: Installing the upgrade utilities on Linux systems

Linux

Install the upgrade utilities on the system. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Open the directory for your platform and download the package. The name of the package has the following form:

      `5.5.x.x-TIV-TSMUPG-platform.tar.bz2`

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Extract the contents of the upgrade utilities package. For example, from the directory where you saved the download package, issue the commands:

   ```
   bunzip2 package_name.tar.bz2
   tar xvf package_name.tar
   ```
4. Install the upgrade utilities and the device driver. Use the following command:

   ```
   rpm -ivh package_name.rpm
   ```

   The utilities are installed in the directory `/opt/tivoli/tsm/upgrade/bin` by default.
5. Optional: Install the language package.
   a. Extract the contents of the downloaded package.

      ```
      bunzip2 package_name.tar.bz2
      tar xvf package_name.tar
      ```
   b. Install the package for the language that you want to use.

      ```
      rpm -ivh package_name.rpm
      ```
   c. Enter the following command to set the locale environment variable for messages:

      ```
      export LC_MESSAGES=xxxx
      ```

      where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:

- The locale is installed on the system.
- The upgrade utilities support the locale.
- The language package that you installed for the upgrade utilities matches the locale.

6. After the upgrade utilities are installed, continue at "Scenario 1: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 88.

Scenario 1: Installing the upgrade utilities on Sun Solaris systems

Solaris

Install the upgrade utilities on the system. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package that matches your platform, and download it to a convenient location on the server system. The name of the package has the following form:

      `5.5.x.x-TIV-TSMUPG-platform.tar.Z`

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Change to the directory where the upgrade utilities package was downloaded.
4. Extract the contents of the upgrade utilities package. For example, from the directory where you saved the download package, issue the command:

   ```
   uncompress -c package_name.tar.Z | tar -xvf -
   ```
5. Install the upgrade utilities and the device driver. Use the source argument (**-d**) to specify the directory where the package was extracted. For example, if the directory is `/tmp/TSM`, issue the command:

   ```
   pkgadd -d /tmp/TSM package_name
   ```

   The utilities are installed in the directory `/opt/tivoli/tsm/upgrade/bin` by default.
6. Optional: Install the language package.
   a. Extract the contents of the downloaded package.

      ```
      uncompress package_name.pkg.Z
      ```

b. Install the package for the language that you want to use. Use the source argument (**-d**) to specify the directory where the package was extracted. For example, if the directory is `/tmp/TSM`, issue the command:

```
pkgadd -d /tmp/TSM package_name.pkg package_name
```

c. Enter the following command to set the locale environment variable for messages:

```
export LC_MESSAGES=xxxx
```

where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:

- The locale is installed on the system.
- The upgrade utilities support the locale.
- The language package that you installed for the upgrade utilities matches the locale.

7. After the upgrade utilities are installed, continue at "Scenario 1: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems."

Scenario 1: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems

AIX HP-UX Linux Solaris

After installing the upgrade utility package, you must set environment variables in the shell from which you will run the utilities. An environment variable describes the operating environment of a process, such as the home directory or terminal in use.

The environment variables available are:

DSMSERV_DIR
Specifies the installed location of the upgrade utilities.

By default the location is:

AIX `/usr/tivoli/tsm/upgrade/bin`

HP-UX Linux Solaris `/opt/tivoli/tsm/upgrade/bin`

DSMSERV_CONFIG
Specifies the name and location of the options file for the server that you want to upgrade. For example, to set the name to `dsmserv.opt` and the location to be the directory from which you run the DSMUPGRD utility, use: `./dsmserv.opt`

If you are upgrading multiple servers on the system, you can instead use the -o option each time that you use the DSMUPGRD utility, to specify the server option file for the server that you want to work with.

If you set the **DSMSERV_CONFIG** environment variable using a relative path (for example, `./dsmserv.opt`), you *must* run the DSMUPGRD utility from the directory where the `dsmserv.opt` file is stored. Otherwise the DSMUPGRD utility fails to open the server options file and stops.

Use the appropriate command for your system to set the environment variables for running the utilities. For example, on an AIX system that uses a shell in the `ksh` family, enter the command to set the **DSMSERV_DIR** variable:

```
export DSMSERV_DIR=/usr/tivoli/tsm/upgrade/bin
```

If you set the **DSMSERV_CONFIG** variable, you set it in a similar way. For example:

```
export DSMSERV_CONFIG=./dsmserv.opt
```

Use the following command if your shell is in the `csh` family:

```
setenv DSMSERV_DIR /usr/tivoli/tsm/upgrade/bin
```

After you set the environment variables, continue at "Scenario 1: Preparing the database of a V5 server for upgrade" on page 90.

Scenario 1: Installing the upgrade utilities on Microsoft Windows systems

Windows

Install the upgrade utilities on the system. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/WIN
   b. Open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package and download it to a convenient location on the server system. The name of the package has the following form:

      ```
      5.5.x.x-TIV-TSMUPG-Windows.exe
      ```

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
2. Log on with an administrator ID.
3. Run the executable package for the upgrade utilities.

   The default location for the installation of the utilities is based on the location where the V5 server was last installed. For example, if the V5 server was installed using the default path, `C:\Program Files\Tivoli\TSM\server`, the upgrade utilities are installed in `C:\Program Files\Tivoli\TSM\upgrade`.

After the upgrade utilities are installed, continue at "Scenario 1: Preparing the database of a V5 server for upgrade" on page 90.

Tip: When you use the upgrade utilities, if you have multiple servers running on the system, you must use the -k option to specify the name of the Windows registry key from which to retrieve information about the server being upgraded. The default value for the option is SERVER1.

Scenario 1: Preparing the database of a V5 server for upgrade

Before extracting the data from the database, you must prepare the server database by using the DSMUPGRD PREPAREDB utility. If you have multiple servers on a single system, you must repeat this task for each server.

1. Ensure that you have completed all preparation steps.
2. Log in using the root user ID on the system that has the original server. Log on with the administrator ID on a Windows system.
3. Change to the instance directory for the server that you are upgrading. The instance directory is the directory that contains the files such as `dsmserv.dsk` for the server.
4. AIX HP-UX Linux Solaris Set the environment variables for the shell. See "Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 240.
5. Prepare the database. Direct the output of the process to a file for monitoring.

   AIX

   From the instance directory for the server that you are upgrading, issue the following command to run the process in the background and direct the output to the file called `prepare.out`:

   ```
   nohup /usr/tivoli/tsm/upgrade/bin/dsmupgrd preparedb >prepare.out 2>&1 &
   ```

   HP-UX Linux Solaris

   From the instance directory for the server that you are upgrading, issue the following command to run the process in the background and direct the output to the file called `prepare.out`:

   ```
   nohup /opt/tivoli/tsm/upgrade/bin/dsmupgrd preparedb >prepare.out 2>&1 &
   ```

   Windows

   From the instance directory for the server that you are upgrading, issue the following command to run the process and direct the output to the file called `prepare.out`:

   ```
   "c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd"
       preparedb 1>>prepare.out 2>&1
   ```

   If multiple servers exist on the system, issue the command from the instance directory for the server that you want to prepare, and specify the registry key for that server. For example, if the server is SERVER2:

   ```
   "c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd" -k server2
       preparedb 1>>prepare.out 2>&1
   ```

6. Monitor the process for errors and warning messages. The final message indicates success or failure of the operation. From the instance directory for the server that you are upgrading, issue the following command to monitor the process:

   ```
   tail -f prepare.out
   ```

   Tip: On Windows systems, use the tail command or an equivalent utility with which you can monitor the contents of a file as it changes. For example, the Windows Server 2003 Resource Kit Tools includes the tail command, which can be used as shown in the preceding example.
7. Ensure that the prepare operation is completed successfully before continuing to the next step. If the prepare operation fails, you might need to restart the V5 server to fix the problem and run the prepare operation again. If the server

being upgraded is a V5.3 or V5.4 server, you might need to restore the database using a backup before you can restart the server to correct the problem.

Related reference

"DSMUPGRD PREPAREDB (Prepare a V5 database for upgrade)" on page 285

Scenario 1: Uninstalling the V5 program before installing V6.1

For best results when you are upgrading the server to V6.1 on the same system where the V5 server is located, uninstall the V5 server program before installing the V6.1 server program.

Use the procedure for your operating system:

- AIX "Scenario 1: Uninstalling the V5 program on AIX systems"
- HP-UX "Scenario 1: Uninstalling the V5 program on HP-UX systems"
- Linux "Scenario 1: Uninstalling the V5 program on Linux systems" on page 92
- Solaris "Scenario 1: Uninstalling the V5 program on Sun Solaris systems" on page 92
- Windows "Scenario 1: Uninstalling the V5 program on Microsoft Windows systems" on page 92

Scenario 1: Uninstalling the V5 program on AIX systems

AIX

Uninstall the V5 server, server license, and device driver. Do *not* remove the database, recovery log, or any other related files or directories, such as the server options file.

- For a V5.4 or V5.5 server, issue the following commands:

```
/usr/sbin/installp -ug tivoli.tsm.license.aix5.rte64
/usr/sbin/installp -ug tivoli.tsm.devices.aix5.rte
/usr/sbin/installp -ug tivoli.tsm.server.aix5.rte64
```

- For a V5.3 server, issue the following commands:

```
/usr/sbin/installp -ug tivoli.tsm.license
/usr/sbin/installp -ug tivoli.tsm.devices
/usr/sbin/installp -ug tivoli.tsm.server
```

After the V5 server program is uninstalled, continue at "Scenario 1: Installing the V6.1 server" on page 93.

Scenario 1: Uninstalling the V5 program on HP-UX systems

HP-UX

Uninstall the V5 server, server license, and device driver. Do *not* remove the database, recovery log, or any other related files or directories, such as the server options file.

- For a V5.4 or V5.5 server, issue the following commands:

```
swremove TIVsmS64IA.server
swremove TIVsmS64IA.license
swremove TIVsmDD64_IA11_23.tsmscsi
```

- For a V5.3 server, issue the following commands:

```
swremove TIVsmS64.server
swremove TIVsmS64.license
swremove TIVsmDD64_HP11_11.tsmscsi
```

After the V5 server program is uninstalled, continue at "Scenario 1: Installing the V6.1 server" on page 93.

Scenario 1: Uninstalling the V5 program on Linux systems

Linux

Uninstall the V5 server, server license, and device driver. Do *not* remove the database, recovery log, or any other related files or directories, such as the server options file.

1. To determine the Tivoli Storage Manager packages that are installed, issue the following command:

   ```
   rpm -qa | grep TIVsm
   ```

2. Remove the server, server license, and device driver packages. Issue the following command for each package:

   ```
   rpm -e package_name
   ```

   For example:

   ```
   rpm -e TIVsm-server-5.5.0-0.ppc64.rpm
   ```

After the V5 server program is uninstalled, continue at "Scenario 1: Installing the V6.1 server" on page 93.

Scenario 1: Uninstalling the V5 program on Sun Solaris systems

Solaris

Uninstall the V5 server, server license, and device driver. Do *not* remove the database, recovery log, or any other related files or directories, such as the server options file.

Issue the following commands:

```
/usr/sbin/pkgrm TIVsmS
/usr/sbin/pkgrm TIVsmSlic
/usr/sbin/pkgrm TIVsmSdev
```

After the V5 server program is uninstalled, continue at "Scenario 1: Installing the V6.1 server" on page 93.

Scenario 1: Uninstalling the V5 program on Microsoft Windows systems

Windows

Uninstall the V5 server, server license, and device driver. Do *not* remove the database, recovery log, or any other related files or directories, such as the server options file.

Do not remove registry entries for the server.

1. Click **Start** → **Control Panel** → **Add or Remove Programs**.

2. Select the Tivoli Storage Manager component, then click **Remove**. Repeat for the license and the device driver.

   If you see any messages suggesting that you reboot, you can ignore them until all Tivoli Storage Manager components have been removed.

After the V5 server program is uninstalled, continue at "Scenario 1: Installing the V6.1 server."

Scenario 1: Installing the V6.1 server

You can use an installation wizard to perform the installation, or install the program using the console.

Ensure that you have completed all upgrade preparation steps, including backup of the server database, before beginning the installation procedure. The server will not be available until after installation and upgrade steps are completed.

1. For some operating systems, you need to check certain system settings before beginning installation.

   Linux

   If you are using Security Enhanced Linux on your system, set `SELINUX=disable` or set `SELINUX=permissive` in the `/etc/sysconfig/selinux` file, at least until the installation process completes.

   If you do not adjust the setting, you receive the following message when you try to install the server:

   ```
   The installer cannot run on your configuration. It will now quit.
   ```

   Solaris

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

2. Log on to the system.

   AIX HP-UX Linux Solaris

   Log in using the root user ID.

   Windows

   Log on as an administrator.

3. If you have the product DVD, complete the following steps.

   AIX HP-UX Linux Solaris

   Insert the Tivoli Storage Manager DVD into a DVD drive. Ensure that the DVD is mounted on directory /dvdrom and change to that directory.

   Windows

   Insert the Tivoli Storage Manager server DVD. Use Windows Explorer to view the contents of the DVD.

4. If you downloaded the program from Passport Advantage as an executable file, complete the following steps.

   AIX HP-UX Linux Solaris

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

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

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

System Storage™ Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24018523

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

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

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.

Windows

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=swg24018518

Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24018521

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24018524

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

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

c. Either double-click the executable file, or enter the following command on the command line to extract the installation files. The files are extracted to the current directory.

```
package_name.exe
```

The *package_name* is typically a name such as `CZ1N9ML`. The package is large, so the extraction takes some time.

5. From the DVD, or from the location where you extracted the program package, start the installation wizard. You can use either the graphical wizard or the console wizard.

AIX HP-UX Linux Solaris

- Start the graphical wizard:

```
./install.bin
```

- Start the console wizard:

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

Windows

- Start the graphical wizard:

  ```
  install.exe
  ```

- Start the console wizard:

  ```
  install.exe -i console
  ```

See the *Tivoli Storage Manager Installation Guide* for information about how to perform a silent installation of the server. For information about translations that are available for the server, see Appendix A, "Server language locales," on page 299.

6. Select the language for the installation and follow the instructions.

   AIX

   a. You must accept the license agreement to complete the installation.
   b. Select the components to install. You must select at least the server, license, and **Tivoli Storage Manager Server Languages** in the component list. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.
   c. On the **Server Language Selection** page, select English (not UTF8) and any other language packs that you need. You must select English because it installs the `tivoli.tsm.server.msg.en_US` package, which includes the help messages.

   HP-UX Linux Solaris

   a. You must accept the license agreement to complete the installation.
   b. Select the components to install. You must install at least the server and license. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.

   Windows

   a. You must accept the license agreement to complete the installation.
   b. Select the components to install. You must install at least the server and license. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.

   The Tivoli Storage Manager application programming interface (API) and DB2 Version 9.5 are automatically installed when you install the server.

7. When the installation is complete, verify that you see a message that the installation is successful.

   Important: If there are any errors during the installation, a summary panel lists the errors and directs you to an error log file. Fix the errors before continuing with the upgrade.

   The installation log is stored in the following location:

   AIX HP-UX Linux Solaris `/var/tivoli/tsm`

   Windows The directory that was chosen for installation (look for the files `log.txt` and `logs.zip`)

8. Download and apply any applicable fixes that have been released for the server. Go to the product support site, http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html, and click **Download**. Search for server updates.

   You can also check the FTP downloads site: ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server/

9. HP-UX Linux Solaris Modify kernel parameter values, if necessary.

   HP-UX

   Run the db2osconf utility to get recommendations for changes to kernel parameter values that are based on the size of the system. Make changes based on the recommendations in the results from the utility. You might need to restart the system.

   For information about the utility and about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter the utility name, db2osconf, in the **Search** field at this site.

   Important: The recommendations from the db2osconf utility are minimum values. Some workloads, for example the database upgrade process, might require that values be set higher than the recommendations. For more details about kernel parameter tuning for Tivoli Storage Manager, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

   System resources such as semaphores might also require special configuration and tuning. See Appendix B, “HP-UX system resource requirements,” on page 305.

   Solaris

   Run the db2osconf utility to get recommendations for changes to kernel parameter values that are based on the size of the system. Make changes based on the recommendations in the results from the utility. You might need to restart the system.

   For information about the utility and about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter the utility name, db2osconf, in the **Search** field at this site.

   Important: The recommendations from the db2osconf utility are minimum values. Some workloads, for example the database upgrade process, might require that values be set higher than the recommendations. For more details about kernel parameter tuning for Tivoli Storage Manager, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

   Linux

   To update the kernel parameters on Red Hat and SUSE Linux, you can run the `ipcs -l` command to list the parameter values. Analyze the output to determine whether any changes are required for your system.

   For information about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter a search string such as `modifying kernel parameters`, in the **Search** field at this site.

For more details about kernel parameter tuning for Tivoli Storage Manager running on Linux systems, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

Related concepts

Appendix D, "Services associated with the Tivoli Storage Manager server," on page 311

Scenario 1: Creating the directories and the user ID for the upgraded server instance

Create the directories that the server instance needs for database and recovery logs, and create the user ID that will own the server instance.

1. 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.

   AIX HP-UX Linux Solaris

   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.

      AIX

      ```
      # mkgroup id=1001 tsmsrvrs
      # mkuser id=1002 pgrp=tsmsrvrs home=/home/tsminst1 tsminst1
      # passwd tsminst1
      ```

      HP-UX

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

      Linux

      ```
      # groupadd tsmsrvrs
      # adduser -d /home/tsminst1 -m -g tsmsrvrs -s /bin/bash tsminst1
      # passwd tsminst1
      ```

      Solaris

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

b. Log off, then log in to your system, using the new user ID and password. Use a login method that causes a prompt for a password, so that the password can be changed 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. Log off the new user ID.

Windows

Identify the user account that will own the Tivoli Storage Manager server instance. When the server is started as a Windows service, this is the account that the service will log on to. The user account must have administrative authority on the system. One user account can own more than one server instance.

You can create a new user account, or use an existing account.

If you have multiple servers on one system and want to run each server with a different user account, create a new user account in this step.

a. Create the user ID.

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

Use the following command to create the user ID:

```
net user user_ID */add
```

You are prompted to create and verify a password for the new user ID.

b. Issue the following commands to create groups and add the new user ID to the groups:

```
net localgroup Administrators user_ID /add
net localgroup DB2ADMNS /add
net localgroup DB2USERS /add
net localgroup DB2ADMNS user_ID /add
net localgroup DB2USERS user_ID /add
```

c. Log in to your system, using the new user ID and password.

2. 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.

AIX HP-UX Linux Solaris

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`	

Windows

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 d:\tsm\server1`	

The database directories	`mkdir d:\tsm\db001`
	`mkdir e:\tsm\db002`
	`mkdir f:\tsm\db003`
	`mkdir g:\tsm\db004`	

Active log directory	`mkdir h:\tsm\log`	
Archive log directory	`mkdir i:\tsm\archlog`	
Optional: Directory for the log mirror for the active log	`mkdir j:\tsm\logmirror`	
Optional: Secondary archive log directory (failover location for archive log)	`mkdir k:\tsm\archlogfailover`	

3. 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.

   AIX HP-UX Linux Solaris

   Change the owner of the directories that were created to the user ID for the server instance.

   Windows

   Ensure that the user ID for the server instance has read/write access to the directories that were created.
4. For all disk space that is used by the V5 server for storage pools (device types of FILE and DISK), change ownership or access control so that the user ID that will own the upgraded Tivoli Storage Manager server instance has ownership or read/write permission. Use the appropriate method for your operating system.

Continue the upgrade process using one of the following topics:

"Scenario 1: Upgrading the server using the upgrade wizard" on page 101

"Scenario 1: Upgrading the server manually using utilities" on page 102

Related tasks

"Planning space for the upgrade process and the upgraded server" on page 30

Related reference

"Server naming best practices" on page 55

Scenario 1: Upgrading the server using the upgrade wizard

The wizard offers a guided approach to upgrading 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 V6.1 server program.

Before beginning the upgrade wizard, you must complete all preceding steps to prepare for the upgrade, to install the upgrade utilities, to install the V6.1 server program, and to create the directories and user ID for the server instance.

1. Ensure that the following requirements are met.

   AIX HP-UX Linux Solaris

   - The system must have the X Window client. You must also be running an X Window server on your desktop.
   - The system must have one of the following protocols enabled. Ensure that the port that the protocol uses is not blocked by a firewall.
     - Secure shell (SSH). Ensure that the port is set to the default value, 22.
     - Remote shell (RSH).
     - Remote Execution Protocol (REXEC).
   - You must be able to log in to the 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.

   Windows

   - 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).
     - Windows server message block (SMB)

       SMB is the interface used by File and Print Sharing (also known as CIFS). To use the SMB protocol, you must ensure that File and Print Sharing is enabled, and that port 445 is not blocked by your firewall. If you are running on Windows Server 2008 or Windows Vista, you might also need to disable User Account Control (at least while running this wizard). If you choose not to disable User Account Control, you must ensure that one of the other protocols is configured to allow the wizard to run.
   - You must be able to log on to the system using a protocol that is enabled on the system, using either the user ID that you created for the server instance, or some other user ID that exists on the system. When using the wizard, you must provide the user ID and password to access the system.

2. Start the upgrade wizard, dsmupgdx, from the V6.1 server installation directory.

   AIX HP-UX Linux Solaris

   Log in using the root user ID. Issue the command:

   ```
   /opt/tivoli/tsm/server/bin/dsmupgdx
   ```

Windows

Open a new Command Prompt window, and issue the command:

```
"c:\Program Files\Tivoli\TSM\server\dsmupgdx.exe"
```

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

   Important: Read all messages that appear for each phase of the upgrade process, in the message display area within the wizard. Informational messages might show actions that occurred during the process that are important to you.

To complete the upgrade, perform the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Scenario 1: Upgrading the server manually using utilities

Use the utilities to upgrade the server using a command interface.

Before beginning the upgrade procedure, you must complete all preceding steps to prepare for the upgrade, to install the upgrade utilities, to install the V6.1 server program, and to create the directories and user ID for the server instance.

Complete the following steps:

1. "Scenario 1: Extracting the data to media"
2. "Scenario 1: Creating and formatting the new database" on page 103
3. "Scenario 1: Loading the extracted data into the new database" on page 107
4. "Scenario 1: Creating a Windows service for the server instance" on page 108
5. "Scenario 1: Configuring the system for database backup" on page 109

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Related concepts

"The manifest file for the data extraction to media" on page 288

"The DSMUPGRD upgrade utilities" on page 15

Scenario 1: Extracting the data to media

You can extract the data from the original server database to sequential media. The sequential media can be tape, or disk space that is defined with the FILE device class.

1. Log in using the root user ID on the system that has the original server. Log on with the administrator ID on a Windows system.
2. Ensure that the device that you want to use to store the extracted data is available. The server database and the device configuration file must contain a valid device class definition for the device.
3. From the instance directory for the server that you are upgrading, issue the command to start the extraction. Direct the output of the process to a file for monitoring. For example, issue the following command, on one line:

   AIX

   ```
   nohup /usr/tivoli/tsm/upgrade/bin/dsmupgrd extractdb \
   devclass=file manifest=./manifest.txt >extract.out 2>&1 &
   ```

HP-UX Linux Solaris

```
nohup /opt/tivoli/tsm/upgrade/bin/dsmupgrd extractdb \
devclass=file manifest=./manifest.txt >extract.out 2>&1 &
```

Windows

```
"c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd" extractdb
devclass=file manifest=.\manifest.txt 1>>extract.out 2>&1
```

Tip: Messages that are issued during the extract operation are *not* saved in the server activity log. Direct the output of the utility to a file, as shown in the examples, to record the messages.

4. Monitor the process for errors and warning messages, and for items that you might need to take action on. A message near the end of the process output indicates success or failure of the operation:

   Success message: `ANR1382I EXTRACTDB: Process 1, database extract, has completed.`

   Failure message: `ANR1396E EXTRACTDB: Process 1, database extract, has completed with errors.`

   For example, from the instance directory for the server that you are upgrading, issue the following command to monitor the process:

   ```
   tail -f extract.out
   ```

   The length of time that the process runs depends on the size of the database. The time will be approximately as much as the time required for a full backup of the database.

   Tip: On Windows systems, use the tail command or an equivalent utility with which you can monitor the contents of a file as it changes. For example, the Windows Server 2003 Resource Kit Tools includes the tail command, which can be used as shown in the preceding example.

Related concepts

"The manifest file for the data extraction to media" on page 288

Related tasks

"Scenario 1: Preparing space for the upgrade process" on page 79

Related reference

"DSMUPGRD EXTRACTDB (Extract data from a V5 server database)" on page 286

Scenario 1: Creating and formatting the new database

Create the server instance and format files for an empty V6.1 database.

1. Log on to the system where you installed the V6.1 program.

   AIX HP-UX Linux Solaris

   Log in using the root user ID. Complete the following checks:

   a. Verify that the home directory exists for the user ID that owns the server instance. For example, if the user ID is tsminst1, the home directory is `/home/tsminst1`.
   b. Verify that a configuration profile exists for the user ID in its home directory. If necessary, create the configuration profile. For example, create a `.profile` file if you are using the Korn shell (ksh). The `.profile` file can be empty.

   Windows

   Log on as an administrator.

2. Create a Tivoli Storage Manager instance using the db2icrt command.

   AIX HP-UX Linux Solaris

   Enter the following command on one line. For the instance name, specify the user ID that you created to own the instance.

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

   For example, if the user ID for this instance is tsminst1, use the following command to create the instance.

   ```
   /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 using the user ID that is the instance owner.

   Windows

   Enter the following command on one line. The user account that you specify becomes the user ID that owns the V6.1 server (the instance user ID).

   ```
   db2icrt -u user_account instance_name
   ```

   The database service for the server instance logs on to the user account that is specified in this command.

   Use the registry key name of the V5 server as the instance name for the V6.1 server. For example, if the user account is tsminst1 and the server's registry key is Server1, enter the following command:

   ```
   db2icrt -u tsminst1 server1
   ```

   You are prompted to enter the password for the user account.

   The instance name that you specify on this db2icrt command is the name that you later specify with the -k option on the DSMSERV LOADFORMAT command, when you create and format the database and recovery log.

3. Log on to the system using the user ID that owns the V6.1 server instance (the instance user ID).
4. Copy the configuration files to the instance directory that you created for the new server. The files are the configuration files that you saved from the original V5 server:
   - Device configuration
   - Server options file (typically named `dsmserv.opt`)

   For example, if you created the instance directory that is shown in the example in the step to create directories for the V6.1 server, copy the files into the following directory:

   AIX HP-UX Linux Solaris `/home/tsminst1/tsminst1`

   Windows `d:\tsm\server1`

   Ensure that the user ID that owns the V6.1 server (the instance user ID) has ownership or read/write permission to the files that you copied.
5. Edit the server options file.

a. Remove any options that are not supported for V6.1. For the list of deleted options, see Table 30 on page 53.
b. Ensure that the server options file contains at least one VOLUMEHISTORY option and at least one DEVCONFIG option. Because a volume history file and a device configuration file are required when you must restore the database, generate copies of these files automatically to help ensure that the files are available when needed.
c. Check whether the server options file includes the TXNGROUPMAX option with a value, and if it does, what the value is. You might want to change the current value because the default value for this option changes from 256 to 4096 with V6.1. The increased value can improve the performance for data movement operations such as storage pool migration and storage pool backup.
   - If the server options file does not include this option, the server automatically uses the new default value of 4096.
   - If the server options file includes a value for this option, the server uses that specified value. If the specified value is less than 4096, consider increasing the value, or removing the option so that the server uses the new default value.

6. Change the default path for the database.

AIX HP-UX Linux Solaris

Change the default path for the database to be the same as the instance directory for the server. Issue the command:

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

For example:

```
db2 update dbm cfg using dftdbpath /home/tsminst1/tsminst1
```

Windows

Change the default path for the database to be the drive where the instance directory for the server is located. Complete the following steps:

a. Click **Start** → **Programs** → **IBM DB2** → **DB2TSM1** → **Command Line Tools** → **Command Line Processor**.
b. Enter `quit` to exit the command-line processor.

   A window with a command prompt opens, with the environment properly set up to successfully issue the commands in the next steps.
c. From the command prompt in that window, issue the following command to set the environment variable for the server instance that you are working with:

   ```
   set db2instance=instance_name
   ```

   The *instance_name* is the same as the instance name that you specified when you issued the db2icrt command. For example, to set the environment variable for the Server1 server instance, issue the following command:

   ```
   set db2instance=server1
   ```
d. Issue the command to set the default drive:

   ```
   db2 update dbm cfg using dftdbpath instance_location
   ```

For example, if the instance directory is `d:\tsm\server1`, the instance location is drive `d:`. Enter the command:

```
db2 update dbm cfg using dftdbpath d:
```

7. Complete this step if the system uses a locale other than the English regional locale.

   AIX HP-UX Linux Solaris

   If the system uses a locale other than the English regional locale, set the DB2CODEPAGE system environment variable to 819:

   ```
   db2set -i instance_name DB2CODEPAGE=819
   ```

   For example:

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

8. Change to the instance directory that you created for the server.
9. Create and format the database and recovery logs. In the command, specify the directories that you created for the database and logs. The directories must be empty.

   AIX HP-UX Linux Solaris

   For example, to get an active log size of 2 GB (2048 MB, the default size), issue the following command, on one line:

   ```
   /opt/tivoli/tsm/server/bin/dsmserv loadformat \
   dbdir=/tsmdb001,/tsmdb002,/tsmdb003,/tsmdb004 \
   activelogsize=2048 activelogdir=/tsmlog \
   mirrorlogdir=/tsmlogmirror archlogdir=/tsmarchlog
   ```

   Windows

   For example, to get an active log size of 2 GB (2048 MB, the default size) for the Server1 server instance, issue the following command, on one line:

   ```
   "c:\Program Files\Tivoli\TSM\server\dsmserv" loadformat
   dbdir=d:\tsm\db001,e:\tsm\db002,f:\tsm\db003,g:\tsm\db004
   activelogsize=2048 activelogdir=h:\tsm\log
   mirrorlogdir=j:\tsm\logmirror archlogdir=i:\tsm\archlog
   ```

   If the server that you are upgrading is not Server1, then you must use the -k option. The -k option specifies the instance name for running this utility. For example, if the system has more than one server instance and the instance that you are upgrading is Server2, issue the command:

   ```
   "c:\Program Files\Tivoli\TSM\server\dsmserv" -k server2
   loadformat dbdir=d:\tsm\db001,e:\tsm\db002,f:\tsm\db003,g:\tsm\db004
   activelogsize=2048 activelogdir=h:\tsm\log
   mirrorlogdir=j:\tsm\logmirror archlogdir=i:\tsm\archlog
   ```

   Important: The server instance that you specify must have already been through all preceding steps for the upgrade process, including the creation of the database instance (db2icrt command).

10. Monitor the process for errors and warning messages. The final message indicates success or failure of the operation.

Related tasks

"Estimating total space requirements for the upgrade process and upgraded server" on page 34

Related reference

"DSMSERV LOADFORMAT (Format a database)" on page 292

"Deleted server commands, utilities, and options" on page 50

Scenario 1: Loading the extracted data into the new database

After you have formatted an empty database using the DSMSERV LOADFORMAT utility, load the data that you extracted from the original server database.

The following requirements must be met:

- The manifest file from the DSMUPGRD EXTRACTDB operation must be available.
- The server options file must contain an entry for the device configuration file.
- The device configuration file must have information about the device class that is specified in the manifest file.
- The media that contains the extracted database must be available to the V6.1 server. The device must be physically attached to the system, and the permissions must be set to grant access to the media for the user ID that owns the V6.1 server instance.

Perform the following steps:

1. Verify that the V6.1 server can access the extracted data.
   - If the extracted data is on tape, the tape drive must be physically attached to the system.
   - If the extracted data was stored using a FILE device class:
     a. Log on to the system using the root user ID.
     b. Change the ownership of the files to the user ID that owns the V6.1 server (the instance user ID).
2. For the manifest file that was created by the extraction process, ensure that the user ID that owns the V6.1 server (the instance user ID) has ownership or read/write permission.
3. Log on with the server instance user ID.
4. Ensure that the device configuration file from the original server is available.
   a. Verify that the server option file includes the DEVCONFIG option, and that the option specifies the full path of the device configuration file.
   b. Verify that the device configuration file is available in the location specified by the DEVCONFIG option.
   c. Verify that the permissions on the device configuration file allow read access for the user ID that owns the V6.1 server instance.
5. Verify that the contents of the device configuration file are correct. The device class that was used for the extraction step is recorded in the manifest file, and that device class must exist and be valid on the V6.1 system.
   a. Verify entries for FILE device classes. For example, paths might be different on the system.
   b. Verify entries for tape and other devices. For example, the device names might have changed.
6. Verify that the contents of the manifest file are correct. The manifest file contains a list of volumes to be used when loading the extracted data into the

new database. For example, if the manifest file contains a list of volumes belonging to a FILE device class, ensure that the fully qualified path to the volumes is correct for the system.

7. Issue the DSMSERV INSERTDB command to load an extracted server database into the prepared, empty V6.1 database. Direct the output of the process to a file for monitoring. For example, enter the following command on one line:

   AIX HP-UX Linux Solaris

   ```
   nohup /opt/tivoli/tsm/server/bin/dsmserv insertdb \
   manifest=./manifest.txt >insert.out 2>&1 &
   ```

   Windows

   ```
   "c:\Program Files\Tivoli\TSM\server\dsmserv" insertdb \
   manifest=.\manifest.txt 1>>insert.out 2>&1
   ```

8. Monitor the process for errors and warning messages, and for items that you might need to take action on. The system displays interim statistics about the operation. A message near the end of the process output indicates success or failure of the operation:

   Success message: `ANR1395I INSERTDB: Process 1, database insert, has completed.`

   Failure message: `ANR1396E INSERTDB: Process 1, database insert, has completed with errors.`

   For example, issue the following command to monitor the process:

   ```
   tail -f insert.out
   ```

   The length of time that the process runs depends on the size of the database.

   Tip: On Windows systems, use the tail command or an equivalent utility with which you can monitor the contents of a file as it changes. For example, the Windows Server 2003 Resource Kit Tools includes the tail command, which can be used as shown in the preceding example.

9. If you used a tape device, after the insertion operation is complete remove or check out from the library the tape that holds the extracted data. Prevent the tape from being reused until you are sure that you do not need to run the insertion operation again.

Related concepts

"The manifest file for the data extraction to media" on page 288

Related reference

"DSMSERV INSERTDB (Move a server database into an empty database)" on page 294

Scenario 1: Creating a Windows service for the server instance

Windows

A Windows service is created for the Tivoli Storage Manager V6.1 server automatically if you use the upgrade wizard (dsmupgdx). If you do not use the wizard, you must create the Windows service for the Tivoli Storage Manager server manually.

1. Change to the installation directory for the server program. By default, the directory is `C:\Program Files\Tivoli\TSM\console`. If you installed the server in a different directory, change to the `console` subdirectory of the server installation directory.
2. Install the Windows service, using the Tivoli Storage Manager server instance name in the service name. Issue the following command:

   ```
   install "TSM server_instance_name"
    "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe" admin_name admin_password
   ```

   where:

   `"TSM server_instance_name"` is the name of the service that is being installed.

   server_instance_name is the instance name that was specified when you issued the db2icrt command.

   admin_name is the administrator account that owns the service.

   admin_password is the password for the administrator account.

   Example 1

   To install the Windows service for the Server1 server instance, enter the following command on one line. The example uses `rudy` as the administrator account, which has the password `s21ret`.

   ```
   install "TSM server1" "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
   rudy s21ret
   ```

   Example 2

   To install the Windows service for the Server2 server instance using LocalSystem as the logon account, issue the following command. Because the LocalSystem account does not have a password, use the quotation marks (" ") to specify a null password.

   ```
   install "TSM Server2" "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
   localsystem ""
   ```
3. Optional: Manually change the service to an automatic startup type by using Windows administrative tools (**Administrative Tools** → **Services**).

Related tasks

"Starting the server on Windows systems" on page 270

Scenario 1: Configuring the system for database backup

The database manager and the Tivoli Storage Manager API must be configured so that the database manager can back up the server database. The configuration is completed for you automatically if you use the upgrade wizard (dsmupgdx). If you do not use the wizard, you must complete the configuration manually.

- "Scenario 1: Configuring the system for database backup on AIX, HP-UX, Linux, and Solaris systems" on page 110
- "Scenario 1: Configuring the system for database backup on Microsoft Windows systems" on page 111

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Scenario 1: Configuring the system for database backup on AIX, HP-UX, Linux, and Solaris systems

AIX HP-UX Linux Solaris

If you did not use the upgrade wizard, you must complete the configuration for the database backup manually.

In the following steps, the examples use tsminst1 for the server instance user ID and `/home/tsminst1/tsminst1` for the Tivoli Storage Manager server instance directory.

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:

      AIX

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

      HP-UX Linux Solaris

      ```
      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:

   AIX `/usr/tivoli/tsm/client/api/bin64`

   HP-UX Linux Solaris `/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 on AIX, HP-UX, Linux, and Sun Solaris systems" on page 267 for the details.
   b. Log in using the root user ID.
   c. Source the database manager by running the following command.

      Important: Solaris Switch to the Korn shell (/bin/ksh) before running the following command.
      ```
      . /home/tsminst1/sqllib/db2profile
      ```
   d. Change the API password, using this command:
      ```
      /home/tsminst1/sqllib/adsm/dsmapipw
      ```
   e. When prompted by the dsmapipw command, specify `TSMDBMGR` as both the original and new password.
   f. Enter this operating system command:
      ```
      rm /home/tsminst1/tsminst1/tsmdbmgr.log
      ```

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Scenario 1: Configuring the system for database backup on Microsoft Windows systems

Windows

If you did not use the upgrade wizard, you must complete the configuration for the database backup manually.

Windows In the following commands, the examples use `server1` for the database instance and `d:\tsmserver1` for the Tivoli Storage Manager server directory. Replace these values with your actual values in the commands.

1. Create a file called `tsmdbmgr.env` in the `d:\tsmserver1` directory with the following contents:
   ```
   DSMI_CONFIG=d:\tsmserver1\tsmdbmgr.opt
   DSMI_LOG=d:\tsmserver1
   ```
2. Set the DSMI_ api environment-variable configuration for the database instance:
   a. Open a DB2 command window. One method of doing this is by going to the `C:\Program Files\Tivoli\TSM\db2\bin` directory, or if you installed Tivoli Storage Manager in a different location, go to the `db2\bin` subdirectory in your main installation directory. Then, issue this command:
      ```
      db2cmd
      ```

b. Issue this command:

```
db2set -i server1 DB2_VENDOR_INI=d:\tsmserver1\tsmdbmgr.env
```

3. Create a file called `tsmdbmgr.opt` in the `d:\tsmserver1` directory with the following contents:

```
************************************************
nodename $$_TSMDBMGR_$$
commmethod tcpip
tcpserveraddr localhost
tcpport 1500
passwordaccess generate
errorlogname d:\tsmserver1\TSMDBMGR_TSMSERVER1.log
```

4. Stop and start the database instance:

   a. Open a DB2 command window. One method of doing this is by going to the `C:\Program Files\Tivoli\TSM\db2\bin` directory, or if you installed Tivoli Storage Manager in a different location, go to the `db2\bin` subdirectory in your main installation directory. Then, issue this command:

   ```
   db2cmd
   ```

   b. Set the database instance:

   ```
   set db2instance=server1
   ```

   c. Stop DB2:

   ```
   db2stop
   ```

   d. Start DB2:

   ```
   db2start
   ```

5. Enter the following command on one line:

```
"c:\program files\tivoli\tsm\server\dsmsutil.exe"
UPDATEPW /NODE:$$_TSMDBMGR_$$ /PASSWORD:TSMDBMGR /VALIDATE:NO /OPTFILE:
"d:\tsmserver1\tsmdbmgr.opt"
```

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, “Taking the first steps after upgrade,” on page 267.

Chapter 5. Scenario 2: Same system, network method

Use this procedure if you are upgrading your server on the same system as your V5 server, and you are using the network method to move the data from the V5 database to the V6.1 database.

Perform these tasks to upgrade a server:

1. "Scenario 2: Preparing for the upgrade"
2. "Scenario 2: Installing the upgrade utilities" on page 118
3. "Scenario 2: Preparing the database of a V5 server for upgrade" on page 125
4. "Scenario 2: Uninstalling the V5 program before installing V6.1" on page 126
5. "Scenario 2: Installing the V6.1 server" on page 128
6. "Scenario 2: Creating the directories and the user ID for the upgraded server instance" on page 132
7. Upgrading the server, using one of the following methods:
   - "Scenario 2: Upgrading the server using the upgrade wizard" on page 136
   - "Scenario 2: Upgrading the server manually using utilities" on page 137
8. Completing the upgrade by taking important first steps:
   a. "Verifying access to storage pools on disk" on page 267
   b. "Starting the server instance after the upgrade" on page 267
   c. "Registering licenses" on page 271
   d. "Backing up the database after upgrading the server" on page 271
   e. "Verifying the upgraded server" on page 272
   f. "Updating automation" on page 273
   g. "Monitoring the upgraded server" on page 273

Scenario 2: Preparing for the upgrade

Prepare for the upgrade by checking requirements, preparing the space that is required, backing up the server, and modifying certain server settings.

Follow the preparation steps carefully to protect your server and its data.

Important: It is possible, after the upgrade to V6.1 is complete, that conditions might cause the need to temporarily revert to the previous version of the server. Successfully reverting to the previous version of the server is possible only if you performed all preparation steps. To understand why it is important to perform all preparation steps, review the procedure for reverting an upgraded server to its previous version.

Perform these steps to prepare for the upgrade:

1. "Scenario 2: Checking the prerequisites for the upgrade" on page 114
2. "Scenario 2: Preparing space for the upgrade process" on page 115
3. "Scenario 2: Modifying the server before the upgrade" on page 115
4. "Scenario 2: Disabling sessions" on page 116
5. "Scenario 2: Backing up storage pools and the server database" on page 116
6. "Scenario 2: Backing up configuration information" on page 117

7. "Scenario 2: Stopping the server before installing the upgrade" on page 117

Related tasks

"Reverting from V6.1 to the previous V5 server version" on page 280

Scenario 2: Checking the prerequisites for the upgrade

Check your system against requirements for the server.

1. Ensure that the server that you plan to upgrade is at version 5.3.6 or later.
2. Ensure that the system where the V5 server is located meets the minimum requirements. Use the information in "Hardware and software requirements for the V5 server system that is being upgraded" on page 16 to determine whether you need to update your system before you continue.
3. Ensure that the system where you plan to install the V6.1 server meets requirements. Check the operating system level and the platform against the list of supported operating systems and platforms.

   Restriction: You cannot upgrade your server to run on an operating system that is different from the operating system it currently runs on. For example, you cannot upgrade a server running on an AIX system to a server running on a Linux system.

   Some platforms that were supported for earlier versions of the server are *not* supported for V6.1. If the server that you want to upgrade is running on one of these platforms, you cannot upgrade your server to V6.1 on the same platform. You must install your V6.1 server on a system that is a specific supported platform, depending on the original platform. See the following table.

Platform for V5 server	Required platform for upgrade to V6.1
HP-UX running on a PA-RISC system	HP-UX running on an Itanium system
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system
Linux running on a 32-bit x86 system	Linux running on an x86_64 system
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system

4. Check that the system memory meets the server requirements.
   - Ensure that the system memory is sufficient to run two servers at the same time.

     When you run the process that extracts the database from the existing server and inserts the database for the new server, the net effect is that two servers are running at the same time on the system. System memory must be large enough to handle these processes.
   - If you plan to run multiple instances of the V6.1 server on the system, each instance requires the memory listed for one server. Multiply the memory for one server by the number of instances planned for the system.
5. Ensure that the system has enough disk storage for the database and recovery logs. Review the planning information for requirements and guidance.

   Ensure that the system has enough disk storage for storing database and recovery logs for both the original server and the new V6.1 server. Both will be stored on disk storage during the upgrade process.

   If you are adding new hardware for the server, such as new disk storage for the database, have the hardware installed and running.

Related concepts

"Hardware and software requirements for upgrading to the V6.1 server" on page 15

Scenario 2: Preparing space for the upgrade process

Determine the amount and type of space that is required for the upgrade process before beginning the process.

Verify that the system has the amount of space that was estimated in the planning step. Use the planning work sheet that you filled in with your information.

Related tasks

"Estimating total space requirements for the upgrade process and upgraded server" on page 34

Scenario 2: Modifying the server before the upgrade

A command must be run on the server to prevent one type of problem during the upgrade process. Some modifications to typical server settings are recommended to prepare for the upgrade.

1. From a Tivoli Storage Manager administrative command line, issue the command:

   ```
   convert ussfilespace
   ```

   This command fixes a problem that might exist in older Tivoli Storage Manager databases. If the problem does not exist in your database, the command completes quickly. If the problem exists in your database, the command might take some time to run.

   Important: Do not skip this step. If your database has the problem and you do not run this command now, the DSMUPGRD PREPAREDB utility fails when you run it. You must then restart the V5 server and run the CONVERT USSFILESPACE command before continuing with the upgrade process.
2. Review the steps for reverting to the earlier version of the server in the section, "Reverting from V6.1 to the previous V5 server version" on page 280.

   If for some reason you need to revert to the earlier version after the upgrade to V6.1, the results of the reversion will be better if you understand the steps and prepare for the possibility now.
3. Make the following adjustments to settings on your server and clients. These adjustments must be done to make it possible for you to revert to the original server after the upgrade, if problems occur.
   a. For each sequential-access storage pool, set the **REUSEDELAY** parameter to the number of days during which you want to be able to revert to the original server, if that becomes necessary.

      For example, if you want to be able to revert to the original server for up to 30 days after upgrading to V6.1, set the **REUSEDELAY** parameter to 31 days.
   b. For each copy storage pool, set the **RECLAIM** parameter to 100 (meaning 100%).
   c. If you typically use a DELETE VOLHISTORY command to delete database backups, ensure that the command does not delete database backups for at least the same number of days that you set for the **REUSEDELAY** period for sequential-access storage pools.

d. For important clients that use the server, check that the value for the schedlogretention client option is set to retain the client schedule log for a long enough time. Update the option for clients if needed.

   The entries in the client schedule log might be useful if the server must revert to the original version. If the retention period for the schedule log is too short, the schedule log information might be deleted too soon.

Scenario 2: Disabling sessions

In preparation for the upgrade, prevent activity on the server by disabling new sessions. Cancel any existing sessions.

The commands in the following procedure are Tivoli Storage Manager administrative commands.

1. Prevent all clients, storage agents, and other servers from starting new sessions with the server. Use the commands:

   ```
   disable sessions client
   disable sessions server
   ```

2. Prevent administrative activity from any user ID other than the administrator ID that is being used to perform the upgrade preparation. Lock out other administrator IDs if necessary:

   ```
   lock admin administrator_name
   ```

3. Check whether any sessions exist, and notify the users that the server is going to be stopped. To check for existing sessions, use the command:

   ```
   query session
   ```

4. Cancel sessions that are still running. Use the command:

   ```
   cancel session
   ```

Scenario 2: Backing up storage pools and the server database

Immediately before upgrading the server, back up primary storage pools to copy storage pools, and perform a full database backup.

1. Back up primary storage pools to copy storage pools using the BACKUP STGPOOL command. If you have been performing regular backups of the storage pools, this step backs up only the data that was added to the primary storage pools since they were last backed up.
2. Back up the database using the following command. Use either a full or snapshot backup type.

   ```
   backup db type=type devclass=device_class_name
   ```

   The device class that you specify must exist and have volumes that are available to it. For example, to perform a snapshot backup of your database to the TAPECLASS device class using scratch volumes, enter:

   ```
   backup db type=dbsnapshot devclass=tapeclass
   ```

   To use specific volumes instead of scratch volumes, specify the volume names in the command.

   Consider making two copies of the backup to protect the backup from media failures.

Scenario 2: Backing up configuration information

Before installing the new version, back up critical files and information for the server. Store the files in a safe place, because they are needed after the installation of the new software version is completed. You also need these files if you must revert to the previous version after the upgrade.

1. Back up device configuration information:

   ```
   backup devconfig filenames=file_name
   ```

2. Back up volume history information:

   ```
   backup volhistory filenames=file_name
   ```

   Ensure that the volume history includes information about the database backup that you completed in the preceding steps. For example, issue the command:

   ```
   query volhistory type=dbbackup
   ```

3. Make copies of these files, which are located in the default directory for the server:

   server options file, typically named `dsmserv.opt`

   `dsmserv.dsk`

4. Optional: Make a copy of the accounting log file, `dsmaccnt.log`.
5. Back up any scripts that have been used to perform daily housekeeping for the server. Examine the scripts for changes that are needed after the upgrade.
6. Store the device configuration file, the volume history file, the server options file, and the other files in a safe place. Select a location that is not on the system that is being upgraded.

Scenario 2: Creating a summary of database contents

Create a summary of the contents of the original database. After the upgrade, you can use the same commands to compare the results and to confirm that the database contents are intact.

Run commands that give a summary of information about your database contents. For example, issue commands that summarize the file spaces being protected, and save the results. See the sample commands for ideas.

Related reference

"Sample commands to run for validation of the database upgrade" on page 297

Scenario 2: Stopping the server before installing the upgrade

Stop all server processes and dismount any tapes that are mounted. Then stop the server.

The commands in the following procedure are Tivoli Storage Manager administrative commands.

1. Cancel sessions if any are still running. Use the command:

   ```
   cancel session
   ```

   Allow time for the sessions to be stopped. Some sessions, such as backup by a backup-archive client, might take some time to stop.

2. Determine whether server processes are running. Either cancel processes, or allow them to complete. Use the commands:

   ```
   query process
   cancel process process_number
   ```

Allow time for the processes to be stopped. Some processes, such as storage pool migration, might take some time to stop.

3. After all sessions and processes are stopped, determine whether any tapes are mounted. Dismount any tapes that are mounted. Use the commands:

```
query mount
dismount volume volume_name
```

4. Stop the server. Use the command:

```
halt
```

Scenario 2: Installing the upgrade utilities

You must install the upgrade utilities on the system. The installation package for the utilities must be downloaded from a Web site.

Use the procedure for your operating system:

- AIX "Scenario 2: Installing the upgrade utilities on AIX systems"
- HP-UX "Scenario 2: Installing the upgrade utilities on HP-UX systems" on page 120
- Linux "Scenario 2: Installing the upgrade utilities on Linux systems" on page 121
- Solaris "Scenario 2: Installing the upgrade utilities on Sun Solaris systems" on page 122
- Windows "Scenario 2: Installing the upgrade utilities on Microsoft Windows systems" on page 124

Related concepts

"The DSMUPGRD upgrade utilities" on page 15

Scenario 2: Installing the upgrade utilities on AIX systems

AIX

Install the upgrade utilities on the system. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package that matches your platform, and download it to a convenient location on the server system. The name of the package has the following form:

      ```
      5.5.x.x-TIV-TSMUPG-AIX.tar.gz
      ```

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.

d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.

2. Log in with the root user ID.
3. Ensure that the system has the following file sets installed:

   `xlC.rte 8.0.0.5`, or later

   `gsksa.rte 7.0.4.11`

   You can use the following commands to check for these file sets:

   ```
   lslpp -L xlC.rte

   lslpp -L gsksa.rte
   ```

   If needed, you can obtain the `gsksa.rte` file set from any of the regular V5.5 maintenance packages for the AIX server. The maintenance packages are available on the FTP downloads site: ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server/v5r5/AIX/
4. Extract the contents of the upgrade utilities package. If you downloaded a language package, also extract the contents of that package.
5. Access the System Management Interface Tool (SMIT).
   a. Enter `smitty install_update`
   b. Select **Install and Update Software** → **Install and Update from ALL Available Software**.
6. Select the **INPUT** device. Specify the directory location of the upgrade utilities package on the system.
7. Select **Software to Install**. Press F4 or Esc+4 for the list of available file sets in the directory.
8. Select the file sets for the upgrade utilities, the device driver, and optionally the language pack. The file set for the upgrade utilities is `tivoli.tsmupg.server`. Optional language packs include messages for languages other than U.S. English.
9. Set **COMMIT software updates** to `Yes`. Press F4 or Esc+4.
10. Set **SAVE replaced files** to `No`.
11. Ensure that the default settings for the options in the window for all the selected file sets show `success`.
12. Press Enter, and respond to the `ARE YOU SURE?` question by pressing Enter again. The installation begins.
13. When the installation is complete, exit the SMIT program.
14. Optional: If you installed a language package, ensure that the locale environment variable is set to use it. Enter the following command to set the locale environment variable for messages:

    ```
    export LC_MESSAGES=xxxx
    ```

    where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:

    - The locale is installed on the system.
    - The upgrade utilities support the locale.
    - The language package that you installed for the upgrade utilities matches the locale.

15. After the upgrade utilities are installed, continue at "Scenario 2: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 123.

Scenario 2: Installing the upgrade utilities on HP-UX systems

HP-UX

Install the upgrade utilities on the system. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package that matches your platform, and download it to a convenient location on the server system. The name of the package has the following form:

      `5.5.x.x-TIV-TSMUPG-platform.tar.gz`

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Extract the contents of the upgrade utilities package. For example, from the directory where you saved the download package, issue the command:

   ```
   gzip -dc package_name.tar.gz | tar -xvf -
   ```
4. Install the upgrade utilities and the device driver. Use the source argument (**-s**) to specify the directory where the package was extracted. For example, if the directory is `/tmp/TSM`, issue the command:

   ```
   swinstall -s /tmp/TSM package_name
   ```

   The utilities are installed in the directory `/opt/tivoli/tsm/upgrade/bin`.
5. Optional: Install the language package.
   a. Extract the contents of the package.

      ```
      gzip -d package_name.img.gz
      ```
   b. Install the package. For example, if the directory is `/tmp/TSM`, issue the command:

      ```
      swinstall -s /tmp/TSM/package_name.img package_name
      ```
   c. Enter the following command to set the locale environment variable for messages:

      ```
      export LC_MESSAGES=xxxx
      ```

      where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:

- The locale is installed on the system.
- The upgrade utilities support the locale.
- The language package that you installed for the upgrade utilities matches the locale.

6. After the upgrade utilities are installed, continue at "Scenario 2: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 123.

Scenario 2: Installing the upgrade utilities on Linux systems

Linux

Install the upgrade utilities on the system. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Open the directory for your platform and download the package. The name of the package has the following form:

      ```
      5.5.x.x-TIV-TSMUPG-platform.tar.bz2
      ```

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Extract the contents of the upgrade utilities package. For example, from the directory where you saved the download package, issue the commands:

   ```
   bunzip2 package_name.tar.bz2
   tar xvf package_name.tar
   ```

4. Install the upgrade utilities and the device driver. Use the following command:

   ```
   rpm -ivh package_name.rpm
   ```

   The utilities are installed in the directory `/opt/tivoli/tsm/upgrade/bin` by default.
5. Optional: Install the language package.
   a. Extract the contents of the downloaded package.

      ```
      bunzip2 package_name.tar.bz2
      tar xvf package_name.tar
      ```

   b. Install the package for the language that you want to use.

      ```
      rpm -ivh package_name.rpm
      ```

   c. Enter the following command to set the locale environment variable for messages:

      ```
      export LC_MESSAGES=xxxx
      ```

where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:

- The locale is installed on the system.
- The upgrade utilities support the locale.
- The language package that you installed for the upgrade utilities matches the locale.

6. After the upgrade utilities are installed, continue at "Scenario 2: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 123.

Scenario 2: Installing the upgrade utilities on Sun Solaris systems

Solaris

Install the upgrade utilities on the system. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package that matches your platform, and download it to a convenient location on the server system. The name of the package has the following form:

      `5.5.x.x-TIV-TSMUPG-platform.tar.Z`

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Change to the directory where the upgrade utilities package was downloaded.
4. Extract the contents of the upgrade utilities package. For example, from the directory where you saved the download package, issue the command:

   ```
   uncompress -c package_name.tar.Z | tar -xvf -
   ```
5. Install the upgrade utilities and the device driver. Use the source argument (**-d**) to specify the directory where the package was extracted. For example, if the directory is `/tmp/TSM`, issue the command:

   ```
   pkgadd -d /tmp/TSM package_name
   ```

   The utilities are installed in the directory `/opt/tivoli/tsm/upgrade/bin` by default.
6. Optional: Install the language package.
   a. Extract the contents of the downloaded package.

```
uncompress package_name.pkg.Z
```

b. Install the package for the language that you want to use. Use the source argument (**-d**) to specify the directory where the package was extracted. For example, if the directory is `/tmp/TSM`, issue the command:

```
pkgadd -d /tmp/TSM package_name.pkg package_name
```

c. Enter the following command to set the locale environment variable for messages:

```
export LC_MESSAGES=xxxx
```

where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:

- The locale is installed on the system.
- The upgrade utilities support the locale.
- The language package that you installed for the upgrade utilities matches the locale.

7. After the upgrade utilities are installed, continue at "Scenario 2: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems."

Scenario 2: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems

AIX HP-UX Linux Solaris

After installing the upgrade utility package, you must set environment variables in the shell from which you will run the utilities. An environment variable describes the operating environment of a process, such as the home directory or terminal in use.

The environment variables available are:

DSMSERV_DIR

Specifies the installed location of the upgrade utilities.

By default the location is:

AIX `/usr/tivoli/tsm/upgrade/bin`

HP-UX Linux Solaris `/opt/tivoli/tsm/upgrade/bin`

DSMSERV_CONFIG

Specifies the name and location of the options file for the server that you want to upgrade. For example, to set the name to `dsmserv.opt` and the location to be the directory from which you run the DSMUPGRD utility, use: `./dsmserv.opt`

If you are upgrading multiple servers on the system, you can instead use the -o option each time that you use the DSMUPGRD utility, to specify the server option file for the server that you want to work with.

If you set the **DSMSERV_CONFIG** environment variable using a relative path (for example, `./dsmserv.opt`), you *must* run the DSMUPGRD utility from the directory where the `dsmserv.opt` file is stored. Otherwise the DSMUPGRD utility fails to open the server options file and stops.

Use the appropriate command for your system to set the environment variables for running the utilities. For example, on an AIX system that uses a shell in the `ksh` family, enter the command to set the **DSMSERV_DIR** variable:

```
export DSMSERV_DIR=/usr/tivoli/tsm/upgrade/bin
```

If you set the **DSMSERV_CONFIG** variable, you set it in a similar way. For example:

```
export DSMSERV_CONFIG=./dsmserv.opt
```

Use the following command if your shell is in the `csh` family:

```
setenv DSMSERV_DIR /usr/tivoli/tsm/upgrade/bin
```

After you set the environment variables, continue at "Scenario 2: Preparing the database of a V5 server for upgrade" on page 125.

Scenario 2: Installing the upgrade utilities on Microsoft Windows systems

Windows

Install the upgrade utilities on the system. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/WIN
   b. Open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package and download it to a convenient location on the server system. The name of the package has the following form:

      `5.5.x.x-TIV-TSMUPG-Windows.exe`

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
2. Log on with an administrator ID.
3. Run the executable package for the upgrade utilities.

   The default location for the installation of the utilities is based on the location where the V5 server was last installed. For example, if the V5 server was installed using the default path, `C:\Program Files\Tivoli\TSM\server`, the upgrade utilities are installed in `C:\Program Files\Tivoli\TSM\upgrade`.

After the upgrade utilities are installed, continue at "Scenario 2: Preparing the database of a V5 server for upgrade" on page 125.

Tip: When you use the upgrade utilities, if you have multiple servers running on the system, you must use the -k option to specify the name of the Windows registry key from which to retrieve information about the server being upgraded. The default value for the option is SERVER1. Use the -o option with the DSMUPGRD command to specify the location of the server options file.

Scenario 2: Preparing the database of a V5 server for upgrade

Before extracting the data from the database, you must prepare the server database by using the DSMUPGRD PREPAREDB utility. If you have multiple servers on a single system, you must repeat this task for each server.

1. Ensure that you have completed all preparation steps.
2. Log in using the root user ID on the system that has the original server. Log on with the administrator ID on a Windows system.
3. Change to the instance directory for the server that you are upgrading. The instance directory is the directory that contains the files such as `dsmserv.dsk` for the server.
4. AIX HP-UX Linux Solaris Set the environment variables for the shell. See "Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 240.
5. Prepare the database. Direct the output of the process to a file for monitoring.

   AIX

   From the instance directory for the server that you are upgrading, issue the following command to run the process in the background and direct the output to the file called `prepare.out`:

   ```
   nohup /usr/tivoli/tsm/upgrade/bin/dsmupgrd preparedb >prepare.out 2>&1 &
   ```

   HP-UX Linux Solaris

   From the instance directory for the server that you are upgrading, issue the following command to run the process in the background and direct the output to the file called `prepare.out`:

   ```
   nohup /opt/tivoli/tsm/upgrade/bin/dsmupgrd preparedb >prepare.out 2>&1 &
   ```

   Windows

   From the instance directory for the server that you are upgrading, issue the following command to run the process and direct the output to the file called `prepare.out`:

   ```
   "c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd"
       preparedb 1>>prepare.out 2>&1
   ```

   If multiple servers exist on the system, issue the command from the instance directory for the server that you want to prepare, and specify the registry key for that server. For example, if the server is SERVER2:

   ```
   "c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd" -k server2
       preparedb 1>>prepare.out 2>&1
   ```

6. Monitor the process for errors and warning messages. The final message indicates success or failure of the operation. From the instance directory for the server that you are upgrading, issue the following command to monitor the process:

   ```
   tail -f prepare.out
   ```

   Tip: On Windows systems, use the tail command or an equivalent utility with which you can monitor the contents of a file as it changes. For example, the Windows Server 2003 Resource Kit Tools includes the tail command, which can be used as shown in the preceding example.
7. Ensure that the prepare operation is completed successfully before continuing to the next step. If the prepare operation fails, you might need to restart the V5 server to fix the problem and run the prepare operation again. If the server

being upgraded is a V5.3 or V5.4 server, you might need to restore the database using a backup before you can restart the server to correct the problem.

Related reference

"DSMUPGRD PREPAREDB (Prepare a V5 database for upgrade)" on page 285

Scenario 2: Uninstalling the V5 program before installing V6.1

For best results when you are upgrading the server to V6.1 on the same system where the V5 server is located, uninstall the V5 server program before installing the V6.1 server program.

Use the procedure for your operating system:

- AIX "Scenario 2: Uninstalling the V5 program on AIX systems"
- HP-UX "Scenario 2: Uninstalling the V5 program on HP-UX systems"
- Linux "Scenario 2: Uninstalling the V5 program on Linux systems" on page 127
- Solaris "Scenario 2: Uninstalling the V5 program on Sun Solaris systems" on page 127
- Windows "Scenario 2: Uninstalling the V5 program on Microsoft Windows systems" on page 127

Scenario 2: Uninstalling the V5 program on AIX systems

AIX

Uninstall the V5 server, server license, and device driver. Do *not* remove the database, recovery log, or any other related files or directories, such as the server options file.

- For a V5.4 or V5.5 server, issue the following commands:

```
/usr/sbin/installp -ug tivoli.tsm.license.aix5.rte64
/usr/sbin/installp -ug tivoli.tsm.devices.aix5.rte
/usr/sbin/installp -ug tivoli.tsm.server.aix5.rte64
```

- For a V5.3 server, issue the following commands:

```
/usr/sbin/installp -ug tivoli.tsm.license
/usr/sbin/installp -ug tivoli.tsm.devices
/usr/sbin/installp -ug tivoli.tsm.server
```

After the V5 server program is uninstalled, continue at "Scenario 2: Installing the V6.1 server" on page 128.

Scenario 2: Uninstalling the V5 program on HP-UX systems

HP-UX

Uninstall the V5 server, server license, and device driver. Do *not* remove the database, recovery log, or any other related files or directories, such as the server options file.

- For a V5.4 or V5.5 server, issue the following commands:

```
swremove TIVsmS64IA.server
swremove TIVsmS64IA.license
swremove TIVsmDD64_IA11_23.tsmscsi
```

- For a V5.3 server, issue the following commands:

```
swremove TIVsmS64.server
swremove TIVsmS64.license
swremove TIVsmDD64_HP11_11.tsmscsi
```

After the V5 server program is uninstalled, continue at “Scenario 2: Installing the V6.1 server” on page 128.

Scenario 2: Uninstalling the V5 program on Linux systems

Linux

Uninstall the V5 server, server license, and device driver. Do *not* remove the database, recovery log, or any other related files or directories, such as the server options file.

1. To determine the Tivoli Storage Manager packages that are installed, issue the following command:

   ```
   rpm -qa | grep TIVsm
   ```

2. Remove the server, server license, and device driver packages. Issue the following command for each package:

   ```
   rpm -e package_name
   ```

   For example:

   ```
   rpm -e TIVsm-server-5.5.0-0.ppc64.rpm
   ```

After the V5 server program is uninstalled, continue at “Scenario 2: Installing the V6.1 server” on page 128.

Scenario 2: Uninstalling the V5 program on Sun Solaris systems

Solaris

Uninstall the V5 server, server license, and device driver. Do *not* remove the database, recovery log, or any other related files or directories, such as the server options file.

Issue the following commands:

```
/usr/sbin/pkgrm TIVsmS
/usr/sbin/pkgrm TIVsmSlic
/usr/sbin/pkgrm TIVsmSdev
```

After the V5 server program is uninstalled, continue at “Scenario 2: Installing the V6.1 server” on page 128.

Scenario 2: Uninstalling the V5 program on Microsoft Windows systems

Windows

Uninstall the V5 server, server license, and device driver. Do *not* remove the database, recovery log, or any other related files or directories, such as the server options file.

Do not remove registry entries for the server.

1. Click **Start** → **Control Panel** → **Add or Remove Programs**.

2. Select the Tivoli Storage Manager component, then click **Remove**. Repeat for the license and the device driver.

   If you see any messages suggesting that you reboot, you can ignore them until all Tivoli Storage Manager components have been removed.

After the V5 server program is uninstalled, continue at "Scenario 2: Installing the V6.1 server."

Scenario 2: Installing the V6.1 server

You can use an installation wizard to perform the installation, or install the program using the console.

Ensure that you have completed all upgrade preparation steps, including backup of the server database, before beginning the installation procedure. The server will not be available until after installation and upgrade steps are completed.

1. For some operating systems, you need to check certain system settings before beginning installation.

   Linux

   If you are using Security Enhanced Linux on your system, set `SELINUX=disable` or set `SELINUX=permissive` in the `/etc/sysconfig/selinux` file, at least until the installation process completes.

   If you do not adjust the setting, you receive the following message when you try to install the server:

   ```
   The installer cannot run on your configuration. It will now quit.
   ```

   Solaris

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

2. Log on to the system.

   AIX HP-UX Linux Solaris

   Log in using the root user ID.

   Windows

   Log on as an administrator.

3. If you have the product DVD, complete the following steps.

   AIX HP-UX Linux Solaris

   Insert the Tivoli Storage Manager DVD into a DVD drive. Ensure that the DVD is mounted on directory /dvdrom and change to that directory.

   Windows

   Insert the Tivoli Storage Manager server DVD. Use Windows Explorer to view the contents of the DVD.

4. If you downloaded the program from Passport Advantage as an executable file, complete the following steps.

   AIX HP-UX Linux Solaris

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

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

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

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24018523

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

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

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.

Windows

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=swg24018518

Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24018521

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24018524

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

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

c. Either double-click the executable file, or enter the following command on the command line to extract the installation files. The files are extracted to the current directory.

```
package_name.exe
```

The *package_name* is typically a name such as `CZ1N9ML`. The package is large, so the extraction takes some time.

5. From the DVD, or from the location where you extracted the program package, start the installation wizard. You can use either the graphical wizard or the console wizard.

AIX HP-UX Linux Solaris

- Start the graphical wizard:

```
./install.bin
```

- Start the console wizard:

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

Windows

- Start the graphical wizard:

  ```
  install.exe
  ```

- Start the console wizard:

  ```
  install.exe -i console
  ```

See the *Tivoli Storage Manager Installation Guide* for information about how to perform a silent installation of the server. For information about translations that are available for the server, see Appendix A, "Server language locales," on page 299.

6. Select the language for the installation and follow the instructions.

   AIX

   a. You must accept the license agreement to complete the installation.
   b. Select the components to install. You must select at least the server, license, and **Tivoli Storage Manager Server Languages** in the component list. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.
   c. On the **Server Language Selection** page, select English (not UTF8) and any other language packs that you need. You must select English because it installs the `tivoli.tsm.server.msg.en_US` package, which includes the help messages.

   HP-UX Linux Solaris

   a. You must accept the license agreement to complete the installation.
   b. Select the components to install. You must install at least the server and license. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.

   Windows

   a. You must accept the license agreement to complete the installation.
   b. Select the components to install. You must install at least the server and license. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.

   The Tivoli Storage Manager application programming interface (API) and DB2 Version 9.5 are automatically installed when you install the server.

7. When the installation is complete, verify that you see a message that the installation is successful.

   Important: If there are any errors during the installation, a summary panel lists the errors and directs you to an error log file. Fix the errors before continuing with the upgrade.

   The installation log is stored in the following location:

   AIX HP-UX Linux Solaris `/var/tivoli/tsm`

   Windows The directory that was chosen for installation (look for the files `log.txt` and `logs.zip`)

8. Download and apply any applicable fixes that have been released for the server. Go to the product support site, http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html, and click **Download**. Search for server updates.

   You can also check the FTP downloads site: ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server/

9. HP-UX Linux Solaris Modify kernel parameter values, if necessary.

   HP-UX

   Run the db2osconf utility to get recommendations for changes to kernel parameter values that are based on the size of the system. Make changes based on the recommendations in the results from the utility. You might need to restart the system.

   For information about the utility and about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter the utility name, db2osconf, in the **Search** field at this site.

   Important: The recommendations from the db2osconf utility are minimum values. Some workloads, for example the database upgrade process, might require that values be set higher than the recommendations. For more details about kernel parameter tuning for Tivoli Storage Manager, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

   System resources such as semaphores might also require special configuration and tuning. See Appendix B, “HP-UX system resource requirements,” on page 305.

   Solaris

   Run the db2osconf utility to get recommendations for changes to kernel parameter values that are based on the size of the system. Make changes based on the recommendations in the results from the utility. You might need to restart the system.

   For information about the utility and about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter the utility name, db2osconf, in the **Search** field at this site.

   Important: The recommendations from the db2osconf utility are minimum values. Some workloads, for example the database upgrade process, might require that values be set higher than the recommendations. For more details about kernel parameter tuning for Tivoli Storage Manager, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

   Linux

   To update the kernel parameters on Red Hat and SUSE Linux, you can run the `ipcs -l` command to list the parameter values. Analyze the output to determine whether any changes are required for your system.

   For information about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter a search string such as `modifying kernel parameters`, in the **Search** field at this site.

For more details about kernel parameter tuning for Tivoli Storage Manager running on Linux systems, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

Related concepts

Appendix D, "Services associated with the Tivoli Storage Manager server," on page 311

Scenario 2: Creating the directories and the user ID for the upgraded server instance

Create the directories that the server instance needs for database and recovery logs, and create the user ID that will own the server instance.

1. 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.

   AIX HP-UX Linux Solaris

   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.

      AIX

      ```
      # mkgroup id=1001 tsmsrvrs
      # mkuser id=1002 pgrp=tsmsrvrs home=/home/tsminst1 tsminst1
      # passwd tsminst1
      ```

      HP-UX

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

      Linux

      ```
      # groupadd tsmsrvrs
      # adduser -d /home/tsminst1 -m -g tsmsrvrs -s /bin/bash tsminst1
      # passwd tsminst1
      ```

      Solaris

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

b. Log off, then log in to your system, using the new user ID and password. Use a login method that causes a prompt for a password, so that the password can be changed 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. Log off the new user ID.

Windows

Identify the user account that will own the Tivoli Storage Manager server instance. When the server is started as a Windows service, this is the account that the service will log on to. The user account must have administrative authority on the system. One user account can own more than one server instance.

You can create a new user account, or use an existing account.

If you have multiple servers on one system and want to run each server with a different user account, create a new user account in this step.

a. Create the user ID.

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

Use the following command to create the user ID:

```
net user user_ID */add
```

You are prompted to create and verify a password for the new user ID.

b. Issue the following commands to create groups and add the new user ID to the groups:

```
net localgroup Administrators user_ID /add
net localgroup DB2ADMNS /add
net localgroup DB2USERS /add
net localgroup DB2ADMNS user_ID /add
net localgroup DB2USERS user_ID /add
```

c. Log in to your system, using the new user ID and password.

2. 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.

AIX HP-UX Linux Solaris

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`	

Windows

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 d:\tsm\server1`	

The database directories	`mkdir d:\tsm\db001`
	`mkdir e:\tsm\db002`
	`mkdir f:\tsm\db003`
	`mkdir g:\tsm\db004`	

Active log directory	`mkdir h:\tsm\log`	
Archive log directory	`mkdir i:\tsm\archlog`	
Optional: Directory for the log mirror for the active log	`mkdir j:\tsm\logmirror`	
Optional: Secondary archive log directory (failover location for archive log)	`mkdir k:\tsm\archlogfailover`	

3. 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.

   AIX HP-UX Linux Solaris

   Change the owner of the directories that were created to the user ID for the server instance.

   Windows

   Ensure that the user ID for the server instance has read/write access to the directories that were created.

4. For all disk space that is used by the V5 server for storage pools (device types of FILE and DISK), change ownership or access control so that the user ID that will own the upgraded Tivoli Storage Manager server instance has ownership or read/write permission. Use the appropriate method for your operating system.

Continue the upgrade process using one of the following topics:

"Scenario 2: Upgrading the server using the upgrade wizard" on page 136

"Scenario 2: Upgrading the server manually using utilities" on page 137

Related tasks

"Planning space for the upgrade process and the upgraded server" on page 30

Related reference

"Server naming best practices" on page 55

Scenario 2: Upgrading the server using the upgrade wizard

The wizard offers a guided approach to upgrading 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 V6.1 server program.

Before beginning the upgrade wizard, you must complete all preceding steps to prepare for the upgrade, to install the upgrade utilities, to install the V6.1 server program, and to create the directories and user ID for the server instance.

1. Ensure that the following requirements are met.

   AIX HP-UX Linux Solaris

   - The system must have the X Window client. You must also be running an X Window server on your desktop.
   - The system must have one of the following protocols enabled. Ensure that the port that the protocol uses is not blocked by a firewall.
     - Secure shell (SSH). Ensure that the port is set to the default value, 22.
     - Remote shell (RSH).
     - Remote Execution Protocol (REXEC).
   - You must be able to log in to the 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.

   Windows

   - 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).
     - Windows server message block (SMB)

       SMB is the interface used by File and Print Sharing (also known as CIFS). To use the SMB protocol, you must ensure that File and Print Sharing is enabled, and that port 445 is not blocked by your firewall. If you are running on Windows Server 2008 or Windows Vista, you might also need to disable User Account Control (at least while running this wizard). If you choose not to disable User Account Control, you must ensure that one of the other protocols is configured to allow the wizard to run.
   - You must be able to log on to the system using a protocol that is enabled on the system, using either the user ID that you created for the server instance, or some other user ID that exists on the system. When using the wizard, you must provide the user ID and password to access the system.

2. Start the upgrade wizard, dsmupgdx, from the V6.1 server installation directory.

   AIX HP-UX Linux Solaris

   Log in using the root user ID. Issue the command:

   ```
   /opt/tivoli/tsm/server/bin/dsmupgdx
   ```

Windows

Open a new Command Prompt window, and issue the command:

```
"c:\Program Files\Tivoli\TSM\server\dsmupgdx.exe"
```

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

   Important: Read all messages that appear for each phase of the upgrade process, in the message display area within the wizard. Informational messages might show actions that occurred during the process that are important to you.

To complete the upgrade, perform the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Scenario 2: Upgrading the server manually using utilities

Use the utilities to upgrade the server using a command interface.

Before beginning the upgrade procedure, you must complete all preceding steps to prepare for the upgrade, to install the upgrade utilities, to install the V6.1 server program, and to create the directories and user ID for the server instance.

Complete the following steps:

1. "Scenario 2: Creating and formatting the new database"
2. "Scenario 2: Moving the server database over a network" on page 141
3. "Scenario 2: Creating a Windows service for the server instance" on page 142
4. "Scenario 2: Configuring the system for database backup" on page 143

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Related concepts

"The DSMUPGRD upgrade utilities" on page 15

Scenario 2: Creating and formatting the new database

Create the server instance and format files for an empty V6.1 database.

1. Log on to the system where you installed the V6.1 program.

   AIX HP-UX Linux Solaris

   Log in using the root user ID. Complete the following checks:

   a. Verify that the home directory exists for the user ID that owns the server instance. For example, if the user ID is tsminst1, the home directory is `/home/tsminst1`.
   b. Verify that a configuration profile exists for the user ID in its home directory. If necessary, create the configuration profile. For example, create a `.profile` file if you are using the Korn shell (ksh). The `.profile` file can be empty.

   Windows

   Log on as an administrator.

2. Create a Tivoli Storage Manager instance using the db2icrt command.

AIX HP-UX Linux Solaris

Enter the following command on one line. For the instance name, specify the user ID that you created to own the instance.

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

For example, if the user ID for this instance is tsminst1, use the following command to create the instance.

```
/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 using the user ID that is the instance owner.

Windows

Enter the following command on one line. The user account that you specify becomes the user ID that owns the V6.1 server (the instance user ID).

```
db2icrt -u user_account instance_name
```

The database service for the server instance logs on to the user account that is specified in this command.

Use the registry key name of the V5 server as the instance name for the V6.1 server. For example, if the user account is tsminst1 and the server's registry key is Server1, enter the following command:

```
db2icrt -u tsminst1 server1
```

You are prompted to enter the password for the user account.

The instance name that you specify on this db2icrt command is the name that you later specify with the -k option on the DSMSERV LOADFORMAT command, when you create and format the database and recovery log.

3. Log on to the system using the user ID that owns the V6.1 server instance (the instance user ID).
4. Copy the configuration files to the instance directory that you created for the new server. The files are the configuration files that you saved from the original V5 server:
   - Device configuration
   - Server options file (typically named `dsmserv.opt`)

   For example, if you created the instance directory that is shown in the example in the step to create directories for the V6.1 server, copy the files into the following directory:

   AIX HP-UX Linux Solaris `/home/tsminst1/tsminst1`

   Windows `d:\tsm\server1`

   Ensure that the user ID that owns the V6.1 server (the instance user ID) has ownership or read/write permission to the files that you copied.
5. Edit the server options file.
   a. Remove any options that are not supported for V6.1. For the list of deleted options, see Table 30 on page 53.

b. Ensure that the server options file contains at least one VOLUMEHISTORY option and at least one DEVCONFIG option. Because a volume history file and a device configuration file are required when you must restore the database, generate copies of these files automatically to help ensure that the files are available when needed.

c. Check whether the server options file includes the TXNGROUPMAX option with a value, and if it does, what the value is. You might want to change the current value because the default value for this option changes from 256 to 4096 with V6.1. The increased value can improve the performance for data movement operations such as storage pool migration and storage pool backup.

- If the server options file does not include this option, the server automatically uses the new default value of 4096.
- If the server options file includes a value for this option, the server uses that specified value. If the specified value is less than 4096, consider increasing the value, or removing the option so that the server uses the new default value.

6. Change the default path for the database.

AIX HP-UX Linux Solaris

Change the default path for the database to be the same as the instance directory for the server. Issue the command:

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

For example:

```
db2 update dbm cfg using dftdbpath /home/tsminst1/tsminst1
```

Windows

Change the default path for the database to be the drive where the instance directory for the server is located. Complete the following steps:

a. Click **Start** → **Programs** → **IBM DB2** → **DB2TSM1** → **Command Line Tools** → **Command Line Processor**.

b. Enter `quit` to exit the command-line processor.

A window with a command prompt opens, with the environment properly set up to successfully issue the commands in the next steps.

c. From the command prompt in that window, issue the following command to set the environment variable for the server instance that you are working with:

```
set db2instance=instance_name
```

The *instance_name* is the same as the instance name that you specified when you issued the db2icrt command. For example, to set the environment variable for the Server1 server instance, issue the following command:

```
set db2instance=server1
```

d. Issue the command to set the default drive:

```
db2 update dbm cfg using dftdbpath instance_location
```

For example, if the instance directory is `d:\tsm\server1`, the instance location is drive `d:`. Enter the command:

```
db2 update dbm cfg using dftdbpath d:
```

7. Complete this step if the system uses a locale other than the English regional locale.

   AIX HP-UX Linux Solaris

   If the system uses a locale other than the English regional locale, set the DB2CODEPAGE system environment variable to 819:

   ```
   db2set -i instance_name DB2CODEPAGE=819
   ```

   For example:

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

8. Change to the instance directory that you created for the server.
9. Create and format the database and recovery logs. In the command, specify the directories that you created for the database and logs. The directories must be empty.

   AIX HP-UX Linux Solaris

   For example, to get an active log size of 2 GB (2048 MB, the default size), issue the following command, on one line:

   ```
   /opt/tivoli/tsm/server/bin/dsmserv loadformat \
   dbdir=/tsmdb001,/tsmdb002,/tsmdb003,/tsmdb004 \
   activelogsize=2048 activelogdir=/tsmlog \
   mirrorlogdir=/tsmlogmirror archlogdir=/tsmarchlog
   ```

   Windows

   For example, to get an active log size of 2 GB (2048 MB, the default size) for the Server1 server instance, issue the following command, on one line:

   ```
   "c:\Program Files\Tivoli\TSM\server\dsmserv" loadformat
   dbdir=d:\tsm\db001,e:\tsm\db002,f:\tsm\db003,g:\tsm\db004
   activelogsize=2048 activelogdir=h:\tsm\log
   mirrorlogdir=j:\tsm\logmirror archlogdir=i:\tsm\archlog
   ```

   If the server that you are upgrading is not Server1, then you must use the -k option. The -k option specifies the instance name for running this utility. For example, if the system has more than one server instance and the instance that you are upgrading is Server2, issue the command:

   ```
   "c:\Program Files\Tivoli\TSM\server\dsmserv" -k server2
   loadformat dbdir=d:\tsm\db001,e:\tsm\db002,f:\tsm\db003,g:\tsm\db004
   activelogsize=2048 activelogdir=h:\tsm\log
   mirrorlogdir=j:\tsm\logmirror archlogdir=i:\tsm\archlog
   ```

   Important: The server instance that you specify must have already been through all preceding steps for the upgrade process, including the creation of the database instance (db2icrt command).

10. Monitor the process for errors and warning messages. The final message indicates success or failure of the operation.

Related tasks

"Estimating total space requirements for the upgrade process and upgraded server" on page 34

Related reference

"DSMSERV LOADFORMAT (Format a database)" on page 292

"Deleted server commands, utilities, and options" on page 50

Scenario 2: Moving the server database over a network

Move the database by starting the insertion process for the V6.1 server to accept the server database, and then starting the extraction process for the V5 server to extract and send the database.

Before starting this procedure, ensure that both the V5 server and the new server are not running.

1. Start the insertion process on the V6.1 server to accept the database. To monitor the process, direct the output of the process to a file. For example, start the server, allowing 60 minutes (the default time) for the other server to contact the V6.1 server and directing the process output to `insert.out`, using this command:

   AIX HP-UX Linux Solaris

   ```
   nohup /opt/tivoli/tsm/server/bin/dsmserv insertdb \
   sesswait=60 >insert.out 2>&1 &
   ```

   Windows

   ```
   "c:\Program Files\Tivoli\TSM\server\dsmserv" insertdb
   sesswait=60 1>>insert.out 2>&1
   ```

   The server starts and waits up to 60 minutes to be contacted by the original server.
2. Monitor the output of the process. Verify that the DSMSERV INSERTDB process has issued the following message before continuing to the next step:

   ```
   ANR1336I INSERTDB: Ready for connections from the source server
   ```

   Issue the following command to monitor the process output in the `insert.out` file:

   ```
   tail -f insert.out
   ```

   Tip: On Windows systems, use the tail command or an equivalent utility with which you can monitor the contents of a file as it changes. For example, the Windows Server 2003 Resource Kit Tools includes the tail command, which can be used as shown in the preceding example.
3. Start the extraction from the original server. Specify the TCP/IP address and port for the V6.1 server. Direct the output of the process to a file for monitoring. For example, enter the following command on one line:

   AIX

   ```
   nohup /usr/tivoli/tsm/upgrade/bin/dsmupgrd extractdb \
   hladdress=127.0.0.1 lladdress=1500 >extract.out 2>&1 &
   ```

   HP-UX Linux Solaris

   ```
   nohup /opt/tivoli/tsm/upgrade/bin/dsmupgrd extractdb \
   hladdress=127.0.0.1 lladdress=1500 >extract.out 2>&1 &
   ```

   Windows

   ```
   "c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd" extractdb hladdress=127.0.0.1
     lladdress=1500 1>>extract.out 2>&1
   ```
4. Monitor the processes for errors and warning messages, and for items that you might need to take action on. From the instance directory for the server that you are upgrading, issue the following command to monitor the extraction process:

```
tail -f extract.out
```

The length of time that the process runs depends on the size of the database, the hardware being used, and the network.

5. Examine the process outputs for the extraction and insertion processes to find the messages that indicate the success or failure of the operations.

Process	Success message	Failure message
Extraction	`ANR1382I EXTRACTDB: Process 1, database extract, has completed.`	`ANR1396E EXTRACTDB: Process 1, database extract, has completed with errors.`
Insertion	`ANR1395I INSERTDB: Process 1, database insert, has completed.`	`ANR1396E INSERTDB: Process 1, database insert, has completed with errors.`

Related reference

"DSMUPGRD EXTRACTDB (Extract data from a V5 server database)" on page 286

"DSMSERV INSERTDB (Move a server database into an empty database)" on page 294

Scenario 2: Creating a Windows service for the server instance

Windows

A Windows service is created for the Tivoli Storage Manager V6.1 server automatically if you use the upgrade wizard (dsmupgdx). If you do not use the wizard, you must create the Windows service for the Tivoli Storage Manager server manually.

1. Change to the installation directory for the server program. By default, the directory is `C:\Program Files\Tivoli\TSM\console`. If you installed the server in a different directory, change to the `console` subdirectory of the server installation directory.
2. Install the Windows service, using the Tivoli Storage Manager server instance name in the service name. Issue the following command:

   ```
   install "TSM server_instance_name"
    "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe" admin_name admin_password
   ```

   where:

   `"TSM server_instance_name"` is the name of the service that is being installed.

   server_instance_name is the instance name that was specified when you issued the db2icrt command.

   admin_name is the administrator account that owns the service.

   admin_password is the password for the administrator account.

   Example 1

   To install the Windows service for the Server1 server instance, enter the following command on one line. The example uses `rudy` as the administrator account, which has the password `s21ret`.

   ```
   install "TSM server1" "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
   rudy s21ret
   ```

Example 2

To install the Windows service for the Server2 server instance using LocalSystem as the logon account, issue the following command. Because the LocalSystem account does not have a password, use the quotation marks (" ") to specify a null password.

```
install "TSM Server2" "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
localsystem ""
```

3. Optional: Manually change the service to an automatic startup type by using Windows administrative tools (**Administrative Tools** → **Services**).

Related tasks

"Starting the server on Windows systems" on page 270

Scenario 2: Configuring the system for database backup

The database manager and the Tivoli Storage Manager API must be configured so that the database manager can back up the server database. The configuration is completed for you automatically if you use the upgrade wizard (dsmupgdx). If you do not use the wizard, you must complete the configuration manually.

- "Scenario 2: Configuring the system for database backup on AIX, HP-UX, Linux, and Solaris systems"
- "Scenario 2: Configuring the system for database backup on Microsoft Windows systems" on page 145

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Scenario 2: Configuring the system for database backup on AIX, HP-UX, Linux, and Solaris systems

AIX HP-UX Linux Solaris

If you did not use the upgrade wizard, you must complete the configuration for the database backup manually.

In the following steps, the examples use tsminst1 for the server instance user ID and `/home/tsminst1/tsminst1` for the Tivoli Storage Manager server instance directory.

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:

      AIX

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

HP-UX Linux Solaris

```
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:

   AIX `/usr/tivoli/tsm/client/api/bin64`

   HP-UX Linux Solaris `/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 on AIX, HP-UX, Linux, and Sun Solaris systems" on page 267 for the details.
   b. Log in using the root user ID.
   c. Source the database manager by running the following command.

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

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

   d. Change the API password, using this command:

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

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

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

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, “Taking the first steps after upgrade,” on page 267.

Scenario 2: Configuring the system for database backup on Microsoft Windows systems

Windows

If you did not use the upgrade wizard, you must complete the configuration for the database backup manually.

Windows In the following commands, the examples use `server1` for the database instance and `d:\tsmserver1` for the Tivoli Storage Manager server directory. Replace these values with your actual values in the commands.

1. Create a file called `tsmdbmgr.env` in the `d:\tsmserver1` directory with the following contents:

   ```
   DSMI_CONFIG=d:\tsmserver1\tsmdbmgr.opt
   DSMI_LOG=d:\tsmserver1
   ```

2. Set the DSMI_ api environment-variable configuration for the database instance:
   a. Open a DB2 command window. One method of doing this is by going to the `C:\Program Files\Tivoli\TSM\db2\bin` directory, or if you installed Tivoli Storage Manager in a different location, go to the `db2\bin` subdirectory in your main installation directory. Then, issue this command:

      ```
      db2cmd
      ```

   b. Issue this command:

      ```
      db2set -i server1 DB2_VENDOR_INI=d:\tsmserver1\tsmdbmgr.env
      ```

3. Create a file called `tsmdbmgr.opt` in the `d:\tsmserver1` directory with the following contents:

   ```
   ************************************************
   nodename $$_TSMDBMGR_$$
   commmethod tcpip
   tcpserveraddr localhost
   tcpport 1500
   passwordaccess generate
   errorlogname d:\tsmserver1\TSMDBMGR_TSMSERVER1.log
   ```

4. Stop and start the database instance:
   a. Open a DB2 command window. One method of doing this is by going to the `C:\Program Files\Tivoli\TSM\db2\bin` directory, or if you installed Tivoli Storage Manager in a different location, go to the `db2\bin` subdirectory in your main installation directory. Then, issue this command:

      ```
      db2cmd
      ```

   b. Set the database instance:

      ```
      set db2instance=server1
      ```

   c. Stop DB2:

      ```
      db2stop
      ```

   d. Start DB2:

      ```
      db2start
      ```

5. Enter the following command on one line:

   ```
   "c:\program files\tivoli\tsm\server\dsmsutil.exe"
   UPDATEPW /NODE:$$_TSMDBMGR_$$ /PASSWORD:TSMDBMGR /VALIDATE:NO /OPTFILE:
   "d:\tsmserver1\tsmdbmgr.opt"
   ```

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, “Taking the first steps after upgrade,” on page 267.

Chapter 6. Scenario 3: New system, media method

Use this procedure if you are upgrading your server on a different system than your V5 server, and you are using the media method to move the data from the V5 database to the V6.1 database.

Perform these tasks to upgrade a server:

1. "Scenario 3: Preparing for the upgrade"
2. "Scenario 3: Installing the upgrade utilities" on page 152
3. Upgrading the server, using one of the following methods:
   - "Scenario 3: Upgrading the server using the upgrade wizard" on page 160
   - "Scenario 3: Upgrading the server manually using utilities" on page 169
4. Completing the upgrade by taking important first steps:
   a. "Verifying access to storage pools on disk" on page 267
   b. "Starting the server instance after the upgrade" on page 267
   c. "Registering licenses" on page 271
   d. "Backing up the database after upgrading the server" on page 271
   e. "Verifying the upgraded server" on page 272
   f. "Updating automation" on page 273
   g. "Monitoring the upgraded server" on page 273

Scenario 3: Preparing for the upgrade

Prepare for the upgrade by checking requirements, preparing the space that is required, backing up the server, and modifying certain server settings.

Follow the preparation steps carefully to protect your server and its data.

Important: It is possible, after the upgrade to V6.1 is complete, that conditions might cause the need to temporarily revert to the previous version of the server. Successfully reverting to the previous version of the server is possible only if you performed all preparation steps. To understand why it is important to perform all preparation steps, review the procedure for reverting an upgraded server to its previous version.

Perform these steps to prepare for the upgrade:

1. "Scenario 3: Checking the prerequisites for the upgrade" on page 148
2. "Scenario 3: Preparing space for the upgrade process" on page 149
3. "Scenario 3: Modifying the server before the upgrade" on page 149
4. "Scenario 3: Disabling sessions" on page 150
5. "Scenario 3: Backing up storage pools and the server database" on page 151
6. "Scenario 3: Backing up configuration information" on page 151
7. "Scenario 3: Stopping the server before installing the upgrade" on page 152

Related tasks

"Reverting from V6.1 to the previous V5 server version" on page 280

Scenario 3: Checking the prerequisites for the upgrade

Check your system against requirements for the server.

1. Ensure that the server that you plan to upgrade is at version 5.3.6 or later.
2. Ensure that the system where the V5 server is located meets the minimum requirements. Use the information in "Hardware and software requirements for the V5 server system that is being upgraded" on page 16 to determine whether you need to update your system before you continue.
3. Ensure that the system where you plan to install the V6.1 server meets requirements. Check the operating system level and the platform against the list of supported operating systems and platforms.

   Restriction: You cannot upgrade your server to run on an operating system that is different from the operating system it currently runs on. For example, you cannot upgrade a server running on an AIX system to a server running on a Linux system.

   Some platforms that were supported for earlier versions of the server are *not* supported for V6.1. If the server that you want to upgrade is running on one of these platforms, you cannot upgrade your server to V6.1 on the same platform. You must install your V6.1 server on a system that is a specific supported platform, depending on the original platform. See the following table.

Platform for V5 server	Required platform for upgrade to V6.1
HP-UX running on a PA-RISC system	HP-UX running on an Itanium system
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system
Linux running on a 32-bit x86 system	Linux running on an x86_64 system
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system

4. Check that the system memory meets the server requirements. If you plan to run multiple instances of the V6.1 server on the system, each instance requires the memory listed for one server. Multiply the memory for one server by the number of instances planned for the system.
5. Ensure that the system has enough disk storage for the database and recovery logs. Review the planning information for requirements and guidance.

   If you are adding new hardware for the server, such as new disk storage for the database, have the hardware installed and running.
6. Ensure that the new system can access the storage devices that are used on the original system. This includes disk and tape devices that are used to store client data.

   You might need to leave a storage device attached to the original system to perform the database extraction. Then move the storage device to the new system.

Related concepts

"Hardware and software requirements for upgrading to the V6.1 server" on page 15

Scenario 3: Preparing space for the upgrade process

Determine the amount and type of space that is required for the upgrade process before beginning the process.

1. Verify that the system has the amount of space that was estimated in the planning step. Use the planning work sheet that you filled in with your information.
2. Ensure that you have space available for storing the database and the manifest file that the extraction process creates.
   a. Identify the device class to which you will extract the original database. The definition must exist in the server database, not just in the device configuration file.

      The device class must be a sequential device class that has volumes or space available. Define a new device class if necessary. The device class type cannot be **NAS** or **CENTERA**.

      Important: You must confirm *now* that the definition that is in the server database for the device class is correct. After you prepare the database for upgrade (by completing the **Prepare Database** phase in the upgrade wizard, or by using the DSMUPGRD PREPAREDB utility), you cannot update this device class definition. For example, check the path for a FILE device class. If you copied the original server to a different system to extract the data, the path might be different on the current system.
   b. Ensure that space or volumes are available in the selected device class. The amount of space that you need is about the same as the current size of the original database.

      Ensure that the instance user ID that you create for the upgraded server has access permission to the location of the extracted data.
   c. Check that the access permissions are correct for the location that you plan to specify for the manifest file.

      The user ID that will run the database preparation and extraction utilities (DSMUPGRD PREPAREDB and DSMUPGRD EXTRACTDB) must have write access to this file. This is typically the root user ID.

      When the data is later inserted into the V6.1 database, the instance user ID that you use for the upgraded server must have access permission for the manifest file.

      The manifest file is typically less than 1 KB.

Related tasks

"Estimating total space requirements for the upgrade process and upgraded server" on page 34

Scenario 3: Modifying the server before the upgrade

A command must be run on the server to prevent one type of problem during the upgrade process. Some modifications to typical server settings are recommended to prepare for the upgrade.

1. From a Tivoli Storage Manager administrative command line, issue the command:

   ```
   convert ussfilespace
   ```

   This command fixes a problem that might exist in older Tivoli Storage Manager databases. If the problem does not exist in your database, the command completes quickly. If the problem exists in your database, the command might take some time to run.

Important: Do not skip this step. If your database has the problem and you do not run this command now, the DSMUPGRD PREPAREDB utility fails when you run it. You must then restart the V5 server and run the CONVERT USSFILESPACE command before continuing with the upgrade process.

2. Review the steps for reverting to the earlier version of the server in the section, "Reverting from V6.1 to the previous V5 server version" on page 280.

   If for some reason you need to revert to the earlier version after the upgrade to V6.1, the results of the reversion will be better if you understand the steps and prepare for the possibility now.

3. Make the following adjustments to settings on your server and clients. These adjustments must be done to make it possible for you to revert to the original server after the upgrade, if problems occur.
   a. For each sequential-access storage pool, set the **REUSEDELAY** parameter to the number of days during which you want to be able to revert to the original server, if that becomes necessary.

      For example, if you want to be able to revert to the original server for up to 30 days after upgrading to V6.1, set the **REUSEDELAY** parameter to 31 days.

   b. For each copy storage pool, set the **RECLAIM** parameter to 100 (meaning 100%).
   c. If you typically use a DELETE VOLHISTORY command to delete database backups, ensure that the command does not delete database backups for at least the same number of days that you set for the **REUSEDELAY** period for sequential-access storage pools.
   d. For important clients that use the server, check that the value for the schedlogretention client option is set to retain the client schedule log for a long enough time. Update the option for clients if needed.

      The entries in the client schedule log might be useful if the server must revert to the original version. If the retention period for the schedule log is too short, the schedule log information might be deleted too soon.

Scenario 3: Disabling sessions

In preparation for the upgrade, prevent activity on the server by disabling new sessions. Cancel any existing sessions.

The commands in the following procedure are Tivoli Storage Manager administrative commands.

1. Prevent all clients, storage agents, and other servers from starting new sessions with the server. Use the commands:

   ```
   disable sessions client
   disable sessions server
   ```

2. Prevent administrative activity from any user ID other than the administrator ID that is being used to perform the upgrade preparation. Lock out other administrator IDs if necessary:

   ```
   lock admin administrator_name
   ```

3. Check whether any sessions exist, and notify the users that the server is going to be stopped. To check for existing sessions, use the command:

   ```
   query session
   ```

4. Cancel sessions that are still running. Use the command:

   ```
   cancel session
   ```

Scenario 3: Backing up storage pools and the server database

Immediately before upgrading the server, back up primary storage pools to copy storage pools, and perform a full database backup.

1. Back up primary storage pools to copy storage pools using the BACKUP STGPOOL command. If you have been performing regular backups of the storage pools, this step backs up only the data that was added to the primary storage pools since they were last backed up.
2. Back up the database using the following command. Use either a full or snapshot backup type.

   ```
   backup db type=type devclass=device_class_name
   ```

   The device class that you specify must exist and have volumes that are available to it. For example, to perform a snapshot backup of your database to the TAPECLASS device class using scratch volumes, enter:

   ```
   backup db type=dbsnapshot devclass=tapeclass
   ```

   To use specific volumes instead of scratch volumes, specify the volume names in the command.

   Consider making two copies of the backup to protect the backup from media failures.

Scenario 3: Backing up configuration information

Before installing the new version, back up critical files and information for the server. Store the files in a safe place, because they are needed after the installation of the new software version is completed. You also need these files if you must revert to the previous version after the upgrade.

1. Back up device configuration information:

   ```
   backup devconfig filenames=file_name
   ```

2. Back up volume history information:

   ```
   backup volhistory filenames=file_name
   ```

   Ensure that the volume history includes information about the database backup that you completed in the preceding steps. For example, issue the command:

   ```
   query volhistory type=dbbackup
   ```

3. Make copies of these files, which are located in the default directory for the server:

   server options file, typically named `dsmserv.opt`

   `dsmserv.dsk`

4. Optional: Make a copy of the accounting log file, `dsmaccnt.log`.
5. Back up any scripts that have been used to perform daily housekeeping for the server. Examine the scripts for changes that are needed after the upgrade.
6. Store the device configuration file, the volume history file, the server options file, and the other files in a safe place. Select a location that is not on the system that is being upgraded.

Scenario 3: Creating a summary of database contents

Create a summary of the contents of the original database. After the upgrade, you can use the same commands to compare the results and to confirm that the database contents are intact.

Run commands that give a summary of information about your database contents. For example, issue commands that summarize the file spaces being protected, and save the results. See the sample commands for ideas.

Related reference

"Sample commands to run for validation of the database upgrade" on page 297

Scenario 3: Stopping the server before installing the upgrade

Stop all server processes and dismount any tapes that are mounted. Then stop the server.

The commands in the following procedure are Tivoli Storage Manager administrative commands.

1. Cancel sessions if any are still running. Use the command:

   ```
   cancel session
   ```

   Allow time for the sessions to be stopped. Some sessions, such as backup by a backup-archive client, might take some time to stop.
2. Determine whether server processes are running. Either cancel processes, or allow them to complete. Use the commands:

   ```
   query process
   cancel process process_number
   ```

   Allow time for the processes to be stopped. Some processes, such as storage pool migration, might take some time to stop.
3. After all sessions and processes are stopped, determine whether any tapes are mounted. Dismount any tapes that are mounted. Use the commands:

   ```
   query mount
   dismount volume volume_name
   ```
4. Stop the server. Use the command:

   ```
   halt
   ```

Scenario 3: Installing the upgrade utilities

You must install the upgrade utilities on the system where the V5 server is located. The installation package for the utilities must be downloaded from a Web site.

Use the procedure for your operating system:

- AIX "Scenario 3: Installing the upgrade utilities on AIX systems" on page 153
- HP-UX "Scenario 3: Installing the upgrade utilities on HP-UX systems" on page 154
- Linux "Scenario 3: Installing the upgrade utilities on Linux systems" on page 155
- Solaris "Scenario 3: Installing the upgrade utilities on Sun Solaris systems" on page 157

- Windows "Scenario 3: Installing the upgrade utilities on Microsoft Windows systems" on page 159

Related concepts

"The DSMUPGRD upgrade utilities" on page 15

Scenario 3: Installing the upgrade utilities on AIX systems

AIX

Install the upgrade utilities on the system where the V5 server is located. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package that matches your platform, and download it to a convenient location on the server system. The name of the package has the following form:

      `5.5.x.x-TIV-TSMUPG-AIX.tar.gz`

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Ensure that the system has the following file sets installed:

   `xlC.rte 8.0.0.5`, or later

   `gsksa.rte 7.0.4.11`

   You can use the following commands to check for these file sets:

   ```
   lslpp -L xlC.rte

   lslpp -L gsksa.rte
   ```

   If needed, you can obtain the `gsksa.rte` file set from any of the regular V5.5 maintenance packages for the AIX server. The maintenance packages are available on the FTP downloads site: ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server/v5r5/AIX/
4. Extract the contents of the upgrade utilities package. If you downloaded a language package, also extract the contents of that package.
5. Access the System Management Interface Tool (SMIT).
   a. Enter `smitty install_update`
   b. Select **Install and Update Software** → **Install and Update from ALL Available Software**.

6. Select the **INPUT** device. Specify the directory location of the upgrade utilities package on the system.
7. Select **Software to Install**. Press F4 or Esc+4 for the list of available file sets in the directory.
8. Select the file sets for the upgrade utilities, the device driver, and optionally the language pack. The file set for the upgrade utilities is `tivoli.tsmupg.server`. Optional language packs include messages for languages other than U.S. English.
9. Set **COMMIT software updates** to `Yes`. Press F4 or Esc+4.
10. Set **SAVE replaced files** to `No`.
11. Ensure that the default settings for the options in the window for all the selected file sets show `success`.
12. Press Enter, and respond to the `ARE YOU SURE?` question by pressing Enter again. The installation begins.
13. When the installation is complete, exit the SMIT program.
14. Optional: If you installed a language package, ensure that the locale environment variable is set to use it. Enter the following command to set the locale environment variable for messages:

    ```
    export LC_MESSAGES=xxxx
    ```

    where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:
    - The locale is installed on the system.
    - The upgrade utilities support the locale.
    - The language package that you installed for the upgrade utilities matches the locale.
15. After the upgrade utilities are installed, continue at "Scenario 3: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 158

Scenario 3: Installing the upgrade utilities on HP-UX systems

HP-UX

Install the upgrade utilities on the system where the V5 server is located. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package that matches your platform, and download it to a convenient location on the server system. The name of the package has the following form:

      ```
      5.5.x.x-TIV-TSMUPG-platform.tar.gz
      ```

The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.

d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.

2. Log in with the root user ID.
3. Extract the contents of the upgrade utilities package. For example, from the directory where you saved the download package, issue the command:

   ```
   gzip -dc package_name.tar.gz | tar -xvf -
   ```

4. Install the upgrade utilities and the device driver. Use the source argument (**-s**) to specify the directory where the package was extracted. For example, if the directory is `/tmp/TSM`, issue the command:

   ```
   swinstall -s /tmp/TSM package_name
   ```

   The utilities are installed in the directory `/opt/tivoli/tsm/upgrade/bin`.

5. Optional: Install the language package.
   a. Extract the contents of the package.

      ```
      gzip -d package_name.img.gz
      ```

   b. Install the package. For example, if the directory is `/tmp/TSM`, issue the command:

      ```
      swinstall -s /tmp/TSM/package_name.img package_name
      ```

   c. Enter the following command to set the locale environment variable for messages:

      ```
      export LC_MESSAGES=xxxx
      ```

      where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:
      - The locale is installed on the system.
      - The upgrade utilities support the locale.
      - The language package that you installed for the upgrade utilities matches the locale.

6. After the upgrade utilities are installed, continue at "Scenario 3: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 158

Scenario 3: Installing the upgrade utilities on Linux systems

Linux

Install the upgrade utilities on the system where the V5 server is located. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/

b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.

c. Open the directory for your platform and download the package. The name of the package has the following form:

```
5.5.x.x-TIV-TSMUPG-platform.tar.bz2
```

The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.

d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.

2. Log in with the root user ID.
3. Extract the contents of the upgrade utilities package. For example, from the directory where you saved the download package, issue the commands:

```
bunzip2 package_name.tar.bz2
tar xvf package_name.tar
```

4. Install the upgrade utilities and the device driver. Use the following command:

```
rpm -ivh package_name.rpm
```

The utilities are installed in the directory `/opt/tivoli/tsm/upgrade/bin` by default.

5. Optional: Install the language package.

a. Extract the contents of the downloaded package.

```
bunzip2 package_name.tar.bz2
tar xvf package_name.tar
```

b. Install the package for the language that you want to use.

```
rpm -ivh package_name.rpm
```

c. Enter the following command to set the locale environment variable for messages:

```
export LC_MESSAGES=xxxx
```

where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:

- The locale is installed on the system.
- The upgrade utilities support the locale.
- The language package that you installed for the upgrade utilities matches the locale.

6. After the upgrade utilities are installed, continue at "Scenario 3: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 158

Scenario 3: Installing the upgrade utilities on Sun Solaris systems

Solaris

Install the upgrade utilities on the system where the V5 server is located. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package that matches your platform, and download it to a convenient location on the server system. The name of the package has the following form:

      `5.5.x.x-TIV-TSMUPG-platform.tar.Z`

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Change to the directory where the upgrade utilities package was downloaded.
4. Extract the contents of the upgrade utilities package. For example, from the directory where you saved the download package, issue the command:

   ```
   uncompress -c package_name.tar.Z | tar -xvf -
   ```
5. Install the upgrade utilities and the device driver. Use the source argument (**-d**) to specify the directory where the package was extracted. For example, if the directory is `/tmp/TSM`, issue the command:

   ```
   pkgadd -d /tmp/TSM package_name
   ```

   The utilities are installed in the directory `/opt/tivoli/tsm/upgrade/bin` by default.
6. Optional: Install the language package.
   a. Extract the contents of the downloaded package.

      ```
      uncompress package_name.pkg.Z
      ```
   b. Install the package for the language that you want to use. Use the source argument (**-d**) to specify the directory where the package was extracted. For example, if the directory is `/tmp/TSM`, issue the command:

      ```
      pkgadd -d /tmp/TSM package_name.pkg package_name
      ```
   c. Enter the following command to set the locale environment variable for messages:

      ```
      export LC_MESSAGES=xxxx
      ```

where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:

- The locale is installed on the system.
- The upgrade utilities support the locale.
- The language package that you installed for the upgrade utilities matches the locale.

7. After the upgrade utilities are installed, continue at "Scenario 3: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems"

Scenario 3: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems

AIX HP-UX Linux Solaris

After installing the upgrade utility package, you must set environment variables in the shell from which you will run the utilities. An environment variable describes the operating environment of a process, such as the home directory or terminal in use.

The environment variables available are:

DSMSERV_DIR
Specifies the installed location of the upgrade utilities.

By default the location is:

AIX `/usr/tivoli/tsm/upgrade/bin`

HP-UX Linux Solaris `/opt/tivoli/tsm/upgrade/bin`

DSMSERV_CONFIG
Specifies the name and location of the options file for the server that you want to upgrade. For example, to set the name to `dsmserv.opt` and the location to be the directory from which you run the DSMUPGRD utility, use: `./dsmserv.opt`

If you are upgrading multiple servers on the system, you can instead use the -o option each time that you use the DSMUPGRD utility, to specify the server option file for the server that you want to work with.

If you set the **DSMSERV_CONFIG** environment variable using a relative path (for example, `./dsmserv.opt`), you *must* run the DSMUPGRD utility from the directory where the `dsmserv.opt` file is stored. Otherwise the DSMUPGRD utility fails to open the server options file and stops.

Use the appropriate command for your system to set the environment variables for running the utilities. For example, on an AIX system that uses a shell in the `ksh` family, enter the command to set the **DSMSERV_DIR** variable:

```
export DSMSERV_DIR=/usr/tivoli/tsm/upgrade/bin
```

If you set the **DSMSERV_CONFIG** variable, you set it in a similar way. For example:

```
export DSMSERV_CONFIG=./dsmserv.opt
```

Use the following command if your shell is in the `csh` family:

```
setenv DSMSERV_DIR /usr/tivoli/tsm/upgrade/bin
```

After you set the environment variables, continue the upgrade process using one of the following topics:

- "Scenario 3: Upgrading the server using the upgrade wizard" on page 160
- "Scenario 3: Upgrading the server manually using utilities" on page 169

Scenario 3: Installing the upgrade utilities on Microsoft Windows systems

Windows

Install the upgrade utilities on the system where the V5 server is located. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/WIN
   b. Open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package and download it to a convenient location on the server system. The name of the package has the following form:

      `5.5.x.x-TIV-TSMUPG-Windows.exe`

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
2. Log on with an administrator ID.
3. Run the executable package for the upgrade utilities.

   The default location for the installation of the utilities is based on the location where the V5 server was last installed. For example, if the V5 server was installed using the default path, `C:\Program Files\Tivoli\TSM\server`, the upgrade utilities are installed in `C:\Program Files\Tivoli\TSM\upgrade`.

   Restriction: Do *not* install the utilities in the same directory as the original server that is to be upgraded. Install the utilities package in its own directory.

After the upgrade utilities are installed, continue the upgrade process using one of the following topics:

- "Scenario 3: Upgrading the server using the upgrade wizard" on page 160
- "Scenario 3: Upgrading the server manually using utilities" on page 169

Tip: When you use the upgrade utilities, if you have multiple servers running on the system, you must use the -k option to specify the name of the Windows registry key from which to retrieve information about the server being upgraded. The default value for the option is SERVER1.

Scenario 3: Upgrading the server using the upgrade wizard

The wizard offers a guided approach to upgrading 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 V6.1 server program.

Before beginning the following steps, you must complete all preceding steps to prepare for the upgrade and to install the upgrade utilities.

The V6.1 server must be installed, and directories and the user ID must be created before starting the upgrade wizard. Complete the following steps:

1. Scenario 3: Installing the V6.1 server
2. Scenario 3: Creating the directories and the user ID for the upgraded server instance
3. "Scenario 3: Starting the upgrade wizard" on page 168

Scenario 3, wizard: Installing the V6.1 server

You can use an installation wizard to perform the installation, or install the program using the console.

Ensure that you have completed all upgrade preparation steps, including backup of the server database, before beginning the installation procedure. The server will not be available until after installation and upgrade steps are completed.

1. For some operating systems, you need to check certain system settings before beginning installation.

   Linux

   If you are using Security Enhanced Linux on your system, set `SELINUX=disable` or set `SELINUX=permissive` in the `/etc/sysconfig/selinux` file, at least until the installation process completes.

   If you do not adjust the setting, you receive the following message when you try to install the server:

   ```
   The installer cannot run on your configuration. It will now quit.
   ```

   Solaris

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

2. Log on to the system.

   AIX HP-UX Linux Solaris

   Log in using the root user ID.

   Windows

   Log on as an administrator.

3. If you have the product DVD, complete the following steps.

   AIX HP-UX Linux Solaris

   Insert the Tivoli Storage Manager DVD into a DVD drive. Ensure that the DVD is mounted on directory /dvdrom and change to that directory.

   Windows

   Insert the Tivoli Storage Manager server DVD. Use Windows Explorer to view the contents of the DVD.

4. If you downloaded the program from Passport Advantage as an executable file, complete the following steps.

AIX HP-UX Linux Solaris

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

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

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

   System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24018523

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

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

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.

Windows

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=swg24018518

   Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24018521

   System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24018524

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

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

c. Either double-click the executable file, or enter the following command on the command line to extract the installation files. The files are extracted to the current directory.

   ```
   package_name.exe
   ```

   The *package_name* is typically a name such as `CZ1N9ML`. The package is large, so the extraction takes some time.

5. From the DVD, or from the location where you extracted the program package, start the installation wizard. You can use either the graphical wizard or the console wizard.

AIX HP-UX Linux Solaris

- Start the graphical wizard:
  `./install.bin`
- Start the console wizard:
  `./install.bin -i console`

Windows

- Start the graphical wizard:
  `install.exe`
- Start the console wizard:
  `install.exe -i console`

See the *Tivoli Storage Manager Installation Guide* for information about how to perform a silent installation of the server. For information about translations that are available for the server, see Appendix A, "Server language locales," on page 299.

6. Select the language for the installation and follow the instructions.

AIX

a. You must accept the license agreement to complete the installation.
b. Select the components to install. You must select at least the server, license, and **Tivoli Storage Manager Server Languages** in the component list. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.
c. On the **Server Language Selection** page, select English (not UTF8) and any other language packs that you need. You must select English because it installs the `tivoli.tsm.server.msg.en_US` package, which includes the help messages.

HP-UX Linux Solaris

a. You must accept the license agreement to complete the installation.
b. Select the components to install. You must install at least the server and license. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.

Windows

a. You must accept the license agreement to complete the installation.
b. Select the components to install. You must install at least the server and license. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.

The Tivoli Storage Manager application programming interface (API) and DB2 Version 9.5 are automatically installed when you install the server.

7. When the installation is complete, verify that you see a message that the installation is successful.

   Important: If there are any errors during the installation, a summary panel lists the errors and directs you to an error log file. Fix the errors before continuing with the upgrade.

   The installation log is stored in the following location:

   AIX HP-UX Linux Solaris `/var/tivoli/tsm`

Windows The directory that was chosen for installation (look for the files `log.txt` and `logs.zip`)

8. Download and apply any applicable fixes that have been released for the server. Go to the product support site, http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html, and click **Download**. Search for server updates.

   You can also check the FTP downloads site: ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server/

9. HP-UX Linux Solaris Modify kernel parameter values, if necessary.

   HP-UX

   Run the db2osconf utility to get recommendations for changes to kernel parameter values that are based on the size of the system. Make changes based on the recommendations in the results from the utility. You might need to restart the system.

   For information about the utility and about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter the utility name, db2osconf, in the **Search** field at this site.

   Important: The recommendations from the db2osconf utility are minimum values. Some workloads, for example the database upgrade process, might require that values be set higher than the recommendations. For more details about kernel parameter tuning for Tivoli Storage Manager, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

   System resources such as semaphores might also require special configuration and tuning. See Appendix B, “HP-UX system resource requirements,” on page 305.

   Solaris

   Run the db2osconf utility to get recommendations for changes to kernel parameter values that are based on the size of the system. Make changes based on the recommendations in the results from the utility. You might need to restart the system.

   For information about the utility and about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter the utility name, db2osconf, in the **Search** field at this site.

   Important: The recommendations from the db2osconf utility are minimum values. Some workloads, for example the database upgrade process, might require that values be set higher than the recommendations. For more details about kernel parameter tuning for Tivoli Storage Manager, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

   Linux

   To update the kernel parameters on Red Hat and SUSE Linux, you can run the `ipcs -l` command to list the parameter values. Analyze the output to determine whether any changes are required for your system.

   For information about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To

find the information, enter a search string such as `modifying kernel parameters`, in the **Search** field at this site.

For more details about kernel parameter tuning for Tivoli Storage Manager running on Linux systems, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

Related concepts

Appendix D, "Services associated with the Tivoli Storage Manager server," on page 311

Scenario 3, wizard: Creating the directories and the user ID for the upgraded server instance

Create the directories that the server instance needs for database and recovery logs, and create the user ID that will own the server instance.

1. 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.

   AIX HP-UX Linux Solaris

   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.

      AIX

      ```
      # mkgroup id=1001 tsmsrvrs
      # mkuser id=1002 pgrp=tsmsrvrs home=/home/tsminst1 tsminst1
      # passwd tsminst1
      ```

      HP-UX

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

      Linux

      ```
      # groupadd tsmsrvrs
      # adduser -d /home/tsminst1 -m -g tsmsrvrs -s /bin/bash tsminst1
      # passwd tsminst1
      ```

      Solaris

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

b. Log off, then log in to your system, using the new user ID and password. Use a login method that causes a prompt for a password, so that the password can be changed 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. Log off the new user ID.

Windows

Identify the user account that will own the Tivoli Storage Manager server instance. When the server is started as a Windows service, this is the account that the service will log on to. The user account must have administrative authority on the system. One user account can own more than one server instance.

You can create a new user account, or use an existing account.

If you have multiple servers on one system and want to run each server with a different user account, create a new user account in this step.

a. Create the user ID.

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

Use the following command to create the user ID:

```
net user user_ID */add
```

You are prompted to create and verify a password for the new user ID.

b. Issue the following commands to create groups and add the new user ID to the groups:

```
net localgroup Administrators user_ID /add
net localgroup DB2ADMNS /add
net localgroup DB2USERS /add
net localgroup DB2ADMNS user_ID /add
net localgroup DB2USERS user_ID /add
```

c. Log in to your system, using the new user ID and password.

2. 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.

AIX HP-UX Linux Solaris

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`	

Windows

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 d:\tsm\server1`	

The database directories	`mkdir d:\tsm\db001`
	`mkdir e:\tsm\db002`
	`mkdir f:\tsm\db003`
	`mkdir g:\tsm\db004`	

Active log directory	`mkdir h:\tsm\log`	
Archive log directory	`mkdir i:\tsm\archlog`	
Optional: Directory for the log mirror for the active log	`mkdir j:\tsm\logmirror`	
Optional: Secondary archive log directory (failover location for archive log)	`mkdir k:\tsm\archlogfailover`	

3. 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.

   AIX HP-UX Linux Solaris

   Change the owner of the directories that were created to the user ID for the server instance.

   Windows

   Ensure that the user ID for the server instance has read/write access to the directories that were created.

4. For all disk space that is used by the V5 server for storage pools (device types of FILE and DISK), change ownership or access control so that the user ID that will own the upgraded Tivoli Storage Manager server instance has ownership or read/write permission. Use the appropriate method for your operating system.

Related tasks

"Planning space for the upgrade process and the upgraded server" on page 30

Related reference

"Server naming best practices" on page 55

Scenario 3: Starting the upgrade wizard

The wizard offers a guided approach to upgrading 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 V6.1 server program.

Before beginning the upgrade wizard, you must complete all preceding steps to prepare for the upgrade, to install the upgrade utilities, to install the V6.1 server program, and to create the directories and user ID for the server instance.

1. Ensure that the following requirements are met.

   AIX HP-UX Linux Solaris

   - The system where you installed the V6.1 server program must have the X Window client. You must also be running an X Window server on your desktop.
   - The systems 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 V6.1 system with the user ID that you created for the server instance, using the SSH, RSH, or REXEC protocol. When using the wizard, you must provide this user ID and password to access that system.

   Windows

   - The systems 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).
     - Windows server message block (SMB)

       SMB is the interface used by File and Print Sharing (also known as CIFS). To use the SMB protocol, you must ensure that File and Print Sharing is enabled, and that port 445 is not blocked by your firewall. If you are running on Windows Server 2008 or Windows Vista, you might also need to disable User Account Control (at least while running this wizard). If you choose not to disable User Account Control, you must ensure that one of the other protocols is configured to allow the wizard to run.
   - You must be able to log on to the system using a protocol that is enabled on the system, using either the user ID that you created for the server instance, or some other user ID that exists on the system. When using the wizard, you must provide the user ID and password to access the system.
2. Start the upgrade wizard, dsmupgdx, from the V6.1 server installation directory.

AIX HP-UX Linux Solaris

Log in using the root user ID. Issue the command:

```
/opt/tivoli/tsm/server/bin/dsmupgdx
```

Windows

Open a new Command Prompt window, and issue the command:

```
"c:\Program Files\Tivoli\TSM\server\dsmupgdx.exe"
```

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

   Important: Read all messages that appear for each phase of the upgrade process, in the message display area within the wizard. Informational messages might show actions that occurred during the process that are important to you.

To complete the upgrade, perform the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Scenario 3: Upgrading the server manually using utilities

Use the utilities to upgrade the server using a command interface.

Before beginning the following steps, you must complete all preceding steps to prepare for the upgrade and to install the upgrade utilities.

Complete the following steps:

1. "Scenario 3: Preparing the database of a V5 server for upgrade" on page 170
2. "Scenario 3: Extracting the data to media" on page 171
3. Scenario 3: Installing the V6.1 server
4. Scenario 3: Creating the directories and the user ID for the upgraded server instance
5. "Scenario 3: Creating and formatting the new database" on page 180
6. "Scenario 3: Loading the extracted data into the new database" on page 183
7. "Scenario 3: Creating a Windows service for the server instance" on page 185
8. "Scenario 3: Configuring the system for database backup" on page 186

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Related concepts

"The manifest file for the data extraction to media" on page 288

"The DSMUPGRD upgrade utilities" on page 15

Scenario 3: Preparing the database of a V5 server for upgrade

Before extracting the data from the database, you must prepare the server database by using the DSMUPGRD PREPAREDB utility. If you have multiple servers on a single system, you must repeat this task for each server.

1. Ensure that you have completed all preparation steps.
2. Log in using the root user ID on the system that has the original server. Log on with the administrator ID on a Windows system.
3. Change to the instance directory for the server that you are upgrading. The instance directory is the directory that contains the files such as `dsmserv.dsk` for the server.
4. AIX HP-UX Linux Solaris Set the environment variables for the shell. See "Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 240.
5. Prepare the database. Direct the output of the process to a file for monitoring.

   AIX

   From the instance directory for the server that you are upgrading, issue the following command to run the process in the background and direct the output to the file called `prepare.out`:

   ```
   nohup /usr/tivoli/tsm/upgrade/bin/dsmupgrd preparedb >prepare.out 2>&1 &
   ```

   HP-UX Linux Solaris

   From the instance directory for the server that you are upgrading, issue the following command to run the process in the background and direct the output to the file called `prepare.out`:

   ```
   nohup /opt/tivoli/tsm/upgrade/bin/dsmupgrd preparedb >prepare.out 2>&1 &
   ```

   Windows

   From the instance directory for the server that you are upgrading, issue the following command to run the process and direct the output to the file called `prepare.out`:

   ```
   "c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd"
       preparedb 1>>prepare.out 2>&1
   ```

   If multiple servers exist on the system, issue the command from the instance directory for the server that you want to prepare, and specify the registry key for that server. For example, if the server is SERVER2:

   ```
   "c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd" -k server2
       preparedb 1>>prepare.out 2>&1
   ```

6. Monitor the process for errors and warning messages. The final message indicates success or failure of the operation. From the instance directory for the server that you are upgrading, issue the following command to monitor the process:

   ```
   tail -f prepare.out
   ```

   Tip: On Windows systems, use the tail command or an equivalent utility with which you can monitor the contents of a file as it changes. For example, the Windows Server 2003 Resource Kit Tools includes the tail command, which can be used as shown in the preceding example.
7. Ensure that the prepare operation is completed successfully before continuing to the next step. If the prepare operation fails, you might need to restart the V5 server to fix the problem and run the prepare operation again. If the server being upgraded is a V5.3 or V5.4 server, you might need to restore the database using a backup before you can restart the server to correct the problem.

Related reference

"DSMUPGRD PREPAREDB (Prepare a V5 database for upgrade)" on page 285

Scenario 3: Extracting the data to media

You can extract the data from the original server database to sequential media. The sequential media can be tape, or disk space that is defined with the FILE device class.

1. Log in using the root user ID on the system that has the original server. Log on with the administrator ID on a Windows system.
2. Ensure that the device that you want to use to store the extracted data is available. The server database and the device configuration file must contain a valid device class definition for the device.
3. From the instance directory for the server that you are upgrading, issue the command to start the extraction. Direct the output of the process to a file for monitoring. For example, issue the following command, on one line:

   AIX

   ```
   nohup /usr/tivoli/tsm/upgrade/bin/dsmupgrd extractdb \
   devclass=file manifest=./manifest.txt >extract.out 2>&1 &
   ```

   HP-UX Linux Solaris

   ```
   nohup /opt/tivoli/tsm/upgrade/bin/dsmupgrd extractdb \
   devclass=file manifest=./manifest.txt >extract.out 2>&1 &
   ```

   Windows

   ```
   "c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd" extractdb
   devclass=file manifest=.\manifest.txt 1>>extract.out 2>&1
   ```

   Tip: Messages that are issued during the extract operation are *not* saved in the server activity log. Direct the output of the utility to a file, as shown in the examples, to record the messages.
4. Monitor the process for errors and warning messages, and for items that you might need to take action on. A message near the end of the process output indicates success or failure of the operation:

   Success message: `ANR1382I EXTRACTDB: Process 1, database extract, has completed.`

   Failure message: `ANR1396E EXTRACTDB: Process 1, database extract, has completed with errors.`

   For example, from the instance directory for the server that you are upgrading, issue the following command to monitor the process:

   ```
   tail -f extract.out
   ```

   The length of time that the process runs depends on the size of the database. The time will be approximately as much as the time required for a full backup of the database.

   Tip: On Windows systems, use the tail command or an equivalent utility with which you can monitor the contents of a file as it changes. For example, the Windows Server 2003 Resource Kit Tools includes the tail command, which can be used as shown in the preceding example.

Related concepts

"The manifest file for the data extraction to media" on page 288

Related tasks

"Scenario 3: Preparing space for the upgrade process" on page 149

Related reference

"DSMUPGRD EXTRACTDB (Extract data from a V5 server database)" on page 286

Scenario 3, manual: Installing the V6.1 server

You can use an installation wizard to perform the installation, or install the program using the console.

Ensure that you have completed all upgrade preparation steps, including backup of the server database, before beginning the installation procedure. The server will not be available until after installation and upgrade steps are completed.

1. For some operating systems, you need to check certain system settings before beginning installation.

   Linux

   If you are using Security Enhanced Linux on your system, set `SELINUX=disable` or set `SELINUX=permissive` in the `/etc/sysconfig/selinux` file, at least until the installation process completes.

   If you do not adjust the setting, you receive the following message when you try to install the server:

   ```
   The installer cannot run on your configuration. It will now quit.
   ```

   Solaris

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

2. Log on to the system.

   AIX HP-UX Linux Solaris

   Log in using the root user ID.

   Windows

   Log on as an administrator.

3. If you have the product DVD, complete the following steps.

   AIX HP-UX Linux Solaris

   Insert the Tivoli Storage Manager DVD into a DVD drive. Ensure that the DVD is mounted on directory /dvdrom and change to that directory.

   Windows

   Insert the Tivoli Storage Manager server DVD. Use Windows Explorer to view the contents of the DVD.

4. If you downloaded the program from Passport Advantage as an executable file, complete the following steps.

   AIX HP-UX Linux Solaris

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

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

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

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24018523

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

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

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.

Windows

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=swg24018518

Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24018521

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24018524

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

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

c. Either double-click the executable file, or enter the following command on the command line to extract the installation files. The files are extracted to the current directory.

```
package_name.exe
```

The *package_name* is typically a name such as `CZ1N9ML`. The package is large, so the extraction takes some time.

5. From the DVD, or from the location where you extracted the program package, start the installation wizard. You can use either the graphical wizard or the console wizard.

AIX HP-UX Linux Solaris

- Start the graphical wizard:

```
./install.bin
```

- Start the console wizard:

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

Windows

- Start the graphical wizard:

```
install.exe
```

- Start the console wizard:

```
install.exe -i console
```

See the *Tivoli Storage Manager Installation Guide* for information about how to perform a silent installation of the server. For information about translations that are available for the server, see Appendix A, "Server language locales," on page 299.

6. Select the language for the installation and follow the instructions.

AIX

a. You must accept the license agreement to complete the installation.
b. Select the components to install. You must select at least the server, license, and **Tivoli Storage Manager Server Languages** in the component list. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.
c. On the **Server Language Selection** page, select English (not UTF8) and any other language packs that you need. You must select English because it installs the `tivoli.tsm.server.msg.en_US` package, which includes the help messages.

HP-UX Linux Solaris

a. You must accept the license agreement to complete the installation.
b. Select the components to install. You must install at least the server and license. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.

Windows

a. You must accept the license agreement to complete the installation.
b. Select the components to install. You must install at least the server and license. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.

The Tivoli Storage Manager application programming interface (API) and DB2 Version 9.5 are automatically installed when you install the server.

7. When the installation is complete, verify that you see a message that the installation is successful.

   Important: If there are any errors during the installation, a summary panel lists the errors and directs you to an error log file. Fix the errors before continuing with the upgrade.

   The installation log is stored in the following location:

   AIX HP-UX Linux Solaris `/var/tivoli/tsm`

   Windows The directory that was chosen for installation (look for the files `log.txt` and `logs.zip`)

8. Download and apply any applicable fixes that have been released for the server. Go to the product support site, http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html, and click **Download**. Search for server updates.

   You can also check the FTP downloads site: ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server/

9. HP-UX Linux Solaris Modify kernel parameter values, if necessary.

HP-UX

Run the db2osconf utility to get recommendations for changes to kernel parameter values that are based on the size of the system. Make changes based on the recommendations in the results from the utility. You might need to restart the system.

For information about the utility and about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter the utility name, db2osconf, in the **Search** field at this site.

Important: The recommendations from the db2osconf utility are minimum values. Some workloads, for example the database upgrade process, might require that values be set higher than the recommendations. For more details about kernel parameter tuning for Tivoli Storage Manager, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

System resources such as semaphores might also require special configuration and tuning. See Appendix B, "HP-UX system resource requirements," on page 305.

Solaris

Run the db2osconf utility to get recommendations for changes to kernel parameter values that are based on the size of the system. Make changes based on the recommendations in the results from the utility. You might need to restart the system.

For information about the utility and about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter the utility name, db2osconf, in the **Search** field at this site.

Important: The recommendations from the db2osconf utility are minimum values. Some workloads, for example the database upgrade process, might require that values be set higher than the recommendations. For more details about kernel parameter tuning for Tivoli Storage Manager, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

Linux

To update the kernel parameters on Red Hat and SUSE Linux, you can run the `ipcs -l` command to list the parameter values. Analyze the output to determine whether any changes are required for your system.

For information about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter a search string such as `modifying kernel parameters`, in the **Search** field at this site.

For more details about kernel parameter tuning for Tivoli Storage Manager running on Linux systems, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

Related concepts

Appendix D, “Services associated with the Tivoli Storage Manager server,” on page 311

Scenario 3, manual: Creating the directories and the user ID for the upgraded server instance

Create the directories that the server instance needs for database and recovery logs, and create the user ID that will own the server instance.

1. 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.

   AIX HP-UX Linux Solaris

   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.

      AIX

      ```
      # mkgroup id=1001 tsmsrvrs
      # mkuser id=1002 pgrp=tsmsrvrs home=/home/tsminst1 tsminst1
      # passwd tsminst1
      ```

      HP-UX

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

      Linux

      ```
      # groupadd tsmsrvrs
      # adduser -d /home/tsminst1 -m -g tsmsrvrs -s /bin/bash tsminst1
      # passwd tsminst1
      ```

      Solaris

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

   b. Log off, then log in to your system, using the new user ID and password. Use a login method that causes a prompt for a password, so that the password can be changed 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. Log off the new user ID.

Windows

Identify the user account that will own the Tivoli Storage Manager server instance. When the server is started as a Windows service, this is the account that the service will log on to. The user account must have administrative authority on the system. One user account can own more than one server instance.

You can create a new user account, or use an existing account.

If you have multiple servers on one system and want to run each server with a different user account, create a new user account in this step.

a. Create the user ID.

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

Use the following command to create the user ID:

```
net user user_ID */add
```

You are prompted to create and verify a password for the new user ID.

b. Issue the following commands to create groups and add the new user ID to the groups:

```
net localgroup Administrators user_ID /add
net localgroup DB2ADMNS /add
net localgroup DB2USERS /add
net localgroup DB2ADMNS user_ID /add
net localgroup DB2USERS user_ID /add
```

c. Log in to your system, using the new user ID and password.

2. 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.

AIX HP-UX Linux Solaris

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`	

Windows

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 d:\tsm\server1`	

The database directories	`mkdir d:\tsm\db001`
	`mkdir e:\tsm\db002`
	`mkdir f:\tsm\db003`
	`mkdir g:\tsm\db004`	

Active log directory	`mkdir h:\tsm\log`	
Archive log directory	`mkdir i:\tsm\archlog`	
Optional: Directory for the log mirror for the active log	`mkdir j:\tsm\logmirror`	
Optional: Secondary archive log directory (failover location for archive log)	`mkdir k:\tsm\archlogfailover`	

3. 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.

   AIX HP-UX Linux Solaris

   Change the owner of the directories that were created to the user ID for the server instance.

   Windows

   Ensure that the user ID for the server instance has read/write access to the directories that were created.

4. For all disk space that is used by the V5 server for storage pools (device types of FILE and DISK), change ownership or access control so that the user ID that will own the upgraded Tivoli Storage Manager server instance has ownership or read/write permission. Use the appropriate method for your operating system.

Related tasks

"Planning space for the upgrade process and the upgraded server" on page 30

Related reference

"Server naming best practices" on page 55

Scenario 3: Creating and formatting the new database

Create the server instance and format files for an empty V6.1 database.

1. Log on to the system where you installed the V6.1 program.

   AIX HP-UX Linux Solaris

   Log in using the root user ID. Complete the following checks:

   a. Verify that the home directory exists for the user ID that owns the server instance. For example, if the user ID is tsminst1, the home directory is `/home/tsminst1`.
   b. Verify that a configuration profile exists for the user ID in its home directory. If necessary, create the configuration profile. For example, create a `.profile` file if you are using the Korn shell (ksh). The `.profile` file can be empty.

   Windows

   Log on as an administrator.

2. Create a Tivoli Storage Manager instance using the db2icrt command.

   AIX HP-UX Linux Solaris

   Enter the following command on one line. For the instance name, specify the user ID that you created to own the instance.

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

   For example, if the user ID for this instance is tsminst1, use the following command to create the instance.

   ```
   /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 using the user ID that is the instance owner.

   Windows

   Enter the following command on one line. The user account that you specify becomes the user ID that owns the V6.1 server (the instance user ID).

   ```
   db2icrt -u user_account instance_name
   ```

   The database service for the server instance logs on to the user account that is specified in this command.

   Use the registry key name of the V5 server as the instance name for the V6.1 server. For example, if the user account is tsminst1 and the server's registry key is Server1, enter the following command:

   ```
   db2icrt -u tsminst1 server1
   ```

   You are prompted to enter the password for the user account.

   The instance name that you specify on this db2icrt command is the name that you later specify with the -k option on the DSMSERV LOADFORMAT command, when you create and format the database and recovery log.

3. Log on to the system using the user ID that owns the V6.1 server instance (the instance user ID).

4. Copy the configuration files to the instance directory that you created for the new server. The files are the configuration files that you saved from the original V5 server:
   - Device configuration
   - Server options file (typically named `dsmserv.opt`)

   For example, if you created the instance directory that is shown in the example in the step to create directories for the V6.1 server, copy the files into the following directory:

   AIX HP-UX Linux Solaris `/home/tsminst1/tsminst1`

   Windows `d:\tsm\server1`

   Ensure that the user ID that owns the V6.1 server (the instance user ID) has ownership or read/write permission to the files that you copied.
5. Edit the server options file.
   a. Remove any options that are not supported for V6.1. For the list of deleted options, see Table 30 on page 53.
   b. Ensure that the server options file contains at least one VOLUMEHISTORY option and at least one DEVCONFIG option. Because a volume history file and a device configuration file are required when you must restore the database, generate copies of these files automatically to help ensure that the files are available when needed.
   c. Check whether the server options file includes the TXNGROUPMAX option with a value, and if it does, what the value is. You might want to change the current value because the default value for this option changes from 256 to 4096 with V6.1. The increased value can improve the performance for data movement operations such as storage pool migration and storage pool backup.
      - If the server options file does not include this option, the server automatically uses the new default value of 4096.
      - If the server options file includes a value for this option, the server uses that specified value. If the specified value is less than 4096, consider increasing the value, or removing the option so that the server uses the new default value.
6. Change the default path for the database.

   AIX HP-UX Linux Solaris

   Change the default path for the database to be the same as the instance directory for the server. Issue the command:

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

   For example:

   ```
   db2 update dbm cfg using dftdbpath /home/tsminst1/tsminst1
   ```

   Windows

   Change the default path for the database to be the drive where the instance directory for the server is located. Complete the following steps:
   a. Click **Start** → **Programs** → **IBM DB2** → **DB2TSM1** → **Command Line Tools** → **Command Line Processor**.
   b. Enter `quit` to exit the command-line processor.

A window with a command prompt opens, with the environment properly set up to successfully issue the commands in the next steps.

c. From the command prompt in that window, issue the following command to set the environment variable for the server instance that you are working with:

```
set db2instance=instance_name
```

The *instance_name* is the same as the instance name that you specified when you issued the db2icrt command. For example, to set the environment variable for the Server1 server instance, issue the following command:

```
set db2instance=server1
```

d. Issue the command to set the default drive:

```
db2 update dbm cfg using dftdbpath instance_location
```

For example, if the instance directory is `d:\tsm\server1`, the instance location is drive `d:`. Enter the command:

```
db2 update dbm cfg using dftdbpath d:
```

7. Complete this step if the system uses a locale other than the English regional locale.

AIX HP-UX Linux Solaris

If the system uses a locale other than the English regional locale, set the DB2CODEPAGE system environment variable to 819:

```
db2set -i instance_name DB2CODEPAGE=819
```

For example:

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

8. Change to the instance directory that you created for the server.
9. Create and format the database and recovery logs. In the command, specify the directories that you created for the database and logs. The directories must be empty.

AIX HP-UX Linux Solaris

For example, to get an active log size of 2 GB (2048 MB, the default size), issue the following command, on one line:

```
/opt/tivoli/tsm/server/bin/dsmserv loadformat \
dbdir=/tsmdb001,/tsmdb002,/tsmdb003,/tsmdb004 \
activelogsize=2048 activelogdir=/tsmlog \
mirrorlogdir=/tsmlogmirror archlogdir=/tsmarchlog
```

Windows

For example, to get an active log size of 2 GB (2048 MB, the default size) for the Server1 server instance, issue the following command, on one line:

```
"c:\Program Files\Tivoli\TSM\server\dsmserv" loadformat
dbdir=d:\tsm\db001,e:\tsm\db002,f:\tsm\db003,g:\tsm\db004
activelogsize=2048 activelogdir=h:\tsm\log
mirrorlogdir=j:\tsm\logmirror archlogdir=i:\tsm\archlog
```

If you have already created the first server instance on the system (server1) and are creating more, then you must use the -k option. The

-k option specifies the instance name for running this utility. For example, if the instance name for the server is server2, issue the command:

```
"c:\Program Files\Tivoli\TSM\server\dsmserv" -k server2
loadformat dbdir=d:\tsm\db001,e:\tsm\db002,f:\tsm\db003,g:\tsm\db004
activelogsize=2048 activelogdir=h:\tsm\log
mirrorlogdir=j:\tsm\logmirror archlogdir=i:\tsm\archlog
```

10. Monitor the process for errors and warning messages. The final message indicates success or failure of the operation.

Related tasks

"Estimating total space requirements for the upgrade process and upgraded server" on page 34

Related reference

"DSMSERV LOADFORMAT (Format a database)" on page 292

"Deleted server commands, utilities, and options" on page 50

Scenario 3: Loading the extracted data into the new database

After you have formatted an empty database using the DSMSERV LOADFORMAT utility, load the data that you extracted from the original server database.

The following requirements must be met:

- The manifest file from the DSMUPGRD EXTRACTDB operation must be available.
- The server options file must contain an entry for the device configuration file.
- The device configuration file must have information about the device class that is specified in the manifest file.
- The media that contains the extracted database must be available to the V6.1 server. The device must be physically attached to the system, and the permissions must be set to grant access to the media for the user ID that owns the V6.1 server instance.

Perform the following steps:

1. Verify that the V6.1 server can access the extracted data.
   - If the extracted data is on tape, the tape drive must be physically attached to the system.
   - If the extracted data was stored using a FILE device class:
     a. Log on to the system using the root user ID.
     b. Change the ownership of the files to the user ID that owns the V6.1 server (the instance user ID).
2. Log on with the server instance user ID on the system where you installed the V6.1 server.
3. Copy the manifest file that was created by the extraction process to the V6.1 system.
   a. Ensure that the user ID that owns the V6.1 server (the instance user ID) has ownership or read/write permission for the manifest file.
   b. View the contents of the manifest file to verify that any paths to volumes in a FILE device class are correct for the new system.
4. Ensure that the device configuration file from the original server is available.
   a. Verify that the server option file includes the DEVCONFIG option, and that the option specifies the full path of the device configuration file.

b. Verify that the device configuration file is available in the location specified by the DEVCONFIG option.
c. Verify that the permissions on the device configuration file allow read access for the user ID that owns the V6.1 server instance.

5. Verify that the contents of the device configuration file are correct. The device class that was used for the extraction step is recorded in the manifest file, and that device class must exist and be valid on the V6.1 system.
   a. Verify entries for FILE device classes. For example, paths might be different on the system.
   b. Verify entries for tape and other devices. For example, the device names might have changed.
6. Verify that the contents of the manifest file are correct. The manifest file contains a list of volumes to be used when loading the extracted data into the new database. For example, if the manifest file contains a list of volumes belonging to a FILE device class, ensure that the fully qualified path to the volumes is correct for the system.
7. Issue the DSMSERV INSERTDB command to load an extracted server database into the prepared, empty V6.1 database. Direct the output of the process to a file for monitoring. For example, enter the following command on one line:

   AIX HP-UX Linux Solaris

   ```
   nohup /opt/tivoli/tsm/server/bin/dsmserv insertdb \
   manifest=./manifest.txt >insert.out 2>&1 &
   ```

   Windows

   ```
   "c:\Program Files\Tivoli\TSM\server\dsmserv" insertdb \
   manifest=.\manifest.txt 1>>insert.out 2>&1
   ```

8. Monitor the process for errors and warning messages, and for items that you might need to take action on. The system displays interim statistics about the operation. A message near the end of the process output indicates success or failure of the operation:

   Success message: `ANR1395I INSERTDB: Process 1, database insert, has completed.`

   Failure message: `ANR1396E INSERTDB: Process 1, database insert, has completed with errors.`

   For example, issue the following command to monitor the process:

   ```
   tail -f insert.out
   ```

   The length of time that the process runs depends on the size of the database.

   Tip: On Windows systems, use the tail command or an equivalent utility with which you can monitor the contents of a file as it changes. For example, the Windows Server 2003 Resource Kit Tools includes the tail command, which can be used as shown in the preceding example.
9. If you used a tape device, after the insertion operation is complete remove or check out from the library the tape that holds the extracted data. Prevent the tape from being reused until you are sure that you do not need to run the insertion operation again.

Related concepts

"The manifest file for the data extraction to media" on page 288

Related reference

"DSMSERV INSERTDB (Move a server database into an empty database)" on page 294

Scenario 3: Creating a Windows service for the server instance

Windows

A Windows service is created for the Tivoli Storage Manager V6.1 server automatically if you use the upgrade wizard (dsmupgdx). If you do not use the wizard, you must create the Windows service for the Tivoli Storage Manager server manually.

1. Change to the installation directory for the server program. By default, the directory is `C:\Program Files\Tivoli\TSM\console`. If you installed the server in a different directory, change to the `console` subdirectory of the server installation directory.
2. Install the Windows service, using the Tivoli Storage Manager server instance name in the service name. Issue the following command:

   ```
   install "TSM server_instance_name"
    "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe" admin_name admin_password
   ```

   where:

   `"TSM server_instance_name"` is the name of the service that is being installed.

   server_instance_name is the instance name that was specified when you issued the db2icrt command.

   admin_name is the administrator account that owns the service.

   admin_password is the password for the administrator account.

   Example 1

   To install the Windows service for the Server1 server instance, enter the following command on one line. The example uses `rudy` as the administrator account, which has the password `s21ret`.

   ```
   install "TSM server1" "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
   rudy s21ret
   ```

   Example 2

   To install the Windows service for the Server2 server instance using LocalSystem as the logon account, issue the following command. Because the LocalSystem account does not have a password, use the quotation marks (" ") to specify a null password.

   ```
   install "TSM Server2" "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
   localsystem ""
   ```
3. Optional: Manually change the service to an automatic startup type by using Windows administrative tools (**Administrative Tools** → **Services**).

Related tasks

"Starting the server on Windows systems" on page 270

Scenario 3: Configuring the system for database backup

The database manager and the Tivoli Storage Manager API must be configured so that the database manager can back up the server database. The configuration is completed for you automatically if you use the upgrade wizard (dsmupgdx). If you do not use the wizard, you must complete the configuration manually.

- "Scenario 3: Configuring the system for database backup on AIX, HP-UX, Linux, and Solaris systems"
- "Scenario 3: Configuring the system for database backup on Microsoft Windows systems" on page 188

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Scenario 3: Configuring the system for database backup on AIX, HP-UX, Linux, and Solaris systems

AIX HP-UX Linux Solaris

If you did not use the upgrade wizard, you must complete the configuration for the database backup manually.

In the following steps, the examples use tsminst1 for the server instance user ID and `/home/tsminst1/tsminst1` for the Tivoli Storage Manager server instance directory.

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:

      AIX

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

      HP-UX Linux Solaris

      ```
      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:

   AIX `/usr/tivoli/tsm/client/api/bin64`

   HP-UX Linux Solaris `/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 on AIX, HP-UX, Linux, and Sun Solaris systems" on page 267 for the details.
   b. Log in using the root user ID.
   c. Source the database manager by running the following command.

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

      `. /home/tsminst1/sqllib/db2profile`
   d. Change the API password, using this command:
      `/home/tsminst1/sqllib/adsm/dsmapipw`
   e. When prompted by the dsmapipw command, specify `TSMDBMGR` as both the original and new password.
   f. Enter this operating system command:
      `rm /home/tsminst1/tsminst1/tsmdbmgr.log`

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Scenario 3: Configuring the system for database backup on Microsoft Windows systems

Windows

If you did not use the upgrade wizard, you must complete the configuration for the database backup manually.

Windows In the following commands, the examples use `server1` for the database instance and `d:\tsmserver1` for the Tivoli Storage Manager server directory. Replace these values with your actual values in the commands.

1. Create a file called `tsmdbmgr.env` in the `d:\tsmserver1` directory with the following contents:

   ```
   DSMI_CONFIG=d:\tsmserver1\tsmdbmgr.opt
   DSMI_LOG=d:\tsmserver1
   ```

2. Set the DSMI_ api environment-variable configuration for the database instance:
   a. Open a DB2 command window. One method of doing this is by going to the `C:\Program Files\Tivoli\TSM\db2\bin` directory, or if you installed Tivoli Storage Manager in a different location, go to the `db2\bin` subdirectory in your main installation directory. Then, issue this command:

      ```
      db2cmd
      ```

   b. Issue this command:

      ```
      db2set -i server1 DB2_VENDOR_INI=d:\tsmserver1\tsmdbmgr.env
      ```

3. Create a file called `tsmdbmgr.opt` in the `d:\tsmserver1` directory with the following contents:

   ```
   ************************************************
   nodename $$_TSMDBMGR_$$
   commmethod tcpip
   tcpserveraddr localhost
   tcpport 1500
   passwordaccess generate
   errorlogname d:\tsmserver1\TSMDBMGR_TSMSERVER1.log
   ```

4. Stop and start the database instance:
   a. Open a DB2 command window. One method of doing this is by going to the `C:\Program Files\Tivoli\TSM\db2\bin` directory, or if you installed Tivoli Storage Manager in a different location, go to the `db2\bin` subdirectory in your main installation directory. Then, issue this command:

      ```
      db2cmd
      ```

   b. Set the database instance:

      ```
      set db2instance=server1
      ```

   c. Stop DB2:

      ```
      db2stop
      ```

   d. Start DB2:

      ```
      db2start
      ```

5. Enter the following command on one line:

   ```
   "c:\program files\tivoli\tsm\server\dsmsutil.exe"
   UPDATEPW /NODE:$$_TSMDBMGR_$$ /PASSWORD:TSMDBMGR /VALIDATE:NO /OPTFILE:
   "d:\tsmserver1\tsmdbmgr.opt"
   ```

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, “Taking the first steps after upgrade,” on page 267.

Chapter 7. Scenario 4: New system, network method

Use this procedure if you are upgrading your server on a different system than your V5 server, and you are using the network method to move the data from the V5 database to the V6.1 database.

Perform these tasks to upgrade a server:

1. "Scenario 4: Preparing for the upgrade"
2. "Scenario 4: Installing the upgrade utilities" on page 194
3. Upgrading the server, using one of the following methods:
   - "Scenario 4: Upgrading the server using the upgrade wizard" on page 201
   - "Scenario 4: Upgrading the server manually using utilities" on page 210
4. Completing the upgrade by taking important first steps:
   a. "Verifying access to storage pools on disk" on page 267
   b. "Starting the server instance after the upgrade" on page 267
   c. "Registering licenses" on page 271
   d. "Backing up the database after upgrading the server" on page 271
   e. "Verifying the upgraded server" on page 272
   f. "Updating automation" on page 273
   g. "Monitoring the upgraded server" on page 273

Scenario 4: Preparing for the upgrade

Prepare for the upgrade by checking requirements, preparing the space that is required, backing up the server, and modifying certain server settings.

Follow the preparation steps carefully to protect your server and its data.

Important: It is possible, after the upgrade to V6.1 is complete, that conditions might cause the need to temporarily revert to the previous version of the server. Successfully reverting to the previous version of the server is possible only if you performed all preparation steps. To understand why it is important to perform all preparation steps, review the procedure for reverting an upgraded server to its previous version.

Perform these steps to prepare for the upgrade:

1. "Scenario 4: Checking the prerequisites for the upgrade" on page 190
2. "Scenario 4: Preparing space for the upgrade process" on page 191
3. "Scenario 4: Modifying the server before the upgrade" on page 191
4. "Scenario 4: Disabling sessions" on page 192
5. "Scenario 4: Backing up storage pools and the server database" on page 192
6. "Scenario 4: Backing up configuration information" on page 193
7. "Scenario 4: Stopping the server before installing the upgrade" on page 193

Related tasks

"Reverting from V6.1 to the previous V5 server version" on page 280

Scenario 4: Checking the prerequisites for the upgrade

Check your system against requirements for the server.

1. Ensure that the server that you plan to upgrade is at version 5.3.6 or later.
2. Ensure that the system where the V5 server is located meets the minimum requirements. Use the information in "Hardware and software requirements for the V5 server system that is being upgraded" on page 16 to determine whether you need to update your system before you continue.
3. Ensure that the system where you plan to install the V6.1 server meets requirements. Check the operating system level and the platform against the list of supported operating systems and platforms.

   Restriction: You cannot upgrade your server to run on an operating system that is different from the operating system it currently runs on. For example, you cannot upgrade a server running on an AIX system to a server running on a Linux system.

   Some platforms that were supported for earlier versions of the server are *not* supported for V6.1. If the server that you want to upgrade is running on one of these platforms, you cannot upgrade your server to V6.1 on the same platform. You must install your V6.1 server on a system that is a specific supported platform, depending on the original platform. See the following table.

Platform for V5 server	Required platform for upgrade to V6.1
HP-UX running on a PA-RISC system	HP-UX running on an Itanium system
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system
Linux running on a 32-bit x86 system	Linux running on an x86_64 system
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system

4. Check that the system memory meets the server requirements. If you plan to run multiple instances of the V6.1 server on the system, each instance requires the memory listed for one server. Multiply the memory for one server by the number of instances planned for the system.
5. Ensure that the system has enough disk storage for the database and recovery logs. Review the planning information for requirements and guidance.

   If you are adding new hardware for the server, such as new disk storage for the database, have the hardware installed and running.
6. Ensure that the new system can access the storage devices that are used on the original system. This includes disk and tape devices that are used to store client data.

Related concepts

"Hardware and software requirements for upgrading to the V6.1 server" on page 15

Scenario 4: Preparing space for the upgrade process

Determine the amount and type of space that is required for the upgrade process before beginning the process.

Verify that the system has the amount of space that was estimated in the planning step. Use the planning work sheet that you filled in with your information.

Related tasks

"Estimating total space requirements for the upgrade process and upgraded server" on page 34

Scenario 4: Modifying the server before the upgrade

A command must be run on the server to prevent one type of problem during the upgrade process. Some modifications to typical server settings are recommended to prepare for the upgrade.

1. From a Tivoli Storage Manager administrative command line, issue the command:

   ```
   convert ussfilespace
   ```

   This command fixes a problem that might exist in older Tivoli Storage Manager databases. If the problem does not exist in your database, the command completes quickly. If the problem exists in your database, the command might take some time to run.

   Important: Do not skip this step. If your database has the problem and you do not run this command now, the DSMUPGRD PREPAREDB utility fails when you run it. You must then restart the V5 server and run the CONVERT USSFILESPACE command before continuing with the upgrade process.
2. Review the steps for reverting to the earlier version of the server in the section, "Reverting from V6.1 to the previous V5 server version" on page 280.

   If for some reason you need to revert to the earlier version after the upgrade to V6.1, the results of the reversion will be better if you understand the steps and prepare for the possibility now.
3. Make the following adjustments to settings on your server and clients. These adjustments must be done to make it possible for you to revert to the original server after the upgrade, if problems occur.
   a. For each sequential-access storage pool, set the **REUSEDELAY** parameter to the number of days during which you want to be able to revert to the original server, if that becomes necessary.

      For example, if you want to be able to revert to the original server for up to 30 days after upgrading to V6.1, set the **REUSEDELAY** parameter to 31 days.
   b. For each copy storage pool, set the **RECLAIM** parameter to 100 (meaning 100%).
   c. If you typically use a DELETE VOLHISTORY command to delete database backups, ensure that the command does not delete database backups for at least the same number of days that you set for the **REUSEDELAY** period for sequential-access storage pools.
   d. For important clients that use the server, check that the value for the schedlogretention client option is set to retain the client schedule log for a long enough time. Update the option for clients if needed.

The entries in the client schedule log might be useful if the server must revert to the original version. If the retention period for the schedule log is too short, the schedule log information might be deleted too soon.

Scenario 4: Disabling sessions

In preparation for the upgrade, prevent activity on the server by disabling new sessions. Cancel any existing sessions.

The commands in the following procedure are Tivoli Storage Manager administrative commands.

1. Prevent all clients, storage agents, and other servers from starting new sessions with the server. Use the commands:

   ```
   disable sessions client
   disable sessions server
   ```

2. Prevent administrative activity from any user ID other than the administrator ID that is being used to perform the upgrade preparation. Lock out other administrator IDs if necessary:

   ```
   lock admin administrator_name
   ```

3. Check whether any sessions exist, and notify the users that the server is going to be stopped. To check for existing sessions, use the command:

   ```
   query session
   ```

4. Cancel sessions that are still running. Use the command:

   ```
   cancel session
   ```

Scenario 4: Backing up storage pools and the server database

Immediately before upgrading the server, back up primary storage pools to copy storage pools, and perform a full database backup.

1. Back up primary storage pools to copy storage pools using the BACKUP STGPOOL command. If you have been performing regular backups of the storage pools, this step backs up only the data that was added to the primary storage pools since they were last backed up.
2. Back up the database using the following command. Use either a full or snapshot backup type.

   ```
   backup db type=type devclass=device_class_name
   ```

   The device class that you specify must exist and have volumes that are available to it. For example, to perform a snapshot backup of your database to the TAPECLASS device class using scratch volumes, enter:

   ```
   backup db type=dbsnapshot devclass=tapeclass
   ```

   To use specific volumes instead of scratch volumes, specify the volume names in the command.

   Consider making two copies of the backup to protect the backup from media failures.

Scenario 4: Backing up configuration information

Before installing the new version, back up critical files and information for the server. Store the files in a safe place, because they are needed after the installation of the new software version is completed. You also need these files if you must revert to the previous version after the upgrade.

1. Back up device configuration information:

   ```
   backup devconfig filenames=file_name
   ```

2. Back up volume history information:

   ```
   backup volhistory filenames=file_name
   ```

   Ensure that the volume history includes information about the database backup that you completed in the preceding steps. For example, issue the command:

   ```
   query volhistory type=dbbackup
   ```

3. Make copies of these files, which are located in the default directory for the server:

   server options file, typically named `dsmserv.opt`

   `dsmserv.dsk`

4. Optional: Make a copy of the accounting log file, `dsmaccnt.log`.
5. Back up any scripts that have been used to perform daily housekeeping for the server. Examine the scripts for changes that are needed after the upgrade.
6. Store the device configuration file, the volume history file, the server options file, and the other files in a safe place. Select a location that is not on the system that is being upgraded.

Scenario 4: Creating a summary of database contents

Create a summary of the contents of the original database. After the upgrade, you can use the same commands to compare the results and to confirm that the database contents are intact.

Run commands that give a summary of information about your database contents. For example, issue commands that summarize the file spaces being protected, and save the results. See the sample commands for ideas.

Related reference

"Sample commands to run for validation of the database upgrade" on page 297

Scenario 4: Stopping the server before installing the upgrade

Stop all server processes and dismount any tapes that are mounted. Then stop the server.

The commands in the following procedure are Tivoli Storage Manager administrative commands.

1. Cancel sessions if any are still running. Use the command:

   ```
   cancel session
   ```

   Allow time for the sessions to be stopped. Some sessions, such as backup by a backup-archive client, might take some time to stop.

2. Determine whether server processes are running. Either cancel processes, or allow them to complete. Use the commands:

   ```
   query process
   cancel process process_number
   ```

Allow time for the processes to be stopped. Some processes, such as storage pool migration, might take some time to stop.

3. After all sessions and processes are stopped, determine whether any tapes are mounted. Dismount any tapes that are mounted. Use the commands:

```
query mount
dismount volume volume_name
```

4. Stop the server. Use the command:

```
halt
```

Scenario 4: Installing the upgrade utilities

You must install the upgrade utilities on the system where the V5 server is located. The installation package for the utilities must be downloaded from a Web site.

Use the procedure for your operating system:

- AIX "Scenario 4: Installing the upgrade utilities on AIX systems"
- HP-UX "Scenario 4: Installing the upgrade utilities on HP-UX systems" on page 196
- Linux "Scenario 4: Installing the upgrade utilities on Linux systems" on page 197
- Solaris "Scenario 4: Installing the upgrade utilities on Sun Solaris systems" on page 198
- Windows "Scenario 4: Installing the upgrade utilities on Microsoft Windows systems" on page 200

Related concepts

"The DSMUPGRD upgrade utilities" on page 15

Scenario 4: Installing the upgrade utilities on AIX systems

AIX

Install the upgrade utilities on the system where the V5 server is located. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package that matches your platform, and download it to a convenient location on the server system. The name of the package has the following form:

      ```
      5.5.x.x-TIV-TSMUPG-AIX.tar.gz
      ```

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.

d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.

2. Log in with the root user ID.
3. Ensure that the system has the following file sets installed:

   `xlC.rte 8.0.0.5`, or later

   `gsksa.rte 7.0.4.11`

   You can use the following commands to check for these file sets:

   ```
   lslpp -L xlC.rte
   ```

   ```
   lslpp -L gsksa.rte
   ```

   If needed, you can obtain the `gsksa.rte` file set from any of the regular V5.5 maintenance packages for the AIX server. The maintenance packages are available on the FTP downloads site: ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server/v5r5/AIX/
4. Extract the contents of the upgrade utilities package. If you downloaded a language package, also extract the contents of that package.
5. Access the System Management Interface Tool (SMIT).
   a. Enter `smitty install_update`
   b. Select **Install and Update Software** → **Install and Update from ALL Available Software**.
6. Select the **INPUT** device. Specify the directory location of the upgrade utilities package on the system.
7. Select **Software to Install**. Press F4 or Esc+4 for the list of available file sets in the directory.
8. Select the file sets for the upgrade utilities, the device driver, and optionally the language pack. The file set for the upgrade utilities is `tivoli.tsmupg.server`. Optional language packs include messages for languages other than U.S. English.
9. Set **COMMIT software updates** to `Yes`. Press F4 or Esc+4.
10. Set **SAVE replaced files** to `No`.
11. Ensure that the default settings for the options in the window for all the selected file sets show `success`.
12. Press Enter, and respond to the `ARE YOU SURE?` question by pressing Enter again. The installation begins.
13. When the installation is complete, exit the SMIT program.
14. Optional: If you installed a language package, ensure that the locale environment variable is set to use it. Enter the following command to set the locale environment variable for messages:

    ```
    export LC_MESSAGES=xxxx
    ```

    where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:

    - The locale is installed on the system.
    - The upgrade utilities support the locale.
    - The language package that you installed for the upgrade utilities matches the locale.

15. After the upgrade utilities are installed, continue at "Scenario 4: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 199.

Scenario 4: Installing the upgrade utilities on HP-UX systems

HP-UX

Install the upgrade utilities on the system where the V5 server is located. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package that matches your platform, and download it to a convenient location on the server system. The name of the package has the following form:

      `5.5.x.x-TIV-TSMUPG-platform.tar.gz`

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Extract the contents of the upgrade utilities package. For example, from the directory where you saved the download package, issue the command:

   ```
   gzip -dc package_name.tar.gz | tar -xvf -
   ```
4. Install the upgrade utilities and the device driver. Use the source argument (**-s**) to specify the directory where the package was extracted. For example, if the directory is `/tmp/TSM`, issue the command:

   ```
   swinstall -s /tmp/TSM package_name
   ```

   The utilities are installed in the directory `/opt/tivoli/tsm/upgrade/bin`.
5. Optional: Install the language package.
   a. Extract the contents of the package.

      ```
      gzip -d package_name.img.gz
      ```
   b. Install the package. For example, if the directory is `/tmp/TSM`, issue the command:

      ```
      swinstall -s /tmp/TSM/package_name.img package_name
      ```
   c. Enter the following command to set the locale environment variable for messages:

      ```
      export LC_MESSAGES=xxxx
      ```

where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:

- The locale is installed on the system.
- The upgrade utilities support the locale.
- The language package that you installed for the upgrade utilities matches the locale.

6. After the upgrade utilities are installed, continue at "Scenario 4: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 199.

Scenario 4: Installing the upgrade utilities on Linux systems

Linux

Install the upgrade utilities on the system where the V5 server is located. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Open the directory for your platform and download the package. The name of the package has the following form:

      ```
      5.5.x.x-TIV-TSMUPG-platform.tar.bz2
      ```

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Extract the contents of the upgrade utilities package. For example, from the directory where you saved the download package, issue the commands:

   ```
   bunzip2 package_name.tar.bz2
   tar xvf package_name.tar
   ```

4. Install the upgrade utilities and the device driver. Use the following command:

   ```
   rpm -ivh package_name.rpm
   ```

   The utilities are installed in the directory `/opt/tivoli/tsm/upgrade/bin` by default.
5. Optional: Install the language package.
   a. Extract the contents of the downloaded package.

      ```
      bunzip2 package_name.tar.bz2
      tar xvf package_name.tar
      ```

   b. Install the package for the language that you want to use.

      ```
      rpm -ivh package_name.rpm
      ```

c. Enter the following command to set the locale environment variable for messages:

```
export LC_MESSAGES=xxxx
```

where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:

- The locale is installed on the system.
- The upgrade utilities support the locale.
- The language package that you installed for the upgrade utilities matches the locale.

6. After the upgrade utilities are installed, continue at "Scenario 4: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 199.

Scenario 4: Installing the upgrade utilities on Sun Solaris systems

Solaris

Install the upgrade utilities on the system where the V5 server is located. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package that matches your platform, and download it to a convenient location on the server system. The name of the package has the following form:

      ```
      5.5.x.x-TIV-TSMUPG-platform.tar.Z
      ```

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Change to the directory where the upgrade utilities package was downloaded.
4. Extract the contents of the upgrade utilities package. For example, from the directory where you saved the download package, issue the command:

   ```
   uncompress -c package_name.tar.Z | tar -xvf -
   ```
5. Install the upgrade utilities and the device driver. Use the source argument (**-d**) to specify the directory where the package was extracted. For example, if the directory is `/tmp/TSM`, issue the command:

   ```
   pkgadd -d /tmp/TSM package_name
   ```

The utilities are installed in the directory `/opt/tivoli/tsm/upgrade/bin` by default.

6. Optional: Install the language package.
   a. Extract the contents of the downloaded package.

      ```
      uncompress package_name.pkg.Z
      ```

   b. Install the package for the language that you want to use. Use the source argument (**-d**) to specify the directory where the package was extracted. For example, if the directory is `/tmp/TSM`, issue the command:

      ```
      pkgadd -d /tmp/TSM package_name.pkg package_name
      ```

   c. Enter the following command to set the locale environment variable for messages:

      ```
      export LC_MESSAGES=xxxx
      ```

      where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:
      - The locale is installed on the system.
      - The upgrade utilities support the locale.
      - The language package that you installed for the upgrade utilities matches the locale.
7. After the upgrade utilities are installed, continue at "Scenario 4: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems."

Scenario 4: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems

AIX HP-UX Linux Solaris

After installing the upgrade utility package, you must set environment variables in the shell from which you will run the utilities. An environment variable describes the operating environment of a process, such as the home directory or terminal in use.

The environment variables available are:

DSMSERV_DIR

Specifies the installed location of the upgrade utilities.

By default the location is:

AIX `/usr/tivoli/tsm/upgrade/bin`

HP-UX Linux Solaris `/opt/tivoli/tsm/upgrade/bin`

DSMSERV_CONFIG

Specifies the name and location of the options file for the server that you want to upgrade. For example, to set the name to `dsmserv.opt` and the location to be the directory from which you run the DSMUPGRD utility, use: `./dsmserv.opt`

If you are upgrading multiple servers on the system, you can instead use the -o option each time that you use the DSMUPGRD utility, to specify the server option file for the server that you want to work with.

If you set the **DSMSERV_CONFIG** environment variable using a relative path (for example, `./dsmserv.opt`), you *must* run the DSMUPGRD utility

from the directory where the `dsmserv.opt` file is stored. Otherwise the DSMUPGRD utility fails to open the server options file and stops.

Use the appropriate command for your system to set the environment variables for running the utilities. For example, on an AIX system that uses a shell in the `ksh` family, enter the command to set the **DSMSERV_DIR** variable:

```
export DSMSERV_DIR=/usr/tivoli/tsm/upgrade/bin
```

If you set the **DSMSERV_CONFIG** variable, you set it in a similar way. For example:

```
export DSMSERV_CONFIG=./dsmserv.opt
```

Use the following command if your shell is in the `csh` family:

```
setenv DSMSERV_DIR /usr/tivoli/tsm/upgrade/bin
```

After you set the environment variables, continue the upgrade process using one of the following topics:

- "Scenario 4: Upgrading the server using the upgrade wizard" on page 201
- "Scenario 4: Upgrading the server manually using utilities" on page 210

Scenario 4: Installing the upgrade utilities on Microsoft Windows systems

Windows

Install the upgrade utilities on the system where the V5 server is located. The package to install is available for download from the FTP downloads site. The upgrade utilities are used to prepare and extract the database from the original server.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/WIN
   b. Open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package and download it to a convenient location on the server system. The name of the package has the following form:

      ```
      5.5.x.x-TIV-TSMUPG-Windows.exe
      ```

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
2. Log on with an administrator ID.
3. Run the executable package for the upgrade utilities.

   The default location for the installation of the utilities is based on the location where the V5 server was last installed. For example, if the V5 server was installed using the default path, `C:\Program Files\Tivoli\TSM\server`, the upgrade utilities are installed in `C:\Program Files\Tivoli\TSM\upgrade`.

   Restriction: Do *not* install the utilities in the same directory as the original server that is to be upgraded. Install the utilities package in its own directory.

After the upgrade utilities are installed, continue the upgrade process using one of the following topics:

- “Scenario 4: Upgrading the server using the upgrade wizard”
- “Scenario 4: Upgrading the server manually using utilities” on page 210

Tip: When you use the upgrade utilities, if you have multiple servers running on the system, you must use the -k option to specify the name of the Windows registry key from which to retrieve information about the server being upgraded. The default value for the option is SERVER1.

Scenario 4: Upgrading the server using the upgrade wizard

The wizard offers a guided approach to upgrading 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 V6.1 server program.

Before beginning the following steps, you must complete all preceding steps to prepare for the upgrade and to install the upgrade utilities.

The V6.1 server must be installed, and directories and the user ID must be created before starting the upgrade wizard. Complete the following steps:

1. Scenario 4: Installing the V6.1 server
2. Scenario 4: Creating the directories and the user ID for the upgraded server instance
3. “Scenario 4: Starting the upgrade wizard” on page 209

Scenario 4, wizard: Installing the V6.1 server

You can use an installation wizard to perform the installation, or install the program using the console.

Ensure that you have completed all upgrade preparation steps, including backup of the server database, before beginning the installation procedure. The server will not be available until after installation and upgrade steps are completed.

1. For some operating systems, you need to check certain system settings before beginning installation.

   Linux

   If you are using Security Enhanced Linux on your system, set `SELINUX=disable` or set `SELINUX=permissive` in the `/etc/sysconfig/selinux` file, at least until the installation process completes.

   If you do not adjust the setting, you receive the following message when you try to install the server:

   ```
   The installer cannot run on your configuration. It will now quit.
   ```

   Solaris

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

2. Log on to the system.

   AIX HP-UX Linux Solaris

   Log in using the root user ID.

   Windows

   Log on as an administrator.

3. If you have the product DVD, complete the following steps.

AIX HP-UX Linux Solaris

Insert the Tivoli Storage Manager DVD into a DVD drive. Ensure that the DVD is mounted on directory /dvdrom and change to that directory.

Windows

Insert the Tivoli Storage Manager server DVD. Use Windows Explorer to view the contents of the DVD.

4. If you downloaded the program from Passport Advantage as an executable file, complete the following steps.

AIX HP-UX Linux Solaris

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

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

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

   System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24018523

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

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

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.

Windows

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=swg24018518

   Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24018521

   System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24018524

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

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

c. Either double-click the executable file, or enter the following command on the command line to extract the installation files. The files are extracted to the current directory.

```
package_name.exe
```

The *package_name* is typically a name such as `CZ1N9ML`. The package is large, so the extraction takes some time.

5. From the DVD, or from the location where you extracted the program package, start the installation wizard. You can use either the graphical wizard or the console wizard.

   AIX HP-UX Linux Solaris

   - Start the graphical wizard:
     ```
     ./install.bin
     ```
   - Start the console wizard:
     ```
     ./install.bin -i console
     ```

   Windows

   - Start the graphical wizard:
     ```
     install.exe
     ```
   - Start the console wizard:
     ```
     install.exe -i console
     ```

   See the *Tivoli Storage Manager Installation Guide* for information about how to perform a silent installation of the server. For information about translations that are available for the server, see Appendix A, "Server language locales," on page 299.

6. Select the language for the installation and follow the instructions.

   AIX

   a. You must accept the license agreement to complete the installation.
   b. Select the components to install. You must select at least the server, license, and **Tivoli Storage Manager Server Languages** in the component list. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.
   c. On the **Server Language Selection** page, select English (not UTF8) and any other language packs that you need. You must select English because it installs the `tivoli.tsm.server.msg.en_US` package, which includes the help messages.

   HP-UX Linux Solaris

   a. You must accept the license agreement to complete the installation.
   b. Select the components to install. You must install at least the server and license. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.

   Windows

   a. You must accept the license agreement to complete the installation.
   b. Select the components to install. You must install at least the server and license. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.

   The Tivoli Storage Manager application programming interface (API) and DB2 Version 9.5 are automatically installed when you install the server.

7. When the installation is complete, verify that you see a message that the installation is successful.

   Important: If there are any errors during the installation, a summary panel lists the errors and directs you to an error log file. Fix the errors before continuing with the upgrade.

   The installation log is stored in the following location:

   AIX HP-UX Linux Solaris `/var/tivoli/tsm`

   Windows The directory that was chosen for installation (look for the files `log.txt` and `logs.zip`)

8. Download and apply any applicable fixes that have been released for the server. Go to the product support site, http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html, and click **Download**. Search for server updates.

   You can also check the FTP downloads site: ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server/

9. HP-UX Linux Solaris Modify kernel parameter values, if necessary.

   HP-UX

   Run the db2osconf utility to get recommendations for changes to kernel parameter values that are based on the size of the system. Make changes based on the recommendations in the results from the utility. You might need to restart the system.

   For information about the utility and about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter the utility name, db2osconf, in the **Search** field at this site.

   Important: The recommendations from the db2osconf utility are minimum values. Some workloads, for example the database upgrade process, might require that values be set higher than the recommendations. For more details about kernel parameter tuning for Tivoli Storage Manager, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

   System resources such as semaphores might also require special configuration and tuning. See Appendix B, “HP-UX system resource requirements,” on page 305.

   Solaris

   Run the db2osconf utility to get recommendations for changes to kernel parameter values that are based on the size of the system. Make changes based on the recommendations in the results from the utility. You might need to restart the system.

   For information about the utility and about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter the utility name, db2osconf, in the **Search** field at this site.

   Important: The recommendations from the db2osconf utility are minimum values. Some workloads, for example the database upgrade process, might require that values be set higher than the

recommendations. For more details about kernel parameter tuning for Tivoli Storage Manager, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

Linux

To update the kernel parameters on Red Hat and SUSE Linux, you can run the `ipcs -l` command to list the parameter values. Analyze the output to determine whether any changes are required for your system.

For information about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter a search string such as `modifying kernel parameters`, in the **Search** field at this site.

For more details about kernel parameter tuning for Tivoli Storage Manager running on Linux systems, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

Related concepts

Appendix D, "Services associated with the Tivoli Storage Manager server," on page 311

Scenario 4, wizard: Creating the directories and the user ID for the upgraded server instance

Create the directories that the server instance needs for database and recovery logs, and create the user ID that will own the server instance.

1. 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.

   AIX HP-UX Linux Solaris

   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.

      AIX

      ```
      # mkgroup id=1001 tsmsrvrs
      # mkuser id=1002 pgrp=tsmsrvrs home=/home/tsminst1 tsminst1
      # passwd tsminst1
      ```

      HP-UX

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

Linux

```
# groupadd tsmsrvrs
# adduser -d /home/tsminst1 -m -g tsmsrvrs -s /bin/bash tsminst1
# passwd tsminst1
```

Solaris

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

b. Log off, then log in to your system, using the new user ID and password. Use a login method that causes a prompt for a password, so that the password can be changed 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. Log off the new user ID.

Windows

Identify the user account that will own the Tivoli Storage Manager server instance. When the server is started as a Windows service, this is the account that the service will log on to. The user account must have administrative authority on the system. One user account can own more than one server instance.

You can create a new user account, or use an existing account.

If you have multiple servers on one system and want to run each server with a different user account, create a new user account in this step.

a. Create the user ID.

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

Use the following command to create the user ID:

```
net user user_ID */add
```

You are prompted to create and verify a password for the new user ID.

b. Issue the following commands to create groups and add the new user ID to the groups:

```
net localgroup Administrators user_ID /add
net localgroup DB2ADMNS /add
net localgroup DB2USERS /add
net localgroup DB2ADMNS user_ID /add
net localgroup DB2USERS user_ID /add
```

c. Log in to your system, using the new user ID and password.

2. 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.

AIX HP-UX Linux Solaris

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`	

Windows

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 d:\tsm\server1`	

The database directories	`mkdir d:\tsm\db001`
	`mkdir e:\tsm\db002`
	`mkdir f:\tsm\db003`
	`mkdir g:\tsm\db004`	

Active log directory	`mkdir h:\tsm\log`	
Archive log directory	`mkdir i:\tsm\archlog`	
Optional: Directory for the log mirror for the active log	`mkdir j:\tsm\logmirror`	
Optional: Secondary archive log directory (failover location for archive log)	`mkdir k:\tsm\archlogfailover`	

3. 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.

   AIX HP-UX Linux Solaris

   Change the owner of the directories that were created to the user ID for the server instance.

   Windows

   Ensure that the user ID for the server instance has read/write access to the directories that were created.

4. For all disk space that is used by the V5 server for storage pools (device types of FILE and DISK), change ownership or access control so that the user ID that will own the upgraded Tivoli Storage Manager server instance has ownership or read/write permission. Use the appropriate method for your operating system.

Related tasks

"Planning space for the upgrade process and the upgraded server" on page 30

Related reference

"Server naming best practices" on page 55

Scenario 4: Starting the upgrade wizard

The wizard offers a guided approach to upgrading 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 V6.1 server program.

Before beginning the upgrade wizard, you must complete all preceding steps to prepare for the upgrade, to install the upgrade utilities, to install the V6.1 server program, and to create the directories and user ID for the server instance.

1. Ensure that the following requirements are met.

   AIX HP-UX Linux Solaris

   - The system where you installed the V6.1 server program must have the X Window client. You must also be running an X Window server on your desktop.
   - The systems 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 V6.1 system with the user ID that you created for the server instance, using the SSH, RSH, or REXEC protocol. When using the wizard, you must provide this user ID and password to access that system.

   Windows

   - The systems 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).
     - Windows server message block (SMB)

       SMB is the interface used by File and Print Sharing (also known as CIFS). To use the SMB protocol, you must ensure that File and Print Sharing is enabled, and that port 445 is not blocked by your firewall. If you are running on Windows Server 2008 or Windows Vista, you might also need to disable User Account Control (at least while running this wizard). If you choose not to disable User Account Control, you must ensure that one of the other protocols is configured to allow the wizard to run.
   - You must be able to log on to the system using a protocol that is enabled on the system, using either the user ID that you created for the server instance, or some other user ID that exists on the system. When using the wizard, you must provide the user ID and password to access the system.
2. Start the upgrade wizard, dsmupgdx, from the V6.1 server installation directory.

AIX HP-UX Linux Solaris

Log in using the root user ID. Issue the command:

```
/opt/tivoli/tsm/server/bin/dsmupgdx
```

Windows

Open a new Command Prompt window, and issue the command:

```
"c:\Program Files\Tivoli\TSM\server\dsmupgdx.exe"
```

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

   Important: Read all messages that appear for each phase of the upgrade process, in the message display area within the wizard. Informational messages might show actions that occurred during the process that are important to you.

To complete the upgrade, perform the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Scenario 4: Upgrading the server manually using utilities

Use the utilities to upgrade the server using a command interface.

Before beginning the following steps, you must complete all preceding steps to prepare for the upgrade and to install the upgrade utilities.

Complete the following steps:

1. "Scenario 4: Preparing the database of a V5 server for upgrade"
2. Scenario 4: Installing the V6.1 server
3. Scenario 4: Creating the directories and the user ID for the upgraded server instance
4. "Scenario 4: Creating and formatting the new database" on page 220
5. "Scenario 4: Moving the server database over a network" on page 223
6. "Scenario 4: Creating a Windows service for the server instance" on page 224
7. "Scenario 4: Configuring the system for database backup" on page 225

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Related concepts

"The DSMUPGRD upgrade utilities" on page 15

Scenario 4: Preparing the database of a V5 server for upgrade

Before extracting the data from the database, you must prepare the server database by using the DSMUPGRD PREPAREDB utility. If you have multiple servers on a single system, you must repeat this task for each server.

1. Ensure that you have completed all preparation steps.
2. Log in using the root user ID on the system that has the original server. Log on with the administrator ID on a Windows system.
3. Change to the instance directory for the server that you are upgrading. The instance directory is the directory that contains the files such as `dsmserv.dsk` for the server.

4. AIX HP-UX Linux Solaris Set the environment variables for the shell. See "Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 240.
5. Prepare the database. Direct the output of the process to a file for monitoring.

   AIX

   From the instance directory for the server that you are upgrading, issue the following command to run the process in the background and direct the output to the file called `prepare.out`:

   ```
   nohup /usr/tivoli/tsm/upgrade/bin/dsmupgrd preparedb >prepare.out 2>&1 &
   ```

   HP-UX Linux Solaris

   From the instance directory for the server that you are upgrading, issue the following command to run the process in the background and direct the output to the file called `prepare.out`:

   ```
   nohup /opt/tivoli/tsm/upgrade/bin/dsmupgrd preparedb >prepare.out 2>&1 &
   ```

   Windows

   From the instance directory for the server that you are upgrading, issue the following command to run the process and direct the output to the file called `prepare.out`:

   ```
   "c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd"
       preparedb 1>>prepare.out 2>&1
   ```

   If multiple servers exist on the system, issue the command from the instance directory for the server that you want to prepare, and specify the registry key for that server. For example, if the server is SERVER2:

   ```
   "c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd" -k server2
       preparedb 1>>prepare.out 2>&1
   ```

6. Monitor the process for errors and warning messages. The final message indicates success or failure of the operation. From the instance directory for the server that you are upgrading, issue the following command to monitor the process:

   ```
   tail -f prepare.out
   ```

   Tip: On Windows systems, use the tail command or an equivalent utility with which you can monitor the contents of a file as it changes. For example, the Windows Server 2003 Resource Kit Tools includes the tail command, which can be used as shown in the preceding example.
7. Ensure that the prepare operation is completed successfully before continuing to the next step. If the prepare operation fails, you might need to restart the V5 server to fix the problem and run the prepare operation again. If the server being upgraded is a V5.3 or V5.4 server, you might need to restore the database using a backup before you can restart the server to correct the problem.

Related reference

"DSMUPGRD PREPAREDB (Prepare a V5 database for upgrade)" on page 285

Scenario 4, manual: Installing the V6.1 server

You can use an installation wizard to perform the installation, or install the program using the console.

Ensure that you have completed all upgrade preparation steps, including backup of the server database, before beginning the installation procedure. The server will not be available until after installation and upgrade steps are completed.

1. For some operating systems, you need to check certain system settings before beginning installation.

   Linux

   If you are using Security Enhanced Linux on your system, set `SELINUX=disable` or set `SELINUX=permissive` in the `/etc/sysconfig/selinux` file, at least until the installation process completes.

   If you do not adjust the setting, you receive the following message when you try to install the server:

   ```
   The installer cannot run on your configuration. It will now quit.
   ```

   Solaris

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

2. Log on to the system.

   AIX HP-UX Linux Solaris

   Log in using the root user ID.

   Windows

   Log on as an administrator.

3. If you have the product DVD, complete the following steps.

   AIX HP-UX Linux Solaris

   Insert the Tivoli Storage Manager DVD into a DVD drive. Ensure that the DVD is mounted on directory /dvdrom and change to that directory.

   Windows

   Insert the Tivoli Storage Manager server DVD. Use Windows Explorer to view the contents of the DVD.

4. If you downloaded the program from Passport Advantage as an executable file, complete the following steps.

   AIX HP-UX Linux Solaris

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

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

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

      System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24018523

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

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

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.

Windows

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=swg24018518

Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24018521

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24018524

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

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

c. Either double-click the executable file, or enter the following command on the command line to extract the installation files. The files are extracted to the current directory.

```
package_name.exe
```

The *package_name* is typically a name such as `CZ1N9ML`. The package is large, so the extraction takes some time.

5. From the DVD, or from the location where you extracted the program package, start the installation wizard. You can use either the graphical wizard or the console wizard.

AIX HP-UX Linux Solaris

- Start the graphical wizard:

```
./install.bin
```

- Start the console wizard:

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

Windows

- Start the graphical wizard:

```
install.exe
```

- Start the console wizard:

```
install.exe -i console
```

See the *Tivoli Storage Manager Installation Guide* for information about how to perform a silent installation of the server. For information about translations that are available for the server, see Appendix A, "Server language locales," on page 299.

6. Select the language for the installation and follow the instructions.

   AIX

   a. You must accept the license agreement to complete the installation.
   b. Select the components to install. You must select at least the server, license, and **Tivoli Storage Manager Server Languages** in the component list. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.
   c. On the **Server Language Selection** page, select English (not UTF8) and any other language packs that you need. You must select English because it installs the `tivoli.tsm.server.msg.en_US` package, which includes the help messages.

   HP-UX Linux Solaris

   a. You must accept the license agreement to complete the installation.
   b. Select the components to install. You must install at least the server and license. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.

   Windows

   a. You must accept the license agreement to complete the installation.
   b. Select the components to install. You must install at least the server and license. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.

   The Tivoli Storage Manager application programming interface (API) and DB2 Version 9.5 are automatically installed when you install the server.

7. When the installation is complete, verify that you see a message that the installation is successful.

   Important: If there are any errors during the installation, a summary panel lists the errors and directs you to an error log file. Fix the errors before continuing with the upgrade.

   The installation log is stored in the following location:

   AIX HP-UX Linux Solaris `/var/tivoli/tsm`

   Windows The directory that was chosen for installation (look for the files `log.txt` and `logs.zip`)

8. Download and apply any applicable fixes that have been released for the server. Go to the product support site, http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html, and click **Download**. Search for server updates.

   You can also check the FTP downloads site: ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server/

9. HP-UX Linux Solaris Modify kernel parameter values, if necessary.

HP-UX

Run the db2osconf utility to get recommendations for changes to kernel parameter values that are based on the size of the system. Make changes based on the recommendations in the results from the utility. You might need to restart the system.

For information about the utility and about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter the utility name, db2osconf, in the **Search** field at this site.

Important: The recommendations from the db2osconf utility are minimum values. Some workloads, for example the database upgrade process, might require that values be set higher than the recommendations. For more details about kernel parameter tuning for Tivoli Storage Manager, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

System resources such as semaphores might also require special configuration and tuning. See Appendix B, "HP-UX system resource requirements," on page 305.

Solaris

Run the db2osconf utility to get recommendations for changes to kernel parameter values that are based on the size of the system. Make changes based on the recommendations in the results from the utility. You might need to restart the system.

For information about the utility and about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter the utility name, db2osconf, in the **Search** field at this site.

Important: The recommendations from the db2osconf utility are minimum values. Some workloads, for example the database upgrade process, might require that values be set higher than the recommendations. For more details about kernel parameter tuning for Tivoli Storage Manager, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

Linux

To update the kernel parameters on Red Hat and SUSE Linux, you can run the `ipcs -l` command to list the parameter values. Analyze the output to determine whether any changes are required for your system.

For information about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter a search string such as `modifying kernel parameters`, in the **Search** field at this site.

For more details about kernel parameter tuning for Tivoli Storage Manager running on Linux systems, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

Related concepts

Appendix D, "Services associated with the Tivoli Storage Manager server," on page 311

Scenario 4, manual: Creating the directories and the user ID for the upgraded server instance

Create the directories that the server instance needs for database and recovery logs, and create the user ID that will own the server instance.

1. 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.

   AIX HP-UX Linux Solaris

   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.

      AIX

      ```
      # mkgroup id=1001 tsmsrvrs
      # mkuser id=1002 pgrp=tsmsrvrs home=/home/tsminst1 tsminst1
      # passwd tsminst1
      ```

      HP-UX

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

      Linux

      ```
      # groupadd tsmsrvrs
      # adduser -d /home/tsminst1 -m -g tsmsrvrs -s /bin/bash tsminst1
      # passwd tsminst1
      ```

      Solaris

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

   b. Log off, then log in to your system, using the new user ID and password. Use a login method that causes a prompt for a password, so that the password can be changed 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. Log off the new user ID.

Windows

Identify the user account that will own the Tivoli Storage Manager server instance. When the server is started as a Windows service, this is the account that the service will log on to. The user account must have administrative authority on the system. One user account can own more than one server instance.

You can create a new user account, or use an existing account.

If you have multiple servers on one system and want to run each server with a different user account, create a new user account in this step.

a. Create the user ID.

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

   Use the following command to create the user ID:

   ```
   net user user_ID */add
   ```

   You are prompted to create and verify a password for the new user ID.

b. Issue the following commands to create groups and add the new user ID to the groups:

   ```
   net localgroup Administrators user_ID /add
   net localgroup DB2ADMNS /add
   net localgroup DB2USERS /add
   net localgroup DB2ADMNS user_ID /add
   net localgroup DB2USERS user_ID /add
   ```

c. Log in to your system, using the new user ID and password.

2. 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.

AIX HP-UX Linux Solaris

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`	

Windows

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 d:\tsm\server1`	

The database directories	`mkdir d:\tsm\db001`
	`mkdir e:\tsm\db002`
	`mkdir f:\tsm\db003`
	`mkdir g:\tsm\db004`	

Active log directory	`mkdir h:\tsm\log`	
Archive log directory	`mkdir i:\tsm\archlog`	
Optional: Directory for the log mirror for the active log	`mkdir j:\tsm\logmirror`	
Optional: Secondary archive log directory (failover location for archive log)	`mkdir k:\tsm\archlogfailover`	

3. 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.

   AIX HP-UX Linux Solaris

   Change the owner of the directories that were created to the user ID for the server instance.

   Windows

   Ensure that the user ID for the server instance has read/write access to the directories that were created.

4. For all disk space that is used by the V5 server for storage pools (device types of FILE and DISK), change ownership or access control so that the user ID that will own the upgraded Tivoli Storage Manager server instance has ownership or read/write permission. Use the appropriate method for your operating system.

Related tasks

"Planning space for the upgrade process and the upgraded server" on page 30

Related reference

"Server naming best practices" on page 55

Scenario 4: Creating and formatting the new database

Create the server instance and format files for an empty V6.1 database.

1. Log on to the system where you installed the V6.1 program.

   AIX HP-UX Linux Solaris

   Log in using the root user ID. Complete the following checks:

   a. Verify that the home directory exists for the user ID that owns the server instance. For example, if the user ID is tsminst1, the home directory is `/home/tsminst1`.
   b. Verify that a configuration profile exists for the user ID in its home directory. If necessary, create the configuration profile. For example, create a `.profile` file if you are using the Korn shell (ksh). The `.profile` file can be empty.

   Windows

   Log on as an administrator.

2. Create a Tivoli Storage Manager instance using the db2icrt command.

   AIX HP-UX Linux Solaris

   Enter the following command on one line. For the instance name, specify the user ID that you created to own the instance.

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

   For example, if the user ID for this instance is tsminst1, use the following command to create the instance.

   ```
   /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 using the user ID that is the instance owner.

   Windows

   Enter the following command on one line. The user account that you specify becomes the user ID that owns the V6.1 server (the instance user ID).

   ```
   db2icrt -u user_account instance_name
   ```

   The database service for the server instance logs on to the user account that is specified in this command.

   Use the registry key name of the V5 server as the instance name for the V6.1 server. For example, if the user account is tsminst1 and the server's registry key is Server1, enter the following command:

   ```
   db2icrt -u tsminst1 server1
   ```

   You are prompted to enter the password for the user account.

   The instance name that you specify on this db2icrt command is the name that you later specify with the -k option on the DSMSERV LOADFORMAT command, when you create and format the database and recovery log.

3. Log on to the system using the user ID that owns the V6.1 server instance (the instance user ID).

4. Copy the configuration files to the instance directory that you created for the new server. The files are the configuration files that you saved from the original V5 server:
   - Device configuration
   - Server options file (typically named `dsmserv.opt`)

   For example, if you created the instance directory that is shown in the example in the step to create directories for the V6.1 server, copy the files into the following directory:

   AIX HP-UX Linux Solaris `/home/tsminst1/tsminst1`

   Windows `d:\tsm\server1`

   Ensure that the user ID that owns the V6.1 server (the instance user ID) has ownership or read/write permission to the files that you copied.
5. Edit the server options file.
   a. Remove any options that are not supported for V6.1. For the list of deleted options, see Table 30 on page 53.
   b. Ensure that the server options file contains at least one VOLUMEHISTORY option and at least one DEVCONFIG option. Because a volume history file and a device configuration file are required when you must restore the database, generate copies of these files automatically to help ensure that the files are available when needed.
   c. Check whether the server options file includes the TXNGROUPMAX option with a value, and if it does, what the value is. You might want to change the current value because the default value for this option changes from 256 to 4096 with V6.1. The increased value can improve the performance for data movement operations such as storage pool migration and storage pool backup.
      - If the server options file does not include this option, the server automatically uses the new default value of 4096.
      - If the server options file includes a value for this option, the server uses that specified value. If the specified value is less than 4096, consider increasing the value, or removing the option so that the server uses the new default value.
6. Change the default path for the database.

   AIX HP-UX Linux Solaris

   Change the default path for the database to be the same as the instance directory for the server. Issue the command:

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

   For example:

   ```
   db2 update dbm cfg using dftdbpath /home/tsminst1/tsminst1
   ```

   Windows

   Change the default path for the database to be the drive where the instance directory for the server is located. Complete the following steps:
   a. Click **Start** → **Programs** → **IBM DB2** → **DB2TSM1** → **Command Line Tools** → **Command Line Processor**.
   b. Enter `quit` to exit the command-line processor.

A window with a command prompt opens, with the environment properly set up to successfully issue the commands in the next steps.

c. From the command prompt in that window, issue the following command to set the environment variable for the server instance that you are working with:

```
set db2instance=instance_name
```

The *instance_name* is the same as the instance name that you specified when you issued the db2icrt command. For example, to set the environment variable for the Server1 server instance, issue the following command:

```
set db2instance=server1
```

d. Issue the command to set the default drive:

```
db2 update dbm cfg using dftdbpath instance_location
```

For example, if the instance directory is `d:\tsm\server1`, the instance location is drive `d:`. Enter the command:

```
db2 update dbm cfg using dftdbpath d:
```

7. Complete this step if the system uses a locale other than the English regional locale.

AIX HP-UX Linux Solaris

If the system uses a locale other than the English regional locale, set the DB2CODEPAGE system environment variable to 819:

```
db2set -i instance_name DB2CODEPAGE=819
```

For example:

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

8. Change to the instance directory that you created for the server.
9. Create and format the database and recovery logs. In the command, specify the directories that you created for the database and logs. The directories must be empty.

AIX HP-UX Linux Solaris

For example, to get an active log size of 2 GB (2048 MB, the default size), issue the following command, on one line:

```
/opt/tivoli/tsm/server/bin/dsmserv loadformat \
dbdir=/tsmdb001,/tsmdb002,/tsmdb003,/tsmdb004 \
activelogsize=2048 activelogdir=/tsmlog \
mirrorlogdir=/tsmlogmirror archlogdir=/tsmarchlog
```

Windows

For example, to get an active log size of 2 GB (2048 MB, the default size) for the Server1 server instance, issue the following command, on one line:

```
"c:\Program Files\Tivoli\TSM\server\dsmserv" loadformat
dbdir=d:\tsm\db001,e:\tsm\db002,f:\tsm\db003,g:\tsm\db004
activelogsize=2048 activelogdir=h:\tsm\log
mirrorlogdir=j:\tsm\logmirror archlogdir=i:\tsm\archlog
```

If you have already created the first server instance on the system (server1) and are creating more, then you must use the -k option. The

-k option specifies the instance name for running this utility. For example, if the instance name for the server is server2, issue the command:

```
"c:\Program Files\Tivoli\TSM\server\dsmserv" -k server2
loadformat dbdir=d:\tsm\db001,e:\tsm\db002,f:\tsm\db003,g:\tsm\db004
activelogsize=2048 activelogdir=h:\tsm\log
mirrorlogdir=j:\tsm\logmirror archlogdir=i:\tsm\archlog
```

10. Monitor the process for errors and warning messages. The final message indicates success or failure of the operation.

Related tasks

"Estimating total space requirements for the upgrade process and upgraded server" on page 34

Related reference

"DSMSERV LOADFORMAT (Format a database)" on page 292

"Deleted server commands, utilities, and options" on page 50

Scenario 4: Moving the server database over a network

Move the database by starting the insertion process for the V6.1 server to accept the server database, and then starting extraction process for the V5 server to extract and send the database.

Before starting this procedure, ensure that both the V5 server and the new server are not running.

1. Verify that there is a good network connection between the two systems.
2. Start the insertion process on the V6.1 server to accept the database. To monitor the process, direct the output of the process to a file. For example, start the server, allowing 60 minutes (the default time) for the other server to contact the V6.1 server and directing the process output to `insert.out`, using this command:

   AIX HP-UX Linux Solaris

   ```
   nohup /opt/tivoli/tsm/server/bin/dsmserv insertdb \
   sesswait=60 >insert.out 2>&1 &
   ```

   Windows

   ```
   "c:\Program Files\Tivoli\TSM\server\dsmserv" insertdb
   sesswait=60 1>>insert.out 2>&1
   ```

   The server starts and waits up to 60 minutes to be contacted by the original server.
3. Monitor the output of the process. Verify that the DSMSERV INSERTDB process has issued the following message before continuing to the next step:

   ```
   ANR1336I INSERTDB: Ready for connections from the source server
   ```

   Issue the following command to monitor the process output in the `insert.out` file:

   ```
   tail -f insert.out
   ```

   Tip: On Windows systems, use the tail command or an equivalent utility with which you can monitor the contents of a file as it changes. For example, the Windows Server 2003 Resource Kit Tools includes the tail command, which can be used as shown in the preceding example.

4. Start the extraction from the original server. Specify the TCP/IP address and port for the V6.1 server. Direct the output of the process to a file for monitoring. For example, enter the following command on one line:

   AIX

   ```
   nohup /usr/tivoli/tsm/upgrade/bin/dsmupgrd extractdb \
   hladdress=127.0.0.1 lladdress=1500 >extract.out 2>&1 &
   ```

   HP-UX Linux Solaris

   ```
   nohup /opt/tivoli/tsm/upgrade/bin/dsmupgrd extractdb \
   hladdress=127.0.0.1 lladdress=1500 >extract.out 2>&1 &
   ```

   Windows

   ```
   "c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd" extractdb hladdress=127.0.0.1
     lladdress=1500 1>>extract.out 2>&1
   ```

5. Monitor the processes for errors and warning messages, and for items that you might need to take action on. From the instance directory for the server that you are upgrading, issue the following command to monitor the extraction process:

   ```
   tail -f extract.out
   ```

   The length of time that the process runs depends on the size of the database, the hardware being used, and the network.

6. Examine the process outputs for the extraction and insertion processes to find the messages that indicate the success or failure of the operations.

Process	Success message	Failure message
Extraction	`ANR1382I EXTRACTDB: Process 1, database extract, has completed.`	`ANR1396E EXTRACTDB: Process 1, database extract, has completed with errors.`
Insertion	`ANR1395I INSERTDB: Process 1, database insert, has completed.`	`ANR1396E INSERTDB: Process 1, database insert, has completed with errors.`

Related reference

"DSMUPGRD EXTRACTDB (Extract data from a V5 server database)" on page 286

"DSMSERV INSERTDB (Move a server database into an empty database)" on page 294

Scenario 4: Creating a Windows service for the server instance

Windows

A Windows service is created for the Tivoli Storage Manager V6.1 server automatically if you use the upgrade wizard (dsmupgdx). If you do not use the wizard, you must create the Windows service for the Tivoli Storage Manager server manually.

1. Change to the installation directory for the server program. By default, the directory is `C:\Program Files\Tivoli\TSM\console`. If you installed the server in a different directory, change to the `console` subdirectory of the server installation directory.
2. Install the Windows service, using the Tivoli Storage Manager server instance name in the service name. Issue the following command:

```
install "TSM server_instance_name"
 "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe" admin_name admin_password
```

where:

"TSM *server_instance_name*" is the name of the service that is being installed.

server_instance_name is the instance name that was specified when you issued the db2icrt command.

admin_name is the administrator account that owns the service.

admin_password is the password for the administrator account.

Example 1

To install the Windows service for the Server1 server instance, enter the following command on one line. The example uses `rudy` as the administrator account, which has the password `s21ret`.

```
install "TSM server1" "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
rudy s21ret
```

Example 2

To install the Windows service for the Server2 server instance using LocalSystem as the logon account, issue the following command. Because the LocalSystem account does not have a password, use the quotation marks (" ") to specify a null password.

```
install "TSM Server2" "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
localsystem ""
```

3. Optional: Manually change the service to an automatic startup type by using Windows administrative tools (**Administrative Tools** → **Services**).

Related tasks

"Starting the server on Windows systems" on page 270

Scenario 4: Configuring the system for database backup

The database manager and the Tivoli Storage Manager API must be configured so that the database manager can back up the server database. The configuration is completed for you automatically if you use the upgrade wizard (dsmupgdx). If you do not use the wizard, you must complete the configuration manually.

- "Scenario 4: Configuring the system for database backup on AIX, HP-UX, Linux, and Solaris systems"
- "Scenario 4: Configuring the system for database backup on Microsoft Windows systems" on page 227

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Scenario 4: Configuring the system for database backup on AIX, HP-UX, Linux, and Solaris systems

AIX HP-UX Linux Solaris

If you did not use the upgrade wizard, you must complete the configuration for the database backup manually.

In the following steps, the examples use tsminst1 for the server instance user ID and `/home/tsminst1/tsminst1` for the Tivoli Storage Manager server instance directory.

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:

      AIX

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

      HP-UX Linux Solaris

      ```
      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:

   AIX `/usr/tivoli/tsm/client/api/bin64`

   HP-UX Linux Solaris `/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 on AIX, HP-UX, Linux, and Sun Solaris systems" on page 267 for the details.
   b. Log in using the root user ID.
   c. Source the database manager by running the following command.

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

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

   d. Change the API password, using this command:

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

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

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

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Scenario 4: Configuring the system for database backup on Microsoft Windows systems

Windows

If you did not use the upgrade wizard, you must complete the configuration for the database backup manually.

Windows In the following commands, the examples use `server1` for the database instance and `d:\tsmserver1` for the Tivoli Storage Manager server directory. Replace these values with your actual values in the commands.

1. Create a file called `tsmdbmgr.env` in the `d:\tsmserver1` directory with the following contents:

   ```
   DSMI_CONFIG=d:\tsmserver1\tsmdbmgr.opt
   DSMI_LOG=d:\tsmserver1
   ```

2. Set the DSMI_ api environment-variable configuration for the database instance:
   a. Open a DB2 command window. One method of doing this is by going to the `C:\Program Files\Tivoli\TSM\db2\bin` directory, or if you installed Tivoli Storage Manager in a different location, go to the `db2\bin` subdirectory in your main installation directory. Then, issue this command:

      ```
      db2cmd
      ```

   b. Issue this command:

      ```
      db2set -i server1 DB2_VENDOR_INI=d:\tsmserver1\tsmdbmgr.env
      ```

3. Create a file called `tsmdbmgr.opt` in the `d:\tsmserver1` directory with the following contents:

   ```
   ************************************************
   nodename $$_TSMDBMGR_$$
   commmethod tcpip
   tcpserveraddr localhost
   ```

```
tcpport 1500
passwordaccess generate
errorlogname d:\tsmserver1\TSMDBMGR_TSMSERVER1.log
```

4. Stop and start the database instance:
   a. Open a DB2 command window. One method of doing this is by going to the `C:\Program Files\Tivoli\TSM\db2\bin` directory, or if you installed Tivoli Storage Manager in a different location, go to the `db2\bin` subdirectory in your main installation directory. Then, issue this command:

      ```
      db2cmd
      ```

   b. Set the database instance:

      ```
      set db2instance=server1
      ```

   c. Stop DB2:

      ```
      db2stop
      ```

   d. Start DB2:

      ```
      db2start
      ```

5. Enter the following command on one line:

   ```
   "c:\program files\tivoli\tsm\server\dsmsutil.exe"
   UPDATEPW /NODE:$$_TSMDBMGR_$$ /PASSWORD:TSMDBMGR /VALIDATE:NO /OPTFILE:
   "d:\tsmserver1\tsmdbmgr.opt"
   ```

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, “Taking the first steps after upgrade,” on page 267.

Chapter 8. General procedures for upgrading a server to V6.1

Utilities and a wizard are provided to assist in the upgrade. This general set of procedures can be used for any upgrade scenario. You can instead select the scenario that matches your upgrade plan and use the set of procedures that is specifically for that scenario.

Perform the following tasks to upgrade a server:

1. "Preparing for the upgrade"
2. "Installing the upgrade utilities on the original server" on page 235
3. "Preparing the database of a V5 server for upgrade" on page 242
4. Same-system upgrade only: "Uninstalling the V5 program before installing V6.1" on page 243
5. "Installing the V6.1 server" on page 245
6. "Creating the directories and the user ID for the upgraded server instance" on page 249
7. Upgrading the server, using one of the following methods:
   - "Upgrading the server using the upgrade wizard" on page 253
   - "Upgrading the server manually using utilities" on page 254
8. Completing the upgrade by taking important first steps:
   a. "Verifying access to storage pools on disk" on page 267
   b. "Starting the server instance after the upgrade" on page 267
   c. "Registering licenses" on page 271
   d. "Backing up the database after upgrading the server" on page 271
   e. "Verifying the upgraded server" on page 272
   f. "Updating automation" on page 273
   g. "Monitoring the upgraded server" on page 273

Preparing for the upgrade

Prepare for the upgrade by checking requirements, preparing the space that is required, backing up the server, and modifying certain server settings.

Follow the preparation steps carefully to protect your server and its data.

Important: It is possible, after the upgrade to V6.1 is complete, that conditions might cause the need to temporarily revert to the previous version of the server. Successfully reverting to the previous version of the server is possible only if you performed all preparation steps. To understand why it is important to perform all preparation steps, review the procedure for reverting an upgraded server to its previous version.

Perform these steps to prepare for the upgrade:

1. "Checking the prerequisites for the upgrade" on page 230
2. "Preparing space for the upgrade process" on page 231
3. "Modifying the server before the upgrade" on page 232
4. "Disabling sessions" on page 233

5. "Backing up storage pools and the server database" on page 233
6. "Backing up configuration information" on page 234
7. "Creating a summary of database contents" on page 234
8. "Stopping the server before installing the upgrade" on page 234

Related tasks

"Reverting from V6.1 to the previous V5 server version" on page 280

Checking the prerequisites for the upgrade

Check your system against requirements for the server.

1. Ensure that the server that you plan to upgrade is at version 5.3.6 or later.
2. Ensure that the system where the V5 server is located meets the minimum requirements. Use the information in "Hardware and software requirements for the V5 server system that is being upgraded" on page 16 to determine whether you need to update your system before you continue.
3. Ensure that the system where you plan to install the V6.1 server meets requirements. Check the operating system level and the platform against the list of supported operating systems and platforms.

   Restriction: You cannot upgrade your server to run on an operating system that is different from the operating system it currently runs on. For example, you cannot upgrade a server running on an AIX system to a server running on a Linux system.

   Some platforms that were supported for earlier versions of the server are *not* supported for V6.1. If the server that you want to upgrade is running on one of these platforms, you cannot upgrade your server to V6.1 on the same platform. You must install your V6.1 server on a system that is a specific supported platform, depending on the original platform. See the following table.

Platform for V5 server	Required platform for upgrade to V6.1
HP-UX running on a PA-RISC system	HP-UX running on an Itanium system
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system
Linux running on a 32-bit x86 system	Linux running on an x86_64 system
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system

4. Check that the system memory meets the server requirements.
   - If you plan to upgrade the server on the same system, and use the network method for moving the database, you must ensure that the system memory is sufficient to run two servers at the same time.

     When you run the process that extracts the database from the existing server and inserts the database for the new server, the net effect is that two servers are running at the same time on the system. System memory must be large enough to handle these processes.
   - If you plan to run multiple instances of the V6.1 server on the system, each instance requires the memory listed for one server. Multiply the memory for one server by the number of instances planned for the system.
5. Ensure that the system has enough disk storage for the database and recovery logs. Review the planning information for requirements and guidance.

   If you are adding new hardware for the server, such as new disk storage for the database, have the hardware installed and running.

If you plan to upgrade the server on the same system, you can take one of two approaches:

- Ensure that the system has enough disk storage for storing database and recovery logs for both the original server and the new V6.1 server. Both will be stored on disk storage during the upgrade process.
- After you back up the V5 database and extract the data in the database to media, reconfigure the disk subsystem used for the database storage. Then insert the data to the new database from the media. You must take this approach if you do not have enough disk space for both the original server and the new server.

6. If you are moving the server to a new system, ensure that the new system can access the storage devices that are used on the original system. This includes disk and tape devices that are used to store client data.

   If you moving the database using the media method, you might need to leave a storage device attached to the original system to perform the database extraction. Then move the storage device to the new system.

Related concepts

"Hardware and software requirements for upgrading to the V6.1 server" on page 15

Preparing space for the upgrade process

The amount and type of space that is required for the upgrade process depends on whether you are upgrading to the new version on the same system or a different system. Another factor is whether you will be using the media method or the network method for moving data into the new database.

1. Verify that the system has the amount of space that was estimated in the planning step. Use the planning work sheet that you filled in with your information.
2. If you plan to extract the original server's database to media for later insertion into the new database, ensure that you have space available for storing the database and the manifest file that the extraction process creates.
   a. Identify the device class to which you will extract the original database. The definition must exist in the server database, not just in the device configuration file.

      The device class must be a sequential device class that has volumes or space available. Define a new device class if necessary. The device class type cannot be **NAS** or **CENTERA**.

      Important: You must confirm *now* that the definition that is in the server database for the device class is correct. After you prepare the database for upgrade (by completing the **Prepare Database** phase in the upgrade wizard, or by using the DSMUPGRD PREPAREDB utility), you cannot update this device class definition. For example, check the path for a FILE device class. If you copied the original server to a different system to extract the data, the path might be different on the current system.
   b. Ensure that space or volumes are available in the selected device class. The amount of space that you need is about the same as the current size of the original database.

      Ensure that the instance user ID that you create for the upgraded server has access permission to the location of the extracted data.
   c. Check that the access permissions are correct for the location that you plan to specify for the manifest file.

The user ID that will run the database preparation and extraction utilities (DSMUPGRD PREPAREDB and DSMUPGRD EXTRACTDB) must have write access to this file. This is typically the root user ID.

When the data is later inserted into the V6.1 database, the instance user ID that you use for the upgraded server must have access permission for the manifest file.

The manifest file is typically less than 1 KB.

Related tasks

"Estimating total space requirements for the upgrade process and upgraded server" on page 34

Modifying the server before the upgrade

A command must be run on the server to prevent one type of problem during the upgrade process. Some modifications to typical server settings are recommended to prepare for the upgrade.

1. From a Tivoli Storage Manager administrative command line, issue the command:

   ```
   convert ussfilespace
   ```

   This command fixes a problem that might exist in older Tivoli Storage Manager databases. If the problem does not exist in your database, the command completes quickly. If the problem exists in your database, the command might take some time to run.

   Important: Do not skip this step. If your database has the problem and you do not run this command now, the DSMUPGRD PREPAREDB utility fails when you run it. You must then restart the V5 server and run the CONVERT USSFILESPACE command before continuing with the upgrade process.
2. Review the steps for reverting to the earlier version of the server in the section, "Reverting from V6.1 to the previous V5 server version" on page 280.

   If for some reason you need to revert to the earlier version after the upgrade to V6.1, the results of the reversion will be better if you understand the steps and prepare for the possibility now.
3. Make the following adjustments to settings on your server and clients. These adjustments must be done to make it possible for you to revert to the original server after the upgrade, if problems occur.
   a. For each sequential-access storage pool, set the **REUSEDELAY** parameter to the number of days during which you want to be able to revert to the original server, if that becomes necessary.

      For example, if you want to be able to revert to the original server for up to 30 days after upgrading to V6.1, set the **REUSEDELAY** parameter to 31 days.
   b. For each copy storage pool, set the **RECLAIM** parameter to 100 (meaning 100%).
   c. If you typically use a DELETE VOLHISTORY command to delete database backups, ensure that the command does not delete database backups for at least the same number of days that you set for the **REUSEDELAY** period for sequential-access storage pools.
   d. For important clients that use the server, check that the value for the schedlogretention client option is set to retain the client schedule log for a long enough time. Update the option for clients if needed.

The entries in the client schedule log might be useful if the server must revert to the original version. If the retention period for the schedule log is too short, the schedule log information might be deleted too soon.

Disabling sessions

In preparation for the upgrade, prevent activity on the server by disabling new sessions. Cancel any existing sessions.

The commands in the following procedure are Tivoli Storage Manager administrative commands.

1. Prevent all clients, storage agents, and other servers from starting new sessions with the server. Use the commands:

   ```
   disable sessions client
   disable sessions server
   ```

2. Prevent administrative activity from any user ID other than the administrator ID that is being used to perform the upgrade preparation. Lock out other administrator IDs if necessary:

   ```
   lock admin administrator_name
   ```

3. Check whether any sessions exist, and notify the users that the server is going to be stopped. To check for existing sessions, use the command:

   ```
   query session
   ```

4. Cancel sessions that are still running. Use the command:

   ```
   cancel session
   ```

Backing up storage pools and the server database

Immediately before upgrading the server, back up primary storage pools to copy storage pools, and perform a full database backup.

1. Back up primary storage pools to copy storage pools using the BACKUP STGPOOL command. If you have been performing regular backups of the storage pools, this step backs up only the data that was added to the primary storage pools since they were last backed up.
2. Back up the database using the following command. Use either a full or snapshot backup type.

   ```
   backup db type=type devclass=device_class_name
   ```

   The device class that you specify must exist and have volumes that are available to it. For example, to perform a snapshot backup of your database to the TAPECLASS device class using scratch volumes, enter:

   ```
   backup db type=dbsnapshot devclass=tapeclass
   ```

   To use specific volumes instead of scratch volumes, specify the volume names in the command.

   Consider making two copies of the backup to protect the backup from media failures.

Backing up configuration information

Before installing the new version, back up critical files and information for the server. Store the files in a safe place, because they are needed after the installation of the new software version is completed. You also need these files if you must revert to the previous version after the upgrade.

1. Back up device configuration information:

   ```
   backup devconfig filenames=file_name
   ```

2. Back up volume history information:

   ```
   backup volhistory filenames=file_name
   ```

   Ensure that the volume history includes information about the database backup that you completed in the preceding steps. For example, issue the command:

   ```
   query volhistory type=dbbackup
   ```

3. Make copies of these files, which are located in the default directory for the server:

   server options file, typically named `dsmserv.opt`

   `dsmserv.dsk`

4. Optional: Make a copy of the accounting log file, `dsmaccnt.log`.
5. Back up any scripts that have been used to perform daily housekeeping for the server. Examine the scripts for changes that are needed after the upgrade.
6. Store the device configuration file, the volume history file, the server options file, and the other files in a safe place. Select a location that is not on the system that is being upgraded.

Creating a summary of database contents

Create a summary of the contents of the original database. After the upgrade, you can use the same commands to compare the results and to confirm that the database contents are intact.

Run commands that give a summary of information about your database contents. For example, issue commands that summarize the file spaces being protected, and save the results. See the sample commands for ideas.

Related reference

"Sample commands to run for validation of the database upgrade" on page 297

Stopping the server before installing the upgrade

Stop all server processes and dismount any tapes that are mounted. Then stop the server.

The commands in the following procedure are Tivoli Storage Manager administrative commands.

1. Cancel sessions if any are still running. Use the command:

   ```
   cancel session
   ```

   Allow time for the sessions to be stopped. Some sessions, such as backup by a backup-archive client, might take some time to stop.

2. Determine whether server processes are running. Either cancel processes, or allow them to complete. Use the commands:

   ```
   query process
   cancel process process_number
   ```

Allow time for the processes to be stopped. Some processes, such as storage pool migration, might take some time to stop.

3. After all sessions and processes are stopped, determine whether any tapes are mounted. Dismount any tapes that are mounted. Use the commands:

   ```
   query mount
   dismount volume volume_name
   ```

4. Stop the server. Use the command:

   ```
   halt
   ```

Installing the upgrade utilities on the original server

You must install the upgrade utilities on the system where the V5 server is located. The installation package for the utilities must be downloaded from a Web site.

Use the procedure for your operating system:

- AIX "Installing the upgrade utilities on AIX systems"
- HP-UX "Installing the upgrade utilities on HP-UX systems" on page 237
- Linux "Installing the upgrade utilities on Linux systems" on page 238
- Solaris "Installing the upgrade utilities on Sun Solaris systems" on page 239
- Windows "Installing the upgrade utilities on Microsoft Windows systems" on page 241

Installing the upgrade utilities on AIX systems

AIX

You must install the upgrade utilities on the system that has the original server and its database. The package to install is available for download from the FTP downloads site.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package that matches your platform, and download it to a convenient location on the server system. The name of the package has the following form:

      ```
      5.5.x.x-TIV-TSMUPG-AIX.tar.gz
      ```

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Ensure that the system has the following file sets installed:

   `xlC.rte 8.0.0.5`, or later

```
gsksa.rte 7.0.4.11
```

You can use the following commands to check for these file sets:

```
lslpp -L xlC.rte

lslpp -L gsksa.rte
```

If needed, you can obtain the `gsksa.rte` file set from any of the regular V5.5 maintenance packages for the AIX server. The maintenance packages are available on the FTP downloads site: ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server/v5r5/AIX/

4. Extract the contents of the upgrade utilities package. If you downloaded a language package, also extract the contents of that package.
5. Access the System Management Interface Tool (SMIT).
   a. Enter `smitty install_update`
   b. Select **Install and Update Software** → **Install and Update from ALL Available Software**.
6. Select the **INPUT** device. Specify the directory location of the upgrade utilities package on the system.
7. Select **Software to Install**. Press F4 or Esc+4 for the list of available file sets in the directory.
8. Select the file sets for the upgrade utilities, the device driver, and optionally the language pack. The file set for the upgrade utilities is `tivoli.tsmupg.server`. Optional language packs include messages for languages other than U.S. English.
9. Set **COMMIT software updates** to `Yes`. Press F4 or Esc+4.
10. Set **SAVE replaced files** to `No`.
11. Ensure that the default settings for the options in the window for all the selected file sets show `success`.
12. Press Enter, and respond to the `ARE YOU SURE?` question by pressing Enter again. The installation begins.
13. When the installation is complete, exit the SMIT program.
14. Optional: If you installed a language package, ensure that the locale environment variable is set to use it. Enter the following command to set the locale environment variable for messages:

    ```
    export LC_MESSAGES=xxxx
    ```

    where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:
    - The locale is installed on the system.
    - The upgrade utilities support the locale.
    - The language package that you installed for the upgrade utilities matches the locale.
15. After the upgrade utilities are installed, continue at "Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 240.

Installing the upgrade utilities on HP-UX systems

HP-UX

You must install the upgrade utilities on the system that has the original server and its database. The package to install is available for download from the FTP downloads site.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package that matches your platform, and download it to a convenient location on the server system. The name of the package has the following form:

      ```
      5.5.x.x-TIV-TSMUPG-platform.tar.gz
      ```

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Extract the contents of the upgrade utilities package. For example, from the directory where you saved the download package, issue the command:

   ```
   gzip -dc package_name.tar.gz | tar -xvf -
   ```
4. Install the upgrade utilities and the device driver. Use the source argument (**-s**) to specify the directory where the package was extracted. For example, if the directory is `/tmp/TSM`, issue the command:

   ```
   swinstall -s /tmp/TSM package_name
   ```

   The utilities are installed in the directory `/opt/tivoli/tsm/upgrade/bin`.
5. Optional: Install the language package.
   a. Extract the contents of the package.

      ```
      gzip -d package_name.img.gz
      ```
   b. Install the package. For example, if the directory is `/tmp/TSM`, issue the command:

      ```
      swinstall -s /tmp/TSM/package_name.img package_name
      ```
   c. Enter the following command to set the locale environment variable for messages:

      ```
      export LC_MESSAGES=xxxx
      ```

      where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:
      - The locale is installed on the system.
      - The upgrade utilities support the locale.

- The language package that you installed for the upgrade utilities matches the locale.

6. After the upgrade utilities are installed, continue at "Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 240.

Installing the upgrade utilities on Linux systems

Linux

You must install the upgrade utilities on the system that has the original server and its database. The package to install is available for download from the FTP downloads site.

Restriction: Do *not* install the utilities in the installation directory for the original server that is to be upgraded. Install the utilities package in its own directory.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Open the directory for your platform and download the package. The name of the package has the following form:

      ```
      5.5.x.x-TIV-TSMUPG-platform.tar.bz2
      ```

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Extract the contents of the upgrade utilities package. For example, from the directory where you saved the download package, issue the commands:

   ```
   bunzip2 package_name.tar.bz2
   tar xvf package_name.tar
   ```

4. Install the upgrade utilities and the device driver. Use the following command:

   ```
   rpm -ivh package_name.rpm
   ```

   The utilities are installed in the directory `/opt/tivoli/tsm/upgrade/bin` by default.
5. Optional: Install the language package.
   a. Extract the contents of the downloaded package.

      ```
      bunzip2 package_name.tar.bz2
      tar xvf package_name.tar
      ```

   b. Install the package for the language that you want to use.

      ```
      rpm -ivh package_name.rpm
      ```

   c. Enter the following command to set the locale environment variable for messages:

      ```
      export LC_MESSAGES=xxxx
      ```

where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:

- The locale is installed on the system.
- The upgrade utilities support the locale.
- The language package that you installed for the upgrade utilities matches the locale.

6. After the upgrade utilities are installed, continue at "Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 240.

Installing the upgrade utilities on Sun Solaris systems

Solaris

You must install the upgrade utilities on the system that has the original server and its database. The package to install is available for download from the FTP downloads site.

Restriction: Do *not* install the utilities in the installation directory for the original server that is to be upgraded. Install the utilities package in its own directory.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the directory that names the operating system that your V5 server runs on. From that directory, open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package that matches your platform, and download it to a convenient location on the server system. The name of the package has the following form:

      `5.5.x.x-TIV-TSMUPG-platform.tar.Z`

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
   d. Optional: To install messages in a language other than English, open the `LANG` directory, and download a language package. Translated messages are available in the usual set of languages for a V5 server.
2. Log in with the root user ID.
3. Change to the directory where the upgrade utilities package was downloaded.
4. Extract the contents of the upgrade utilities package. For example, from the directory where you saved the download package, issue the command:

   ```
   uncompress -c package_name.tar.Z | tar -xvf -
   ```
5. Install the upgrade utilities and the device driver. Use the source argument (**-d**) to specify the directory where the package was extracted. For example, if the directory is `/tmp/TSM`, issue the command:

   ```
   pkgadd -d /tmp/TSM package_name
   ```

   The utilities are installed in the directory `/opt/tivoli/tsm/upgrade/bin` by default.
6. Optional: Install the language package.

a. Extract the contents of the downloaded package.

```
uncompress package_name.pkg.Z
```

b. Install the package for the language that you want to use. Use the source argument (**-d**) to specify the directory where the package was extracted. For example, if the directory is `/tmp/TSM`, issue the command:

```
pkgadd -d /tmp/TSM package_name.pkg package_name
```

c. Enter the following command to set the locale environment variable for messages:

```
export LC_MESSAGES=xxxx
```

where *xxxx* is the locale that you want to use. For example, use `it_IT` for Italian. The upgrade utilities run with the locale that you specify if the following statements are true:

- The locale is installed on the system.
- The upgrade utilities support the locale.
- The language package that you installed for the upgrade utilities matches the locale.

7. After the upgrade utilities are installed, continue at "Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems."

Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems

AIX HP-UX Linux Solaris

After installing the upgrade utility package, you must set environment variables in the shell from which you will run the utilities. An environment variable describes the operating environment of a process, such as the home directory or terminal in use.

The environment variables available are:

DSMSERV_DIR

Specifies the installed location of the upgrade utilities.

By default the location is:

AIX `/usr/tivoli/tsm/upgrade/bin`

HP-UX Linux Solaris `/opt/tivoli/tsm/upgrade/bin`

DSMSERV_CONFIG

Specifies the name and location of the options file for the server that you want to upgrade. For example, to set the name to `dsmserv.opt` and the location to be the directory from which you run the DSMUPGRD utility, use: `./dsmserv.opt`

If you are upgrading multiple servers on the system, you can instead use the -o option each time that you use the DSMUPGRD utility, to specify the server option file for the server that you want to work with.

If you set the **DSMSERV_CONFIG** environment variable using a relative path (for example, `./dsmserv.opt`), you *must* run the DSMUPGRD utility from the directory where the `dsmserv.opt` file is stored. Otherwise the DSMUPGRD utility fails to open the server options file and stops.

Use the appropriate command for your system to set the environment variables for running the utilities. For example, on an AIX system that uses a shell in the `ksh` family, enter the command to set the **DSMSERV_DIR** variable:

```
export DSMSERV_DIR=/usr/tivoli/tsm/upgrade/bin
```

If you set the **DSMSERV_CONFIG** variable, you set it in a similar way. For example:

```
export DSMSERV_CONFIG=./dsmserv.opt
```

Use the following command if your shell is in the `csh` family:

```
setenv DSMSERV_DIR /usr/tivoli/tsm/upgrade/bin
```

After you set the environment variables, continue at "Preparing the database of a V5 server for upgrade" on page 242.

Installing the upgrade utilities on Microsoft Windows systems

Windows

You must install the upgrade utilities on the system that has the original server and its database. The package to install is available for download from the FTP downloads site.

1. Obtain the upgrade utilities package from the FTP downloads site.
   a. Go to ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/WIN
   b. Open the `5.5.x.x` directory. The `5.5.x.x` number must be the same as or later than the level of the V5 server that you are upgrading.
   c. Select the package and download it to a convenient location on the server system. The name of the package has the following form:

      ```
      5.5.x.x-TIV-TSMUPG-Windows.exe
      ```

      The numbers at the beginning of the package name identify the release level of the upgrade utilities package. The level of the upgrade utilities package must be the same as or later than the level of the V5 server that you are upgrading.
2. Log on with an administrator ID.
3. Run the executable package for the upgrade utilities.

   The default location for the installation of the utilities is based on the location where the V5 server was last installed. For example, if the V5 server was installed using the default path, `C:\Program Files\Tivoli\TSM\server`, the upgrade utilities are installed in `C:\Program Files\Tivoli\TSM\upgrade`.

   Restriction: Do *not* install the utilities in the same directory as the original server that is to be upgraded. Install the utilities package in its own directory.

After the upgrade utilities are installed, continue at "Preparing the database of a V5 server for upgrade" on page 242.

Tip: When you use the upgrade utilities, if you have multiple servers running on the system, you must use the -k option to specify the name of the Windows registry key from which to retrieve information about the server being upgraded. The default value for the option is SERVER1.

If you are upgrading the server on the same system as the earlier version, and using the network method to extract and insert the data into the V6.1 database, use

the -o option with the DSMUPGRD command to specify the location of the server options file.

Preparing the database of a V5 server for upgrade

Before extracting the data from the database, you must prepare the server database by using the DSMUPGRD PREPAREDB utility. If you have multiple servers on a single system, you must repeat this task for each server.

The upgrade utilities must be installed on the system where the database is located.

Important: After you prepare a V5.3 or V5.4 database using the DSMUPGRD PREPAREDB utility, the version of the server database is V5.5. You can no longer use that database to run with a V5.3 or V5.4 server program. If, after upgrading to V6.1, you later decide to revert to the earlier version of the server, you must reinstall the earlier version of the server code and then restore the backed-up server database that matches that version.

1. Ensure that you have completed all preparation steps.
2. Log in using the root user ID on the system that has the original server. Log on with the administrator ID on a Windows system.
3. Change to the instance directory for the server that you are upgrading. The instance directory is the directory that contains the files such as `dsmserv.dsk` for the server.
4. AIX HP-UX Linux Solaris Set the environment variables for the shell. See "Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Sun Solaris systems" on page 240.
5. Prepare the database. Direct the output of the process to a file for monitoring.

   AIX

   From the instance directory for the server that you are upgrading, issue the following command to run the process in the background and direct the output to the file called `prepare.out`:

   ```
   nohup /usr/tivoli/tsm/upgrade/bin/dsmupgrd preparedb >prepare.out 2>&1 &
   ```

   HP-UX Linux Solaris

   From the instance directory for the server that you are upgrading, issue the following command to run the process in the background and direct the output to the file called `prepare.out`:

   ```
   nohup /opt/tivoli/tsm/upgrade/bin/dsmupgrd preparedb >prepare.out 2>&1 &
   ```

   Windows

   From the instance directory for the server that you are upgrading, issue the following command to run the process and direct the output to the file called `prepare.out`:

   ```
   "c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd"
       preparedb 1>>prepare.out 2>&1
   ```

   If multiple servers exist on the system, issue the command from the instance directory for the server that you want to prepare, and specify the registry key for that server. For example, if the server is SERVER2:

   ```
   "c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd" -k server2
       preparedb 1>>prepare.out 2>&1
   ```

6. Monitor the process for errors and warning messages. The final message indicates success or failure of the operation. From the instance directory for the server that you are upgrading, issue the following command to monitor the process:

   ```
   tail -f prepare.out
   ```

   Tip: On Windows systems, use the tail command or an equivalent utility with which you can monitor the contents of a file as it changes. For example, the Windows Server 2003 Resource Kit Tools includes the tail command, which can be used as shown in the preceding example.
7. Ensure that the prepare operation is completed successfully before continuing to the next step. If the prepare operation fails, you might need to restart the V5 server to fix the problem and run the prepare operation again. If the server being upgraded is a V5.3 or V5.4 server, you might need to restore the database using a backup before you can restart the server to correct the problem.

Related reference

"DSMUPGRD PREPAREDB (Prepare a V5 database for upgrade)" on page 285

Uninstalling the V5 program before installing V6.1

For best results when you are upgrading the server to V6.1 on the same system where the V5 server is located, uninstall the V5 server program before installing the V6.1 server program.

Uninstalling the V5 program on AIX systems

AIX

Uninstall the V5 server, server license, and device driver. Do *not* remove the database, recovery log, or any other related files or directories, such as the server options file.

- For a V5.4 or V5.5 server, issue the following commands:

  ```
  /usr/sbin/installp -ug tivoli.tsm.license.aix5.rte64
  /usr/sbin/installp -ug tivoli.tsm.devices.aix5.rte
  /usr/sbin/installp -ug tivoli.tsm.server.aix5.rte64
  ```
- For a V5.3 server, issue the following commands:

  ```
  /usr/sbin/installp -ug tivoli.tsm.license
  /usr/sbin/installp -ug tivoli.tsm.devices
  /usr/sbin/installp -ug tivoli.tsm.server
  ```

After the V5 server program is uninstalled, continue at "Installing the V6.1 server" on page 245.

Uninstalling the V5 program on HP-UX systems

HP-UX

Uninstall the V5 server, server license, and device driver. Do *not* remove the database, recovery log, or any other related files or directories, such as the server options file.

- For a V5.4 or V5.5 server, issue the following commands:

  ```
  swremove TIVsmS64IA.server
  swremove TIVsmS64IA.license
  swremove TIVsmDD64_IA11_23.tsmscsi
  ```
- For a V5.3 server, issue the following commands:

```
swremove TIVsmS64.server
swremove TIVsmS64.license
swremove TIVsmDD64_HP11_11.tsmscsi
```

After the V5 server program is uninstalled, continue at "Installing the V6.1 server" on page 245.

Uninstalling the V5 program on Linux systems

Linux

Uninstall the V5 server, server license, and device driver. Do *not* remove the database, recovery log, or any other related files or directories, such as the server options file.

1. To determine the Tivoli Storage Manager packages that are installed, issue the following command:

   ```
   rpm -qa | grep TIVsm
   ```

2. Remove the server, server license, and device driver packages. Issue the following command for each package:

   ```
   rpm -e package_name
   ```

   For example:

   ```
   rpm -e TIVsm-server-5.5.0-0.ppc64.rpm
   ```

After the V5 server program is uninstalled, continue at "Installing the V6.1 server" on page 245.

Uninstalling the V5 program on Sun Solaris systems

Solaris

Uninstall the V5 server, server license, and device driver. Do *not* remove the database, recovery log, or any other related files or directories, such as the server options file.

Issue the following commands:

```
/usr/sbin/pkgrm TIVsmS
/usr/sbin/pkgrm TIVsmSlic
/usr/sbin/pkgrm TIVsmSdev
```

After the V5 server program is uninstalled, continue at "Installing the V6.1 server" on page 245.

Uninstalling the V5 program on Microsoft Windows systems

Windows

Uninstall the V5 server, server license, and device driver. Do *not* remove the database, recovery log, or any other related files or directories, such as the server options file.

Do not remove registry entries for the server.

1. Click **Start** → **Control Panel** → **Add or Remove Programs**.
2. Select the Tivoli Storage Manager component, then click **Remove**. Repeat for the license and the device driver.

If you see any messages suggesting that you reboot, you can ignore them until all Tivoli Storage Manager components have been removed.

After the V5 server program is uninstalled, continue at “Installing the V6.1 server.”

Installing the V6.1 server

You can use an installation wizard to perform the installation, or install the program using the console.

If you are installing the V6.1 server on the same system as the V5 server that you are upgrading, ensure that you have completed all upgrade preparation steps, including backup of the server database, before beginning the installation procedure. The server that you are upgrading will not be available until after installation and upgrade steps are completed.

1. For some operating systems, you need to check certain system settings before beginning installation.

   Linux

   If you are using Security Enhanced Linux on your system, set `SELINUX=disable` or set `SELINUX=permissive` in the `/etc/sysconfig/selinux` file, at least until the installation process completes.

   If you do not adjust the setting, you receive the following message when you try to install the server:

   ```
   The installer cannot run on your configuration. It will now quit.
   ```

   Solaris

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

2. Log on to the system.

   AIX HP-UX Linux Solaris

   Log in using the root user ID.

   Windows

   Log on as an administrator.

3. If you have the product DVD, complete the following steps.

   AIX HP-UX Linux Solaris

   Insert the Tivoli Storage Manager DVD into a DVD drive. Ensure that the DVD is mounted on directory /dvdrom and change to that directory.

   Windows

   Insert the Tivoli Storage Manager server DVD. Use Windows Explorer to view the contents of the DVD.

4. If you downloaded the program from Passport Advantage as an executable file, complete the following steps.

   AIX HP-UX Linux Solaris

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

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

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

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24018523

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

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

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.

Windows

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=swg24018518

Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24018521

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24018524

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

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

c. Either double-click the executable file, or enter the following command on the command line to extract the installation files. The files are extracted to the current directory.

```
package_name.exe
```

The *package_name* is typically a name such as `CZ1N9ML`. The package is large, so the extraction takes some time.

5. From the DVD, or from the location where you extracted the program package, start the installation wizard. You can use either the graphical wizard or the console wizard.

AIX HP-UX Linux Solaris

- Start the graphical wizard:

```
./install.bin
```

- Start the console wizard:

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

Windows

- Start the graphical wizard:

```
install.exe
```

- Start the console wizard:

```
install.exe -i console
```

See the *Tivoli Storage Manager Installation Guide* for information about how to perform a silent installation of the server. For information about translations that are available for the server, see Appendix A, “Server language locales,” on page 299.

6. Select the language for the installation and follow the instructions.

AIX

a. You must accept the license agreement to complete the installation.
b. Select the components to install. You must select at least the server, license, and **Tivoli Storage Manager Server Languages** in the component list. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.
c. On the **Server Language Selection** page, select English (not UTF8) and any other language packs that you need. You must select English because it installs the `tivoli.tsm.server.msg.en_US` package, which includes the help messages.

HP-UX Linux Solaris

a. You must accept the license agreement to complete the installation.
b. Select the components to install. You must install at least the server and license. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.

Windows

a. You must accept the license agreement to complete the installation.
b. Select the components to install. You must install at least the server and license. Typical installations also include the device driver. See the *Tivoli Storage Manager Installation Guide* for information about other components that you can choose to install.

The Tivoli Storage Manager application programming interface (API) and DB2 Version 9.5 are automatically installed when you install the server.

7. When the installation is complete, verify that you see a message that the installation is successful.

Important: If there are any errors during the installation, a summary panel lists the errors and directs you to an error log file. Fix the errors before continuing with the upgrade.

The installation log is stored in the following location:

AIX HP-UX Linux Solaris `/var/tivoli/tsm`

Windows The directory that was chosen for installation (look for the files `log.txt` and `logs.zip`)

8. Download and apply any applicable fixes that have been released for the server. Go to the product support site, http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html, and click **Download**. Search for server updates.

You can also check the FTP downloads site: ftp://ftp.software.ibm.com/storage/tivoli-storage-management/maintenance/server/

9. HP-UX Linux Solaris Modify kernel parameter values, if necessary.

HP-UX

Run the db2osconf utility to get recommendations for changes to kernel parameter values that are based on the size of the system. Make changes based on the recommendations in the results from the utility. You might need to restart the system.

For information about the utility and about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter the utility name, db2osconf, in the **Search** field at this site.

Important: The recommendations from the db2osconf utility are minimum values. Some workloads, for example the database upgrade process, might require that values be set higher than the recommendations. For more details about kernel parameter tuning for Tivoli Storage Manager, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

System resources such as semaphores might also require special configuration and tuning. See Appendix B, "HP-UX system resource requirements," on page 305.

Solaris

Run the db2osconf utility to get recommendations for changes to kernel parameter values that are based on the size of the system. Make changes based on the recommendations in the results from the utility. You might need to restart the system.

For information about the utility and about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter the utility name, db2osconf, in the **Search** field at this site.

Important: The recommendations from the db2osconf utility are minimum values. Some workloads, for example the database upgrade process, might require that values be set higher than the recommendations. For more details about kernel parameter tuning for Tivoli Storage Manager, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

Linux

To update the kernel parameters on Red Hat and SUSE Linux, you can run the `ipcs -l` command to list the parameter values. Analyze the output to determine whether any changes are required for your system.

For information about modifying kernel parameters, see http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp. To find the information, enter a search string such as `modifying kernel parameters`, in the **Search** field at this site.

For more details about kernel parameter tuning for Tivoli Storage Manager running on Linux systems, see http://www.ibm.com/support/docview.wss?uid=swg27015156.

Related concepts

Appendix D, "Services associated with the Tivoli Storage Manager server," on page 311

Creating the directories and the user ID for the upgraded server instance

Create the directories that the server instance needs for database and recovery logs, and create the user ID that will own the server instance.

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

1. 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.

   AIX HP-UX Linux Solaris

   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.

      AIX

      ```
      # mkgroup id=1001 tsmsrvrs
      # mkuser id=1002 pgrp=tsmsrvrs home=/home/tsminst1 tsminst1
      # passwd tsminst1
      ```

      HP-UX

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

      Linux

      ```
      # groupadd tsmsrvrs
      # adduser -d /home/tsminst1 -m -g tsmsrvrs -s /bin/bash tsminst1
      # passwd tsminst1
      ```

      Solaris

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

b. Log off, then log in to your system, using the new user ID and password. Use a login method that causes a prompt for a password, so that the password can be changed 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. Log off the new user ID.

Windows

Identify the user account that will own the Tivoli Storage Manager server instance. When the server is started as a Windows service, this is the account that the service will log on to. The user account must have administrative authority on the system. One user account can own more than one server instance.

You can create a new user account, or use an existing account.

If you have multiple servers on one system and want to run each server with a different user account, create a new user account in this step.

a. Create the user ID.

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

Use the following command to create the user ID:

```
net user user_ID */add
```

You are prompted to create and verify a password for the new user ID.

b. Issue the following commands to create groups and add the new user ID to the groups:

```
net localgroup Administrators user_ID /add
net localgroup DB2ADMNS /add
net localgroup DB2USERS /add
net localgroup DB2ADMNS user_ID /add
net localgroup DB2USERS user_ID /add
```

c. Log in to your system, using the new user ID and password.

2. 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.

AIX HP-UX Linux Solaris

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`	

Windows

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 d:\tsm\server1`	

The database directories	`mkdir d:\tsm\db001`
	`mkdir e:\tsm\db002`
	`mkdir f:\tsm\db003`
	`mkdir g:\tsm\db004`	

Active log directory	`mkdir h:\tsm\log`	
Archive log directory	`mkdir i:\tsm\archlog`	
Optional: Directory for the log mirror for the active log	`mkdir j:\tsm\logmirror`	
Optional: Secondary archive log directory (failover location for archive log)	`mkdir k:\tsm\archlogfailover`	

3. 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.

   AIX HP-UX Linux Solaris

   Change the owner of the directories that were created to the user ID for the server instance.

   Windows

   Ensure that the user ID for the server instance has read/write access to the directories that were created.
4. For all disk space that is used by the V5 server for storage pools (device types of FILE and DISK), change ownership or access control so that the user ID that will own the upgraded Tivoli Storage Manager server instance has ownership or read/write permission. Use the appropriate method for your operating system.

Continue the upgrade process using one of the following topics:

"Upgrading the server using the upgrade wizard" on page 253

"Upgrading the server manually using utilities" on page 254

Related tasks

"Planning space for the upgrade process and the upgraded server" on page 30

Related reference

"Server naming best practices" on page 55

Upgrading the server using the upgrade wizard

The wizard offers a guided approach to upgrading 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 V6.1 server program.

Before beginning the upgrade wizard, you must complete all preceding steps to prepare for the upgrade, to install the upgrade utilities, to install the V6.1 server program, and to create the directories and user ID for the server instance.

1. Ensure that the following requirements are met:

   AIX HP-UX Linux Solaris

   - The system where you installed the V6.1 server program must have the X Window client. You must also be running an X Window server on your desktop.
   - The system must have one of the following protocols enabled. Ensure that the port that the protocol uses is not blocked by a firewall.
     - Secure shell (SSH). Ensure that the port is set to the default value, 22.
     - Remote shell (RSH).
     - Remote Execution Protocol (REXEC).

     If the V5 server is located on a different system than the V6.1 server, that system must also have one of the protocols enabled.
   - You must be able to log in to the V6.1 system with the user ID that you created for the server instance, using the SSH, RSH, or REXEC protocol. When using the wizard, you must provide this user ID and password to access that system.

   Windows

   - 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).
     - Windows server message block (SMB)

       SMB is the interface used by File and Print Sharing (also known as CIFS). To use the SMB protocol, you must ensure that File and Print Sharing is enabled, and that port 445 is not blocked by your firewall. If you are running on Windows Server 2008 or Windows Vista, you might also need to disable User Account Control (at least while running this wizard). If you choose not to disable User Account Control, you must ensure that one of the other protocols is configured to allow the wizard to run.

     If the V5 server is located on a different system than the V6.1 server, that system must also have one of the protocols enabled.
   - You must be able to log on to the system using a protocol that is enabled on the system, using either the user ID that you created for the server instance, or some other user ID that exists on the system. When using the wizard, you must provide the user ID and password to access the system.

2. Start the upgrade wizard, dsmupgdx, from the V6.1 server installation directory.

   AIX HP-UX Linux Solaris

   Log in using the root user ID. Issue the command:

   ```
   /opt/tivoli/tsm/server/bin/dsmupgdx
   ```

   Windows

   Open a new Command Prompt window, and issue the command:

   ```
   "c:\Program Files\Tivoli\TSM\server\dsmupgdx.exe"
   ```

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

   Important: Read all messages that appear for each phase of the upgrade process, in the message display area within the wizard. Informational messages might show actions that occurred during the process that are important to you.

To complete the upgrade, perform the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Related tasks

"Upgrading the server manually using utilities"

Upgrading the server manually using utilities

Use the utilities to upgrade the server using a command interface.

Before beginning the upgrade procedure, you must complete all preceding steps to prepare for the upgrade, to install the upgrade utilities, to install the V6.1 server program, and to create the directories and user ID for the server instance.

Complete the following steps:

1. "Creating and formatting the new database" on page 255
2. Use one of the following methods to move the database:
   - "Moving the server database using media" on page 258
   - "Moving the server database over a network" on page 261
3. "Creating a Windows service for the server instance" on page 263
4. "Configuring the system for database backup" on page 264

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Related concepts

"The DSMUPGRD upgrade utilities" on page 15

Creating and formatting the new database

Create the server instance and format files for an empty V6.1 database.

1. Log on to the system where you installed the V6.1 program.

   AIX HP-UX Linux Solaris

   Log in using the root user ID. Complete the following checks:

   a. Verify that the home directory exists for the user ID that owns the server instance. For example, if the user ID is tsminst1, the home directory is `/home/tsminst1`.

   b. Verify that a configuration profile exists for the user ID in its home directory. If necessary, create the configuration profile. For example, create a `.profile` file if you are using the Korn shell (ksh). The `.profile` file can be empty.

   Windows

   Log on as an administrator.

2. Create a Tivoli Storage Manager instance using the db2icrt command.

   AIX HP-UX Linux Solaris

   Enter the following command on one line. For the instance name, specify the user ID that you created to own the instance.

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

   For example, if the user ID for this instance is tsminst1, use the following command to create the instance.

   ```
   /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 using the user ID that is the instance owner.

   Windows

   Enter the following command on one line. The user account that you specify becomes the user ID that owns the V6.1 server (the instance user ID).

   ```
   db2icrt -u user_account instance_name
   ```

   The database service for the server instance logs on to the user account that is specified in this command.

   Use the registry key name of the V5 server as the instance name for the V6.1 server. For example, if the user account is tsminst1 and the server's registry key is Server1, enter the following command:

   ```
   db2icrt -u tsminst1 server1
   ```

   You are prompted to enter the password for the user account.

   The instance name that you specify on this db2icrt command is the name that you later specify with the -k option on the DSMSERV LOADFORMAT command, when you create and format the database and recovery log.

3. Log on to the system using the user ID that owns the V6.1 server instance (the instance user ID).

4. Copy the configuration files to the instance directory that you created for the new server. The files are the configuration files that you saved from the original V5 server:
   - Device configuration
   - Server options file (typically named `dsmserv.opt`)

   For example, if you created the instance directory that is shown in the example in the step to create directories for the V6.1 server, copy the files into the following directory:

   AIX HP-UX Linux Solaris `/home/tsminst1/tsminst1`

   Windows `d:\tsm\server1`

   Ensure that the user ID that owns the V6.1 server (the instance user ID) has ownership or read/write permission to the files that you copied.
5. Edit the server options file.
   a. Remove any options that are not supported for V6.1. For the list of deleted options, see Table 30 on page 53.
   b. Ensure that the server options file contains at least one VOLUMEHISTORY option and at least one DEVCONFIG option. Because a volume history file and a device configuration file are required when you must restore the database, generate copies of these files automatically to help ensure that the files are available when needed.
   c. Check whether the server options file includes the TXNGROUPMAX option with a value, and if it does, what the value is. You might want to change the current value because the default value for this option changes from 256 to 4096 with V6.1. The increased value can improve the performance for data movement operations such as storage pool migration and storage pool backup.
      - If the server options file does not include this option, the server automatically uses the new default value of 4096.
      - If the server options file includes a value for this option, the server uses that specified value. If the specified value is less than 4096, consider increasing the value, or removing the option so that the server uses the new default value.
6. Change the default path for the database.

   AIX HP-UX Linux Solaris

   Change the default path for the database to be the same as the instance directory for the server. Issue the command:

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

   For example:

   ```
   db2 update dbm cfg using dftdbpath /home/tsminst1/tsminst1
   ```

   Windows

   Change the default path for the database to be the drive where the instance directory for the server is located. Complete the following steps:
   a. Click **Start** → **Programs** → **IBM DB2** → **DB2TSM1** → **Command Line Tools** → **Command Line Processor**.
   b. Enter `quit` to exit the command-line processor.

A window with a command prompt opens, with the environment properly set up to successfully issue the commands in the next steps.

c. From the command prompt in that window, issue the following command to set the environment variable for the server instance that you are working with:

```
set db2instance=instance_name
```

The *instance_name* is the same as the instance name that you specified when you issued the db2icrt command. For example, to set the environment variable for the Server1 server instance, issue the following command:

```
set db2instance=server1
```

d. Issue the command to set the default drive:

```
db2 update dbm cfg using dftdbpath instance_location
```

For example, if the instance directory is `d:\tsm\server1`, the instance location is drive `d:`. Enter the command:

```
db2 update dbm cfg using dftdbpath d:
```

7. Complete this step if the system uses a locale other than the English regional locale.

AIX HP-UX Linux Solaris

If the system uses a locale other than the English regional locale, set the DB2CODEPAGE system environment variable to 819:

```
db2set -i instance_name DB2CODEPAGE=819
```

For example:

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

8. Change to the instance directory that you created for the server.
9. Create and format the database and recovery logs. In the command, specify the directories that you created for the database and logs. The directories must be empty.

AIX HP-UX Linux Solaris

For example, to get an active log size of 2 GB (2048 MB, the default size), issue the following command, on one line:

```
/opt/tivoli/tsm/server/bin/dsmserv loadformat \
dbdir=/tsmdb001,/tsmdb002,/tsmdb003,/tsmdb004 \
activelogsize=2048 activelogdir=/tsmlog \
mirrorlogdir=/tsmlogmirror archlogdir=/tsmarchlog
```

Windows

For example, to get an active log size of 2 GB (2048 MB, the default size) for the Server1 server instance, issue the following command, on one line:

```
"c:\Program Files\Tivoli\TSM\server\dsmserv" loadformat
dbdir=d:\tsm\db001,e:\tsm\db002,f:\tsm\db003,g:\tsm\db004
activelogsize=2048 activelogdir=h:\tsm\log
mirrorlogdir=j:\tsm\logmirror archlogdir=i:\tsm\archlog
```

If the server that you are upgrading is not Server1, then you must use the -k option. The -k option specifies the instance name for running

this utility. For example, if the system has more than one server instance and the instance that you are upgrading is Server2, issue the command:

```
"c:\Program Files\Tivoli\TSM\server\dsmserv" -k server2
loadformat dbdir=d:\tsm\db001,e:\tsm\db002,f:\tsm\db003,g:\tsm\db004
activelogsize=2048 activelogdir=h:\tsm\log
mirrorlogdir=j:\tsm\logmirror archlogdir=i:\tsm\archlog
```

Important: The server instance that you specify must have already been through all preceding steps for the upgrade process, including the creation of the database instance (db2icrt command).

10. Monitor the process for errors and warning messages. The final message indicates success or failure of the operation.

Continue the upgrade process using one of the following topics:

"Moving the server database using media"

"Moving the server database over a network" on page 261

Related tasks

"Estimating total space requirements for the upgrade process and upgraded server" on page 34

Related reference

"DSMSERV LOADFORMAT (Format a database)" on page 292

"Deleted server commands, utilities, and options" on page 50

Moving the server database using media

Use media to move the server database to the V6.1 server if the V6.1 server is installed on a different system and no network connection is available, if the server system does not have enough space for both databases, or if you want to test the upgrade process and set up a test server.

The process creates a manifest file during the data extraction, which contains information about the media that is used to store the data. The process requires the manifest file for loading the data into the new database.

1. "Extracting the data to media"
2. "Loading the extracted data into the new database" on page 259

Related concepts

"The manifest file for the data extraction to media" on page 288

Extracting the data to media

You can extract the data from the original server database to sequential media. The sequential media can be tape, or disk space that is defined with the FILE device class.

1. Log in using the root user ID on the system that has the original server. Log on with the administrator ID on a Windows system.
2. Ensure that the device that you want to use to store the extracted data is available. The server database and the device configuration file must contain a valid device class definition for the device.
3. From the instance directory for the server that you are upgrading, issue the command to start the extraction. Direct the output of the process to a file for monitoring. For example, issue the following command, on one line:

   AIX

```
nohup /usr/tivoli/tsm/upgrade/bin/dsmupgrd extractdb \
devclass=file manifest=./manifest.txt >extract.out 2>&1 &
```

HP-UX Linux Solaris

```
nohup /opt/tivoli/tsm/upgrade/bin/dsmupgrd extractdb \
devclass=file manifest=./manifest.txt >extract.out 2>&1 &
```

Windows

```
"c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd" extractdb
devclass=file manifest=.\manifest.txt 1>>extract.out 2>&1
```

Tip: Messages that are issued during the extract operation are *not* saved in the server activity log. Direct the output of the utility to a file, as shown in the examples, to record the messages.

4. Monitor the process for errors and warning messages, and for items that you might need to take action on. A message near the end of the process output indicates success or failure of the operation:

   Success message: `ANR1382I EXTRACTDB: Process 1, database extract, has completed.`

   Failure message: `ANR1396E EXTRACTDB: Process 1, database extract, has completed with errors.`

   For example, from the instance directory for the server that you are upgrading, issue the following command to monitor the process:

   ```
   tail -f extract.out
   ```

   The length of time that the process runs depends on the size of the database. The time will be approximately as much as the time required for a full backup of the database.

   Tip: On Windows systems, use the tail command or an equivalent utility with which you can monitor the contents of a file as it changes. For example, the Windows Server 2003 Resource Kit Tools includes the tail command, which can be used as shown in the preceding example.

Related concepts

"The manifest file for the data extraction to media" on page 288

Related tasks

"Preparing space for the upgrade process" on page 231

Related reference

"DSMUPGRD EXTRACTDB (Extract data from a V5 server database)" on page 286

Loading the extracted data into the new database

After you have formatted an empty database using the DSMSERV LOADFORMAT utility, load the data that you extracted from the original server database.

The following requirements must be met:

- The manifest file from the DSMUPGRD EXTRACTDB operation must be available.
- The server options file must contain an entry for the device configuration file.
- The device configuration file must have information about the device class that is specified in the manifest file.

- The media that contains the extracted database must be available to the V6.1 server. The device must be physically attached to the system, and the permissions must be set to grant access to the media for the user ID that owns the V6.1 server instance.

Perform the following steps:

1. Verify that the V6.1 server can access the extracted data.
   - If the extracted data is on tape, the tape drive must be physically attached to the system.
   - If the extracted data was stored using a FILE device class:
     a. Log on to the system using the root user ID.
     b. Change the ownership of the files to the user ID that owns the V6.1 server (the instance user ID).
2. Log on with the server instance user ID on the system where you installed the V6.1 server.
3. If the V6.1 server is on a different system than the original server, copy the manifest file that was created by the extraction process to the V6.1 system.
   a. Ensure that the user ID that owns the V6.1 server (the instance user ID) has ownership or read/write permission for the manifest file.
   b. View the contents of the manifest file to verify that any paths to volumes in a FILE device class are correct for the new system.
4. Ensure that the device configuration file from the original server is available.
   a. Verify that the server option file includes the DEVCONFIG option, and that the option specifies the full path of the device configuration file.
   b. Verify that the device configuration file is available in the location specified by the DEVCONFIG option.
   c. Verify that the permissions on the device configuration file allow read access for the user ID that owns the V6.1 server instance.
5. Verify that the contents of the device configuration file are correct. The device class that was used for the extraction step is recorded in the manifest file, and that device class must exist and be valid on the V6.1 system.
   a. Verify entries for FILE device classes. For example, paths might be different on the system.
   b. Verify entries for tape and other devices. For example, the device names might have changed.
6. Verify that the contents of the manifest file are correct. The manifest file contains a list of volumes to be used when loading the extracted data into the new database. For example, if the manifest file contains a list of volumes belonging to a FILE device class, ensure that the fully qualified path to the volumes is correct for the system.
7. Issue the DSMSERV INSERTDB command to load an extracted server database into the prepared, empty V6.1 database. Direct the output of the process to a file for monitoring. For example, enter the following command on one line:

   AIX HP-UX Linux Solaris

   ```
   nohup /opt/tivoli/tsm/server/bin/dsmserv insertdb \
   manifest=./manifest.txt >insert.out 2>&1 &
   ```

   Windows

   ```
   "c:\Program Files\Tivoli\TSM\server\dsmserv" insertdb \
   manifest=.\manifest.txt 1>>insert.out 2>&1
   ```

8. Monitor the process for errors and warning messages, and for items that you might need to take action on. The system displays interim statistics about the operation. A message near the end of the process output indicates success or failure of the operation:

   Success message: `ANR1395I INSERTDB: Process 1, database insert, has completed.`

   Failure message: `ANR1396E INSERTDB: Process 1, database insert, has completed with errors.`

   For example, issue the following command to monitor the process:

   ```
   tail -f insert.out
   ```

   The length of time that the process runs depends on the size of the database.

   Tip: On Windows systems, use the tail command or an equivalent utility with which you can monitor the contents of a file as it changes. For example, the Windows Server 2003 Resource Kit Tools includes the tail command, which can be used as shown in the preceding example.
9. If you used the media method for upgrade *and* used a tape device, after the insertion operation is complete, remove or check out from the library the tape that holds the extracted data. Prevent the tape from being reused until you are sure that you do not need to run the insertion operation again.

Continue the upgrade process by completing the steps in "Creating a Windows service for the server instance" on page 263.

Related concepts

"The manifest file for the data extraction to media" on page 288

Related reference

"DSMSERV INSERTDB (Move a server database into an empty database)" on page 294

Moving the server database over a network

Move the database by starting the insertion process for the V6.1 server to accept the server database, and then starting extraction process for the V5 server to extract and send the database.

Before starting this procedure, ensure that both the V5 server and the new server are not running.

1. Verify that there is a good network connection between the two systems.
2. Ensure that the device configuration file from the original server is available.
   a. Verify that the server option file includes the DEVCONFIG option, and that the option specifies the full path of the device configuration file.
   b. Verify that the device configuration file is available in the location specified by the DEVCONFIG option.
   c. Verify that the permissions on the device configuration file allow read access for the user ID that owns the V6.1 server instance.
3. Start the insertion process on the V6.1 server to accept the database. To monitor the process, direct the output of the process to a file. For example, start the server, allowing 60 minutes (the default time) for the other server to contact the V6.1 server and directing the process output to `insert.out`, using this command:

   AIX HP-UX Linux Solaris

```
nohup /opt/tivoli/tsm/server/bin/dsmserv insertdb \
sesswait=60 >insert.out 2>&1 &
```

Windows

```
"c:\Program Files\Tivoli\TSM\server\dsmserv" insertdb
sesswait=60 1>>insert.out 2>&1
```

The server starts and waits up to 60 minutes to be contacted by the original server.

4. Monitor the output of the process. Verify that the DSMSERV INSERTDB process has issued the following message before continuing to the next step:

   ```
   ANR1336I INSERTDB: Ready for connections from the source server
   ```

   Issue the following command to monitor the process output in the `insert.out` file:

   ```
   tail -f insert.out
   ```

   Tip: On Windows systems, use the tail command or an equivalent utility with which you can monitor the contents of a file as it changes. For example, the Windows Server 2003 Resource Kit Tools includes the tail command, which can be used as shown in the preceding example.

5. Start the extraction from the original server. Specify the TCP/IP address and port for the V6.1 server. Direct the output of the process to a file for monitoring. For example, enter the following command on one line:

   AIX

   ```
   nohup /usr/tivoli/tsm/upgrade/bin/dsmupgrd extractdb \
   hladdress=127.0.0.1 lladdress=1500 >extract.out 2>&1 &
   ```

   HP-UX Linux Solaris

   ```
   nohup /opt/tivoli/tsm/upgrade/bin/dsmupgrd extractdb \
   hladdress=127.0.0.1 lladdress=1500 >extract.out 2>&1 &
   ```

   Windows

   ```
   "c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd" extractdb hladdress=127.0.0.1
     lladdress=1500 1>>extract.out 2>&1
   ```

6. Monitor the processes for errors and warning messages, and for items that you might need to take action on. From the instance directory for the server that you are upgrading, issue the following command to monitor the extraction process:

   ```
   tail -f extract.out
   ```

   The length of time that the process runs depends on the size of the database, the hardware being used, and the network.

7. Examine the process outputs for the extraction and insertion processes to find the messages that indicate the success or failure of the operations.

Process	Success message	Failure message
Extraction	`ANR1382I EXTRACTDB: Process 1, database extract, has completed.`	`ANR1396E EXTRACTDB: Process 1, database extract, has completed with errors.`
Insertion	`ANR1395I INSERTDB: Process 1, database insert, has completed.`	`ANR1396E INSERTDB: Process 1, database insert, has completed with errors.`

Related reference

"DSMUPGRD EXTRACTDB (Extract data from a V5 server database)" on page 286

"DSMSERV INSERTDB (Move a server database into an empty database)" on page 294

Creating a Windows service for the server instance

Windows

A Windows service is created for the Tivoli Storage Manager V6.1 server automatically if you use the upgrade wizard (dsmupgdx). If you do not use the wizard, you must create the Windows service for the Tivoli Storage Manager server manually.

1. Change to the installation directory for the server program. By default, the directory is `C:\Program Files\Tivoli\TSM\console`. If you installed the server in a different directory, change to the `console` subdirectory of the server installation directory.
2. Install the Windows service, using the Tivoli Storage Manager server instance name in the service name. Issue the following command:

   ```
   install "TSM server_instance_name"
    "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe" admin_name admin_password
   ```

   where:

   `"TSM server_instance_name"` is the name of the service that is being installed.

   server_instance_name is the instance name that was specified when you issued the db2icrt command.

   admin_name is the administrator account that owns the service.

   admin_password is the password for the administrator account.

   Example 1

   To install the Windows service for the Server1 server instance, enter the following command on one line. The example uses `rudy` as the administrator account, which has the password `s21ret`.

   ```
   install "TSM server1" "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
   rudy s21ret
   ```

   Example 2

   To install the Windows service for the Server2 server instance using LocalSystem as the logon account, issue the following command. Because the LocalSystem account does not have a password, use the quotation marks (" ") to specify a null password.

   ```
   install "TSM Server2" "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
   localsystem ""
   ```
3. Optional: Manually change the service to an automatic startup type by using Windows administrative tools (**Administrative Tools** → **Services**).

Related tasks

"Starting the server on Windows systems" on page 270

Configuring the system for database backup

The database manager and the Tivoli Storage Manager API must be configured so that the database manager can back up the server database. The configuration is completed for you automatically if you use the upgrade wizard (dsmupgdx). If you do not use the wizard, you must complete the configuration manually.

- "Configuring the system for database backup on AIX, HP-UX, Linux, and Solaris systems"
- "Configuring the system for database backup on Microsoft Windows systems" on page 266

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Configuring the system for database backup on AIX, HP-UX, Linux, and Solaris systems

AIX HP-UX Linux Solaris

If you did not use the upgrade wizard, you must complete the configuration for the database backup manually.

In the following steps, the examples use tsminst1 for the server instance user ID and `/home/tsminst1/tsminst1` for the Tivoli Storage Manager server instance directory.

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:

      AIX

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

      HP-UX Linux Solaris

      ```
      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:

   AIX `/usr/tivoli/tsm/client/api/bin64`

   HP-UX Linux Solaris `/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 on AIX, HP-UX, Linux, and Sun Solaris systems" on page 267 for the details.
   b. Log in using the root user ID.
   c. Source the database manager by running the following command.

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

      `. /home/tsminst1/sqllib/db2profile`
   d. Change the API password, using this command:
      `/home/tsminst1/sqllib/adsm/dsmapipw`
   e. When prompted by the dsmapipw command, specify `TSMDBMGR` as both the original and new password.
   f. Enter this operating system command:
      `rm /home/tsminst1/tsminst1/tsmdbmgr.log`

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, "Taking the first steps after upgrade," on page 267.

Configuring the system for database backup on Microsoft Windows systems

Windows

If you did not use the upgrade wizard, you must complete the configuration for the database backup manually.

Windows In the following commands, the examples use `server1` for the database instance and `d:\tsmserver1` for the Tivoli Storage Manager server directory. Replace these values with your actual values in the commands.

1. Create a file called `tsmdbmgr.env` in the `d:\tsmserver1` directory with the following contents:

   ```
   DSMI_CONFIG=d:\tsmserver1\tsmdbmgr.opt
   DSMI_LOG=d:\tsmserver1
   ```

2. Set the DSMI_ api environment-variable configuration for the database instance:
   a. Open a DB2 command window. One method of doing this is by going to the `C:\Program Files\Tivoli\TSM\db2\bin` directory, or if you installed Tivoli Storage Manager in a different location, go to the `db2\bin` subdirectory in your main installation directory. Then, issue this command:

      ```
      db2cmd
      ```

   b. Issue this command:

      ```
      db2set -i server1 DB2_VENDOR_INI=d:\tsmserver1\tsmdbmgr.env
      ```

3. Create a file called `tsmdbmgr.opt` in the `d:\tsmserver1` directory with the following contents:

   ```
   ************************************************
   nodename $$_TSMDBMGR_$$
   commmethod tcpip
   tcpserveraddr localhost
   tcpport 1500
   passwordaccess generate
   errorlogname d:\tsmserver1\TSMDBMGR_TSMSERVER1.log
   ```

4. Stop and start the database instance:
   a. Open a DB2 command window. One method of doing this is by going to the `C:\Program Files\Tivoli\TSM\db2\bin` directory, or if you installed Tivoli Storage Manager in a different location, go to the `db2\bin` subdirectory in your main installation directory. Then, issue this command:

      ```
      db2cmd
      ```

   b. Set the database instance:

      ```
      set db2instance=server1
      ```

   c. Stop DB2:

      ```
      db2stop
      ```

   d. Start DB2:

      ```
      db2start
      ```

5. Enter the following command on one line:

   ```
   "c:\program files\tivoli\tsm\server\dsmsutil.exe"
   UPDATEPW /NODE:$$_TSMDBMGR_$$ /PASSWORD:TSMDBMGR /VALIDATE:NO /OPTFILE:
   "d:\tsmserver1\tsmdbmgr.opt"
   ```

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 9, “Taking the first steps after upgrade,” on page 267.

Chapter 9. Taking the first steps after upgrade

After the server is upgraded, perform steps to verify that the server was successfully upgraded and can operate normally. The steps include starting the server, registering licenses, and backing up the database.

Complete the following steps:

1. "Verifying access to storage pools on disk"
2. "Starting the server instance after the upgrade"
3. "Registering licenses" on page 271
4. "Backing up the database after upgrading the server" on page 271
5. "Verifying the upgraded server" on page 272
6. "Updating automation" on page 273
7. "Monitoring the upgraded server" on page 273

Verifying access to storage pools on disk

For all disk space that was used for storage pools (device types of FILE or DISK) by the V5 server, verify that the user ID that owns the upgraded Tivoli Storage Manager server instance has ownership or read/write permission.

Starting the server instance after the upgrade

Verify that the server instance is correctly set up by starting the server instance.

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 or write files in the instance directory, you cannot start that instance of the server.

Starting the server on AIX, HP-UX, Linux, and Sun Solaris systems

AIX HP-UX Linux Solaris

You can start the server when logged in to the system with the user ID that you created for the server instance. You can also start the server instance when logged in as the root user.

Related concepts

"Startup of server instances (AIX, HP-UX, Linux, Solaris)" on page 8

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

AIX HP-UX Linux Solaris

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

1. Log in using the user ID that owns the server instance.

   Tip: The `db2profile` script sets the environment variables for the database for the server instance. When the server instance is defined, the script is added to the configuration profile for the user ID that owns the server instance, if that profile exists.

   - If you log in using the user ID that owns the server instance and it had a configuration profile (`.profile` if you are using Korn shell) when the server instance was defined, the `db2profile` script runs automatically. If the profile does not exist, or the script does not run automatically, run it manually by issuing the command:

     ```
     . ~/sqllib/db2profile
     ```

   - If you log in using some other user ID, then manually run the `db2profile` script before starting the server. For example, if the instance user ID is tsminst1, issue the command:

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

2. Change to the instance directory for the server instance that you want to start.
3. Start the server instance by issuing the following command:

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

   The server program runs in the foreground so that you can set up an administrator ID and connect to the server instance.

Example

In this example, the name for the instance of the Tivoli Storage Manager server is tsminst1 and the instance directory is `home/tsminst1/tsminst1`. To start tsminst1, issue the following commands:

```
cd /home/tsminst1/tsminst1
/opt/tivoli/tsm/server/bin/dsmserv
```

To start the server in the background, issue the following commands:

```
cd /home/tsminst1/tsminst1
/opt/tivoli/tsm/server/bin/dsmserv -q &
```

Starting the server from the root user ID

AIX HP-UX Linux Solaris

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 using the root user ID, complete 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 server instance.
2. Change the configuration profile for the root user ID to run the `db2profile` script for the instance user ID. 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
```

If you are running the Bourne shell, determine the fully qualified home directory for the instance user ID, and specify that directory. For example:

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

3. Change the current directory to the instance directory. For example, if you put the instance directory as a subdirectory of the user ID's home directory, 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

AIX HP-UX Linux Solaris

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 upgrade wizard, you had the choice of starting the upgraded 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
```

Related reference

"The server startup script: rc.dsmserv" on page 297

Starting the server on Windows systems

Windows

You can use the Tivoli Storage Manager Management Console (a Microsoft Management Console snap-in), or the DSMSERV utility to start the server.

Start the server using one of the following methods.

- To start the server using the Management Console, complete the following steps:
  1. From the Start menu, click **Program Files** → **Tivoli Storage Manager** → **Management Console**.
  2. In the list of servers on this system, look for the server instance that was created. Select it to start it.
- To start the server as a service, first start the console monitor, then start the service. You can also set the server start mode and options.
  1. Start the console monitor. Because the Tivoli Storage Manager server can issue requests that require action, it is important to monitor server activity with the administrative client using the console monitor.
     a. Double-click the **IBM Tivoli Storage Manager Console** icon on the desktop.
     b. Expand the tree until the server that you want to work with is displayed. Expand the server, and then expand the **Reports** tree under the selected server.
     c. Select **Monitor**, and then **Start**.
  2. Start the server as a Windows service.
     a. Double-click the **IBM Tivoli Storage Manager Console** icon on the desktop.
     b. Expand the tree until the server that you want to work with is displayed. Expand the server, and then expand the **Reports** tree under the selected server.
     c. Select **Service Information**.
     d. Select the server in the right pane.
     e. Click **Start**.
  3. Optional: Set the server start mode and options.

a. Double-click the **IBM Tivoli Storage Manager Console** icon on the desktop.
b. Expand the tree until the server that you want to work with is displayed. Expand the server, and then expand the **Reports** tree under the selected server.
c. Select **Service Information**.
d. Select the server in the right pane.
e. Click **Properties**.
f. Click **Automatic**.
g. Select the **Log on as** account information as appropriate. The default selection is the System account.
h. Check the **Log output to file** check box. Use the default `console.log` file name or specify another file name.

4. Optional: To view start and stop completion messages that are logged in the Windows Application log, you can use the Windows Event Viewer in Administrative Tools.
5. Optional: If you plan to use the Tivoli Storage Manager device driver (tsmscsi), you might also need to start the device driver at this time. See the information about starting and stopping the device driver in the *Administrator's Guide*.

- To start the server using DSMSERV, enter the command:

  ```
  "c:\Program Files\Tivoli\TSM\server\dsmserv" -k server_instance
  ```

  where *server_instance* is the name of your server instance. Server1 is the default for the first instance of the Tivoli Storage Manager server on a system.

Tip: If you receive a Windows error 216 message when you try to start the server, it is a result of using a 64-bit package on a 32-bit Windows system. Retrieve the 32-bit Windows package and reinstall Tivoli Storage Manager.

Related concepts

"Startup of server instances (Windows)" on page 8

Appendix D, "Services associated with the Tivoli Storage Manager server," on page 311

Registering licenses

Immediately register any Tivoli Storage Manager licensed functions that you have purchased so that you do not lose any data after you begin using the server. Use the REGISTER LICENSE command for this task.

Backing up the database after upgrading the server

After successfully upgrading the server, perform a full backup of its database as soon as possible. Before performing the backup, you must first select the device class for backups of the database.

1. Complete the following steps:
   a. If you did not use the upgrade wizard (`dsmupgdx`) to upgrade the server, ensure that you have completed the steps to manually configure the system for database backups.
   b. If you used the media method for upgrade *and* used a tape device, remove or check out from the library the tape that was used to hold the extracted

data. Prevent the tape from being reused until you are sure that the upgraded server is running properly and you do not need to repeat the database insertion step.

2. Select the device class to be used for automatic 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 all automatic database backups.

3. Back up the database.

   ```
   backup db devclass=device_class_name type=full
   ```

   The device class can be the same as or different from the device class that you specified with the SET DBRECOVERY command. If the device class is different, you receive a warning message, but the backup operation continues.

Related tasks

"Configuring the system for database backup" on page 264

Verifying the upgraded server

Verify the operation of the server. If the server was installed on a new system as part of the upgrade, check and update connections to storage devices and other components.

1. Monitor the messages that the server issues as it starts. Watch for error and warning messages.
2. If the server is running on a new system as a result of the upgrade, check the following items:
   a. Ensure that all of the original server's storage devices are accessible to the upgraded server.
   b. Compare the device names on the new system with the names for the devices on the original system. Update definitions for the devices on the server if needed. For example, update path definitions.
   c. Update the network address that is used by backup-archive clients, storage agents, library client servers, and other servers for communicating with the upgraded server.

      Optionally, instead of making these updates, consider whether you can use the network address of the original system as the address of the new system. You might also be able to update domain name service (DNS) to point to the new system instead of the original system. Consult your network administrator.
3. Verify that you can connect to the server using an administrative client as you did for the earlier version of the server.
4. Run commands to get a summary of information in the database. Compare the summary with the results for the same commands before the upgrade.
5. Perform backups for typical client nodes and verify that the backups work as expected.
6. Verify that operations such as LAN-free data movement and library sharing work correctly.

7. After you are satisfied that the server is performing as expected and you will not need to revert to the previous version of the server, remember to return any settings that you changed to prepare for the upgrade back to the original values. See step 3 on page 232.

Related reference

"Sample commands to run for validation of the database upgrade" on page 297

Updating automation

After an upgrade, administrative schedules that were defined in V5 might not work without modification because of changes in command syntax. Implement and verify changes to any automation or scripts that were identified as needing modification in the planning process.

Important: Ensure that automation includes a backup of the database. Back up the database at least once per day.

Monitoring the upgraded server

When you start using the upgraded 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 archive failover 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 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 *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 archive failover 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 archive failover log is used only under unusual conditions, not in normal operation.

Related concepts

"Recovery log space requirements" on page 32

"Database operations" on page 4

Chapter 10. Troubleshooting the database upgrade

Review this section for tips to troubleshoot common problems. A procedure that explains how to return to the previous version of the server is also included.

Check the support site for the latest information: http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html

Upgrade utility issues warnings about server options that are not supported

When running the upgrade wizard or one of the upgrade utilities, warning messages about server options that are not supported are issued.

Symptoms

Warning messages about the server options appear, but the process continues.

Causes

The server options file includes options that are not valid for a V5.5 server. For example, the options file might include some options that are valid only for a V5.4 or earlier server.

If you already updated the server options file to add options that are valid only for a V6.1 server, you might also see warning messages during upgrade processes.

Resolving the problem

You can ignore the warning messages until after the upgrade process is complete.

After the upgrade process is complete, and before starting the V6.1 server, edit the server options file and remove any options that are not valid for V6.1.

Connection refusal message when starting the extraction operation

When using the network method to move the V5 server database to the V6 server database, connection refusal messages are received when starting the extraction operation.

Symptoms

You might see the following messages:

```
ANR8214E Session open with host_address failed due to connection refusal.
ANR0454E Session rejected by server server_name, reason: Communication Failure.
```

Causes

A connection refusal message usually means that the system is trying to connect to a host or port where no process is listening for a connection.

Resolving the problem

Before trying the extraction process again, check the following items:

- Ensure that the TCP/IP communication method is enabled for the target server. The communication method is set using the COMMMETHOD option in the server options file. TCP/IP is the default setting for the server communication method, but the server options file for the target server might have a different value. Check whether the server options file for the target server has `COMMMETHOD NONE`, or has only `COMMMETHOD SHMEM` specified. Remove `COMMMETHOD NONE` if it appears in the server options file. Add `COMMMETHOD TCPIP` if it is not in the server options file.
- Ensure that the values that you specified with the **HLADDRESS** and **LLADDRESS** parameters on the DSMSERV EXTRACTDB command are correct. The **LLADDRESS** parameter must match the value that is specified for the TCPPORT option in the server options file for the target server.
- Before issuing the DSMSERV EXTRACTDB command again, ensure that you wait for the DSMSERV INSERTDB process to issue the following message:

  ```
  ANR1336I INSERTDB: Ready for connections from the source server
  ```

Problems with restarting the upgrade process after database insertion failure

After the upgrade process fails at the database insertion step, restarting the process results in errors.

Symptoms

When you try to restart the process, using either the upgrade wizard (`dsmupgdx`) or commands, you receive messages that the database already exists, or that directories are not empty.

Causes

The problem occurs because a database instance was already created, despite the failure. Directories that you specified in the wizard or with the DSMSERV LOADFORMAT command might no longer be empty because the failed process started to write information in these directories. To do the formatting operation again, the directories must be empty.

Resolving the problem

Try the following actions to resolve the problem.

AIX HP-UX Linux Solaris

1. Ensure that you are logged in with the same user ID that you were using when the insertion operation failed. This should be the user ID that you created specifically for the server instance that you were upgrading when the failure occurred.

   Attention: Ensure that you are using the correct user ID. The database that is owned by the user ID that you log in with now is the database that will be destroyed in the following step. Do not perform the following steps when you are logged in with a user ID that owns a valid, working V6 server instance.
2. Remove the database instance that was created.

```
dsmserv removedb TSMDB1
```

Alternate method: If the DSMSERV REMOVEDB command fails for some reason, use the DB2 command to drop the database. Issue the following commands:

```
db2start
db2 drop db tsmdb1
```

3. To reuse the database and log directories that you specified in the failed attempt to create the server instance, verify that each directory is now empty.
4. Restart the upgrade wizard for the server instance that you are upgrading.

   If you are using commands, restart at the step in which you issue the DSMSERV LOADFORMAT command.

Windows

1. Remove the database instance that was created. Issue the command:

   ```
   dsmserv removedb -k server_instance_name TSMDB1
   ```

   The *server_instance_name* is the name of the registry key for the server instance that you were upgrading when the failure occurred. For example, if you were upgrading Server2, issue the command:

   ```
   dsmserv removedb -k server2 TSMDB1
   ```

   Attention: Ensure that you specify the name of the server instance for which the process failed. The database for the specified server instance is destroyed by issuing this command.

   Alternate method: If the DSMSERV REMOVEDB command fails for some reason, use the DB2 command to drop the database:

   a. Click **Start** → **Programs** → **IBM DB2** → **DB2TSM1** → **Command Line Tools** → **Command Line Processor**.
   b. Enter `quit` to exit the command-line processor.

      A window with a command prompt opens, with the environment properly set up to successfully issue the commands in the next steps.
   c. From the command prompt in that window, issue the following command to set the environment variable for the server instance that you are working with:

      ```
      set db2instance=server_instance_name
      ```

      For example, to set the environment variable for the Server1 server instance, issue the following command:

      ```
      set db2instance=server1
      ```
   d. Issue the command to drop the database:

      ```
      db2 drop db tsmdb1
      ```
2. To reuse the database and log directories that you specified in the failed attempt to create the server instance, verify that each directory is now empty.
3. Restart the upgrade wizard for the server instance that you are upgrading.

If you are using commands, restart at the step in which you issue the DSMSERV LOADFORMAT command.

Database insertion phase: ANR1338E messages from the upgrade utility

One or more ANR1338E messages about constraint violations or other data problems are issued during the database insertion phase, when running the upgrade wizard or the DSMSERV INSERTDB upgrade utility.

Symptoms

The messages about constraint violations appear, and processing continues. Data that has a problem is not inserted into the V6 database.

Causes

The insertion process encountered one or more problems with values from the V5 database that were being inserted into the V6 database. The values did not meet constraints for a data type or data format, or were not valid for some other reason.

Resolving the problem

Because some data was not inserted into the database, the database is in an inconsistent state.

Attention: Do not start the server until the data problems are investigated. Data damage might occur if you start the server. Contact IBM Support to get assistance in determining the extent of the problem, and what action to take next.

The IBM Support team will require you to provide the `constrnt.log` file, which contains details about the problems.

Database insertion phase: ANR1525I messages with no apparent progress

The DSMSERV INSERTDB utility repeatedly issues status message ANR1525I with no sign that any progress is being made.

Symptoms

You might see messages such as the following set while the insertion process is running.

```
ANR1524I INSERTDB: Beginning database update phase.
 ANR1525I INSERTDB: Updated 0 of 25,185,883 database entries in 0:23:10.
 ANR1525I INSERTDB: Updated 0 of 25,185,883 database entries in 0:53:13.
 ANR1525I INSERTDB: Updated 0 of 25,185,883 database entries in 1:23:16.
 ANR1525I INSERTDB: Updated 0 of 25,185,883 database entries in 1:53:19.
 ANR1525I INSERTDB: Updated 0 of 25,185,883 database entries in 2:23:22.
```

The count of updated database entries might not increase for a long time.

Causes

In the database update phase of the DSMSERV INSERTDB utility, information from multiple sets of source tables are merged into a smaller number of target tables. Each operation that merges multiple source tables into one target table is a single, long-running DB2 UPDATE operation. An UPDATE operation does not provide status until it completes. Because the status is not updated until completion, the ANR1525I message repeatedly shows an unchanging value for the number of entries that have been updated.

After each set of tables is merged into one target table, the ANR1525I message changes to reflect the progress up to that point. However, the merge operation for each set of tables can take a considerable amount of time, during which the status remains the same. This lack of change in status is not the sign of a problem. The repeated issuance of the ANR1525I message is an indication that the INSERTDB utility is still running, even if the statistics that the messages report do not change.

Resolving the problem

After the DSMSERV INSERTDB utility enters the database update phase, most of the remaining work is done by DB2. You can use only indirect methods to determine if the operation is progressing. One such method is to use a system monitor, such as topas on AIX, to confirm that the DB2 db2sysc process is operating. The use of processor resource and I/O to the database directories by the db2sysc process are good indications that the update phase is progressing.

Warnings about unsupported server options when starting the server

When you start the V6.1 server, you receive warning messages about server options that are not supported. However, the options do not appear in the list of server options that were deleted for V6.1.

Symptoms

ANR0902W messages about the server options appear, but the server starts.

Causes

V5 releases tolerated the presence of some server options that were not supported by the server. The V6.1 server flags such options by issuing warning messages.

The list of server options that were deleted for V6.1 contains options there were deleted since V5.5 was released. If the server option that causes a warning on your system is not in the list of deleted server options, the option was likely deleted for some earlier release (for example, V5.4).

Resolving the problem

You can ignore the error, or update the server options file and restart the server.

Related reference

"Deleted server commands, utilities, and options" on page 50

Reverting from V6.1 to the previous V5 server version

If you need to revert to the previous version of the server after an upgrade, you must have a full database backup from your original version, the server installation media for your original version, and key configuration files. By carefully following the preparation steps before upgrading the server, it might be possible to revert to the previous version of the Tivoli Storage Manager server with minimal loss of data.

You must have the following items from the earlier version of the server:

- Server database backup
- Volume history file
- Device configuration file
- Server options file
- The `dsmserv.dsk` file

The value of the **REUSEDELAY** parameter for storage pools compared to the length of time that you were running the V6.1 server can affect whether client data is affected by reverting to the earlier server version.

Perform the following steps on the system that has the V6.1 server:

Steps for reverting to the previous server version

1. Back up the V6.1 database and save the contents of the instance directory, including the volume history file, the device configuration file, and server options file. Keep these files in case you need to return to the V6.1 version of the server.
2. Remove the database from the database manager, then delete the database and recovery log directories.
   a. Manually remove the database. Issue the command:
      ```
      dsmserv removedb tsmdb1
      ```
      You can also use the following command to remove the database:
      ```
      db2 drop db tsmdb1
      ```
   b. If you need to reuse the space that is occupied by the database and recovery log directories, you can now delete these directories.
3. Use the installation program to uninstall the V6.1 server. Uninstallation removes the server and the database manager code, with their directories.

   See the *Tivoli Storage Manager Installation Guide* for details.
4. Reinstall the version of the server program that you were using before the upgrade to V6.1. This version must match the version that your server was running when you created the database backup that you will restore in a later step.

   For example, if the server was at version 5.4.4.0 before the upgrade, and you intend to use the database backup that was in use on this server, you must install the V5.4.0.0 server program and then the V5.4.4.0 fix pack to be able to restore the database backup.
   a. Reinstall the base version of the server that was in use before the upgrade to V6.1.
   b. Reinstall any fix packs that had been installed on the base server version before the upgrade to V6.1.

5. Copy the following files, which were backed up before the upgrade of the original server, to the directory for server information.

   Device configuration file

   Volume history file

   The `dsmserv.dsk` file

   The server options file (typically `dsmserv.opt`)
6. Format the database by using the DSMSERV FORMAT utility. For details see the information for the version of the server that you are reinstalling. Information for V5.5 is available at this information center: http://publib.boulder.ibm.com/infocenter/tivihelp/v1r1

   Information for V5.4 and V5.3 is available in the same information center. In the navigation pane, scroll down and expand **Previous versions**.
7. Restore the database using the backup that was created in the preparation steps before the upgrade.
8. If you enabled data deduplication for any FILE-type storage pools that existed before the upgrade, or if you moved data that existed before the upgrade into new storage pools while using the V6.1 server, you must perform additional recovery steps. See "Additional recovery steps if you created new storage pools or enabled data deduplication."
9. If the **REUSEDELAY** setting on storage pools was less than the age of the database that you restored, then restore volumes on any sequential-access storage pools that were reclaimed after that database backup. Use the RESTORE VOLUME command.

   If you do not have a backup of a storage pool, audit the reclaimed volumes using the AUDIT VOLUME command, using the FIX=YES parameter to resolve inconsistencies. Use the command:

   ```
   audit volume volume_name fix=yes
   ```
10. If client backup or archive operations were performed using the V6.1 server, you might need to audit the storage pool volumes on which the data was stored.
11. If you were using active-data pools before upgrading to V6.1, you must recreate them after reverting to the earlier version of the server.

    The amount of time required to recreate the active-data pools might be significant, depending on the number and size of the active-data pools to be recreated.

Additional recovery steps if you created new storage pools or enabled data deduplication

If you created new storage pools, enabled data deduplication for any FILE-type storage pools, or did both while your server was running as a V6.1 server, then you have additional steps to complete to return to the previous version.

Use this information if you did either or both of the following actions while your server was running as a V6.1 server:

- You enabled the data deduplication function for any storage pools that existed before the upgrade to V6.1 program. (Data deduplication applies only to storage pools that use a FILE device type.)
- You created new, primary storage pools after the upgrade, *and* moved data that had been stored in other storage pools into the new storage pools.

Perform these steps after the server is again running as a V5 server.

- For each storage pool for which you turned on the data deduplication function, restore the entire storage pool by using the RESTORE STGPOOL command. To complete this task, you must have a complete backup of the storage pool, which must have been created before the upgrade to V6.1.
- For storage pools that you created after the upgrade, review the following information to determine what action to take.

  Data that was moved from existing, V5 storage pools into the new storage pools might be lost because the new storage pools no longer exist in your restored V5 server. Possible recovery depends on the type of storage pool:

  – If data was moved from V5, DISK-type storage pools into a new storage pool, space that was occupied by the data that was moved has most likely been reused. Therefore you must restore the original, V5 storage pools, by using the storage pool backups that were created before the upgrade to V6.1.

    If *no* data was moved from V5, DISK-type storage pools into a new storage pool, then audit the storage pool volumes in these DISK-type storage pools.

  – If data was moved from V5, sequential-access storage pools into a new storage pool, that data might still exist and be usable in storage pool volumes on the restored V5 server. The data is likely to be usable if the **REUSEDELAY** parameter for the storage pool was set to a value that prevented reclamation while the server was running as a V6.1 server. If any volumes were reclaimed while the server was running as a V6.1 server, those volumes must be restored from storage pool backups that were created before the upgrade to V6.1.

Chapter 11. Utilities, scripts, and sample commands for the server upgrade

Utilities are available to move a server database to an upgraded, V6.1 server. A script is available for starting multiple servers.

DSMUPGRD QUERYDB (Display information about a V5 database)

Use the DSMUPGRD QUERYDB utility to display information about the database and recovery log for a server that is at a version earlier than V6.1. You can use the information to estimate the amount of storage that will be required for the database and recovery log when the server is upgraded to V6.1.

Syntax

```
                                                  ┌─ -k──Server1──┐
►►──DSMUPGRD──┬──────────┬──┬──────────────────┬──┼───────────────┼──QUERYDB──────►◄
              └─ -quiet──┘  └─ -o──options_file─┘  └─ -k──key_name─┘
```

Parameters

AIX HP-UX Linux Solaris **-quiet**
Specifies that messages to the console are suppressed. This parameter is optional.

-o *options_file*
Specifies an options file to use. This parameter is optional.

Windows **-k** *key_name*
Specifies the name of the Windows registry key from which to retrieve information about the server. The default is SERVER1. This parameter is optional.

Examples

Obtain information about the database:

```
dsmupgrd querydb
```

DSMUPGRD PREPAREDB (Prepare a V5 database for upgrade)

Use the DSMUPGRD PREPAREDB utility to prepare a server's database for upgrade to V6.1. You must run this utility before using the DSMUPGRD EXTRACTDB utility.

Syntax

```
►►─DSMUPGRD──┬──────────┬──┬──────────────────────┬──┬─┬─────────┬─┬──────────┬─PREPAREDB──►◄
             └─ -quiet─┘  └─ -o──options_file─────┘  │ └─ -k──Server1─┘ │
                                                     └─ -k──key_name────┘
```

Parameters

AIX HP-UX Linux Solaris **-quiet**
Specifies that messages to the console are suppressed. This parameter is optional.

-o *options_file*
Specifies an options file to use. This parameter is optional.

Windows **-k** *key_name*
Specifies the name of the Windows registry key from which to retrieve information about the server. The default is SERVER1. This parameter is optional.

Example

```
dsmupgrd preparedb
```

DSMUPGRD EXTRACTDB (Extract data from a V5 server database)

Use the DSMUPGRD EXTRACTDB utility to extract data from a server database. The data can be inserted into a version 6.1 server database either later or at the same time as the extraction process.

Prerequisite

Before using this utility, you must use the DSMUPGRD PREPAREDB utility on the existing database.

Syntax

```
                                                  ┌ -k──Server1──┐
►►──DSMUPGRD──┬──────────┬──┬──────────────────┬──┼──────────────┼──EXTRACTDB──►
              └ -quiet───┘  └ -o──options_file──┘  └ -k──key_name─┘

►──┬─┬ A:  Extract to media ┬──────────────────────────────────────────────►
   └─│ B:  Extract and transmit using a network ┬┘

   ┌─EVentbasedused──=──Yes──┐
►──┼────────────────────────┼──────────────────────────────────────────────►◄
   └─EVentbasedused──=──Never┘
```

A: Extract to media:

```
├──DEVclass──=──device_class_name──MANifest──=──file_name──────────────────►

   ┌─SCRatch──=──Yes──────┐
►──┼──────────────────────┼──┬──────────────────────────────────────────┤
   └─SCRatch──=──┬─Yes─┬──┘  │  (1)                   ┌──────────┐       │
                 └─No──┘     └──────VOLumenames──=──┬─,──────────┬─┘       │
                                                     └─volume_name┘
```

B: Extract and transmit using a network:

```
├──HLAddress──=──ip_address──LLAddress──=──tcp_port──────────────────────┤
```

Notes:

1 You must specify **VOLUMENAMES** if you specify **SCRATCH=NO**

Parameters

AIX HP-UX Linux Solaris **-quiet**
Specifies that messages to the console are suppressed. This parameter is optional.

-o *options_file*
Specifies an options file to use. This parameter is optional.

Windows **-k** *key_name*
Specifies the name of the Windows registry key from which to retrieve information about the server. The default is SERVER1. This parameter is optional.

DEVclass
Specifies a sequential device class to use for storing the extracted data. This parameter is required if you want to extract the database to media.

Restriction: You cannot use a device class with a device type of NAS or CENTERA.

MANifest
Specifies the location of the manifest file. Use a fully qualified file name, or place in a local directory. For example: `./manifest.txt`

This parameter is required if you want to extract the database to media.

EVentbasedused
Specifies whether event-based archive retention was ever in use on the server. Event-based archive retention allows the retention of an archived object to be based on an external event. The default value for this parameter is YES. Possible values are:

Yes
Specifies that event-based archive retention was in use on the server. The default is YES. If you are not sure whether event-based archive retention was in use, accept the default.

Overriding the default might cause archive objects to expire prematurely after the upgrade, if event-based archive retention was ever used. Using the default value ensures correct results.

Never
Specifies that event-based archive retention was never in use on the server.

Attention: Specifying EVENTBASEDUSED=NEVER might improve the performance of the upgrade operation. However, do not use this value if there is *any* chance that event-based archive retention was ever used on the server. If event-based archive retention was ever used on the server, specifying EVENTBASEDUSED=NEVER can result in archive files expiring prematurely after the upgrade completes.

SCRatch
Specifies whether scratch volumes can be used to store the data. This parameter is optional. The default value is YES. Possible values are:

Yes
Specifies that scratch volumes can be used.

If you specify **SCRATCH=YES** and also specify volumes with the **VOLUMENAMES** parameter, the specified volumes are used first. Scratch volumes are used only if the specified volumes do not have enough space to contain the extracted data.

If the device type for the device class is FILE, the names for the scratch volumes are generated based on a time stamp.

No
Specifies that scratch volumes cannot be used. If you specify this value, you must also specify volumes by using the **VOLUMENAMES** parameter.

If the volumes that you specify with the **VOLUMENAMES** parameter do not have enough space to contain the extracted data, the process fails.

VOLumenames
Specifies the volumes to use to store the extracted database. To specify multiple volumes, separate the names with commas and without intervening spaces.

HLAddress
Specifies either the numerical IP address or the domain name of the V6.1 server. This parameter is required if you want to extract and simultaneously transmit the data to the V6.1 server using the network.

If the V5 server and the V6.1 server are on the same system, you can specify `localhost`.

LLAddress
Specifies the low-level address of the V6.1 server. This address is the same as the value that is specified with the TCPPORT server option for the V6.1 server. This parameter is required if you want to extract and simultaneously transmit the data to the V6.1 server using the network.

Examples

Extract and transmit the data to a server using the network:

```
dsmupgrd extractdb hladdress=xyz.company.com lladdress=1555
```

Extract and store the data on media:

```
dsmupgrd extractdb devclass=tapeclass manifest=keepthis.txt
```

The manifest file for the data extraction to media

During the data extraction process to media, the DSMUPGRD utility creates a manifest file, which contains information about the volumes that are used for storing the extracted data.

The manifest file is required by the data insertion process when you are using media to move the database to the V6.1 server. You specify the name of the manifest file when you issue the DSMSERV INSERTDB command.

A manifest file has contents such as the following example:

```
* Manifest file for EXTRACTDB
DEVCLASS=FILE
STREAMS=1
VOLUMENAMES000=/home/tsm/97244367.ost
```

Related reference

"DSMUPGRD EXTRACTDB (Extract data from a V5 server database)" on page 286

DSMSERV INSERTDB (Move a server database into an empty database)

DSMUPGRD EXTEND DB (Extend the size of the database)

Use this utility on a V5 database to extend its size. Use this utility only when an error occurs during the upgrade process that indicates that you need additional database space to continue.

Prerequisite

Use the DSMFMT utility to format a new volume to be used for extending the database. For information about how to use the DSMFMT utility, see the version 5.5 information center: http://publib.boulder.ibm.com/infocenter/tivihelp/v1r1

Syntax

```
                                                  ┌─ -k──Server1──┐
►►──DSMUPGRD──┬──────────┬──┬──────────────────┬──┼───────────────┼──EXTEND DB──►
              └─ -quiet──┘  └─ -o──options_file─┘  └─ -k──key_name─┘

►─volume_name──megabytes──────────────────────────────────────────────────────►◄
```

Parameters

AIX HP-UX Linux Solaris **-quiet**
Specifies that messages to the console are suppressed. This parameter is optional.

AIX HP-UX Linux Solaris Windows **-o** *options_file*
Specifies an options file to use. This parameter is optional.

Windows **-k** *key_name*
Specifies the name of the Windows registry key from which to retrieve information about the server. The default is SERVER1. This parameter is optional.

volume_name **(Required)**
Specifies the name to be used for the new database extension volume.

megabytes **(Required)**
Specifies the size of the new volume in megabytes. The size must be a multiple of 4 MB, and it must be 1 MB less than the size of the volume specified in the *volume_name* parameter. For example, if the volume is 5 MB, specify a value of 4.

DSMUPGRD EXTEND LOG (Extend the size of the recovery log)

Use this utility on a V5 server to extend the size of the recovery log when the ANR9999D LOGSEG message was issued during the upgrade process, which indicates that you need additional log space to continue with the upgrade process.

Issue this command if you receive an ANR9999D LOGSEG message. This indicates that your log space has been overcommitted and your server terminates with a LOGSEG871 error. After the server is running, you can do the following:

- Back up the database, which frees the recovery log space.
- Adjust the size of the recovery log, the database backup trigger full percentage, or both to allow for successful future database backups.

Prerequisite

Use the DSMFMT utility to format a new volume to be used for extending the recovery log. For information about how to use the DSMFMT utility, see the version 5.5 information center: http://publib.boulder.ibm.com/infocenter/tivihelp/v1r1

Syntax

```
                                                  ┌─ -k──Server1──┐
►►──DSMUPGRD──┬──────────┬──┬──────────────────┬──┼───────────────┼──────────────►
              └─ -quiet──┘  └─ -o──options_file─┘  └─ -k──key_name─┘

►─EXTEND LOG──volume_name──megabytes──────────────────────────────────────────►◄
```

Parameters

AIX HP-UX Linux Solaris **-quiet**
Specifies that messages to the console are suppressed. This parameter is optional.

-o *options_file*
Specifies an options file to use. This parameter is optional.

Windows **-k** *key_name*
Specifies the name of the Windows registry key from which to retrieve information about the server. The default is SERVER1. This parameter is optional.

volume_name **(Required)**
Specifies the name to be used for the new recovery log extension volume

megabytes **(Required)**
Specifies the size of the new volume in megabytes. The size must be a multiple of 4 MB, and it must be 1 MB less than the size of the volume specified in the *volume_name* parameter. For example, if the volume is 5 MB, specify a value of 4.

DSMUPGRD UPDATE (Create backup registry entries for a V5 server instance)

Windows

Use this utility to create registry entries for a V5 server instance if a problem in the upgrade process has removed the entries when they are still needed. For example, you can use this utility if you are upgrading a V5 server to V6.1 on the same system, and accidentally ran the DSMSERV LOADFORMAT utility before running the DSMUPGRD PREPAREDB utility.

Run this utility from the instance directory for the V5 database (where files such as `dsmserv.dsk` are stored for the server). The utility recreates the original registry entries for the V5 server, but stores the entries in a backup location to avoid overwriting the entries that were added by V6.1.

Syntax

```
                  ┌ -k──Server1──┐
►►──DSMUPGRD──────┼──────────────┼──UPDATE──────────────────────────────►◄
                  └ -k──key_name─┘
```

Parameters

-k *key_name*
Specifies the name of the Windows registry key in which to store information about the server. The default is Server1.

Example

Run the utility to recreate registry entries for the server instance, Server2.

```
"c:\Program Files\Tivoli\TSM\upgrade\dsmupgrd" -k server2 update
```

DSMSERV LOADFORMAT (Format a database)

Use the DSMSERV LOADFORMAT utility when upgrading from Version 5. The utility formats an empty database in preparation for inserting an extracted database into the empty database.

AIX HP-UX Linux Solaris Before you issue the DSMSERV LOADFORMAT command, log on to the system as the server instance owner. If you are running under something other than the English regional locale, set the DB2CODEPAGE system environment variable to 819:

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

AIX HP-UX Linux Solaris Windows

Syntax

```
►►─DSMSERV─┬──────────────┬─┬──────────────┬─┬─────────────┬─┬─────────────┬─┬──────────────┬─┬──────────────┬─┬──────────────┬─LOADFORMAT──►
           └─ -u─user_name─┘ └─ -i─instance_dir─┘ ┌─ -k─Server1─┐ └─ -o─options_file─┘ └─ -noexpire─┘ └─ -quiet─┘
                                                 └─ -k─key_name─┘

►─┬─DBDir──=──┬─directory─┬─┬─ACTIVELOGSize──=──2048──────┬──────────────────────────────────────────────────────────────────────►
  │           │ ▼ ,       │ │                             │
  └─DBFile──=─┘─file──────┘ └─ACTIVELOGSize──=──megabytes─┘

►─ACTIVELOGDir──=──directory──ARCHLogdir──=──directory──────────────────────────────────────────────────────────────────────────►

►─┬──────────────────────────────────────────────┬─┬──────────────────────────────────────────────┬─┬──────────────────────────►◄
  └─ARCHFailoverlogdir──=──directory─────────────┘ └─MIRRorlogdir──=──directory────────────────────┘
```

Parameters

AIX HP-UX Linux Solaris **-u** *user_name*

Specifies a user name to switch to before initializing the server. This parameter is optional.

AIX HP-UX Linux Solaris **-i** *instance_dir*

Specifies an instance directory to use. This becomes the current working directory of the server. This parameter is optional.

Windows **-k** *key_name*

Specifies the name of a Windows registry key that is used to store information about this server. Use this parameter only to install additional servers on the same system. After you install a server using this parameter, you must always start it with the value of this parameter. The default is SERVER1.

-o *options_file*

Specifies an options file to use. This parameter is optional.

-noexpire
Specifies that expiration processing is suppressed when starting. This parameter is optional.

-quiet
Specifies that messages to the console are suppressed. This parameter is optional.

DBDir
Specifies the relative path names of one or more directories that are used to store database objects. Directory names must be separated by commas but without spaces. You can specify up to 128 directory names. You must specify either the DBDIR or the DBFILE parameter.

DBFile
Specifies the name of a file that contains the relative path names of one or more directories that are used to store database objects. Each directory name must be on a separate line in the file. You can specify up to 128 directory names. You must specify either the DBDIR or the DBFILE parameter.

ACTIVELOGSize
Specifies the size of the active log in megabytes. This parameter is optional. The minimum value is 2048 MB (2 GB); the maximum is 131072 MB (128 GB). If you specify an odd number, the value is rounded up to the next even number. The default is 2048 MB.

ACTIVELOGDir (Required)
Specifies the directory in which the Tivoli Storage Manager server writes and stores active log files. There is only one active log location. The name must be a fully qualified directory name. The directory must already exist, it must be empty, and it must be accessible by the user ID of the database manager. The maximum number of characters is 175.

ARCHLogdir (Required)
Specifies the directory for the archive log files. The name must be a fully qualified directory name. The maximum number of characters is 175.

ARCHFailoverlogdir
Specifies the directory to be used as an alternate storage location if the ARCHLOGDIR directory is full. This parameter is optional. The maximum number of characters is 175.

MIRRorlogdir
Specifies the directory in which the server mirrors the active log (those files in the ACTIVELOGDIR directory). This parameter is optional. The directory must be a fully qualified directory name. The maximum number of characters is 175.

Example: Format a database

AIX HP-UX Linux Solaris

```
dsmserv format dbdir=/tsmdb001 activelogsize=8192
activelogdir=/activelog archlogdir=/archivelog
archfailoverlogdir=/archfaillog mirrorlogdir=/mirrorlog
```

Windows

```
dsmserv -k server2 format dbdir=d:\tsm\db001 activelogsize=8192
activelogdir=e:\tsm\activelog archivelogdir=f:\tsm\archlog
archfailoverlogdir=g:\tsm\archfaillog mirrorlogdir=h:\tsm\mirrorlog
```

DSMSERV INSERTDB (Move a server database into an empty database)

Use the DSMSERV INSERTDB utility to move a server database into a new V6.1 database. The database can be extracted from the original server and inserted into a new database on the new server by using a network connection between the original server and the new server. The database can also be inserted from media that contains the extracted database.

Requirements for insertion using media

Before you run the utility to insert the server database into an empty database, ensure that your system meets the following requirements.

- The manifest file from the DSMUPGRD EXTRACTDB operation must be available.
- The server options file must contain an entry for the device configuration file.
- The device configuration file must have information about the device class that is specified in the manifest file.
- The media that contains the extracted database must be available to the V6.1 server. The device must be physically attached to the system, and the permissions must be set to grant access to the media for the user ID that owns the V6.1 server instance.

Syntax

```
►►─DSMSERV─┬──────────────┬─┬──────────────┬─┬─ -k─Server1─┬──►
           └─ -u─user_name─┘ └─ -i─instance_dir─┘ └─ -k─key_name─┘

►─┬──────────────────┬─┬──────────────┬─┬──────────────┬─INSERTDB──►
  └─ -o─options_file─┘ └─ -noexpire─┘ └─ -quiet─┘

►─┬─ A:  Insert from media ─┬─┬─PREview─=─No──────┬──────────►◄
  └─ B:  Insert over a network ─┘ └─PREview─=─┬─Yes─┬─┘
                                              └─No──┘
```

A: Insert from media:

```
├─┬──────────────────────────────┬─MANifest─=─file_name──────────┤
  └─DEVclass─=─device_class_name─┘
```

B: Insert over a network:

```
├─┬─SESSWait─=─60──────┬──────────────────────────────────────────┤
  └─SESSWait─=─minutes─┘
```

Parameters

AIX HP-UX Linux Solaris **-u** *user_name*
Specifies a user name to switch to before initializing the server. This parameter is optional.

AIX HP-UX Linux Solaris **-i** *instance_dir*
Specifies an instance directory to use. This becomes the current working directory of the server. This parameter is optional.

Windows **-k** *key_name*
Specifies the name of the Windows registry key from which to retrieve information about the server. This parameter is optional. The default is SERVER1.

-o *options_file*
Specifies an options file to use. This parameter is optional.

-noexpire
Specifies that expiration processing is suppressed when starting. This parameter is optional.

-quiet
Specifies that messages to the console are suppressed. This parameter is optional.

DEVclass
Specifies a sequential-access device class. You can specify any device class except for the DISK device class. The definition for the device class must exist in the device configuration file.

This parameter is optional and is used only when the database that you want to insert into the empty V6.1 database was extracted to media. If the database is on media and you do not specify a device class, the device class that is identified in the manifest file is used.

Restriction: You cannot use a device class with a device type of NAS or CENTERA.

MANifest
Specifies the location of the manifest file. Use a fully qualified file name, or place in a local directory. For example: `./manifest.txt`

This parameter is required when the database that you want to insert into the empty V6.1 database was extracted to media.

SESSWait
Specifies the number of minutes that the V6.1 server waits to be contacted by the original server. The default value is 60 minutes.

Use this parameter only if the data that you want to insert into the empty V6.1 database is to be transmitted from the source server using a network connection.

PREview
Specifies whether to preview the insertion operation. This parameter is optional. The default value is **NO**.

Use the **PREVIEW=YES** parameter to test a database. When you use this parameter, the operation includes all steps of the process, except for the actual insertion of data into the new database. When you preview the insertion operation, you can quickly verify that the source database is readable. You can

also identify any data constraint violations that might prevent an upgraded database from being put into production.

The server startup script: rc.dsmserv

AIX HP-UX Linux Solaris

The startup script can be used in your system startup to automatically start a server instance under a specific user ID.

Syntax

```
►►──rc.dsmserv──┬─ -u──user_name─┬──┬──────────────────┬──────────────────────►◄
                └─ -U──user_name─┘  └─ -i──instance_dir─┘
```

Parameters

-u *user_name*
Specifies the Tivoli Storage Manager instance user ID for which the environment is set up. The server will run under this user ID.

-U *user_name*
Specifies the Tivoli Storage Manager instance user ID for which the environment is set up. The server will run under the user ID of the invoker of the command.

-i *instance_dir*
Specifies an instance directory to use. This becomes the current working directory of the server.

Sample commands to run for validation of the database upgrade

Run commands before and after you upgrade a server to get a summary of information about the contents of the server database. Comparing the results of the commands before and after the upgrade can help confirm that all data transferred correctly. Samples provide a set of commands to start with.

The following commands show examples for getting summary information for some specific types of objects:

File spaces
```
select node_name, count(*) as "Number of Filespaces" from filespaces
group by node_name order by 2
```

Nodes
```
select platform_name, count(*) as "Number of Nodes" from nodes group
by platform_name
```

Backed-up files
```
select node_name,sum(num_files) as "Number of Backup Files" from
occupancy where type='Bkup' group by node_name
```

Archived files
```
select node_name,sum(num_files) as "Number of Archive Files" from
occupancy where type='Arch' group by node_name
```

Management classes
```
select count(*) as "Number of Management Classes" from mgmtclasses
```

Server scripts
```
select count(*) as "Number of Server Scripts" from script_names
```

Storage pools
```
select count(*) as "Number of Storage Pools" from stgpools
```

The following example shows a more complete set of commands. You can run this set of commands as a script from a Tivoli Storage Manager server command line. Redirect the output to a file to save the results.

```
select node_name, count(*) as "Number of Filespaces" from filespaces group by node_name order by 2
select platform_name, count(*) as "Number of Nodes" from nodes group by platform_name
select count(*) as "Number of Administrators" from admins
select node_name,sum(num_files) as "Number of Backup Files" from occupancy where type='Bkup'
    group by node_name
select node_name,sum(num_files) as "Number of Archive Files" from occupancy where type='Arch'
    group by node_name
select count(*) as "Number of Schedule Associations" from associations
select count(*) as "Number of Backupsets" from backupsets
select count(*) as "Number of Client Option Sets" from cloptsets
select count(*) as "Number of Collocation Groups" from collocgroup
select count(*) as "Number of Archive CopyGroups" from ar_copygroups
select count(*) as "Number of Backup CopyGroups" from bu_copygroups
select count(*) as "Number of Data Movers" from datamovers
select count(*) as "Number of Device Classes" from devclasses
select count(*) as "Number of Domains" from domains
select count(*) as "Number of Drives" from drives
select count(*) as "Number of Libraries" from libraries
select count(*) as "Number of Library Volumes" from libvolumes
select count(*) as "Number of Volumes" from volumes
select count(*) as "Number of Management Classes" from mgmtclasses
select count(*) as "Number of Node Groups" from nodegroup
select count(*) as "Number of Device Paths" from paths
select count(*) as "Number of Policy Sets" from policysets
select count(*) as "Number of Client Schedules" from client_schedules
select count(*) as "Number of Admin Schedules" from admin_schedules
select count(*) as "Number of Server Scripts" from scripts
select count(*) as "Number of Servers Defined" from servers
select count(*) as "Number of Servers Groups Defined" from server_group
select count(*) as "Number of Storage Pools Defined" from stgpools
```

Appendix A. Server language locales

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

You can use the following languages: AIX

Table 31. Server languages for AIX

Language	LANGUAGE option value
Chinese, Simplified	zh_CN
Chinese, Simplified (UTF-8)	ZH_CN
Chinese, Traditional (Big5)	Zh_TW
Chinese, Traditional (UTF-8)	ZH_TW
Chinese, Traditional (euc_tw)	zh_TW
English	en_US
English (UTF-8)	EN_US
French	fr_FR
French (UTF-8)	FR_FR
German	de_DE
German (UTF-8)	DE_DE
Italian	it_IT
Italian (UTF-8)	IT_IT
Japanese, EUC	ja_JP
Japanese, PC	Ja_JP
Japanese, UTF8	JA_JP
Korean	ko_KR
Korean (UTF-8)	KO_KR
Portuguese, Brazilian	pt_BR
Portuguese, Brazilian (UTF-8)	PT_BR
Russian	ru_RU
Russian (UTF-8)	RU_RU
Spanish	es_ES
Spanish (UTF-8)	ES_ES

Table notes:

- The system must have en_US environment support installed.
- Refer to the *Administrator's Reference* for further information on setting the LANGUAGE option.

HP-UX

Table 32. 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
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
Table note: Refer to the *Administrator's Reference* for further information on setting the LANGUAGE option.	

Linux

Table 33. Server languages for Linux

LANGUAGE	LANGUAGE option value
Chinese, Simplified	zh_CN
	zh_CN.gb18030
	zh_CN.utf8
Chinese, Traditional	Big5 / Zh_TW
	zh_TW
	zh_TW.utf8
English, United States	en_US
	en_US.utf8
French	fr_FR
	fr_FR.utf8

Table 33. Server languages for Linux (continued)

LANGUAGE	LANGUAGE option value
German	de_DE
	de_DE.utf8
Italian	it_IT
	it_IT.utf8
Japanese	ja_JP
	ja_JP.utf8
Korean	ko_KR
	ko_KR.utf8
Portuguese, Brazilian	pt_BR
	pt_BR.utf8
Russian	ru_RU
	ru_RU.utf8
Spanish	es_ES
	es_ES.utf8
Table note: Refer to the *Administrator's Reference* for further information on setting the LANGUAGE option.	

Solaris

Table 34. Server languages for Solaris

Language	LANGUAGE option value
Chinese, Simplified	zh
	zh_CN.UTF-8
Chinese, Traditional	zh_TW
	zh_TW.BIG5
	zh_TW.UTF-8
English	en_US.ISO8859-1
	en_US.UTF-8
French	fr_FR.ISO8859-1
	fr_FR.UTF-8
German	de_DE.ISO8859-1
	de_DE.UTF-8
Italian	it_IT.ISO8859-1
	it_IT.UTF-8
Japanese	ja
	ja_JP.UTF-8
Korean	ko
	ko_KR.UTF-8
Portuguese, Brazilian	pt_BR.ISO8859-1
	pt_BR.UTF-8

Table 34. Server languages for Solaris (continued)

Language	LANGUAGE option value
Russian	ru_RU.ISO8859-5
	ru_RU.UTF-8
Spanish	es_ES.ISO8859-1
	es_ES.UTF-8
Table note: Refer to the *Administrator's Reference* for further information on setting the LANGUAGE option.	

Windows

Table 35. Server languages for Windows

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

Windows

Tivoli Storage Manager Console language support

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

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

Installing a language package

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

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

- Set the LANGUAGE option in the server options file to the name of the locale that you want to use. For example:

  AIX Linux To use the it_IT locale, set the LANGUAGE option to it_IT. See Appendix A, “Server language locales,” on page 299.

  HP-UX To use the it_IT.iso88591 locale, set the LANGUAGE option to it_IT.iso88591. See Appendix A, “Server language locales,” on page 299.

  Solaris To use the it_IT.ISO8859-1 locale, set the LANGUAGE option to it_IT.ISO8859-1. See Appendix A, “Server language locales,” on page 299.

  Windows To use the ita locale, set the LANGUAGE option to ita. See Appendix A, “Server language locales,” on page 299.

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

  If an administrative client connects to the server and specifies a locale that is different from the one that is specified at the server, the server tries to initialize that specified locale for returning messages to the client.

- AIX HP-UX Linux Solaris 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.

- Windows Set the LC_MESSAGES environment variable to match the value that is set in the server options file. To set a system environment variable, complete the following steps:

  1. Right-click the **My Computer** icon.
  2. Select **Properties**.
  3. Click **Advanced**.
  4. Click **Environment Variables**.
  5. Select **New** below the System Variables panel. Complete the information required and reboot your system.

Appendix B. HP-UX system resource requirements

Semaphores, shared memory, and processes are HP-UX system resources that might require special configuration and tuning for the Tivoli Storage Manager server.

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 306 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 may 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 306 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 may be too low. To prevent thread creation errors in the Tivoli Storage Manager server, increase HP-UX's 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, you can use either the SAM utility program or edit the configuration file directly. Base the kernel values on the recommendations of the DB2OSCONF utility.

To use SAM, start it, and 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. Solaris zones

Solaris

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

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

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

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

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

Creating a Solaris zone

Solaris

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

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

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

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

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

2. Configure the zone:

   ```
   # zonecfg -z sunshade1
   ```

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

3. Verify the zone:

   ```
   # zoneadm list -cv
   ```

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

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

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

4. Install the zone:

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

5. Start the zone:

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

   ```
   # zoneadm list -cv
   ```

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

6. Configure the zone for the network:

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

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

Appendix D. Services associated with the Tivoli Storage Manager server

Windows

When you start the Tivoli Storage Manager server as a service, other services automatically start. These services are associated with the database manager, DB2.

The following services are associated with the Tivoli Storage Manager server.

Service name	Purpose	Comments
`TSM` *`Server_instance`*	The service for the Tivoli Storage Manager server instance that is named *Server_instance*. For example: `TSM Server1`	Set the start and stop options for this service to start and stop the server instance automatically. Each server instance runs as a separate service.
`DB2 - DB2TSM1 -` *`SERVER_INSTANCE`*	The DB2 service for the server instance that is named *Server_instance*. For example: `DB2 - DB2TSM1 - SERVER1`	This service is automatically started when the service for the Tivoli Storage Manager server instance is started. The DB2 service is not stopped automatically when you stop the service for the server. The system has one of these services for each server-instance service that is started on the system.
`DB2 Governor (DB2TSM1)`	A DB2 service that is created at installation time, and is required for all server instances.	Do not change the options for this service.
`DB2 License Server (DB2TSM1)`	A DB2 service that is created at installation time, and is required for all server instances.	Do not change the options for this service.
`DB2 Management Server (DB2TSM1)`	A DB2 service that is created at installation time, and is required for all server instances.	Do not change the options for this service.
`DB2 Remote Command Server (DB2TSM1)`	A DB2 service that is created at installation time, and is required for all server instances.	Do not change the options for this service.

Appendix E. Accessibility features for Tivoli Storage Manager

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

Accessibility features

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

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

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

Keyboard navigation

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

AIX Tivoli Storage Manager follows AIX operating system conventions for keyboard navigation and access.

HP-UX Tivoli Storage Manager follows HP-UX operating-system conventions for keyboard navigation and access.

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

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

Vendor software

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

Related accessibility information

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

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Glossary

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

The glossary is located in the Tivoli Storage Manager Version 6.1 information center:
http://publib.boulder.ibm.com/infocenter/tsminfo/v6

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