IBM Tivoli Storage Manager
Version 6.3.4

Upgrade and Migration Guide for V5 Servers

GC27-4017-02

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Note:
Before using this information and the product it supports, read the information in "Notices" on page 553.

This edition applies to Version 6.3.4 of IBM Tivoli Storage Manager (product number 5608-E01, 5608-E02, 5608-E03), and to all subsequent releases and modifications until otherwise indicated in new editions or technical newsletters. This edition replaces GC27-4017-01.

Contents

Preface

This publication provides information about upgrading IBM® Tivoli® Storage Manager servers from one of the supported Version 5 levels to Version 6.3 or later.

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 6.3 or later.

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

Note: For information about upgrading the server from V6.1 to V6.3 or later, and from V6.2 to V6.3 or later, see the upgrade procedures in the *Installation Guide*.

How to use this guide

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

If you are upgrading the server from V5 to V6.3 or later on the same operating system, follow this sequence:

1. Read the overview information about the updates to the server: Chapter 1, “Server database updates overview,” on page 3.
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 75
3. Select the scenario to use, and plan for the hardware, software, and storage space requirements for your server and environment. A worksheet can be used for space planning: “Worksheet for planning space for the V6.3 or later server” on page 44.
4. Run a test of the upgrade process: “Testing the upgrade process for a server” on page 49. 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 93
   - Chapter 5, “Scenario 2: Same system, network method,” on page 135
   - Chapter 6, “Scenario 3: New system, media method,” on page 175
   - Chapter 7, “Scenario 4: New system, network method,” on page 223
6. Complete the upgrade process by following the steps in the section:
   - Chapter 10, “Taking the first steps after upgrade,” on page 323

If you are migrating the server from V5 to V6.3 or later on a different operating system, follow the sequence for your selected migration path:

- Part 2, "Migrating Tivoli Storage Manager V5 servers on AIX, HP-UX, or Solaris systems to V6.3.4 on Linux," on page 349
- Part 3, "Migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 on AIX or Linux on System z," on page 433

Publications

Publications for the IBM Tivoli Storage Manager family of products are available online. The Tivoli Storage Manager product family includes IBM Tivoli Storage FlashCopy® Manager, IBM Tivoli Storage Manager for Space Management, IBM Tivoli Storage Manager for Databases, and several other storage management products from IBM Tivoli.

To search all publications, search across the appropriate Tivoli Storage Manager information center:

- Version 6.3 information center: http://pic.dhe.ibm.com/infocenter/tsminfo/v6r3
- Version 6.4 information center: http://pic.dhe.ibm.com/infocenter/tsminfo/v6r4

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

Go to Tivoli Documentation Central to find information centers that contain official product documentation for current and previous versions of Tivoli products, including the Tivoli Storage Manager product family. You can find Tivoli Documentation Central at http://www.ibm.com/tivoli/documentation.

You can also order some related publications from the IBM Publications Center website at http://www.ibm.com/shop/publications/order/. The website provides information about ordering publications from countries other than the United States. In the United States, you can order publications by calling 1-800-879-2755.

Tivoli Storage Manager publications

The following tables list the publications that make up the Tivoli Storage Manager library.

Table 1. Tivoli Storage Manager server publications

Publication title	Order number
IBM Tivoli Storage Manager for AIX Installation Guide	GC23-9781
IBM Tivoli Storage Manager for AIX Administrator's Guide	SC23-9769
IBM Tivoli Storage Manager for AIX Administrator's Reference	SC23-9775
IBM Tivoli Storage Manager for HP-UX Installation Guide	GC23-9782
IBM Tivoli Storage Manager for HP-UX Administrator's Guide	SC23-9770
IBM Tivoli Storage Manager for HP-UX Administrator's Reference	SC23-9776
IBM Tivoli Storage Manager for Linux Installation Guide	GC23-9783
IBM Tivoli Storage Manager for Linux Administrator's Guide	SC23-9771
IBM Tivoli Storage Manager for Linux Administrator's Reference	SC23-9777
IBM Tivoli Storage Manager for Oracle Solaris Installation Guide	GC23-9784

Table 1. Tivoli Storage Manager server publications (continued)

Publication title	Order number
IBM Tivoli Storage Manager for Oracle Solaris Administrator's Guide	SC23-9772
IBM Tivoli Storage Manager for Oracle 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 for z/OS Media Installation and User's Guide	SC27-4018
IBM Tivoli Storage Manager Upgrade and Migration Guide for V5 Servers	GC27-4017
IBM Tivoli Storage Manager Integration Guide for Tivoli Storage Manager FastBack®	SC27-2828

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 Oracle 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 Using the Application Programming Interface	SC23-9793
IBM Tivoli Storage Manager for Space Management for UNIX and Linux: User's Guide	SC23-9794
IBM Tivoli Storage Manager HSM for Windows Administration Guide	SC23-9795

Table 4. Tivoli Storage Manager data protection publications

Publication title	Order number
IBM Tivoli Storage Manager for Databases: Data Protection for Microsoft SQL Server Installation and User's Guide	GC27-4010
IBM Tivoli Storage Manager for Databases: Data Protection for Oracle for UNIX and Linux Installation and User's Guide	SC27-4019
IBM Tivoli Storage Manager for Databases: Data Protection for Oracle for Windows Installation and User's Guide	SC27-4020

Table 4. Tivoli Storage Manager data protection publications (continued)

Publication title	Order number
IBM Tivoli Storage Manager for Mail: Data Protection for Microsoft Exchange Server Installation and User's Guide	GC27-4009
IBM Tivoli Storage Manager for Mail: Data Protection for Lotus Domino® UNIX and Linux Installation and User's Guide	SC27-4021
IBM Tivoli Storage Manager for Mail: Data Protection for Lotus Domino for Windows Installation and User's Guide	SC27-4022
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 Virtual Environments Installation and User's Guide	SC27-2898
IBM Tivoli Storage Manager for Microsoft SharePoint Guide	N/A

Table 5. IBM Tivoli Storage Manager troubleshooting and tuning publications

Publication title	Order number
IBM Tivoli Storage Manager Problem Determination Guide	GC23-9789
IBM Tivoli Storage Manager Optimizing Performance	GC23-9788
IBM Tivoli Storage Manager Client Messages and Application Programming Interface Return Codes	SC27-2878
IBM Tivoli Storage Manager Server Messages and Error Codes	SC27-2877
IBM Tivoli Storage Manager for Mail: Data Protection for Microsoft Exchange Server Messages	GC27-4011
IBM Tivoli Storage Manager for Databases: Data Protection for Microsoft SQL Server Messages	GC27-4012
IBM Tivoli Storage Manager for Databases: Data Protection for Oracle Messages	SC27-4014
IBM Tivoli Storage Manager for Mail: Data Protection for Lotus Domino Messages	SC27-4015
IBM Tivoli Storage Manager for Enterprise Resource Planning: Data Protection for SAP Messages	SC27-4016

Note: You can find information about IBM System Storage® Archive Manager at the Tivoli Storage Manager v6.3.0 information center.

Support information

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

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

Getting technical training

Information about Tivoli technical training courses is available online.

Go to the following websites to sign up for training, ask questions, and interact with others who use IBM storage products.

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

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

Storage Management community
Interact with others who use IBM storage management products at http://www.ibm.com/developerworks/servicemanagement/sm/index.html

Global Tivoli User Community
Share information and learn from other Tivoli users throughout the world at http://www.tivoli-ug.org/.

IBM Education Assistant
View short "how to" recordings designed to help you use IBM software products more effectively at http://publib.boulder.ibm.com/infocenter/ieduasst/tivv1r0/index.jsp

Searching knowledge bases

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

Begin by searching the Tivoli Storage Manager Information Center at http://pic.dhe.ibm.com/infocenter/tsminfo/v6r3. From this website, you can search the current Tivoli Storage Manager documentation.

Searching the Internet

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

To search multiple Internet resources, go to the IBM support website at http://www.ibm.com/support/entry/portal/.

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

From the support website, you can search various resources including:

- IBM technotes.
- IBM downloads.
- IBM Redbooks® publications.
- IBM Authorized Program Analysis Reports (APARs). Select the product and click **Downloads** to search the APAR list.

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

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

To share your experiences and learn from others in the Tivoli Storage Manager and Tivoli Storage FlashCopy Manager user communities, go to Service Management Connect (http://www.ibm.com/developerworks/servicemanagement/sm/index.html). From there you can find links to product wikis and user communities.

Using IBM Support Assistant

IBM Support Assistant is a complimentary software product that can help you with problem determination. It is available for some Tivoli Storage Manager and Tivoli Storage FlashCopy Manager products.

To learn about which products are supported, go to the IBM Support Assistant download web page at http://www.ibm.com/software/support/isa/download.html.

IBM Support Assistant helps you gather support information when you must 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

You can find more information at the IBM Support Assistant website:

http://www.ibm.com/software/support/isa/

You can also install the stand-alone IBM Support Assistant application on any workstation. You can then enhance the application by installing product-specific plug-in modules for the IBM products that you use. Find add-ons for specific products at http://www.ibm.com/support/docview.wss?uid=swg27012689.

Finding product fixes

A product fix to resolve your problem might be available from the IBM software support website.

You can determine what fixes are available by checking the IBM software support website at http://www.ibm.com/support/entry/portal/.

- If you previously customized the site based on your product usage:
  1. Click the link for your product, or a component for which you want to find a fix.
  2. Click **Downloads**, and then click **Fixes by version**.
- If you have not customized the site based on your product usage, click **Downloads** and search for your product.

Receiving notification of product fixes

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

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

1. From the support page at http://www.ibm.com/support/entry/portal/, click **Sign in to create, manage, or view your subscriptions** in the **Notifications** pane.
2. Sign in using your IBM ID and password. If you do not have an ID and password, click **register now** and complete the registration process.
3. Click **Manage all my subscriptions** in the **Notifications** pane.
4. Click the **Subscribe** tab and then click **Tivoli**.
5. Select the products for which you want to receive notifications and click **Continue**.
6. Specify your notification preferences and click **Submit**.

Contacting IBM Software Support

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

To obtain help from IBM Software Support, complete the following steps:

1. Ensure that you have completed the following prerequisites:
   a. Set up a subscription and support contract.
   b. Determine the business impact of your problem.
   c. Describe your problem and gather background information.
2. Follow the instructions in "Submitting the problem to IBM Software Support" on page xviii.

Setting up a subscription and support contract

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

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

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

Determining the business impact

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

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

Describing the problem and gathering 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 re-created? If so, what steps led to the failure?
- Have any changes been made to the system? For example, hardware, operating system, networking software, and so on.
- Are you using a workaround for this problem? If so, be prepared to explain it when you report the problem.

Submitting the problem to IBM Software Support

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

Online

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

By telephone

For the telephone number to call in your country, go to the IBM Software Support Handbook at http://www14.software.ibm.com/webapp/set2/sas/f/handbook/home.html and click **Contacts**.

New in V6.3

This section summarizes changes that were made to IBM Tivoli Storage Manager Version 6.3.

Server updates

New features and other changes are available in the IBM Tivoli Storage Manager V6.3 server. Technical updates since the previous edition are marked with a vertical bar (|) in the left margin.

New for the server in Version 6.3.4

Server fix pack 6.3.4 contains several new features, in addition to fixes for problems.

The server that is included with the Tivoli Storage Manager and IBM Tivoli Storage Manager Extended Edition V6.4 products is at the V6.3.4 level. The V6.3.4 server is also available for download separately, as a fix pack for current users of V6.3.

Tivoli Storage Manager migration to V6.3.4 or later on Linux x86_64

You can now migrate a Tivoli Storage Manager V5 server that runs on an AIX®, HP-UX, or Solaris operating system to V6.3.4 or later on a Linux x86_64 operating system.

Depending on your hardware and software environment, this migration procedure might be useful for achieving server consolidation, load balancing, or standardization on the Linux operating system.

IBM Tivoli Storage Manager Operations Center

The V6.4.1 IBM Tivoli Storage Manager Operations Center is a new web-based user interface for managing a storage environment.

The V6.4.1 Operations Center includes an Overview page that shows the interaction of Tivoli Storage Manager servers and clients. You can use the Operations Center to identify potential issues at a glance, manage alerts, and access the Tivoli Storage Manager command line. The Administration Center interface is also available, but the Operations Center is the preferred monitoring interface.

Tivoli Monitoring for Tivoli Storage Manager updates

Tivoli Monitoring for Tivoli Storage Manager V6.3.4 includes some new Cognos® reports, and features, including some methods for distributing Cognos reports to other organizations.

The following new Cognos reports are available:

Status reports

- Client storage summary and details
- VE activity status
- VE backup type summary
- VE current occupancy summary

Trending reports

- Client storage usage trends

To allow reports to be shared, Cognos reports can be exported and imported in to other Tivoli Common Reporting instances.

The Agent Log workspace is enhanced to display whether the monitored servers are up and running.

Pruning values are now automatically configured during new installations. If you upgraded the application, you must manually configure the pruning settings to periodically remove data from the WAREHOUS database.

New for the server in Version 6.3.3

Server fix pack 6.3.3 contains several new features, in addition to fixes for problems.

The server that is included with the Tivoli Storage Manager and IBM Tivoli Storage Manager Extended Edition V6.4 products is at the V6.3.3 level. The V6.3.3 server is also available for download separately, as a fix pack for current users of V6.3.

LDAP-authenticated passwords

IBM Tivoli Storage Manager server V6.3.3 can use an LDAP directory server to authenticate passwords. LDAP-authenticated passwords give you an extra level of security by being case-sensitive, offering advanced password rule enforcement, and a centralized server on which to authenticate them.

You must have an LDAP directory server on which to authenticate a hash representation of the password. After you configure the Tivoli Storage Manager server, you can authenticate administrator and node passwords with the LDAP directory server.

The two methods of authentication are LDAP and LOCAL. LOCAL means that the password is authenticated with the Tivoli Storage Manager server.

Passwords that are authenticated with the Tivoli Storage Manager server are not case-sensitive. All passwords can be composed of characters from the following list:

```
a b c d e f g h i j k l m n o p q r s t u v w x y z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
0 1 2 3 4 5 6 7 8 9
~ ! @ # $ % ^ & * _ - + = ` | ( ) { } [ ] : ; < > , . ? /
```

Restriction: Client nodes must be at V6.4 or later to use the LDAP directory server to authenticate passwords.

Device driver conflict prevention

Solaris

On Oracle Solaris systems, the native generic SCSI tape driver (st driver) automatically claims supported tape drives when the system is started. If a drive is also configured by the Tivoli Storage Manager device driver or the IBM tape device driver, data can be overwritten because more than one driver can access the same device by using a different device name.

You can use the **rmstdev** utility to delete device special files that are created by the Oracle Solaris st driver for any tape drives that are also configured by the Tivoli Storage Manager device driver or the IBM tape device driver. Deleting these files ensures that only one driver has access to a tape drive.

The **rmstdev** utility runs when the server is automatically started. If startup is not automated, you must manually run the utility as the root user before you start the Tivoli Storage Manager server.

Tivoli Monitoring for Tivoli Storage Manager updates

Tivoli Monitoring for Tivoli Storage Manager now includes some new Tivoli Enterprise Portal workspaces, new Cognos reports, and the option for existing IBM Tivoli Monitoring customers to install and deploy monitoring agents from a small agent package.

The new Cognos reports are:

Status reports:

- Client activity status
- Client backup currency
- Client backup status
- Client schedule status
- Client storage pool usage summary
- Current client occupancy summary
- Current storage pool summary
- Highest storage space usage
- Server schedule status
- Yesterday's missed and failed client schedules

Trending Reports

- Client activity success rate
- Client schedule success rate
- Server database growth trends
- Server storage growth trends

New Tivoli Enterprise Portal monitoring workspaces are:

- Activity summary workspace, which provides data about server and client operations for both virtual and non-virtual environments.
- Sessions workspace, which provides a view of all the active client sessions running on the specified server.

Additional VMware backup information is now provided in the Tivoli Storage Manager server activity log and summary table for Data Protection for VMware

operations. This new information provides improved data collection and reporting content when you use reporting facilities such as Tivoli Common Reporting.

A new option to enable LDAP authentication, when creating and configuring monitoring agent instances.

The improved ability to exclude, or filter-out message numbers, to narrow results.

Existing IBM Tivoli Monitoring users can now install the small agent package, and remotely deploy monitoring agents without having to download the larger Tivoli Monitoring for Tivoli Storage Manager package.

Control for inactive NDMP operation connections

Transmission Control Protocol (TCP) keepalive is a mechanism by which small packets of data are sent across the network at predefined intervals. The packets prevent a long-running, inactive connection from being closed by firewall software that detects and closes inactive connections. With this release, you can enable the TCP keepalive function for control connections of network data-management protocol (NDMP).

Enhancements for expiration processing

Improvements for expiring inventory are available with this release. Node processing can now be spread across more than one thread in parallel, at the file space level. This change in process helps distribute the workload and more efficiently avoid bottlenecks for nodes that use virtual servers.

New for the server in Version 6.3.1

Server fix pack 6.3.1 contains new features, in addition to fixes for problems.

Data validation during read/write operations to tape

With logical block protection, IBM Tivoli Storage Manager includes a cyclic redundancy check (CRC) value at the end of each logical block of data to be written to tape. You can specify CRC data-block validation during read and write operations, or only during write operations.

You can use logical block protection only with the following types of drives and media:

- IBM LTO5 and later
- IBM 3592 Generation 3 drives, and later, with 3592 Generation 2 media, and later

New for the server in Version 6.3.0

New features and other changes are available in the Tivoli Storage Manager V6.3 server.

Node replication

Node replication is the process of incrementally copying or *replicating* client node data from one server of Tivoli Storage Manager to another server of Tivoli Storage Manager for the purpose of disaster recovery.

The server from which client node data is replicated is called a *source replication server*. The server to which client node data is replicated is called a *target replication server*.

Node replication avoids the logistics and security exposure of physically moving tape media to a remote location. If a disaster occurs and the source replication server is unavailable, backup-archive clients of Tivoli Storage Manager can recover their data from the target replication server. If you cannot recover the source replication server, you can convert client nodes to nonreplicating nodes for store operations on the target replication server.

If you use the export and import functions of Tivoli Storage Manager to store client node data on a disaster-recovery server, you can convert the nodes to replicating nodes. When replicating data, you can also use data deduplication to reduce bandwidth and storage requirements.

Tivoli Storage Manager V6.3 servers can be used for node replication. However, you can replicate data for client nodes that are at V6.3 or earlier. You can also replicate data that was stored on a Tivoli Storage Manager V6.2 or earlier server before you upgraded it to V6.3.

You cannot replicate nodes from a Tivoli Storage Manager V6.3.3 server to a server that is running on an earlier level of Tivoli Storage Manager.

Deduplication of NetApp file-server data

Deduplication of data that belongs to network-attached storage (NAS) file-servers is disabled by default. To enable deduplicaton of NetApp file-server data, use the new `ENABLENASDEDUP` server option.

Database table and index reorganization

If automatic table and index reorganization is affecting server performance, you can manually schedule reorganizations.

Automatic backup-archive client deployment

IBM Tivoli Storage Manager, Version 6.3 can be scheduled to automatically deploy backup-archive client software to all workstations that have the backup-archive client installed.

You can deploy backup-archive clients on Microsoft Windows operating systems from a fix pack or interim fixes for all releases at V5.4 or later. You can migrate the Backup-Archive Client to a newer version, release, modification, or fix pack level that is V5.5 and later.

You can deploy backup-archive clients on operating systems other than Windows from all releases at V5.5 or later. These Backup-Archive Clients can go to any later version, release, modification, or fix level. You can coordinate the updates to each Backup-Archive Client from the Administration Center.

Multistream database backup and restore processing

Multiple, concurrent data streams can reduce the amount of time that is required to back up or restore the database. You can specify multiple, concurrent data streams for automatic or manual database-backup operations.

During restore operations, the Tivoli Storage Manager server attempts to use the same number of data streams that you specified for the backup operation. For example, suppose that you specify four data streams for a database backup operation. During a restore operation, the server attempts to use four drives. If one drive is offline and unavailable, the server uses three drives for the restore operation.

The benefit of multiple, concurrent data streaming depends on the size of the database. In general, if the database is less than 100 GB, the amount of time that you can save is relatively small. Multiple, concurrent data streaming also uses more volumes. If the volumes are high-capacity and if you use data compression, the result can be wasted space.

Tivoli Monitoring for Tivoli Storage Manager updates

IBM Tivoli Monitoring for Tivoli Storage Manager, previously referred to as the Reporting and Monitoring feature, has an improved installation wizard. Cognos is now included for custom report creation.

Updates to Tivoli Monitoring for Tivoli Storage Manager include the following items:

- Cognos Business Intelligence V8 is an integrated business intelligence suite that is provided as part of Tivoli Common Reporting. Tivoli Common Reporting is included in the Administration Center installation when you select the Tivoli Common Reporting component. See *Customizing reports with Cognos Business Intelligence*, in the *Monitoring operations* section of the *Administrator's Guide* for details. All of the information regarding client and server reports can also be found in that section.
- The installation process has been improved to include a prerequisite checker, and now performs all installation configuration tasks automatically.
- A customizable dashboard workspace has been added to display many commonly viewed items in a single view. With the default setting, the dashboard displays data about the storage space used by node; unsuccessful client and server schedules; and details about storage pools, drives, and activity log error messages.
- You can include multiple servers in a single report. Reports have been enhanced to refine the accuracy of the data being displayed.
- New Tivoli Enterprise Portal workspaces are: activity log, agent log, updates to client node status, drives, libraries, occupancy, PVU details, and replication status and details.
- New client reports are available: storage pool media details, storage summary details, replication details, replication growth, and replication summary.
- New server reports are available: activity log details, server throughput, and an updated server throughput report for data collected by agents earlier than version 6.3.

Estimation of processor value units

You can use new methods to obtain information about the number of client and server devices connected to the system, and the utilization of processor value units (PVUs) by server devices. The new methods provide information to help you assess the license compliance of the Tivoli Storage Manager system.

By using the new **QUERY PVUESTIMATE** command, you can generate reports that estimate the number of server devices and client devices managed by the Tivoli Storage Manager server. You can also view PVU information on a per-node basis. These reports are not legally binding, but provide a starting point for determining license requirements. Alternatively, you can view PVU information in the Administration Center. The Administration Center provides summaries of client devices, server devices, and estimated PVUs, and more detailed information.

For purposes of PVU estimation, only nodes on Windows 7, Windows XP Professional, and Apple systems are classified as client devices by default. Nodes on all other platforms are classified as server devices by default. You can update the role classification by issuing the **UPDATE NODE** command. You can also view and change the role classifications in the Administration Center client node notebook.

For a detailed report, issue the **SQL SELECT * FROM PVUESTIMATE_DETAILS** command. This command extracts information at the node level. This data can be exported to a spreadsheet and modified to more accurately represent the system environment.

For more information about PVU calculations and their use for licensing purposes, see the topic describing the role of PVUs in the *Administrator's Guide*.

Prerequisite checker

Tivoli Storage Manager Version 6.3 includes a prerequisite checker, a tool that can be run before starting the Tivoli Storage Manager installation.

The prerequisite checker verifies requirements for the Tivoli Storage Manager server, the Administration Center, and Tivoli Monitoring for Tivoli Storage Manager. The prerequisite checker verifies the operating system, the amount of free disk space, the required memory for the server, and other prerequisites. The tool presents a summary of results, informs you about changes that are required in your environment before installation, and creates required directories. In this way, the prerequisite checker can help simplify the installation process.

For more information, see the section about running the prerequisite checker in the *Installation Guide*.

Storage device updates

New device support and other changes to storage devices are available in Tivoli Storage Manager Version 6.3.

Virtual tape libraries:

With enhancements available in Version 6.3, you can define a library as a virtual tape library (VTL) to Tivoli Storage Manager.

VTLs primarily use disk subsystems to internally store data. Because they do not use tape media, you can exceed the capabilities of a physical tape library when using VTL storage. Using a VTL, you can define many volumes and drives which provides for greater flexibility in the storage environment and increases productivity by allowing more simultaneous mounts and tape I/O.

Faster formatting of DISK and preallocated FILE volumes: AIX HP-UX Linux Solaris

On some Linux and UNIX file systems, including ext4 on Linux and JFS2 on AIX, IBM Tivoli Storage Manager formats random-access volumes and preallocated sequential-access disk volumes nearly instantaneously. For example, Tivoli Storage Manager can format a FILE or DISK volume on JFS2 in less than one second.

The new method for formatting volumes on some Linux and UNIX systems is similar to the method that Tivoli Storage Manager has been using to format volumes on Windows operating systems.

The new method provides the following advantages:

- During volume formatting, I/O is negligible and does not affect performance. For example, if you are running a server operation and you require an additional volume, you can format the volume without affecting the performance of the current operation.
- File system storage is allocated for the full file size without writing blocks and without creating sparse files. For example, if you issue the **DEFINE VOLUME** command to create a 10 GB volume, the underlying file in the file system consumes 10 GB of storage. Because the FILE volume size does not change, file-system log files do not require constant updating.
- The possibility for file fragmentation is minimized.

Before using the new volume formatting method, Tivoli Storage Manager checks the file system to determine whether the file system supports the method. If the file system does not, Tivoli Storage Manager uses the old method.

Access to storage devices attached by FICON on a z/OS system:

The database of a Tivoli Storage Manager V5 server that is running on a z/OS® system can be migrated to a V6.3 server that runs on AIX or Linux on System z®. After the upgrade, z/OS users can continue to access data stored on tape volumes whose contents are accessed by using FICON® attached storage devices.

The Tivoli Storage Manager V6.3 server accesses client data by using a storage device attached to z/OS. The storage device is made available by IBM Tivoli Storage Manager for z/OS Media.

In addition, Tivoli Storage Manager for z/OS Media facilitates access to Virtual Storage Access Method (VSAM) linear data sets on z/OS by using an enhanced sequential FILE storage method.

For more information, see the section about migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 in the *Tivoli Storage Manager Upgrade and Migration Guide for V5 Servers*.

Append-only mode for IBM LTO-5 drives:

The `CHECKTAPEPOS` server option allows the Tivoli Storage Manager server to check the validity and consistency of data block positions on tape.

Enhancements to this option enable a drive to check for data overwrite problems before each WRITE operation and allow Tivoli Storage Manager to reposition tapes to the correct location and continue to write data. Use the `CHECKTAPEPOS` option with IBM LTO Generation 5 drives.

Note: You can enable append-only mode for IBM LTO Generation 5 and later drives, and for any drives that support this feature.

Persistent reserve for tape drives:

Persistent reservation allows tape drive reservations from other servers to be cleared, if, for example, a server crashes.

In Tivoli Storage Manager Version 6.3, persistent reserve is enabled for drives and driver levels that support the feature.

For additional details about persistent reserve support, see http://www.ibm.com/support/docview.wss?uid=swg21470319.

Administration Center updates

New Administration Center support is available in Tivoli Storage Manager Version 6.3.

Tivoli Integrated Portal, Version 2.1: AIX Linux Solaris Windows

The Tivoli Storage Manager Administration Center uses Tivoli Integrated Portal for its graphical user interface (GUI). With Tivoli Integrated Portal V2.1, you can now monitor the Administration Center with Internet Explorer 8 and Mozilla Firefox 3.5. All browsers that you used with Tivoli Integrated Portal V1.1.1 and later can be used with this latest version.

When you install Tivoli Integrated Portal V2.1 installing Tivoli Common Reporting, embedded security service, or the time scheduling service is optional. These features can be added and registered with Tivoli Integrated Portal V2.1 at a later time.

Administration Center policy domain updates:

With enhancements to the Administration Center, you can now specify server event-based archive settings using the Policy Domain and Management Class wizards.

If you set an archive retention period for an object through the server, you can update these settings using the Administration Center Management Class notebook.

Setting an archive retention period ensures that objects are not deleted from the Tivoli Storage Manager server until policy-based retention requirements for that object are satisfied.

Analysis of client performance data:

With the new client performance monitor function, you have the capability to gather and analyze performance data about backup and restore operations for an IBM Tivoli Storage Manager client.

The client performance monitor function is accessed from the Tivoli Storage Manager Administration Center and uses data that is collected by the API. You can view performance information about processor, disk, and network utilization, and performance data that relates to data transfer rates and data compression. You can analyze data throughput rates at any time during a backup or restore operation. Also, you can use the performance information to analyze processor, disk, or network performance bottlenecks.

Server session disablement and enablement

You can now temporarily disable and enable all outbound or inbound sessions for a particular Tivoli Storage Manager server.

This feature is useful, for example, if you have a planned network outage that might affect communication between a source and a target replication server. To prevent replication failures, you can disable outbound sessions from the source replication server before the outage. After communications have been reestablished, you can resume replication by enabling outbound sessions.

Command-line help for subcommands

In this release, you can obtain help for Tivoli Storage Manager subcommands. For example, you can display help for the **DEFINE DEVCLASS** command for 3570 device classes and for 3590 device classes. To display command-line help for a subcommand, type `help` followed by the topic number for the command.

Topic numbers are listed in the table of contents, for example:

```
3.0 Administrative commands
  ...
  3.13.10 DEFINE DEVCLASS (Define a device class)
      3.13.10.1 DEFINE DEVCLASS (Define a 3570 device class)
      3.13.10.2 DEFINE DEVCLASS (Define a 3590 device class)
      ...
```

To display help for the **DEFINE DEVCLASS** command for 3570 device classes, type:

```
help 3.13.10.1
```

As in previous releases, you can use this method to display help for commands that have unique names, such as **REGISTER NODE**:

```
3.46 REGISTER
    3.46.1 REGISTER ADMIN (Register an administrator)
    3.46.2 REGISTER LICENSE (Register a new license)
    3.46.3 REGISTER NODE (Register a node)
```

To display help for the **REGISTER NODE** command, you can type:

```
help 3.46.1
```

You can also type `help` *`commandName`*, where *commandName* is the name of the server command for which you want information:

`help register node`

Data encryption with TLS/SSL

You can use Transport Layer Security (TLS)/Secure Sockets Layer (SSL) on HP-UX, Linux, Oracle Solaris, AIX, and Windows platforms.

With TLS/SSL industry-standard communications, you can encrypt all traffic between the backup-archive client, the administrative command-line clients, and the IBM Tivoli Storage Manager server. You can use either self-signed or vendor-acquired SSL certificates.

For Tivoli Storage Manager V6.3 and later, to use SSL with self-signed certificates, use the `SSLTLS12` option after you distribute new self-signed certificates to all V6.3 backup-archive clients. You can use certificates from previous server versions, but you then cannot use TLS 1.2.

For Tivoli Storage Manager V6.3.3 server, TLS/SSL is available for LAN-free and server-to-server functions.

Part 1. Upgrading the server from V5 to V6.3 or later

You can upgrade the IBM Tivoli Storage Manager server directly from Version 5 to Version 6.3 or later.

Tivoli Storage Manager V6.3 provides a relational database that is based on IBM® DB2® technology. When you upgrade the system from V5 to V6.3 or later, you extract the data in a current Tivoli Storage Manager server database and load it into the new database structure. Tivoli Storage Manager provides utilities to perform the process.

Upgrading from V5 to V6.3 or later requires planning, and possibly testing. Start by reviewing what is new in V6.3 or later, and collecting information about your current Tivoli Storage Manager servers.

Who should read this information

This information is intended for administrators of Tivoli Storage Manager servers, who are responsible for upgrading Tivoli Storage Manager V5 servers to V6.3 or later. Administrators should 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 information

Here is the suggested sequence for using this information:

1. Read the overview information about the updates to the server: Chapter 1, “Server database updates overview,” on page 3.
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 75
3. Select the scenario to use, and plan for the hardware, software, and storage space requirements for your server and environment. A worksheet can be used for space planning: “Worksheet for planning space for the V6.3 or later server” on page 44.
4. Run a test of the upgrade process: “Testing the upgrade process for a server” on page 49. 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 93
   - Chapter 5, “Scenario 2: Same system, network method,” on page 135
   - Chapter 6, “Scenario 3: New system, media method,” on page 175
   - Chapter 7, “Scenario 4: New system, network method,” on page 223
6. Complete the upgrade process by following the steps in the section:
   - Chapter 10, “Taking the first steps after upgrade,” on page 323

For information about upgrading the server from V6.1 or V6.2 to V6.3 or later, see the upgrade procedures in the *Installation Guide*.

Chapter 1. Server database updates overview

IBM Tivoli Storage Manager Version 6.3 uses a relational database that is based on IBM DB2 technology. Versions of Tivoli Storage Manager earlier than 6.1 did not use the DB2 technology. Before you upgrade the server to V6.3 or later, learn more about DB2.

The server database

The V6.3 server integrates enterprise-class, IBM DB2 database technology that provides database management functions for the server database. An administrator can manage the server database by using Tivoli Storage Manager administrative interfaces.

The Tivoli Storage Manager administrative interfaces are 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 V6.3 or later 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 V6.3 or later, 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. Enable read cache for the database file systems, and enable write cache if the disk subsystem supports it.

The maximum size of the Tivoli Storage Manager database is 4 TB.

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

For details, see the recovery log section in the *Administrator's Guide*.

Operation changes

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

For details about operations with a V6.3 or later 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 V6.3, 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 IBM Tivoli Monitoring for Tivoli Storage Manager.

IBM Tivoli Storage Manager V6.3 or later is installed with the IBM DB2 database application. Users who are experienced DB2 administrators can choose to perform advanced SQL queries and use DB2 tools to monitor the database. However, do not use DB2 tools to change DB2 configuration settings from those settings that are preset by Tivoli Storage Manager. Do not alter the DB2 environment for Tivoli Storage Manager in other ways, such as with other products. The Tivoli Storage Manager V6.3 server was built and tested with 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 lost. Observe the following restrictions:

- Do not use database tools or interfaces other than those that are provided by Tivoli Storage Manager to change configuration settings from those that are set by Tivoli Storage Manager during the installation process.
- Do not alter the DB2 environment.
- If you use database tools or interfaces other than those provided 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.
- Do not alter the DB2 software that is installed with Tivoli Storage Manager installation packages and fix packs.
- Do not install or upgrade to a different version, release, or fix pack of DB2 software.

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 rollforward 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 V6.3 or later, 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 V6.3. Use hardware mirroring instead.

Recovery log mode
The V6.3 server always runs in a mode that is equivalent to the roll-forward mode.

Changes to the database are recorded in the recovery log to maintain a consistent database image. Active and archive log files, which are included in database backups, make it possible to restore the server to the latest time possible. You can also restore the database 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 is mirrored to another file system location. For the best availability, locate the active log mirror on a different physical device.

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

Before V6.3, the volume history file was optional for restoring the database, and if a device configuration file was not available, you could re-create the file. Starting with the V6.3 server, both the volume history file and the device configuration file must be available; the device configuration file cannot be re-created.

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 by 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 `/tsminst1` and `/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 it possible to start server instances in this way.

The standard way to start the server is by using the instance user ID. By using the instance user ID, you simplify the setup process and avoid potential issues. However, in some cases, it might be necessary to use another user ID to start the server. For example, you might want to use the root user ID to ensure that the server can access specific devices. To allow a user other than the instance user ID to start the server, the user ID must have sufficient authority to issue the start command for the server and database manager, and the user ID must belong to the SYSADM_GROUP group. The user ID must have authority to access the server database and to use all files, directories, and devices required by the server. Before starting the server, explicitly grant server database authority to the user ID and verify all other authorities for the user ID.

Tip: Solaris If you are running a Tivoli Storage Manager server on a Solaris system, you can use the Solaris Service Management Facility (SMF) to set up and control the Tivoli Storage Manager server as a service. For more information, see Technote 7021102 (http://www.ibm.com/support/docview.wss?uid=swg27021102).

Switching user IDs

The *-u userID* option for **DSMSERV** makes it possible for 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** makes it possible for the server to change its current working directory at invocation. This option is primarily intended to ensure that multiple instances of the Tivoli Storage Manager server can be launched from `/etc/inittab` without the need for user-configured scripts.

Setting up the environment by 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 Oracle Solaris systems" on page 325

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 E, "Services associated with the Tivoli Storage Manager server," on page 549

Related tasks:

"Starting the server on Windows systems" on page 329

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 no longer valid.

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 Oracle Solaris systems" on page 294 for the details.

Related tasks:

"Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 294

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 53

Chapter 2. Planning the upgrade of the server

Planning the upgrade to IBM Tivoli Storage Manager V6.3 or later is important because in addition to installing the new code, you must move the contents of the server database into the new database.

Moving data from an original V5 server database to the V6.3 or later 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 from V5 to V6.3 or later

Moving from Tivoli Storage Manager V5 to V6.3 or later 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 provided upgrade tools.

Except for the database extraction and insertion steps, the server upgrade process is similar to the disaster recovery process. Critical server files, such as the option and device configuration files, must be available, and storage pool devices must be made available to the upgraded server.

The major steps in the upgrade process from V5 to V6.3 or later are as follows:

1. Plan system hardware and software, and estimate 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.

   Tip: If you are introducing new hardware or changes in the storage system infrastructure, plan the zoning for the storage area network (SAN). Allow time to create device statements and paths, and to check in tape volumes following the upgrade. For IBM tape devices, no multipathing driver is available for tape drives that are distributed over more than one adapter. Use zoning and device definitions to balance the workload.
2. Back up the Tivoli Storage Manager server database and configuration files. Ensure that at least one full database backup is available onsite.

   Tip: If you must restore the database after a failed upgrade, having an onsite backup database saves time.

3. Optional: Verify your system environment by running the prerequisite checker. Make any changes that are required before proceeding with the installation.
4. Install the server code. Installation tasks include the following:
   - Installing the new server code, which includes the server and its database manager program. Configure a user ID for the new server instance.
   - Installing the upgrade utilities package on the system where the existing V5 server is located.
5. Upgrade the database. This task includes preparing the database, and then moving the database. Use the upgrade utilities or the upgrade wizard to complete these tasks.

   The upgrade utilities or upgrade wizard extracts data from an existing database and inserts the data into a new V6.3 or later 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 require manual correction.

   If you use the wizard, you are guided to complete the upgrade steps in the correct order. If you are performing the upgrade manually by using utilities from a command line, follow the procedure carefully.
6. Verify the upgrade by running basic operations and querying information about the system to confirm that all information transferred correctly.

To help you decide how to perform the upgrade process, review the information that compares upgrade methods, and the descriptions of upgrade scenarios.

Related tasks:

Chapter 3, “Upgrade scenarios overview,” on page 75

Comparison of upgrading on an existing system and a new system

Upgrading the V6.3 or later server on an existing system requires that the system is unavailable for production use during installation and when the data is moved into the new database. Moving the server to a new system gives you more flexibility in terms of the upgrade process, but with some additional costs.

If you are upgrading Tivoli Storage Manager to a different operating system, a limited set of migration paths is available. For instructions about migrating a server that is running on a z/OS operating system, see Part 3, “Migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 on AIX or Linux on System z,” on page 433. For instructions about migrating a server that is running on an AIX, HP-UX, or Solaris operating system, see Part 2, “Migrating Tivoli Storage Manager V5 servers on AIX, HP-UX, or Solaris systems to V6.3.4 on Linux,” on page 349.

The following table lists items to consider when you decide how to upgrade the server.

Table 6. Considerations for selecting a server upgrade scenario

Item	Upgrade on an existing system	Upgrade on a new system
System hardware	More 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 V6.3 or later.
Software	Software on the system must meet requirements for V6.3 or later. The V6.3 or later server cannot coexist with other versions on the same system.	Software on the new system must meet requirements for V6.3 or later. 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).
V5 server availability	All V5 server instances on the system are unavailable after the V6.3 or later server program is installed. Data that is 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. Then, restore the V5 database from a backup.	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. For information about hybrid upgrade methods to use, including export and import operations, and tips about avoiding data loss, see the Tivoli Storage Manager wiki (http://www.ibm.com/developerworks/mydeveloperworks/wikis/home/wiki/Tivoli Storage Manager). A V5.3 or V5.4 server on the original system can be restarted, but its database must be restored first from the database backup.
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.

Table 6. Considerations for selecting a server upgrade scenario (continued)

Item	Upgrade on an existing system	Upgrade on a new system
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. Alternatively, you can make network changes 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 required after the upgrade.

Related concepts:

"Hardware and software requirements for the upgraded server" on page 19

Related tasks:

"Estimating total space requirements for the upgrade process and upgraded server" on page 41

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 V6.3 or later database

The upgrade utilities are required for moving data from an earlier version of the database into the V6.3 or later 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 V6.3 or later 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 V6.3 or later 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:

"**DSMUPGRD** upgrade utilities"

Related tasks:

"Estimating total space requirements for the upgrade process and upgraded server" on page 41

DSMUPGRD upgrade utilities

You can use the **DSMUPGRD** upgrade utilities to prepare and extract data from a V5.3, V5.4, or V5.5 server database for insertion into an empty V6.3 or later 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 simultaneously extract and insert the data into a new database over a network. Alternatively, you can use the utility to 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 512
"DSMUPGRD PREPAREDB (Prepare a V5 database for upgrade)" on page 513
"DSMUPGRD EXTRACTDB (Extract data from a V5 server database)" on page 519
"DSMUPGRD EXTEND DB (Extend the size of the database)" on page 524
"DSMUPGRD EXTEND LOG (Extend the size of the recovery log)" on page 525
"DSMUPGRD UPDATE (Create backup registry entries for a V5 server instance)" on page 526
"DSMSERV INSERTDB (Move a server database into an empty database)" on page 529
DSMSERV LOADFORMAT (Format a database)

Hardware and software requirements for upgrading to the V6.3 or later server

Use the requirements described here as a starting point.

For the latest information about hardware and software requirements, see the product support site at http://www.ibm.com/support/docview.wss?uid=swg21243309.

To verify your installation environment, you can run the prerequisite checker before starting the installation. For more information about the prerequisite checker, see "Running the prerequisite checker" on page 38.

Restrictions: AIX HP-UX Linux Solaris You can install and run the V6.3 or later server on a system that already has DB2 installed on it, whether DB2 was installed by itself or as part of another application, with 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 V6.3 or later server on a system that already has DB2 installed on it, whether DB2 was installed by itself or as part of another application. The V6.3 or later server requires the installation and use of the DB2 version that is packaged with the V6.3 or later server. No other version of DB2 can exist on the system.

Related tasks:

"Estimating total space requirements for the upgrade process and upgraded server" on page 41

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 V6.3 or later. 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 operating systems 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 7 on page 17 to determine whether you are using one of the operating system versions that must be upgraded.

When you prepare to upgrade a system, you must ensure that the source server is at V5.3.6 or later and that the latest interim fix for the selected level is installed.

To optimize the upgrade process and avoid potential issues, consider upgrading the V5 server to the latest available level and installing the latest interim fix for that level. Follow the guidelines in "Determining the appropriate level for a V5 server before an upgrade" on page 37. To download the latest fix pack and interim fix, go to the IBM Support Portal at http://www.ibm.com/support/entry/portal/Downloads. Locate the appropriate version of Tivoli Storage Manager.

Table 7. Operating system versions that must be upgraded to run the upgrade utilities

Operating system	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 earlier 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
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 that are installed on the target computer

Table 7. Operating system versions that must be upgraded to run the upgrade utilities (continued)

Operating system	If you are running this version...	You must upgrade to this version (or later) to use the upgrade utilities.
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
Oracle Solaris	• Oracle Solaris 8 (64 bit)	• SPARC 64 bit: Oracle Solaris 9 Oracle Solaris 10 • x86_64: Oracle Solaris 10
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 websites. 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?uid=swg21052220

HP-UX
http://www.ibm.com/support/docview.wss?uid=swg21052219

Linux

Linux on Power Systems™ Servers: http://www.ibm.com/support/docview.wss?uid=swg21108042

Linux x86: http://www.ibm.com/support/docview.wss?uid=swg21107360

Linux x86_64: http://www.ibm.com/support/docview.wss?uid=swg21204361

Linux zSeries: http://www.ibm.com/support/docview.wss?uid=swg21108040

Solaris
http://www.ibm.com/support/docview.wss?uid=swg21053216

Windows
http://www.ibm.com/support/docview.wss?uid=swg21064234

Hardware and software requirements for the upgraded server

Use these requirements 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/support/entry/portal/Overview/Software/Tivoli/Tivoli_Storage_Manager.

If you are upgrading Tivoli Storage Manager on a different operating system, a limited set of migration paths is available. For instructions about migrating a server that is running on a z/OS operating system, see Part 3, "Migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 on AIX or Linux on System z," on page 433. For instructions about migrating a server that is running on an AIX, HP-UX, or Solaris operating system, see Part 2, "Migrating Tivoli Storage Manager V5 servers on AIX, HP-UX, or Solaris systems to V6.3.4 on Linux," on page 349.

Some platforms that were supported for earlier versions of the server are not supported for V6.3 or later. If the server that you want to upgrade is running on one of these platforms, you cannot upgrade your server to V6.3 or later on the same platform. For required platforms, see the following table.

Table 8. Required platforms for upgrading from V5 to V6.3 or later

Platform for V5 server	Required platform for upgrade to V6.3 or later
HP-UX running on a PA-RISC system	HP-UX running on an Intel Itanium system
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system
Linux running on an x86_32 system	Linux running on an x86_64 system
Solaris running on an x86_64 system	Linux running on an x86_64 system
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system

If you are upgrading from Tivoli Storage Manager V5 to V6.3 or later on a new system, restrictions apply. Ensure that you install the V6.3 or later server in a compatible hardware and software environment, as described in the following table.

Table 9. Requirements for upgrading from V5 to V6.3 or later on a new system

V5 server	V6.3 or later server	Comments
AIX running on an IBM POWER® system	AIX running on an IBM POWER system	
HP-UX running on an Itanium system	HP-UX running on an Itanium system	
HP-UX running on a PA-RISC system	HP-UX running on an Itanium system	HP-UX running on PA-RISC is not supported for V6.3 or later servers.
Linux running on an IBM POWER system	Linux running on an IBM POWER system	
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system	Linux running on Itanium is not supported for V6.3 or later servers.
Linux running on an x86_32 system	Linux running on an x86_64 system	Linux running on x86_32 is not supported for V6.3 or later servers.

Table 9. Requirements for upgrading from V5 to V6.3 or later on a new system (continued)

V5 server	V6.3 or later server	Comments
Linux on System z	Linux on System z	
Solaris running on an x86_64 system	Operating system depends on the migration method	A V6.3 or later server cannot be installed on a Solaris x86_64 system. However, you can migrate a V5 server that is running on a Solaris x86_64 operating system to V6.3.4 or later on a Linux x86_64 operating system. For instructions, see Part 2, "Migrating Tivoli Storage Manager V5 servers on AIX, HP-UX, or Solaris systems to V6.3.4 on Linux," on page 349. Alternatively, you can migrate the Solaris x86_64 system by installing a V6.3 or later server on any operating system that is supported for V6.3 or later. Then, use Tivoli Storage Manager server **EXPORT** and **IMPORT** commands to move the server from the V5 source system to the V6.3 or later target system.
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system	Windows running on Itanium is not supported for V6.3 or later servers.
Windows running on an x86_32 system	Windows running on an x86_64 system	Windows running on x86_32 is not supported for V6.3 or later servers.
z/OS	AIX or Linux on System z	For instructions, see Part 3, "Migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 on AIX or Linux on System z," on page 433.

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 41.

Table 10. Hardware requirements

Type of hardware	Hardware requirements
Hardware	An appropriately configured POWER4, POWER5, POWER6®, POWER7® systems computer (64-bit)
Disk space	The following minimum disk space: • 5 MB for the `/var` directory • 2 GB for the `/opt/tivoli/tsm` directory • 30 MB for the `/opt` directory if you create mount points • 360 MB for the `/tmp` directory • 300 MB for the `/usr` directory • 2 GB in the home directory **Tip:** Expect to use more space for problem determination. Significant additional disk space is required for database and log files. The size of the database depends on the number of client files to be stored and the method by which the server manages them. The default active log space is 16 GB, the minimum that is needed for most workloads and configurations. Allocate at least three times the active log space for the archive log (48 GB). Ensure that you have sufficient resources if you are using data deduplication or expect a heavy client workload. For optimal performance and to facilitate I/O, specify at least two equally sized containers or Logical Unit Numbers (LUNs) for the database. See *Optimizing Performance* for more information about the configuration of directories for the database. In addition, each active log and archive log should have its own container or LUN. Ensure that you see the capacity planning section for more details about disk space.
Memory (minimum)	• 12 GB. • 16 GB if you are using data deduplication. • At least 32 GB for heavily used servers. Using 32 GB or more of memory enhances performance of the Tivoli Storage Manager server database inventory. • If you plan to run multiple instances, each instance requires the memory listed for one server. Multiply the memory for one server by the number of instances planned for the system. • Node replication processing requires additional memory. Use a minimum of 32 GB of memory for node replication without data deduplication. Node replication with data deduplication requires a minimum of 64 GB of memory.

Software requirements

The following table describes the minimum software requirements.

Table 11. Software requirements

Type of software	Minimum software requirements
Operating system	AIX 6.1 running in a 64-bit kernel environment with the following additional requirements: • AIX 6.1 TL 2. • POWER7 systems require AIX 6.1 TL 4. • Minimum C++ runtime level with the xlC.rte 11.1.0.1 and xlC.aix61.rte 11.1.0.1 or later file sets. These file sets are included in the June 2008 fix pack package for IBM C++ Runtime Environment Components for AIX. AIX 7.1 running in a 64-bit kernel environment. • Minimum C++ runtime level requires the xlC.rte 11.1.0.1 and xlC.aix61.rte 11.1.0.1 or later file sets. These file sets are included in the April 2010 IBM C++ Runtime Environment Components for AIX V11.1 package. For the latest recommendations about AIX maintenance levels, see http://www.ibm.com/support/docview.wss?uid=swg21165448
Web browser	A web browser to retrieve an online installation package. The following browsers are supported: • Microsoft Internet Explorer 7.0 or later • Firefox 3.5 or later 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.
Communication protocol	A configured communication method.
Processing	Asynchronous I/O must be enabled.
Drivers	Install the most current Tivoli Storage Manager device driver. The driver must be configured before using the Tivoli Storage Manager server with tape devices. You can locate IBM device drivers at the Fix Central website. 1. Go to the Fix Central website: http://www.ibm.com/support/fixcentral/. 2. Select **Storage Systems** for the Product Group. 3. Select **Tape Systems** for the Product Family. 4. Select **Tape device drivers and software** for the Product Type. 5. Select **Tape device drivers** for the Product. 6. Select your operating system for the Platform.
Gunzip utility	The gunzip utility must be available on your system before you install or upgrade the Tivoli Storage Manager Version 6 server. Ensure that the gunzip utility is installed and the path to it is set in the PATH environment variable.
Other software	Korn Shell (ksh)

Server requirements on HP-UX systems

HP-UX

Check that your HP-UX system meets the requirements.

You cannot run a V6.3 or later 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 V6.3 or later on the same platform. You must install your V6.3 or later 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 41.

Table 12. Hardware requirements

Type of hardware	Hardware requirements
Hardware	A 64-bit Intel Itanium system.
Disk space	The following minimum disk space: • 5 MB for the `/var` directory • 30 MB for the `/opt` directory if you create mount points • 2 GB for the `/opt/tivoli/tsm` directory • 2 GB for the `/opt` directory if you do not create mount points • 600 MB for the `/tmp` directory • 300 MB for the `/usr` directory • 2 GB in the home directory **Tip:** Expect to use more space for problem determination. Significant additional disk space is required for database and log files. The size of the database depends on the number of client files to be stored and the method by which the server manages them. The default active log space is 16 GB, the minimum that is needed for most workloads and configurations. Allocate at least three times the active log space for the archive log (48 GB). Ensure that you have sufficient resources if you are using data deduplication or expect a heavy client workload. For optimal performance and to facilitate I/O, specify at least two equally sized containers or Logical Unit Numbers (LUNs) for the database. See *Optimizing Performance* for more information about the configuration of directories for the database. In addition, each active log and archive log should have its own container or LUN. Ensure that you see the capacity planning section for more details about disk space.

Table 12. Hardware requirements (continued)

Type of hardware	Hardware requirements
Memory	• 12 GB. • 16 GB if you are using data deduplication. • At least 32 GB for heavily used servers. Using 32 GB or more of memory enhances performance of the Tivoli Storage Manager server database inventory. • If you plan to run multiple instances, each instance requires the memory listed for one server. Multiply the memory for one server by the number of instances planned for the system. • Node replication processing requires additional memory. Use a minimum of 32 GB of memory for node replication without data deduplication. Node replication with data deduplication requires a minimum of 64 GB of memory.

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 C, "HP-UX system resource requirements," on page 543.

Table 13. Software requirements

Type of software	Minimum software requirements
Operating system	The HP Itanium system must have operating system 11i v3 (11.31) with the most current maintenance levels installed. 11i v3 with: • PHCO_38658 - libc cumulative patch The latest available service patches for the operating system must be applied. Older levels without patches do not work with the device drivers that Tivoli Storage Manager uses.
Communication protocol	A communication method that is installed and activated (shared memory is the default).

Table 13. Software requirements (continued)

Type of software	Minimum software requirements
Devices and drivers	• A DVD device that is available for the installation process, if you are installing from DVD media. • The Tivoli Storage Manager device driver package does not contain a device driver for this operating system because a SCSI generic device driver is used. Configure the device driver before using the Tivoli Storage Manager server with tape devices. The Tivoli Storage Manager driver package contains driver tools and ACSLS daemons. You can locate IBM driver packages at the Fix Central website. 1. Go to the Fix Central website: http://www.ibm.com/support/fixcentral/. 2. Select **Storage Systems** for the Product Group. 3. Select **Tape Systems** for the Product Family. 4. Select **Tape device drivers and software** for the Product Type. 5. Select **Tape device drivers** for the Product. 6. Select your operating system for the Platform.
Gunzip utility	The gunzip utility must be available on your system before you install or upgrade the Tivoli Storage Manager Version 6 server. Ensure that the gunzip utility is installed and the path to it is set in the PATH environment variable.
Other software	Korn Shell (ksh)

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 V6.3 or later:

- 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 V6.3 or later on the same platform. You must install your V6.3 or later 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: 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 41.

If you have an IBM 3592 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 http://www.ibm.com/support/fixcentral/.

Table 14. Hardware requirements

Type of hardware	Hardware requirements
Hardware	A Linux on Power Systems server on an IBM system, such as one listed in the following website: http://www.ibm.com/systems/power/software/linux/about/index.html
Disk space	The following minimum disk space: • 5 MB for the `/var` directory • 30 MB for the `/opt` directory if you create mount points • 2 GB for the `/opt/tivoli/tsm` directory • 390 MB for the `/tmp` directory • 300 MB for the `/usr` directory • 2 GB in the home directory **Tip:** Expect to use more space for problem determination. Significant additional disk space is required for database and log files. The size of the database depends on the number of client files to be stored and the method by which the server manages them. The default active log space is 16 GB, the minimum that is needed for most workloads and configurations. Allocate at least three times the active log space for the archive log (48 GB). Ensure that you have sufficient resources if you are using data deduplication or expect a heavy client workload. For optimal performance and to facilitate I/O, specify at least two equally sized containers or Logical Unit Numbers (LUNs) for the database. See *Optimizing Performance* for more information about the configuration of directories for the database. In addition, each active log and archive log should have its own container or LUN. Ensure that you see the capacity planning section for more details about disk space.
Memory	• 12 GB. • 16 GB if you are using data deduplication. • At least 32 GB for heavily used servers. Using 32 GB or more of memory enhances performance of the Tivoli Storage Manager server database inventory. • If you plan to run multiple instances, each instance requires the memory listed for one server. Multiply the memory for one server by the number of instances planned for the system. • Node replication processing requires additional memory. Use a minimum of 32 GB of memory for node replication without data deduplication. Node replication with data deduplication requires a minimum of 64 GB of memory.

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 Power (ppc64 architecture) requires one of the following operating systems: • Red Hat Enterprise Linux 5, Update 3 or later • Red Hat Enterprise Linux 6 • SUSE Linux Enterprise Server 10, Service Pack 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 website: http://www.ibm.com/software/awdtools/xlcpp/. For more details about this system requirement, you can check the following website: 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 (32 and 64 bit packages are required). 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.
Communication protocol	• TCP/IP Version 4 or Version 6, which is standard with Linux • Shared memory protocol (with Tivoli Storage Manager Version 6.3 or later System p® client)
Processing	Asynchronous I/O must be enabled. On Linux kernels at 2.6 or later, install the libaio library to enable Asynchronous I/O.
Web browser	A web browser to retrieve an online installation package. The following browsers are supported: • Microsoft Internet Explorer 7.0 or later • Firefox 3.5 or later 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.
Other software	Korn Shell (ksh)

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 41.

If you have an IBM 3592 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 http://www.ibm.com/support/fixcentral/.

Table 16. Hardware requirements

Type of hardware	Hardware requirements
Hardware	An AMD64 or Intel EMT-64 processor
Disk space	The following minimum values for disk space: • 5 MB for the `/var` directory • 30 MB for the `/opt` directory if you create mount points • 2 GB for the `/opt/tivoli/tsm` directory • 390 MB for the `/tmp` directory • 300 MB for the `/usr` directory • 2 GB in the home directory **Tip:** Expect to use more space for problem determination. Significant additional disk space is required for database and log files. The size of the database depends on the number of client files to be stored and the method by which the server manages them. The default active log space is 16 GB, the minimum that is needed for most workloads and configurations. Allocate at least three times the active log space for the archive log (48 GB). Ensure that you have sufficient resources if you are using data deduplication or expect a heavy client workload. For optimal performance and to facilitate I/O, specify at least two equally sized containers or Logical Unit Numbers (LUNs) for the database. See *Optimizing Performance* for more information about the configuration of directories for the database. In addition, each active log and archive log should have its own container or LUN. Ensure that you see the capacity planning section for more details about disk space.

Table 16. Hardware requirements (continued)

Type of hardware	Hardware requirements
Memory	• 12 GB. • 16 GB if you are using data deduplication. • At least 32 GB for heavily used servers. Using 32 GB or more of memory enhances performance of the Tivoli Storage Manager server database inventory. • If you plan to run multiple instances, each instance requires the memory listed for one server. Multiply the memory for one server by the number of instances planned for the system. • Node replication processing requires additional memory. Use a minimum of 32 GB of memory for node replication without data deduplication. Node replication with data deduplication requires a minimum of 64 GB of memory.

Software requirements

The following table describes the minimum software requirements.

Table 17. 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, Update 3 or later • Red Hat Enterprise Linux 6 • SUSE Linux Enterprise Server 10, Service Pack 2 or later • SUSE Linux Enterprise Server 11
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 (32 and 64 bit packages are required) • libstdc++.so.5 (32 and 64 bit packages are required) • libstdc++.so.6 (32 and 64 bit packages are required)
Communication protocol	• TCP/IP Version 4 or Version 6, which is standard with Linux • Shared memory protocol (with Tivoli Storage Manager Version 6.3 or later Linux x86_64 client)
Processing	Asynchronous I/O must be enabled. On Linux kernels at 2.6 or later, install the libaio library to enable Asynchronous I/O.
Web browser	A web browser to retrieve an online installation package. The following browsers are supported: • Microsoft Internet Explorer 7.0 or later • Firefox 3.5 or later 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 17. Software requirements (continued)

Type of software	Minimum software requirements
Other software	Korn Shell (ksh)

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 41.

If you have an IBM 3592 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 http://www.ibm.com/support/fixcentral/.

Table 18. Hardware requirements

Type of hardware	Hardware requirements
Hardware	An IBM zSeries, IBM System z9®, IBM System z10®, or IBM zEnterprise® System (z114 and z196) 64-bit native logical partition (LPAR) or z/VM® guest.
Disk space	The following minimum values for disk space: • 5 MB for the `/var` directory • 30 MB for the `/opt` directory if you create mount points • 2 GB for the `/opt/tivoli/tsm` directory • 390 MB for the `/tmp` directory • 300 MB for the `/usr` directory • 2 GB in the home directory **Tip:** Expect to use more space for problem determination. Significant additional disk space is required for database and log files. The size of the database depends on the number of client files to be stored and the method by which the server manages them. The default active log space is 16 GB, the minimum that is needed for most workloads and configurations. Allocate at least three times the active log space for the archive log (48 GB). Ensure that you have sufficient resources if you are using data deduplication or expect a heavy client workload. For optimal performance and to facilitate I/O, specify at least two equally sized containers or Logical Unit Numbers (LUNs) for the database. See *Optimizing Performance* for more information about the configuration of directories for the database. In addition, each active log and archive log should have its own container or LUN. Ensure that you see the capacity planning section for more details about disk space.

Table 18. Hardware requirements (continued)

Type of hardware	Hardware requirements
Memory	• 12 GB. • 16 GB if you are using data deduplication. • At least 32 GB for heavily used servers. Using 32 GB or more of memory enhances performance of the Tivoli Storage Manager server database inventory. • If you plan to run multiple instances, each instance requires the memory listed for one server. Multiply the memory for one server by the number of instances planned for the system. • Node replication processing requires additional memory. Use a minimum of 32 GB of memory for node replication without data deduplication. Node replication with data deduplication requires a minimum of 64 GB of memory.

Software requirements

The following table describes the minimum software requirements.

Table 19. 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 • Red Hat Enterprise Linux 6 • SUSE Linux Enterprise Server 10, Service Pack 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 (32 and 64 bit packages are required) • libstdc++.so.5 (32 and 64 bit packages are required) • libstdc++.so.6 (32 and 64 bit packages are required)
Communication protocol	• TCP/IP Version 4 or Version 6, which is standard with Linux • Shared memory protocol (with Tivoli Storage Manager Version 6.3 or later Linux on System z client)
Processing	Asynchronous I/O must be enabled. On Linux kernels at 2.6 or later, install the libaio library to enable Asynchronous I/O.
Web browser	A web browser to retrieve an online installation package. The following browsers are supported: • Microsoft Internet Explorer 7.0 or later • Firefox 3.5 or later 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 19. Software requirements (continued)

Type of software	Minimum software requirements
Other software	Korn Shell (ksh)

Server requirements on Solaris systems

Solaris

Check that your 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 41.

Table 20. Hardware requirements

Type of hardware	Hardware requirements
Hardware	One of the following processors is required: • Ultra SPARC-based processors (sun4u architecture) • Ultra SPARC-based processors (sun4v architecture)
Disk space	The following list is the minimum disk space for Ultra SPARC-based processors (sun4u and sun4v architecture) for the respective directories and logs: • 5 MB for the `/var` directory • 30 MB for the `/opt` directory if you create mount points • 2 GB for the `/opt/tivoli/tsm` directory • 600 MB for the `/tmp` directory • 300 MB for the `/usr` directory • 2 GB in the home directory **Tip:** Expect to use more space for problem determination. Significant additional disk space is required for database and log files. The size of the database depends on the number of client files to be stored and the method by which the server manages them. The default active log space is 16 GB, the minimum that is needed for most workloads and configurations. Allocate at least three times the active log space for the archive log (48 GB). Ensure that you have sufficient resources if you are using data deduplication or expect a heavy client workload. For optimal performance and to facilitate I/O, specify at least two equally sized containers or Logical Unit Numbers (LUNs) for the database. See *Optimizing Performance* for more information about the configuration of directories for the database. In addition, each active log and archive log should have its own container or LUN. Ensure that you see the capacity planning section for more details about disk space.

Table 20. Hardware requirements (continued)

Type of hardware	Hardware requirements
Memory	• 12 GB. • 16 GB if you are using data deduplication. • At least 32 GB for heavily used servers. Using 32 GB or more of memory enhances performance of the Tivoli Storage Manager server database inventory. • If you plan to run multiple instances, each instance requires the memory listed for one server. Multiply the memory for one server by the number of instances planned for the system. • Node replication processing requires additional memory. Use a minimum of 32 GB of memory for node replication without data deduplication. Node replication with data deduplication requires a minimum of 64 GB of memory. **Tip:** Ensure that there is at least twice as much swap space allocated as there is physical memory on the system.

Software requirements

The following table describes the minimum software requirements.

Table 21. Software requirements

Type of software	Minimum software requirements
Operating system	Oracle Solaris 10, running in 64-bit mode on an Ultra Sparc system with sun4u or sun4v architecture • Patch 118822-25 • If raw devices are used, patch 125100-07
Communication protocol	TCP/IP
Devices and drivers	If you have an IBM 3570, 3590, 3592, or Ultrium tape library or drive, install the most current device driver. Configure the device driver before you use the Tivoli Storage Manager server with tape devices. You can locate IBM device drivers at the Fix Central website. 1. Go to the Fix Central website: http://www.ibm.com/support/fixcentral/. 2. Select **Storage Systems** for the Product Group. 3. Select **Tape Systems** for the Product Family. 4. Select **Tape device drivers and software** for the Product Type. 5. Select **Tape device drivers** for the Product. 6. Select your operating system for the Platform.
Gunzip utility	The gunzip utility must be available on your system before you install or upgrade the Tivoli Storage Manager Version 6 server. Ensure that the gunzip utility is installed and the path to it is set in the PATH environment variable.
Other software	Korn Shell (ksh)

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 D, "Using Solaris zones," on page 545.

Server requirements on Microsoft Windows systems

Windows

Check that your Microsoft Windows system meets the requirements.

You cannot run a V6.3 or later 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 V6.3 or later on the same platform. You must install your V6.3 or later 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 41.

Table 22. Hardware requirements

Type of hardware	Hardware requirements
Hardware	An AMD64 or Intel EMT-64 processor
Disk Space	• At least 3 GB of free disk storage (for a typical installation) • 200 MB temporary directory space • 2 GB partition size in the C:\ drive • 300 MB in the instance directory Significant additional disk space is required for database and log files. The size of the database depends on the number of client files to be stored and the method by which the server manages them. The default active log space is 16 GB, the minimum that is needed for most workloads and configurations. Allocate at least three times the active log space for the archive log (48 GB). Ensure that you have sufficient resources if you are using data deduplication or expect a heavy client workload. For optimal performance and to facilitate I/O, specify at least two equally sized containers or Logical Unit Numbers (LUNs) for the database. See *Optimizing Performance* for more information about the configuration of directories for the database. In addition, each active log and archive log should have its own container or LUN. Ensure that you see the capacity planning section for more details about disk space.

Table 22. Hardware requirements (continued)

Type of hardware	Hardware requirements
Memory	• 12 GB. • 16 GB if you are using data deduplication. • At least 32 GB for heavily used servers. Using 32 GB or more of memory enhances performance of the Tivoli Storage Manager server database inventory. • If you plan to run multiple instances, each instance requires the memory listed for one server. Multiply the memory for one server by the number of instances planned for the system. • Node replication processing requires additional memory. Use a minimum of 32 GB of memory for node replication without data deduplication. Node replication with data deduplication requires a minimum of 64 GB of memory.

Software requirements

The following table describes the minimum software requirements.

Table 23. Software requirements

Type of software	Minimum software requirements
Operating system	One of the following operating systems: • Microsoft Windows Server 2008: Standard, Enterprise, or Datacenter x64 Edition (64-bit) • Microsoft Windows Server 2008 R2: Standard, Enterprise, or Datacenter Edition (64-bit) • Microsoft Windows 2012 (64-bit)
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 retrieve an online installation package. The following browsers are supported: • Microsoft Internet Explorer 7.0 or later • Firefox 3.5 or later 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.
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 the 64-bit server using the Manage Computer function of the Windows system.
Other software	Windows 2012 requires that .NET Framework 3.5 is installed and enabled.

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 Version 6.3 or later server on AIX, HP-UX, Linux, and Oracle 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:

Table 24. Compatibility of the Tivoli Storage Manager server with other DB2 products on the system

Criterion	Instructions
Version level	The other products that use a DB2 product must use DB2 version 9 or later. DB2 products include product encapsulation and segregation support beginning with Version 9. Starting with this version, 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://pic.dhe.ibm.com/infocenter/db2luw/v9r7.
User IDs and directories	Ensure that the user IDs, fence user IDs, installation location, other directories, and related information are not shared across DB2 installations. Your specifications must be different from the IDs and locations that you used for the Tivoli Storage Manager server installation and configuration. If you used the **dsmicfgx** wizard or **dsmupgdx** wizard to configure Version 6.3 or later, or upgrade the server from Version 5.5, these are values that you entered when running the wizard. If you used the manual configuration for Version 6.3 or later or upgrade from Version 5.5 procedures, review the procedures that you used if necessary to recall the values that were used for the server.

Table 24. Compatibility of the Tivoli Storage Manager server with other DB2 products on the system (continued)

Criterion	Instructions
Resource allocation	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 have 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 workstation support. For example, run a DB2 application on its own virtualized system.

Determining the appropriate level for a V5 server before an upgrade

When you prepare a system for an upgrade, you must verify the level of the V5 server and upgrade the server if required. By reviewing the guidelines and upgrading the V5 server to an appropriate level, you can optimize the subsequent upgrade to V6.

The guidelines apply to server upgrades from V5 to V6 on the same operating system. The guidelines also apply if you are migrating a V5 server to V6 on a different operating system.

You can upgrade the server from V5.3.6 or later to any level of V6.3. However, to determine the most appropriate level for a V5 server before the upgrade to V6, review the following guidelines:

- The preferred method is to upgrade the server to the latest level of V5 before you upgrade the server to V6. In this way, you can use the latest upgrade utilities to extract information from a source server database and to insert the information into a target server database.
- When you upgrade the V5 server, install the latest interim fix. In this way, you can reduce the risk of upgrade issues.
- Because upgrade utilities are provided in a separate package, you can install the latest version of the utilities without upgrading the V5 server. If you are installing only the upgrade utilities, the following restrictions apply:
  - To avoid a potential issue with data extraction, the upgrade utilities must be at V5.5.4 or later.

- The upgrade utilities must be at the same level as the V5 server, or a later level.
- If you plan to extract the server database to media, the preferred method is to upgrade the source server to V5.5.6 or later. If the source server is at V5.5.6 or later, the target server must be at V6.1.5 or later, V6.2.3 or later, or V6.3.0 or later.

To find the latest level of the V5 server and the latest interim fixes, go to the IBM® Support Portal at http://www.ibm.com/support/entry/portal/Downloads.

Running the prerequisite checker

The prerequisite checker is an optional, free-standing tool that verifies the operating system, the amount of free disk space for the installation, the minimum memory to install the Tivoli Storage Manager server, and other prerequisites.

To ensure that your system environment is appropriate for the installation, you can run the prerequisite checker before each installation.

Tip: The prerequisite checker verifies only the minimum memory that is necessary. More memory is required for additional tasks.

The prerequisite checker presents a summary of results at the end of the check. Any changes that are required in your environment before the installation are listed. Any new directories that are required for the installation are created.

To run the prerequisite checker, complete the following steps.

1. Ensure that the appropriate installation package is downloaded and that its files are extracted. A prerequisite checker is part of the installation package.
2. Choose the graphical interface (the default) or console method to start the installation, and follow the wizard instructions to complete the installation:

   AIX HP-UX Linux Solaris

   - Issue this command to start the installation wizard using a graphical interface:

     ```
     ./prereqcheck.bin
     ```

   - Issue this command to start the installation wizard using the console method:

     ```
     ./prereqcheck.bin -i console
     ```

   Windows

   - Issue this command to start the installation wizard using a graphical interface:

     ```
     prereqcheck.exe
     ```

     Or, double-click the `prereqcheck.exe` file.
   - Issue this command to start the installation wizard using the console method:

     ```
     prereqcheck.exe -i console
     ```
3. Select the language for the prerequisite checker user interface.
4. In the welcome and disclaimer panels, review the statements and accept them.

If the Prerequisite Results page indicates that your system passed the checks, you are ready to start the installation.

If an error message is shown in the Prerequisite Results page, make the required corrections before continuing with the installation. The summary page lists the errors and directs you to an error log file.

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 41

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 41

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 manage.

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.

For the latest information and recommendations, see the Tivoli Storage Manager support website at http://www.ibm.com/support/entry/portal/Overview/Software/Tivoli/Tivoli_Storage_Manager.

Recovery log space requirements

The amount of space that you require for the recovery log depends on various factors, including, for example, the amount of client activity with the server.

For details, see the section that describes recovery log space requirements in the *IBM Tivoli Storage Manager Installation Guide*.

For the latest information and updates, go to the Tivoli Storage Manager support site: http://www.ibm.com/support/entry/portal/Overview/Software/Tivoli/Tivoli_Storage_Manager.

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, V6.3 or later server depend on the size of the V5 database and other factors. For details, see "Database space requirements" on page 40 and "Recovery log space requirements."

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 25 on page 42 shows basic tips for estimating each item, for each of the main scenarios. For details about sizing the V6.3 or later database and recovery log, see "Space requirements for the V6 server system" on page 39.

Table 25. 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
V6.3 or later 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
V6.3 or later 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
V6.3 or later active log directory	Disk	16 GB during the upgrade process. A higher value might be needed for normal use.	16 GB during the upgrade process. A higher value might be needed for normal use.	16 GB during the upgrade process. A higher value might be needed for normal use.	16 GB during the upgrade process. A higher value might be needed for normal use.
V6.3 or later 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
V6.3 or later 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 26 on page 43 shows a sample completed worksheet for a 100 GB, V5 database that has 80% space utilization, with the assumption that the database increases by 33% - 50% when upgraded.

Table 26. 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
V6.3 or later database: estimated size	Disk	106 - 120 GB	106 - 120 GB	106 - 120 GB	106 - 120 GB
V6.3 or later database: first backup	Sequential media	106 - 120 GB	106 - 120 GB	106 - 120 GB	106 - 120 GB
V6.3 or later active log directory	Disk	8 GB	8 GB	8 GB	8 GB
V6.3 or later active log mirror (optional)	Disk	(8 GB)	(8 GB)	(8 GB)	(8 GB)
V6.3 or later 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 V6.3 or later 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 39
"Space requirements for the V6 server system" on page 39

Related tasks:

Chapter 3, "Upgrade scenarios overview," on page 75

Worksheet for planning space for the V6.3 or later server

You can use the worksheet to help you plan the amount and location of storage needed for the V6.3 or later 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 that is being upgraded.
- The number and speed of system processors.
- The configuration of storage devices. If new hardware is being introduced, time is required to define the new devices to the server, test the configuration, and adjust storage pools.
- The method 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 that is required for the upgrade because of the overlap.
- The type of workload that the server handles. A workload that consists of large numbers of small files, or files with long file names, can cause a relatively longer upgrade time.
- The amount of fragmentation in the V5 database. A higher level of fragmentation results in a more efficient database insertion process. The reason is that fragmented data on the V5 system can use multiple threads and processors on the V6 system.

Review the performance tips for more information.

In benchmark environments in IBM labs, upgrade operations 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.

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

When you estimate the amount of time that is required for 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 that is 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 extracts information only 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 that is 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 requires.

Example: Estimating the upgrade time based on the database size

You can roughly estimate the time that is required for the upgrade based on the amount of data in the V5 database. To this estimate, add the time that is required for additional tasks, such as configuring storage devices.

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 that is required for the upgrade operation by dividing the amount of data by the expected rate.

   For example, by 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 long as the time required for a full backup of the database.

Do not reorganize the Tivoli Storage Manager V5 database before the upgrade. The reason is that faster throughput can be obtained when the source database does not contain long sequences of pages allocated to a single database table. This tip applies to both the media method and the network method.

The following performance tips depend on the method that you choose for moving the data from the V5 database.

Media method

If you are using the media method, consider the following tips:

- 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 from 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 take more time. The slower speed of extraction might be acceptable, depending on the size of the database and your requirements for the upgrade.

Network method

If you are using the network method, consider the following tips:

- 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 V6.3 or later database

The process for inserting the V5 extracted data into the V6.3 or later database is the longest-running part of an upgrade process. The performance of the data insertion process depends on the system configuration.

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 use multiple processors or cores. The insertion process typically performs better on a system with a relatively small number of fast processors. If the system has many slow processors, you might experience reduced performance levels.

Disk storage
The insertion process is designed to use 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 redundant arrays of independent disks (RAIDs) 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.

Table 27. Example of LUN use

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 V6.3 or later server. Plan to upgrade one server first in a test environment. Then stage the upgrade of additional servers and storage agents.

Components that are available for installation

In addition to the server, you can choose to install language packages, the Operations Center, the Administration Center, Tivoli Monitoring for Tivoli Storage Manager, and other components.

Compatibility with servers and components that are running at earlier versions

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

The product support site is located at: http://www.ibm.com/support/entry/portal/Overview/Software/Tivoli/Tivoli_Storage_Manager

To use the new functions that are available in Tivoli Storage Manager V6.3 or later, install the latest version of the Administration Center.

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 V6.3 or later 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 V6.3 or later 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 6.3 or later 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 V6.3 or later. If library client servers are at V5.4 or later, you can upgrade the server that is the library manager to V6.3 or later first, and then upgrade the library client servers later.

If you are moving a library manager or library clients to new systems for the upgrade to V6.3 or later, 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, see the following website: http://www.ibm.com/support/docview.wss?uid=swg21302789

Planning for upgrading clients

To connect to a V6.3 or later server, client nodes must be running a version 5.5 or later client program.

Planning for upgrading storage agents

To connect to a V6.3 or later server, storage agents must be at version 6.1 or later.

If you have storage agents at earlier versions, upgrade them to V6.1 before upgrading the server to V6.3 or later. 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 following website: 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 V6.3 or later server cannot both be installed on a system at the same time. To evaluate the V6.3 or later 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 V6.3 or later 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 9, “General procedures for upgrading a server to V6.3 or later,” on page 279

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 93

   Chapter 5, "Scenario 2: Same system, network method," on page 135

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 175, 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 175.
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 288.
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 by using the upgrade wizard" on page 191
     a. "Scenario 3, wizard: Installing the V6.3 or later server" on page 191
     b. "Scenario 3, wizard: Creating the directories and the user ID for the upgraded server instance" on page 196
     c. "Scenario 3: Starting the upgrade wizard" on page 199

        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 by using utilities" on page 201
     a. "Scenario 3: Preparing the database of a V5 server for upgrade" on page 201
     b. "Scenario 3: Extracting the data to media" on page 202
4. After the data is extracted from the production server, resume normal operations by restoring the database backup that you made in step 1 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 V6.3 or later 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 211

d. "Scenario 3: Loading the extracted data into the new database" on page 216

   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 219

Preparing for operational changes

As you upgrade your system from V5 to V6.3 or later, the method for backing up and monitoring the server database changes.

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

- Plan to back 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. For best results, consider scheduling more frequent backups for the V6.3 or later database than you did for the V5 database. To ensure that archive log space is pruned, consider scheduling more full database backups and fewer incremental backups.

  Review information about how database backups are performed automatically for the V6.3 or later server. For details, see the *Administrator's Guide*.
- Understand how database and recovery log space is used, and how monitoring will change.
- Verify scripts and administrative schedules. The V6.3 or later server adds new commands, changes some commands, and deletes some commands that are no longer needed. These changes will affect your automated operations. For information about new and changed commands, see "Command and option changes" on page 53.
- Verify the **SELECT** commands that you use regularly. Some parameters and syntax that were previously allowed are not accepted by the database manager program. For information about **SELECT** command updates, see "Changes to the **SELECT** command" on page 70. To resolve problems that are related to **SELECT** commands, see Technote 1380830 (http://www.ibm.com/support/docview.wss?uid=swg21380830).
- If you use products from independent software vendors to interface with the server, ensure that the products are compatible with the V6.3 or later server.

To use the new functions that are available in Tivoli Storage Manager V6.3 or later, install the latest version of the Administration Center.

Related concepts:

"Database protection and recovery" on page 5

"Recovery log" on page 4

"Database operations" on page 4

Related reference:

"Command and option changes" on page 53

"Changes to the **SELECT** command" on page 70

Reference information for planning

Information about new, changed, and deleted administrative commands, server options, and server messages can help you plan for the V6.3 or later 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

As you plan to upgrade the server, be aware of new commands, utilities, and options that were introduced in V6 and later.

"New commands"
"New utilities" on page 56
"New server options" on page 57

New commands

Table 28. New commands

Command	Function	Comparable commands in previous versions
AUDIT LDAPDIRECTORY	Audits a namespace that is controlled by Tivoli Storage Manager on a Lightweight Directory Access Protocol (LDAP) server.	None
CANCEL REPLICATION	Cancels all node replication processes.	None
DEFINE ALERTTRIGGER	Triggers an alert in the Operations Center whenever a server issues a specified error message.	None
AIX Linux DEFINE DEVCLASS - z/OS media server	Defines a device class for a type of storage device. A limited set of device class types is available for devices that are accessed through the z/OS media server.	None
AIX Linux DEFINE LIBRARY (Define a ZOSMEDIA library type)	Defines a library that represents a TAPE or FILE storage resource that is maintained by Tivoli Storage Manager for z/OS Media.	None
AIX Linux DEFINE PATH (Define a path when the destination is a ZOSMEDIA library)	Defines a path to a ZOSMEDIA library. You must first define the z/OS media server in your configuration with the **DEFINE SERVER** command.	None
DEFINE STATUSTHRESHOLD	Defines a status monitoring threshold.	None
DELETE STATUSTHRESHOLD	Deletes a status monitoring threshold.	None
EXTEND DBSPACE	Makes more storage space available for the server to use for its database. You can have multiple locations for database storage space. After you install and use the **DSMSERV FORMAT** or **DSMSERV LOADFORMAT** utility, you can add more storage locations.	DEFINE DBVOLUME EXTEND DB
IDENTIFY DUPLICATES	Starts or stops processes that identify duplicate data in a storage pool.	None
PERFORM LIBACTION	Defines or deletes all drives and their paths for a single library in one step.	None

Table 28. New commands (continued)

Command	Function	Comparable commands in previous versions
QUERY ALERTSTATUS	Displays information about alerts that are issued on the Tivoli Storage Manager server.	None
QUERY ALERTTRIGGER	Displays which server messages are defined as alerts.	None
QUERY DBSPACE	Displays information about the directories that are used by a database to store data.	QUERY DBVOLUME
QUERY MONITORSETTINGS	Displays information about the configuration settings for monitoring alerts and server status.	None
QUERY MONITORSTATUS	Displays monitoring messages that are within a defined status retention period.	None
QUERY PVUESTIMATE	Generates an estimate of the client devices and server devices that are managed by a Tivoli Storage Manager server. In addition, this command provides an estimate of the processor value unit (PVU) totals for server devices.	None
QUERY REPLICATION	Displays information about running and completed node-replication processes.	None
QUERY REPLNODE	Displays the number of client node files that are stored on source and target replication servers.	None
QUERY REPLRULE	Displays information about replication rules.	None
QUERY SSLKEYRINGPW	Displays the Secure Sockets Layer (SSL) key database file password.	None
QUERY STATUSTHRESHOLD	Displays information about thresholds for status monitoring.	None
REMOVE REPLNODE	Removes a client node from replication.	None
REPLICATE NODE	Replicates data in file spaces that belong to one or more client nodes or defined groups of client nodes.	None
SET ALERTACTIVEDURATION	Specifies how long an alert remains active before it becomes inactive.	None
SET ALERTCLOSEDDURATION	Specifies how long an alert remains closed before it is deleted.	None
SET ALERTEMAIL	Enables alerts to be sent to specified administrators by email.	None
SET ALERTEMAILFROMADDR	Specifies the email address of the alert sender.	None
SET ALERTEMAILSMTPHOST	Specifies the Simple Mail Transfer Protocol (SMTP) mail server host name that is used to send alerts by email.	None
SET ALERTEMAILSMTPPORT	Specifies the port number of an SMTP mail server that is used to send alerts by email.	None
SET ALERTINACTIVEDURATION	Specifies how long an alert remains inactive.	None
SET ALERTMONITOR	Enables or disables an alert monitor.	None
SET ALERTSUMMARYTOADMINS	Specifies the administrators who receive hourly alert summaries by email.	None
SET ALERTUPDATEINTERVAL	Specifies how often an alert monitor updates and prunes alerts that are stored in the Tivoli Storage Manager server database.	None

Table 28. New commands (continued)

Command	Function	Comparable commands in previous versions
SET ARREPLRULEDEFAULT	Sets the server replication rule for archive data.	None
SET BKREPLRULEDEFAULT	Sets the server replication rule for backup data.	None
SET CPUINFOREFRESH	Specifies the number of days between workstation scans, which are used to estimate PVU.	None
SET DBRECOVERY	Sets the device class to use for backing up the server 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 a database.	None
SET DEDUPVERIFICATIONLEVEL	Verifies extents that are sent to the server during client-side data deduplication.	None
SET DEFAULTAUTHENTICATION	Sets the default password authentication method for nodes and administrators.	None
SET DRMACTIVEDATASTGPOOL	Sets the active-data pools that are included in recovery plans and procedures.	None
SET LDAPPASSWORD	Defines a password for a user name or ID that you specify by using the **SET LDAPUSER** command.	None
SET LDAPUSER	Specifies the ID of a user or account that can conduct administrative operations when the user or account accesses an LDAP directory server.	None
SET MONITOREDSERVERGROUP	Defines a server group that is monitored for alerts and status.	None
SET MONITORINGADMIN	Sets the name of the monitoring administrator that is used to connect to the servers in a monitored server group.	None
SET REPLRETENTION	Specifies the retention period for client-node replication records in the source replication-server database.	None
SET REPLSERVER	Sets the name of a target replication server.	None
SET SPREPLRULEDEFAULT	Sets the server replication rule for space-managed data.	None.
SET SSLKEYRINGPW	Provides the key database file password to the server.	None
SET STATUSMONITOR	Enables or disables status monitoring.	None
SET STATUSREFRESHINTERVAL	Specifies the number of minutes between server queries. The queries are used for status monitoring.	None
UPDATE ALERTTRIGGER	Updates the attributes of one or more alert triggers.	None
UPDATE ALERTSTATUS	Updates the status of a reported alert.	None
AIX Linux UPDATE DEVCLASS - z/OS media server	Updates a device class. A limited set of device class types is available for devices that are accessed through a z/OS media server.	None
UPDATE FILESPACE	Updates replication rules for file spaces.	None
AIX Linux UPDATE PATH (Update a path when the destination is a ZOSMEDIA library)	Updates a path to a ZOSMEDIA library.	None

Table 28. New commands (continued)

Command	Function	Comparable commands in previous versions
UPDATE REPLRULE	Enables or disables a replication rule.	None
UPDATE STATUSTHRESHOLD	Updates a threshold for status monitoring.	None
VALIDATE REPLICATION	Identifies the replication rules that apply to file spaces in client nodes that are configured for replication.	None
z/OS ZMSPREPARE	Analyzes the V5 server and generates a report that describes the steps that you must take before data migration can begin.	None

New utilities

Table 29. 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 recovery logs, including active logs and archive logs.	DSMSERV DISPLAY LOGVOLUMES
DSMSERV INSERTDB	Offline utility that is used only for inserting data that was extracted from a V5 server database into an empty V6.3 or later database.	None
DSMSERV REMOVEDB	Offline utility that is used only when you are sure that you no longer need a server database and recovery logs. Use with caution.	None
DSMUPGRD EXTEND DB	Offline utility that is used only on a V5 server to extend the database when database space is insufficient to complete the upgrade process.	None
DSMUPGRD EXTEND LOG	Offline utility that is used only on a V5 server to extend the recovery log when recovery log space is insufficient to complete the upgrade process.	None
DSMUPGRD EXTRACTDB	Offline utility that is used only on a V5 server to extract the data from the database. The extracted data is inserted into a V6.3 or later database by using the **DSMSERV INSERTDB** utility.	None
DSMUPGRD PREPAREDB	Offline utility that is 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 by using the **DSMUPGRD EXTRACTDB** utility.	None
DSMUPGRD QUERYDB	Offline utility that is used only on a V5 server to display information about the database and recovery log.	None

New server options

Table 30. 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
ACTIVELOGDIRECTORY	The name of the directory where all active logs are stored.	DEFINE LOGVOLUME
ACTIVELOGSIZE	The maximum size of the active log.	EXTEND LOG REDUCE LOG
ALLOWREORGINDEX	Specifies whether server-initiated index reorganization is enabled.	None
ALLOWREORGTABLE	Specifies whether server-initiated table reorganization is enabled.	None
ARCHFAILOVERLOGDIRECTORY	The directory in which the server stores archive log files if they cannot be stored in the archive log location.	None
ARCHLOGDIRECTORY	The directory in which the server stores the archive log.	None
CLIENTDEDUPTXNLIMIT	The maximum size of a transaction when client-side deduplicated data is backed up or archived.	None
DBDIAGPATHFSTHRESHOLD	The threshold for free space on the file system or disk that contains the `db2diag.log` file. When the amount of free space is equal to or less than the specified threshold, the ANR1545W error message is shown.	None
DBMEMPERCENT	The limit on the percentage of the system memory that is used for the database.	None
DBMTCPPORT	The port number on which the TCP/IP communication driver for the database manager waits for requests for client sessions.	None
DEDUPTIER2FILESIZE	Specifies at what file size Tivoli Storage Manager begins to use Tier 2 data deduplication.	None
DEDUPTIER3FILESIZE	Specifies at what file size Tivoli Storage Manager begins to use Tier 3 data deduplication.	None
ENABLENASDEDUP	Specifies whether a server deduplicates data that is stored by a network-attached storage (NAS) file server. This option applies only to NetApp file servers.	None
FFDCLOGNAME	The name of the first failure data capture (FFDC) log.	None
FFDCMAXLOGSIZE	The size of the FFDC log.	None
LDAPCACHEDURATION	The length of time that the Tivoli Storage Manager server caches LDAP password authentication information.	None
LDAPURL	The location of an LDAP directory server.	None
MIRRORLOGDIRECTORY	The directory where the log mirror for the active log is stored.	DEFINE LOGCOPY

Table 30. 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
NDMPENABLEKEEPALIVE	Specifies whether the server enables the Transmission Control Protocol (TCP) keepalive function on network data-management protocol (NDMP) control connections to NAS devices.	None
NDMPKEEPIDLEMINUTES	The amount of time, in minutes, before an operating system transmits the first TCP keepalive packet on an NDMP control connection.	None
REORGBEGINTIME	The earliest time that the Tivoli Storage Manager server can start table or index reorganization.	None
REORGDURATION	The interval during which server-initiated table or index reorganization can start.	None
AIX Linux Solaris Windows SANDISCOVERYTIMEOUT	The amount of time that is allowed for host bus adapters to respond when they are queried by the SAN discovery process.	None
SERVERDEDUPTXNLIMIT	The maximum size of objects that can be deduplicated on a server.	None
SSLFIPSMODE	Specifies whether the Federal Information Processing Standards (FIPS) mode is in effect for SSL.	None
SSLTLS12	Controls Transport Layer Security (TLS) 1.2, an SSL protocol that is available for use with Tivoli Storage Manager V6.3 or later. TLS 1.2 can be used only with V6.3 or later clients.	None

Updated server commands, utilities, and options

Be aware of the commands, utilities, and options that are updated in V6 and later.

"Updated commands" on page 59
"Updated utilities" on page 65
"Updated server options" on page 66

Updated commands

Table 31. Updated commands

Command	Changes
BACKUP DB	You must run the **SET DBRECOVERY** command before the **BACKUP DB** command. By running the **SET DBRECOVERY** command, you set the device class for the database backup. An incremental database backup is 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. New parameters are available: • The **DEDUPDEVICE** parameter identifies storage devices that support data deduplication and optimize backup images that are stored on these devices. • The **NUMSTREAMS** parameter specifies the number of parallel data movement streams that are used for database backup.
BACKUP NODE QUERY NASBACKUP RESTORE NODE	The commands include the SNAPMIRROR value for the **TYPE** parameter: • When you specify the SNAPMIRROR value for the **BACKUP NODE** command, the file system is copied to a storage pool by using the NetApp SnapMirror to Tape feature. • When you specify the SNAPMIRROR value for the **QUERY NASBACKUP** command, the output shows information about NetApp SnapMirror images. • When you specify the SNAPMIRROR value for the **RESTORE NODE** command, the file system is retrieved from a NetApp SnapMirror image.
BACKUP STGPOOL DEFINE STGPOOL QUERY STGPOOL UPDATE STGPOOL	The commands can be used with data deduplication functions.
BACKUP VOLHISTORY DELETE VOLHISTORY QUERY VOLHISTORY UPDATE VOLHISTORY	Database memory dump operations are no longer available. Therefore, database memory dump volumes are not displayed in volume history. AIX Linux z/OS If you are migrating a V5 server that is running on a z/OS operating system to a V6.3 or later server on an AIX or Linux operating system, you can issue the **DELETE VOLHISTORY** command on the V5 server to prepare for the migration. The command specifies the device class of volumes to be deleted.

Table 31. Updated commands (continued)

Command	Changes
DEFINE DEVCLASS UPDATE DEVCLASS	When you run the **DEFINE DEVCLASS** command or the **UPDATE DEVCLASS** command to specify a 3592 or LTO device class, you can use the **LBPROTECT** parameter. The **LBPROTECT** parameter specifies whether logical block protection is used to ensure data integrity on tape. AIX Linux z/OS A limited set of device class types is available for devices that are accessed through a z/OS media server.
DEFINE LIBRARY	AIX Linux You can use the **DEFINE LIBRARY** command to define a ZOSMEDIA library type. In this way, you can define a library that represents a tape or FILE storage resource that is maintained by Tivoli Storage Manager for z/OS Media.
DEFINE LIBRARY UPDATE LIBRARY	You can use the **DEFINE LIBRARY** command to define a virtual tape library (VTL) to the Tivoli Storage Manager server. You can use the **UPDATE LIBRARY** command to update a VTL definition.
AIX Linux DEFINE PATH	You can use the **DEFINE PATH** command to define a path to a ZOSMEDIA library.
DEFINE SERVER	You can use the **DEFINE SERVER** command to define a server for the following functions: LAN-free data movement, node replication, and data movement by using z/OS media server.
DEFINE SPACETRIGGER DELETE SPACETRIGGER QUERY SPACETRIGGER UPDATE SPACETRIGGER	The commands can be used only for storage pools. Space triggers are no longer available for databases and logs.
DEFINE VOLUME	The maximum capacity of a volume in a DISK storage pool is 8 TB.
DISABLE SESSIONS ENABLE SESSIONS	The **DIRECTION** parameter specifies whether to disable or enable inbound sessions, outbound sessions, or both.
EXPIRE INVENTORY	Expiration processing 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 be specified. The values for the **DURATION** parameter are changed. You can specify a value in the range 1 - 999999 to define the maximum number of minutes for the expiration process.
GRANT AUTHORITY REVOKE AUTHORITY	The **ANALYST** privilege class is removed.
HALT	The **QUIESCE** parameter is removed.

Table 31. Updated commands (continued)

Command	Changes
LOCK ADMIN	The **AUTHENTICATION** parameter specifies the method of authentication that the administrator uses to log on.
LOCK NODE	The **AUTHENTICATION** parameter specifies the method of password authentication that is required to log on to a node.
MOVE DRMEDIA PREPARE QUERY DRMEDIA QUERY DRMSTATUS	Changes to disaster recovery manager commands make it possible to include active-data pools in recovery plans and procedures. The **MOVE DRMEDIA** command cannot be used concurrently with the **BACKUP STGPOOL** command. Ensure that the primary storage pool backup process is complete before you back up the database. Ensure that the **BACKUP STGPOOL** command and the **BACKUP DB** command are complete before you issue the **MOVE DRMEDIA** command.
QUERY DB	The output shows the total number of free pages in all table spaces.
AIX Linux QUERY DEVCLASS QUERY LIBRARY QUERY PATH	You can use this command to view information that is specific to the z/OS media server.
QUERY FILESPACE	You can use this command to view replication information.
QUERY LOG	You can use this command to view information about the active log directory, mirror log directory, archive failover log directory, and archive log directory.
QUERY NODE	You can use this command to view information about the password authentication method and security settings for the administrator ID.
QUERY OPTION	Obsolete options are removed from the output. The output is updated to include information about settings for LDAP directory servers.
QUERY PROCESS	You can use this command to obtain information about duplicate identification processes.
QUERY SERVER	You can use this command to find out whether Secure Sockets Layer (SSL) communication is used.
QUERY SESSION	You can use this command to display the actions that occurred during the session.

Table 31. Updated commands (continued)

Command	Changes
QUERY STATUS	Obsolete options and the database backup trigger are removed. You can use this command to verify whether passwords are authenticated with the Tivoli Storage Manager server or with the LDAP directory server. You can also view the name that is specified for the default target replication server.
QUERY VOLHISTORY	For the **TYPE** parameter, the values `RPFile` and `RPFSnapshot` are added. By using the values, you can display records that contain information about recovery plan file objects.
QUERY VOLUME	You can use this command to verify whether logical block protection is enabled.
REGISTER ADMIN	New parameters are available: • The **ALERT** parameter specifies whether alerts are sent to an administrator email address. • The **AUTHENTICATION** parameter specifies the authentication method for the administrator user ID. • The **SSLREQUIRED** parameter specifies whether the administrator user ID must use SSL to communicate with the backup-archive client from the Tivoli Storage Manager server.
REGISTER ADMIN QUERY ADMIN UPDATE ADMIN	In these commands, the **ALERT** parameter specifies whether alerts are sent to an administrator email address. In the **QUERY ADMIN** command, the output is updated to include information about email alerts, the password authentication method, and security settings for the administrator ID.
REGISTER LICENSE	You are required to use this command to register licenses for server components. Use of the **REGISTER LICENSE** command implies that you agree to and accept the license terms that are specified in the license agreement.

Table 31. Updated commands (continued)

Command	Changes
REGISTER NODE	New parameters are available: • The **AUTHENTICATION** parameter specifies the password authentication method for the node. • The **BACKUPINITIATION** parameter specifies whether the non-root user ID on the client node can back up files to the server. • The **BKREPLRULEDEFAULT**, **ARREPLRULEDEFAULT**, and **SPREPLRULEDEFAULT** parameters specify the replication rule that applies to a data type if the file space rules for the data type are set to DEFAULT. • The **REPLSTATE** parameter specifies whether data that belongs to the client node is ready to be replicated. • The **ROLEOVERRIDE** parameter specifies whether to override the reported role of the client for PVU estimation. • The **SSLREQUIRED** parameter specifies whether the node must use SSL to communicate with the Tivoli Storage Manager server.
REMOVE ADMIN	You can use the **SYNCLDAPDELETE** parameter to remove an administrative user ID that is stored on an LDAP directory server.
REMOVE NODE	You can use the **SYNCLDAPDELETE** parameter to remove a node ID that is stored on an LDAP directory server.
RENAME ADMIN	You can use the **SYNCLDAPDELETE** parameter to rename an administrative user ID that authenticates to an LDAP directory server.
RENAME NODE	You can use the **SYNCLDAPDELETE** parameter to rename a node ID that is stored on an LDAP directory server.

Table 31. Updated commands (continued)

Command	Changes
SELECT	The following updates apply to the **SELECT** command: • In previous versions of the server, syntax that did not conform to SQL syntax rules could be used in the **SELECT** command. In V6.3 and later, you must use SQL syntax that conforms to the syntax rules of the database manager, DB2. • You can use the `SELECT * FROM PVUESTIMATE_DETAILS` query to generate a PVU report that provides detailed information at the node level. • You can use the **SELECT** command to list user ID passwords for administrators and nodes that authenticate with an LDAP directory server. • You can use the **SELECT** command to verify whether logical block protection is enabled for a device class or volume.
SET DBRECOVERY	The **NUMSTREAMS** parameter specifies the number of concurrent data movement streams to use while you back up the database.
SETOPT	Obsolete options are removed. The `LDAPCACHEDURATION` option determines the length of time that the Tivoli Storage Manager server caches information about LDAP password authentication.
UNLOCK ADMIN	The **AUTHENTICATION** parameter specifies the method of password authentication that is required for an administrator to log on.
UNLOCK NODE	The **AUTHENTICATION** parameter specifies the method for node password authentication.
UPDATE ADMIN	The **ANALYST** privilege class is removed. New parameters are available: • The **AUTHENTICATION** parameter specifies the password authentication method that is used for the administrator ID. • The **SSLREQUIRED** parameter specifies whether the administrator user ID must use SSL to communicate with the backup-archive client from the Tivoli Storage Manager server. • The **SYNCLDAPDELETE** parameter is used to remove an administrator user ID from an LDAP directory server.

Table 31. Updated commands (continued)

Command	Changes
UPDATE NODE	The **ANALYST** privilege class is removed. New parameters are available: • The **AUTHENTICATION** parameter specifies the password authentication method. • The **SSLREQUIRED** parameter specifies whether a node must use SSL to communicate with the Tivoli Storage Manager server. • The **SYNCLDAPDELETE** parameter is used to change the authentication method for a node from authentication with the LDAP directory server to authentication with the Tivoli Storage Manager server.
UPDATE LIBRARY	You can use this command to update a library definition for a VTL.
UPDATE NODE	New parameters are available: • The **BACKUPINITIATION** parameter specifies whether the non-root user ID on the client node can back up files to the server. • The **ROLEOVERRIDE** parameter specifies whether to override the reported role of the client for PVU estimation.
AIX Linux UPDATE PATH	You can use this command to update a path to a ZOSMEDIA library.
UPDATE SERVER	You can use this command to specify whether to use SSL during server-to-server communications.

Updated utilities

Table 32. Updated utilities

Utility	Changes
DSMSERV	You can specify the owning user ID for the server instance on startup. You can also specify the user ID for other **DSMSERV** utilities.
DSMSERV FORMAT	Obsolete parameters are removed. New parameters are available to specify the directories for database space, and the maximum size and locations of the recovery log.
DSMSERV INSERTDB	The **CONFIGINFO** parameter specifies the device configuration information that is used by the **DSMSERV INSERTDB** utility to load a database.

Table 32. Updated utilities (continued)

Utility	Changes
DSMSERV RESTORE DB	Volume history is required for restoring a database. All restore operations use rollforward recovery. The function for restoring individual database volumes is removed. The server no longer manages database volumes.
AIX Linux DSMUPGRD EXTRACTDB DSMUPGRD PREPAREDB	The **MEDIASERVER** parameter is used during an upgrade from a V5 server on z/OS. The parameter specifies the name of the server to be used as the z/OS media server.

Updated server options

Table 33. Updated server options

Option	Changes
CHECKTAPEPOS	You can use the `CHECKTAPEPOS` option to enable append-only mode for IBM LTO Generation 5 and later drives, and for any drives that support this feature.
AIX Linux Solaris Windows SANDISCOVERY	The `SANDISCOVERY` option changed in Tivoli Storage Manager V5.5.3 and later releases. To ensure that the system operates correctly, verify the setting for the `SANDISCOVERY` option.
TXNGROUPMAX	The default value is increased from 256 to 4096. Verify 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 the 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. By increasing the value or using the new default value, you 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 by using a smaller 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 68
"Deleted server options" on page 69

Deleted commands

Table 34. 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.
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.

Table 34. Deleted commands (continued)

Deleted command	Comments
REDUCE LOG	The database manager automatically manages space in the recovery log directories.
RESET BUFPOOL	The `BUFPOOLSIZE` option is 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 35. 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 were required 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.

Table 35. Deleted utilities (continued)

Deleted utility	Comments

DSMSERV EXTEND LOG	This utility is replaced by the following server options:
	`ACTIVELOGSIZE`
	`ACTIVELOGDIRECTORY`
	`MIRRORLOGDIRECTORY`
	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 V6.3 or later. 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 cannot be found in this list of deleted options. V5 releases tolerated the presence of some server options that were not supported by the server. The V6.3 or later server flags such options by issuing warning messages. You can ignore the error, or update the server options file and restart the server.

Table 36. 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 V6.3 or later, 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 statements are examples of correct usage.

To list the activity log entries for the last 60 seconds, use:

```
select * from actlog where
TIMESTAMPDIFF(2,CHAR(current_timestamp-date_time)) <= 60
```

To list the activity log entries for the last 60 minutes, use:

```
select * from actlog where
TIMESTAMPDIFF(4,CHAR(current_timestamp-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://pic.dhe.ibm.com/infocenter/db2luw/v9r7.

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 V6.3 or later.

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 V6.3 for the **DISK** device class.

In previous releases, the SHARED field was blank (null) for the **DISK** device class. In V6.3, 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 V6.3 or later, 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://pic.dhe.ibm.com/infocenter/tsminfo/v6r3

The list is also available in the *Tivoli Storage Manager Server Messages and Error Codes* publication for V6.3 or later.

Server naming best practices

Use these descriptions as a reference when you install or upgrade a Tivoli Storage Manager server.

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. The standard way to run the server is 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

Home directory for the instance user ID

The home directory can be created when creating the instance 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`

The home directory is primarily used to contain the profile for the user ID and for security settings.

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 is a directory that contains files specifically for a server instance (the server options file and other server-specific files). It 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`

The instance directory stores the following files for the server instance:

- The server options file, `dsmserv.opt`
- The server key database file, `cert.kdb`, and the `.arm` files (used by clients and other servers to import the Secure Sockets Layer certificates of the server)
- Device configuration file, if the `DEVCONFIG` server option does not specify a fully qualified name
- Volume history file, if the `VOLUMEHISTORY` server option does not specify a fully qualified name
- Volumes for **DEVTYPE**=**FILE** storage pools, if the directory for the device class is not fully specified, or not fully qualified
- User exits
- Trace output (if not fully qualified)

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`

The instance directory stores the following files for the server instance:

- The server options file, `dsmserv.opt`
- The server key database file, `cert.kdb`, and the `.arm` files (used by clients and other servers to import the Secure Sockets Layer certificates of the server)
- Device configuration file, if the `DEVCONFIG` server option does not specify a fully qualified name
- Volume history file, if the `VOLUMEHISTORY` server option does not specify a fully qualified name
- Volumes for **DEVTYPE**=**FILE** storage pools, if the directory for the device class is not fully specified, or not fully qualified
- User exits
- Trace output (if not fully qualified)

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.

AIX Linux Solaris Windows 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.

AIX Linux Windows The server name is also used when you add the server to the Operations Center so that it can be managed using that interface. Use a unique name for each server. For easy identification in the Operations Center (or from a **QUERY SERVER** command), use a name that reflects the location or purpose of the server.

HP-UX Use a unique name for each server. For easy identification from a **QUERY SERVER** command, use a name that reflects the location or purpose of the server.

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

For example:

AIX HP-UX Linux Solaris

```
PAYROLL
SALES
```

Windows

```
TUCSON_SERVER1
TUCSON_SERVER2
```

For more information about server names, see the *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 IBM Tivoli Storage Manager server on the same system or a new system. You can 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 required in each case. To complete the procedure, follow the link from the scenario overview to the detailed procedures.

Table 37. Links to scenario overviews

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 79	Same system as original server	Network method
"Scenario 3 for upgrading the server: new system, media method" on page 83	New system	Media method
"Scenario 4 for upgrading the server: New system, network method" on page 87	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 V6.3 or later database" on page 14

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

In this scenario, all upgrade tasks are completed on the same system. The database is extracted to media and later inserted into the V6.3 or later database.

You can use the wizard, or upgrade the server manually by 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 V6.3 or later database" on page 14

Related tasks:

Chapter 4, "Scenario 1: Same system, media method," on page 93

Upgrading the server by using the wizard

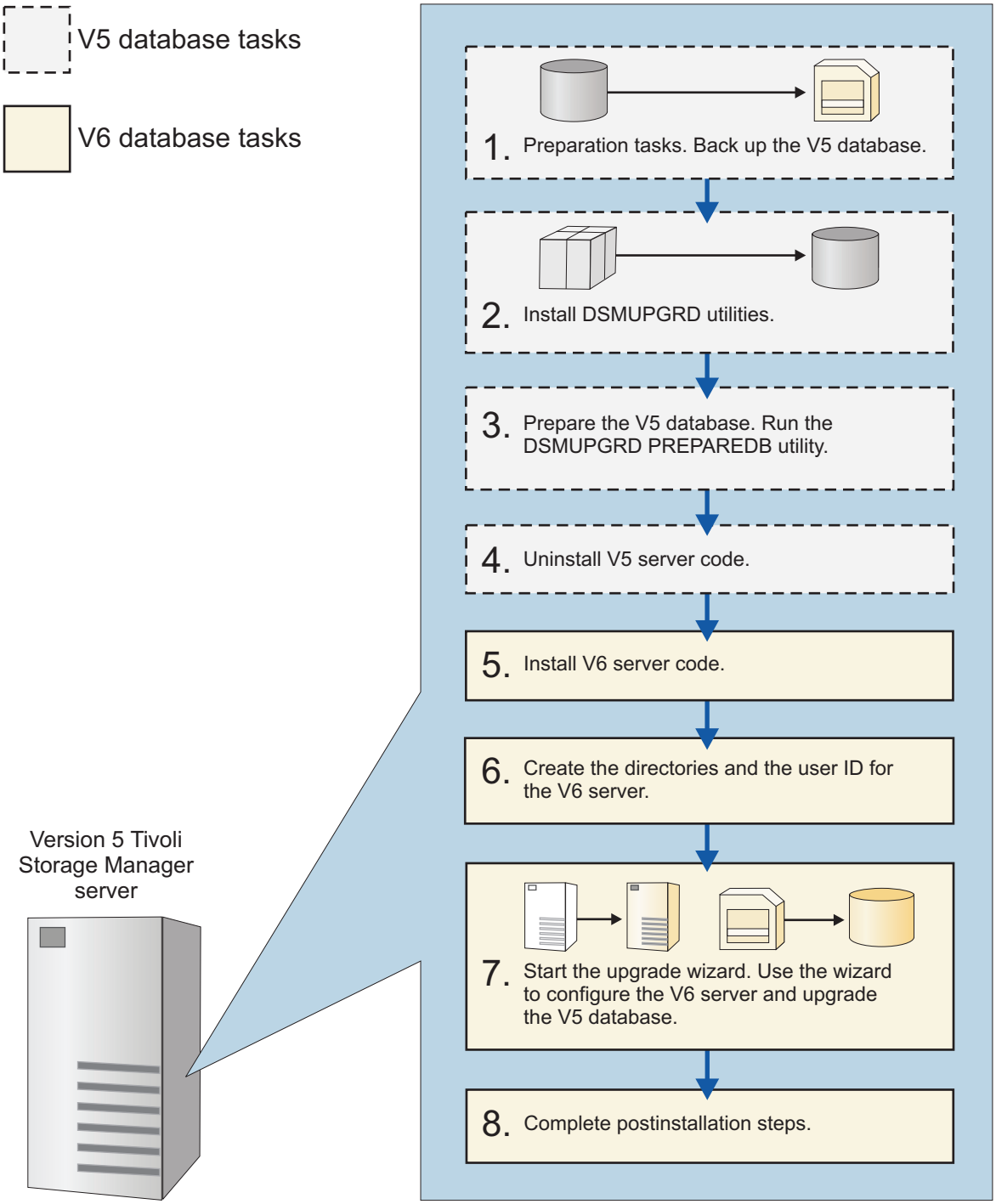

Figure 1. Scenario 1

Upgrading the server from V5 to V6.3 or later

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 93.

1. Complete all preparation tasks, which include 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 by using the **DSMUPGRD PREPAREDB** utility.
4. Uninstall the V5 server code. Optional: Before starting the V6.3 or later installation, run the installation prerequisite checker.
5. Install the V6.3 or later server code on the system.
6. Create the directories for the V6.3 or later 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 by using utilities

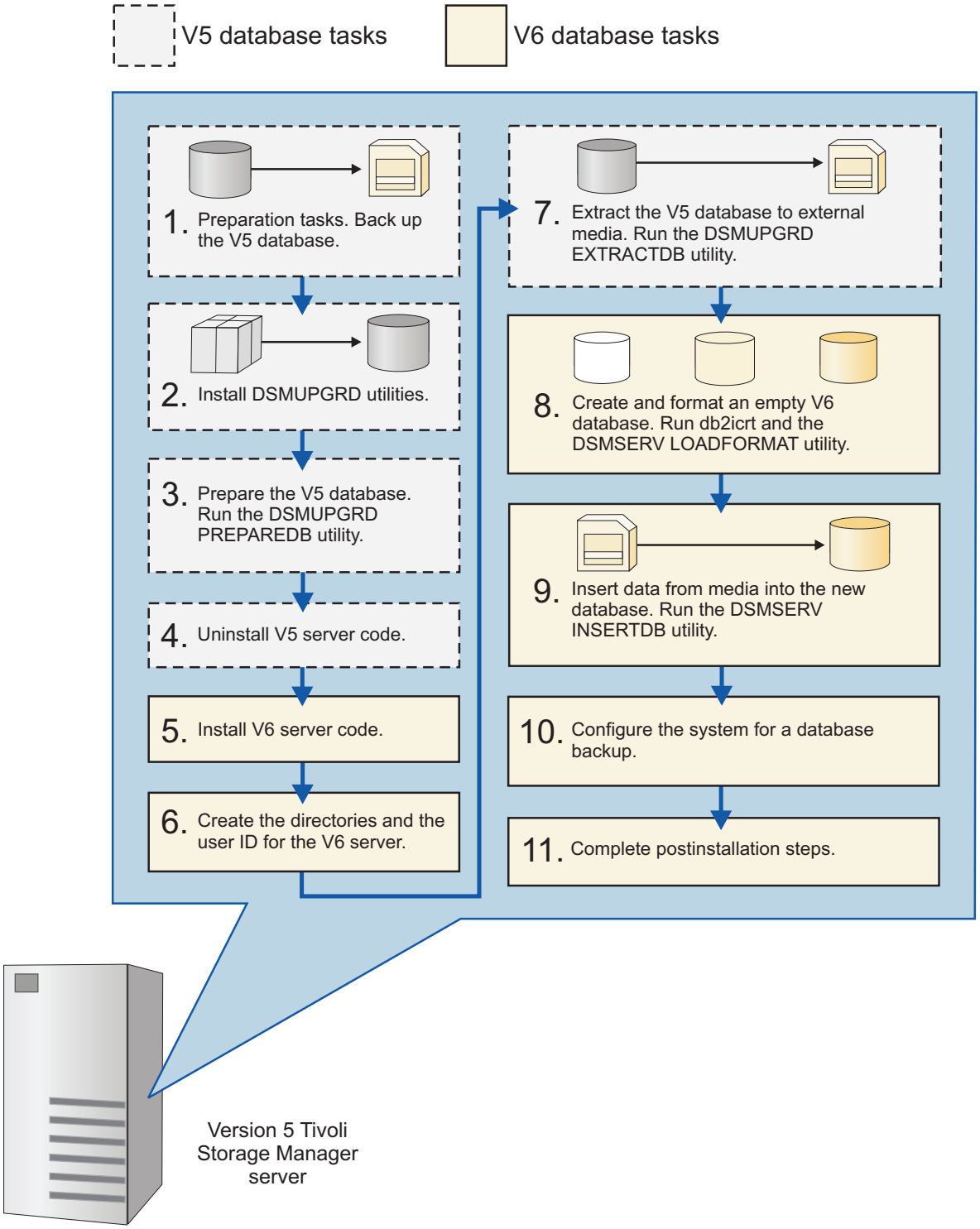

Figure 2. Scenario 1

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 93.

1. Complete all preparation tasks, which include 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 by using the **DSMUPGRD PREPAREDB** utility.
4. Uninstall the V5 server code. Optional: Before starting the V6.3 or later installation, run the installation prerequisite checker.
5. Install the V6.3 or later server code on the system.
6. Create the directories for the V6.3 or later database and logs, and the user ID that will own the server instance.
7. Extract the V5 database to external media by using the **DSMUPGRD EXTRACTDB** utility.
8. Create and format an empty database to receive the data. The database is created with the **db2icrt** command. The database is formatted by using the **DSMSERV LOADFORMAT** utility.
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 **DSMSERV INSERTDB** utility.
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 completed 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 upgrade the server manually by 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 V6.3 or later database" on page 14

Related tasks:

Chapter 5, "Scenario 2: Same system, network method," on page 135

Upgrading the server by using the wizard

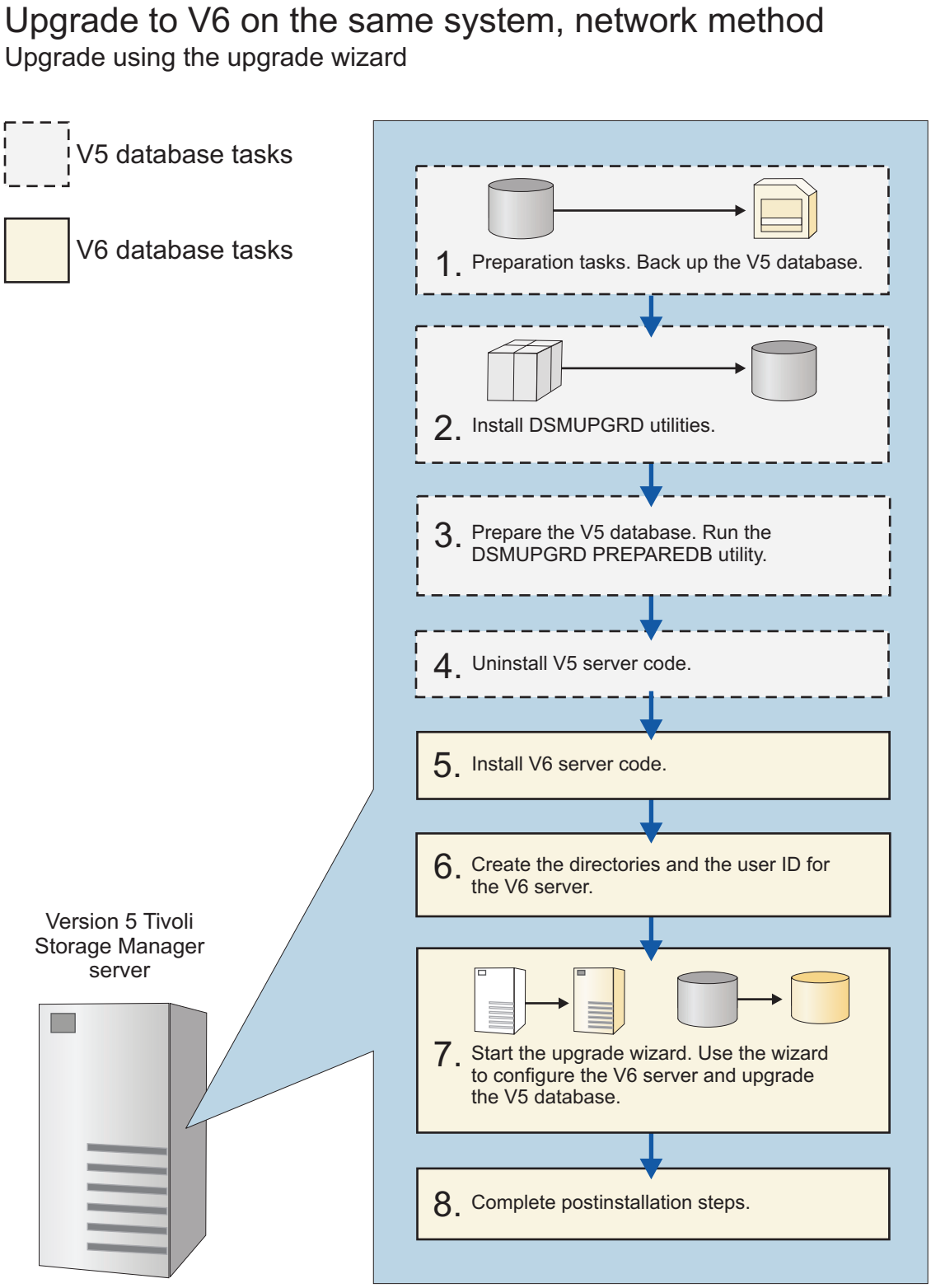

Figure 3. Scenario 2

Upgrading the server from V5 to V6.3 or later

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 135.

1. Complete all preparation tasks, which include 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 by using the **DSMUPGRD PREPAREDB** utility.
4. Uninstall the V5 server code. Optional: Before starting the V6.3 or later installation, run the installation prerequisite checker.
5. Install the V6.3 or later server code on the system.
6. Create the directories for the V6.3 or later 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 V6.3 or later 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 by using utilities

Upgrade to V6 on the same system, network method

Upgrade using the command line and upgrade utilities

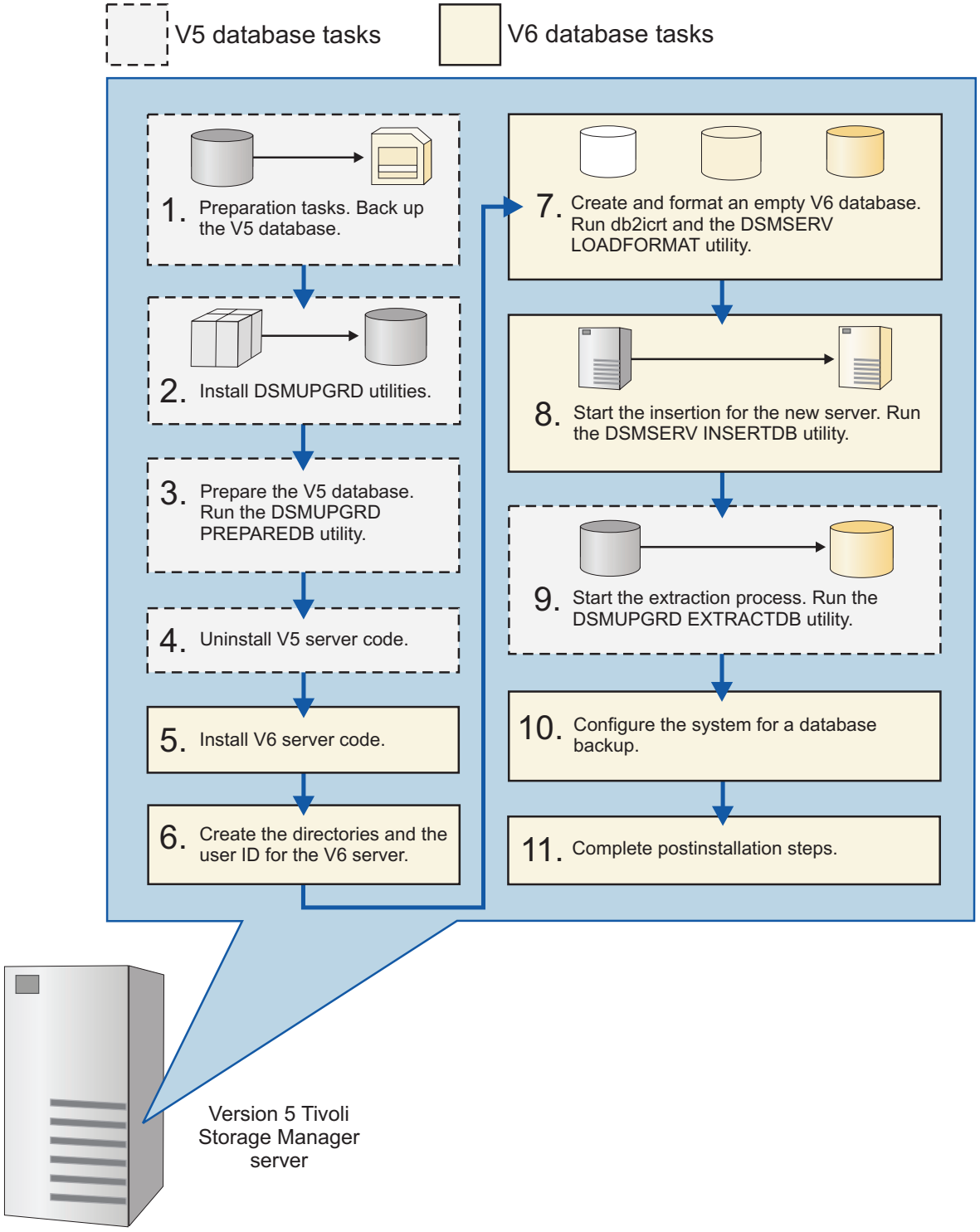

Figure 4. Scenario 2

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 135.

1. Complete all preparation tasks, which include 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 by using the **DSMUPGRD PREPAREDB** utility.
4. Uninstall the V5 server code. Optional: Before starting the V6.3 or later installation, run the installation prerequisite checker.
5. Install the V6.3 or later server code on the system.
6. Create the directories for the V6.3 or later 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 by using the **DSMSERV LOADFORMAT** utility.
8. Start the insertion process for the new server by using the **DSMSERV INSERTDB** utility.
9. Start the extraction process from the V5 database by using the **DSMUPGRD EXTRACTDB** utility.
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 completed on the original system and some on the new system. The database is extracted to media and later inserted into the V6.3 or later database.

You can use the wizard, or upgrade the server manually by 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 V6.3 or later database" on page 14

Related tasks:

Chapter 6, "Scenario 3: New system, media method," on page 175

Upgrading the server by using the wizard

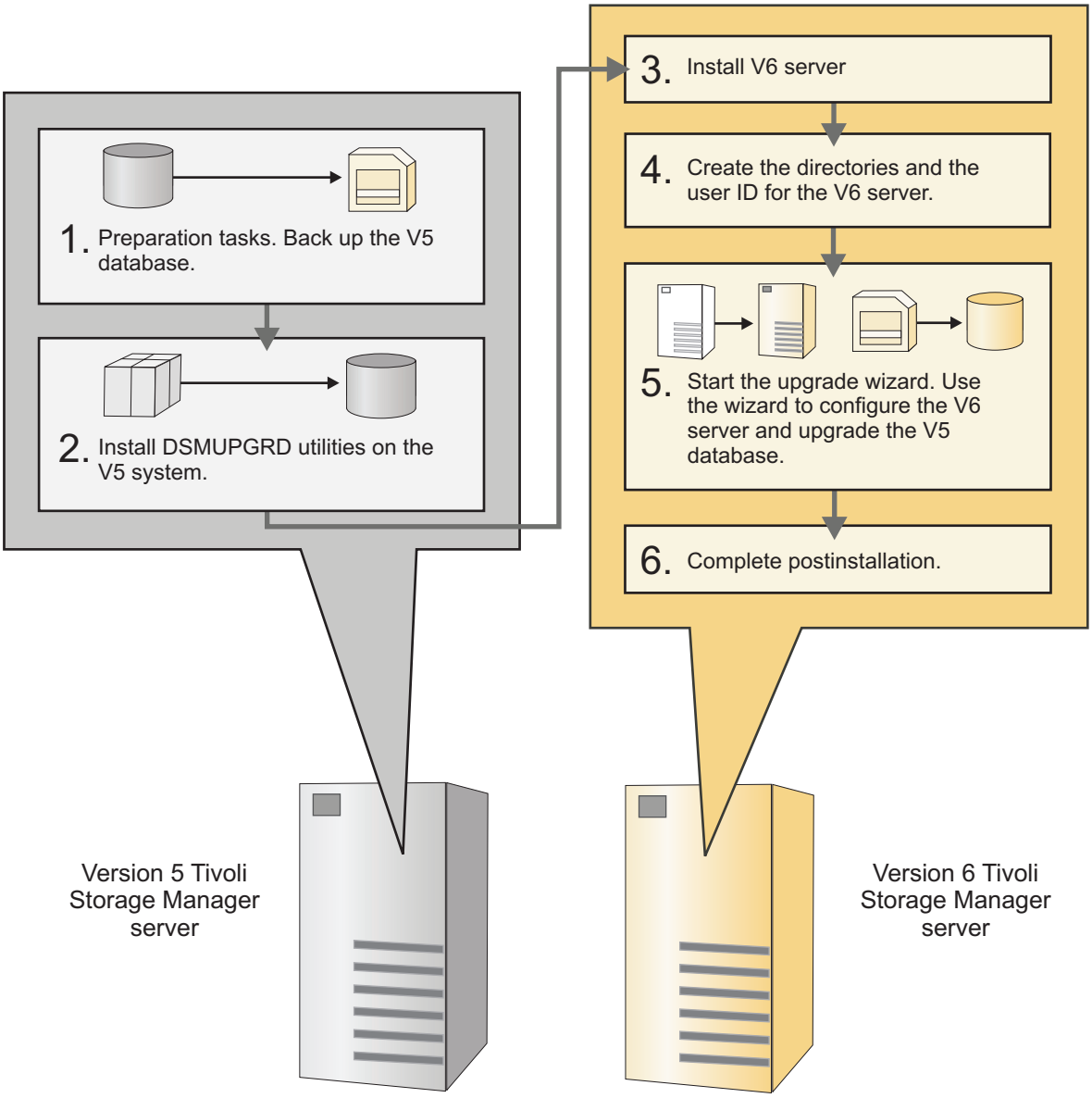

Figure 5. Scenario 3

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 175.

1. Complete 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 are upgrading the server manually by using utilities.

3. Install the V6.3 or later server code on the new system. Optional: Before installing the V6.3 or later server code, run the installation prerequisite checker.
4. Create the directories for the V6.3 or later 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 by using utilities

Upgrade to V6 on a new system, media method

Upgrade using the command line and upgrade utilities

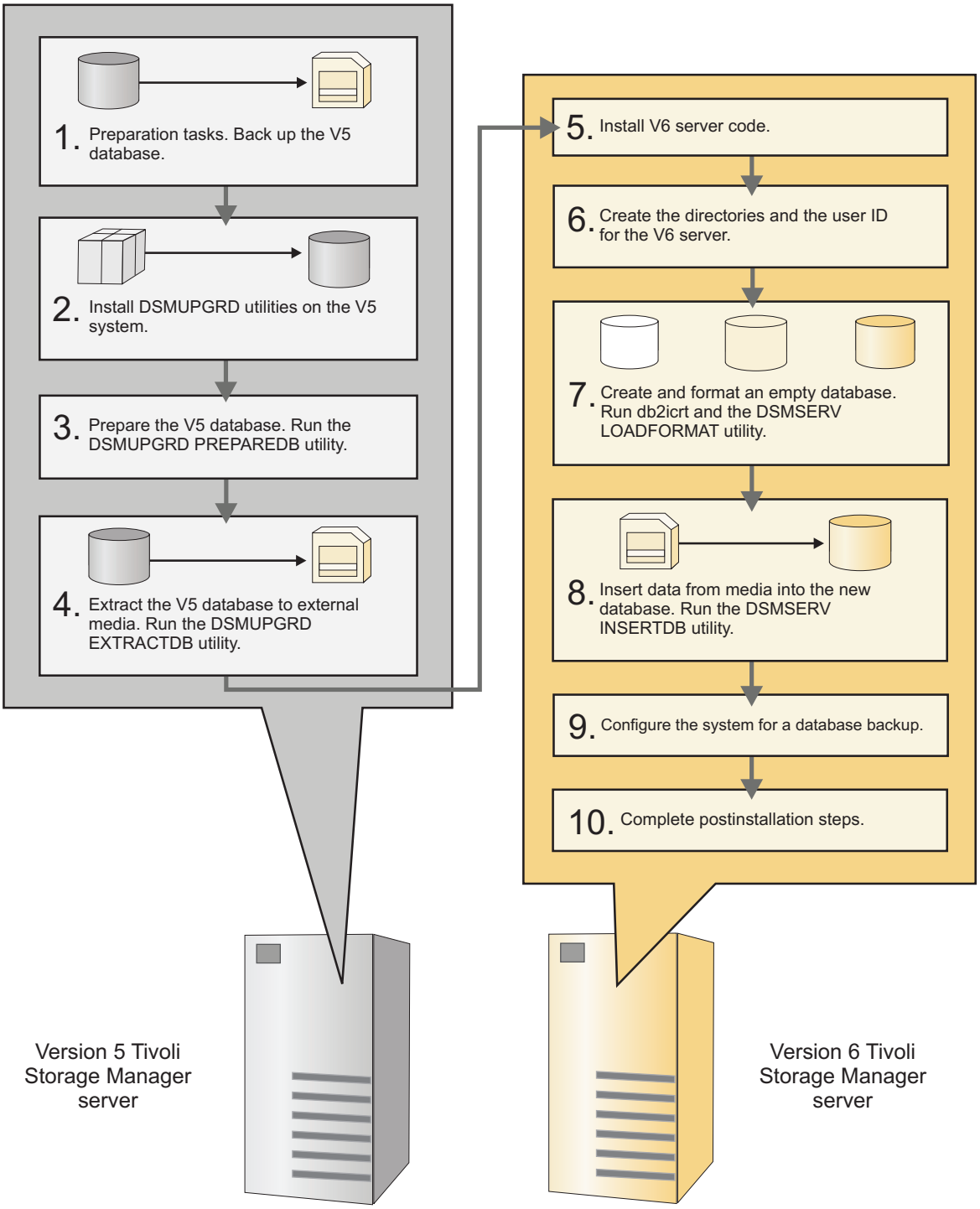

Figure 6. Scenario 3

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 175.

1. Complete 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 are upgrading the server manually by using utilities.
3. On the original system, prepare the V5 database by using the **DSMUPGRD PREPAREDB** utility.
4. On the original system, extract the V5 database to external media by using the **DSMUPGRD EXTRACTDB** utility.
5. Install the V6.3 or later server code on the new system. Optional: Before installing the V6.3 or later server code, run the installation prerequisite checker.
6. Create the directories for the V6.3 or later 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 by using the **DSMSERV LOADFORMAT** utility.
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 **DSMSERV INSERTDB** utility.
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 completed 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 upgrade the server manually by 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 V6.3 or later database" on page 14

Related tasks:

Chapter 7, "Scenario 4: New system, network method," on page 223

Upgrading the server by using the wizard

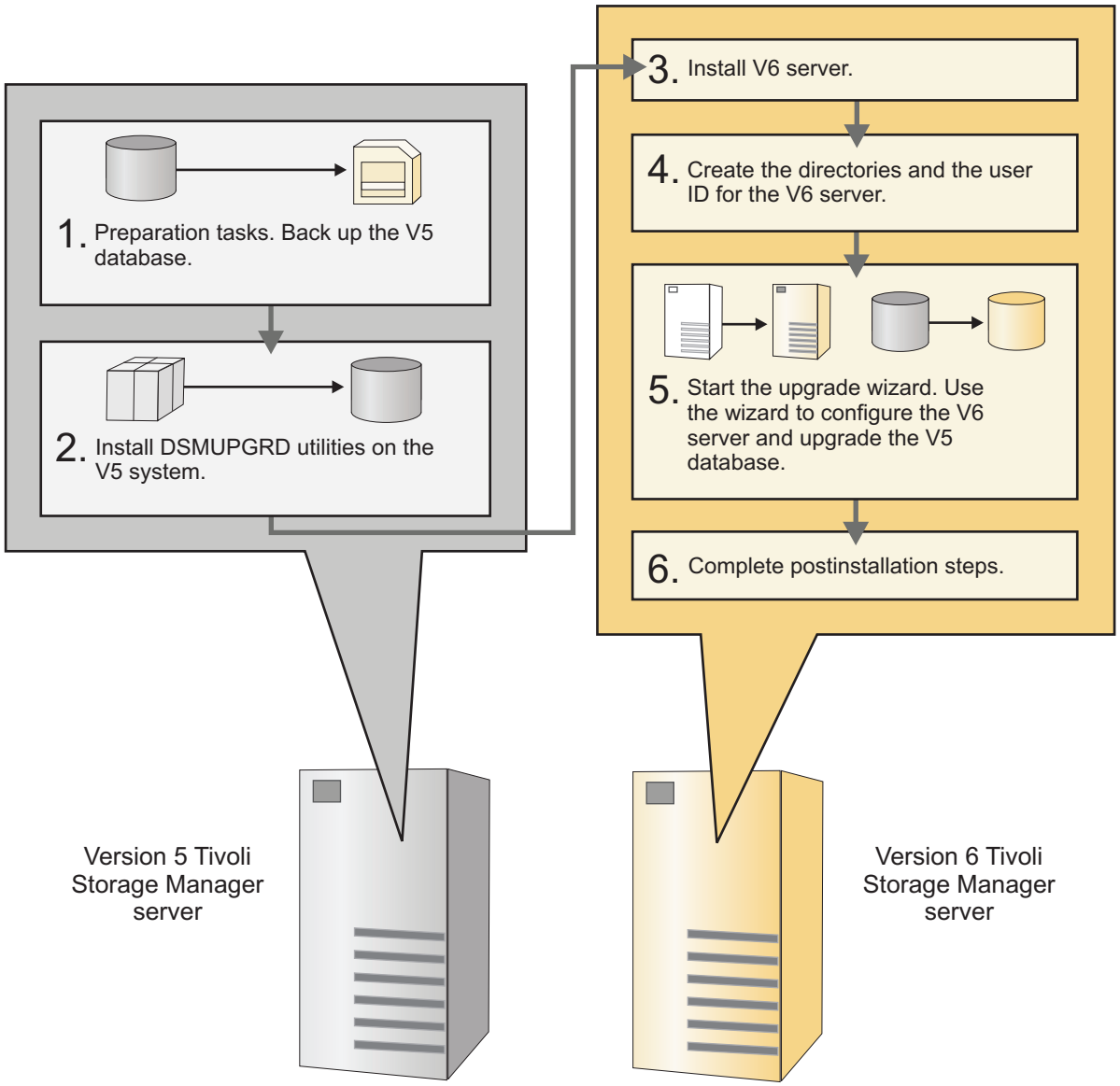

Figure 7. Scenario 4

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 223.

1. Complete 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 are upgrading the server manually by using utilities.

3. Install the V6.3 or later server code on the new system. Optional: Before installing the V6.3 or later server code, run the installation prerequisite checker.
4. Create the directories for the V6.3 or later 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 V6.3 or later 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.

Upgrading the server manually by using utilities

Upgrade to V6 on a new system, network method

Upgrade using the command line and upgrade utilities

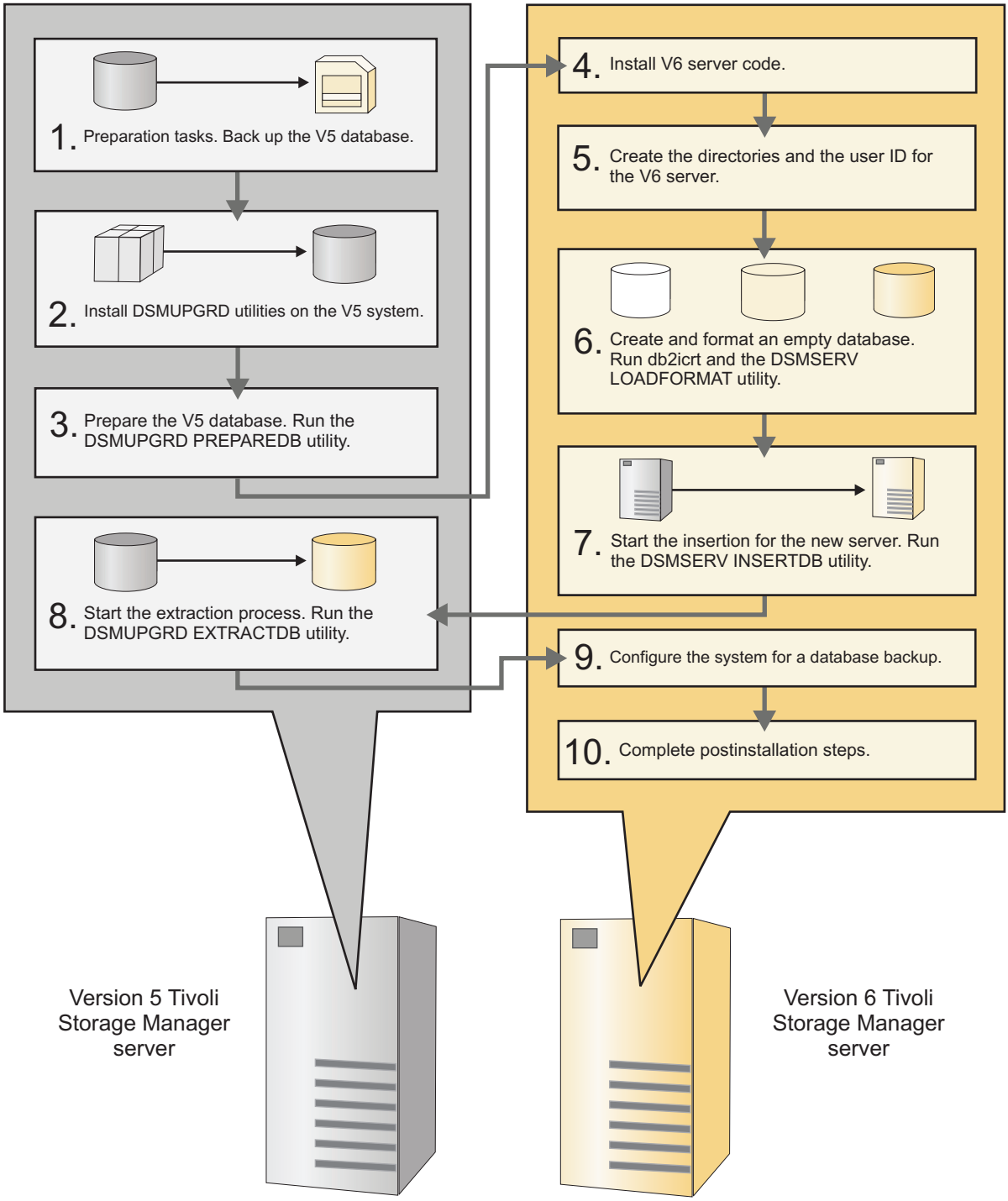

Figure 8. Scenario 4

Upgrading the server from V5 to V6.3 or later

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 223.

1. Complete 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 are upgrading the server manually by using utilities.
3. On the original system, prepare the V5 database by using the **DSMUPGRD PREPAREDB** utility.
4. Install the V6.3 or later server code on the new system. Optional: Before installing the V6.3 or later server code, run the installation prerequisite checker.
5. Create the directories for the V6.3 or later 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 by using the **DSMSERV LOADFORMAT** utility.
7. On the new system, start the insertion process for the new server. Use the **DSMSERV INSERTDB** utility.
8. On the original system, start the extraction process for the V5 database by using the **DSMUPGRD EXTRACTDB** utility.
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 the IBM Tivoli Storage Manager server on the same system as the V5 server, and you are using the media method to move the data.

The procedure for upgrading the server includes the following tasks:

1. "Scenario 1: Preparing for the upgrade"
2. "Scenario 1: Installing the upgrade utilities" on page 102
3. "Scenario 1: Preparing the database of a V5 server for upgrade" on page 108
4. "Scenario 1: Uninstalling the V5 program before installing V6.3 or later" on page 110
5. "Scenario 1: Installing the V6.3 or later server" on page 112
6. "Scenario 1: Creating the directories and the user ID for the upgraded server instance" on page 116
7. Upgrading the server, by using one of the following methods:
   - "Scenario 1: Upgrading the server by using the upgrade wizard" on page 120
   - "Scenario 1: Upgrading the server manually by using utilities" on page 122
8. The following tasks are completed after the upgrade:
   a. "Verifying access to storage pools on disk" on page 323
   b. "Setting up Solaris services for the server instance" on page 324
   c. "Configuring server options for server database maintenance" on page 324
   d. "Starting the server instance after the upgrade" on page 325
   e. "Registering licenses" on page 330
   f. "Backing up the database after upgrading the server" on page 330
   g. "Verifying the upgraded server" on page 331
   h. "Changing the host name for the Tivoli Storage Manager server" on page 332
   i. "Updating automation" on page 333
   j. "Monitoring the upgraded server" on page 334
   k. "Removing GSKit Version 7 after upgrading to Tivoli Storage Manager V6.3 or later" on page 335

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 V6.3 or later 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 have completed all preparation steps. To understand why it is important to complete all preparation steps, review the procedure for reverting an upgraded server to its previous version.

To prepare for the upgrade, complete the following steps:

1. "Scenario 1: Checking the prerequisites for the upgrade"
2. "Scenario 1: Preparing space for the upgrade process" on page 97
3. "Scenario 1: Modifying the server before the upgrade" on page 98
4. "Scenario 1: Disabling sessions" on page 99
5. "Scenario 1: Backing up storage pools and the server database" on page 100
6. "Scenario 1: Deleting or renaming the NODELOCK file" on page 100
7. "Scenario 1: Backing up configuration information" on page 100
8. "Scenario 1: Creating a summary of database contents" on page 101
9. "Scenario 1: Stopping the server before installing the upgrade" on page 101

Related tasks:

"Postupgrade phase: Reverting from V6.3 or later to the previous V5 server version" on page 345

Scenario 1: Checking the prerequisites for the upgrade

Check your system against requirements for the server.

Restriction: If you are upgrading the Tivoli Storage Manager server on the same system, the system must meet the minimum requirements for both the V5 and V6.3 or later servers.

1. Ensure that the server that you plan to upgrade is at version 5.3.6 or later and that the latest interim fix is installed. To optimize the upgrade process and avoid potential issues, consider upgrading the V5 server to the latest available level and install the latest interim fix for that level. Follow the guidelines in "Determining the appropriate level for a V5 server before an upgrade" on page 37. To download the latest server fix pack and latest interim fix, go to the FTP downloads site at ftp://public.dhe.ibm.com/storage/tivoli-storage-management/maintenance/server/. Then, locate the appropriate version of Tivoli Storage Manager.
2. Ensure that the system where the V5 server is located meets the minimum requirements. Review the information in "Hardware and software requirements for the V5 server system that is being upgraded" on page 16 to determine whether you must update your system before you continue.
3. Ensure that the system where you plan to install the V6.3 or later server meets requirements for the operating system type and level. For the latest information about system requirements, see Tivoli Storage Manager Supported Operating Systems (http://www.ibm.com/support/docview.wss?uid=swg21243309). You can verify the installation environment manually now. Alternatively, wait until the installation files are extracted and then run the prerequisite checker, which automatically verifies the system environment. For more information, see "Running the prerequisite checker" on page 38.

   If you are upgrading Tivoli Storage Manager on a different operating system, a limited set of migration paths is available. For instructions about migrating a server that is running on a z/OS operating system, see Part 3, "Migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 on AIX or Linux on System z," on page 433. For instructions about migrating a server that is running on an AIX, HP-UX, or Solaris operating system, see Part 2, "Migrating Tivoli Storage Manager V5 servers on AIX, HP-UX, or Solaris systems to V6.3.4 on Linux," on page 349.

   Some platforms that were supported for earlier versions of the server are not supported for V6.3 or later. If the server that you want to upgrade is running on one of these platforms, you cannot upgrade your server to V6.3 or later on the same platform. For required platforms, see the following table.

Table 38. Required platforms for upgrading from V5 to V6.3 or later

Platform for V5 server	Required platform for upgrade to V6.3 or later
HP-UX running on a PA-RISC system	HP-UX running on an Intel Itanium system
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system
Linux running on an x86_32 system	Linux running on an x86_64 system
Solaris running on an x86_64 system	Linux running on an x86_64 system
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system

If you are upgrading from Tivoli Storage Manager V5 to V6.3 or later on a new system, restrictions apply. Ensure that you install the V6.3 or later server in a compatible hardware and software environment, as described in the following table.

Table 39. Requirements for upgrading from V5 to V6.3 or later on a new system

V5 server	V6.3 or later server	Comments
AIX running on an IBM POWER system	AIX running on an IBM POWER system	
HP-UX running on an Itanium system	HP-UX running on an Itanium system	
HP-UX running on a PA-RISC system	HP-UX running on an Itanium system	HP-UX running on PA-RISC is not supported for V6.3 or later servers.
Linux running on an IBM POWER system	Linux running on an IBM POWER system	
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system	Linux running on Itanium is not supported for V6.3 or later servers.
Linux running on an x86_32 system	Linux running on an x86_64 system	Linux running on x86_32 is not supported for V6.3 or later servers.
Linux on System z	Linux on System z	

Table 39. Requirements for upgrading from V5 to V6.3 or later on a new system (continued)

V5 server	V6.3 or later server	Comments
Solaris running on an x86_64 system	Operating system depends on the migration method	A V6.3 or later server cannot be installed on a Solaris x86_64 system. However, you can migrate a V5 server that is running on a Solaris x86_64 operating system to V6.3.4 or later on a Linux x86_64 operating system. For instructions, see Part 2, "Migrating Tivoli Storage Manager V5 servers on AIX, HP-UX, or Solaris systems to V6.3.4 on Linux," on page 349. Alternatively, you can migrate the Solaris x86_64 system by installing a V6.3 or later server on any operating system that is supported for V6.3 or later. Then, use Tivoli Storage Manager server **EXPORT** and **IMPORT** commands to move the server from the V5 source system to the V6.3 or later target system.
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system	Windows running on Itanium is not supported for V6.3 or later servers.
Windows running on an x86_32 system	Windows running on an x86_64 system	Windows running on x86_32 is not supported for V6.3 or later servers.
z/OS	AIX or Linux on System z	For instructions, see Part 3, "Migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 on AIX or Linux on System z," on page 433.

4. Verify that the system memory meets the server requirements. If you plan to run multiple instances of the V6.3 or later server on the system, each instance requires the memory that is listed for one server. Multiply the memory for one server by the number of instances that are planned for the system.

   For specific information about memory requirements, see the section for your operating system:

Table 40. Memory requirements for the V6.3 or later system

Operating system	Memory requirements
AIX AIX	"Server requirements on AIX systems" on page 20
HP-UX HP-UX	"Server requirements on HP-UX systems" on page 23

Table 40. Memory requirements for the V6.3 or later system (continued)

Operating system	Memory requirements
Linux Linux	"Server requirements on Linux systems" on page 25
Solaris Solaris	"Server requirements on Solaris systems" on page 32
Windows Windows	"Server requirements on Microsoft Windows systems" on page 34

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 V5 server and the V6.3 or later server.
   - After you back up the V5 database and extract the data to media, reconfigure the disk subsystem that is 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 servers.

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

Related concepts:

"Hardware and software requirements for upgrading to the V6.3 or later server" on page 16

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 worksheet that you completed with your information. See "Worksheet for planning space for the V6.3 or later server" on page 44.
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. View information about devices classes by issuing the command:

      ```
      query devclass format=detailed
      ```

      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.

   For example, if the device class is FILE, ensure that the directory has sufficient space for your environment. If the device class is TAPE, ensure that sufficient scratch volumes are available for your environment.

   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 V6.3 or later 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 41

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 can be useful 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 is completed and you might see error ANR2034E. This error can be ignored. For more information, see Technote 1408895 (http://www.ibm.com/support/docview.wss?uid=swg21408895). 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 you continue the upgrade process.

2. Review the steps for reverting to the earlier version of the server in the section, "Postupgrade phase: Reverting from V6.3 or later to the previous V5 server version" on page 345.

   If you must revert to the earlier version after the upgrade to V6.3 or later, 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 necessary.

For example, if you want to be able to revert to the original server for up to 30 days after the upgrade to V6.3 or later, set the **REUSEDELAY** parameter to 31 days. Issue the following administrative command:

```
update stgpool sequential_access_storage_pool reusedelay=31
```

b. For each copy storage pool, set the **RECLAIM** parameter to 100 (meaning 100%). Issue the following administrative command:

```
update stgpool copy_storage_pool reclaim=100
```

c. If you typically use a **DELETE VOLHISTORY** command to delete database backups, ensure that the command does not delete database backups too frequently. The interval between backups should be at least the same number of days that you set for the **REUSEDELAY** period for sequential-access storage pools. For example, to delete database backups every 45 days, issue the following administrative command:

```
delete volhist type=dbbackup todate=-45
```

d. For important clients that use the server, verify that the value for the `schedlogretention` client option is set to retain the client schedule log for a sufficient 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.

For example, to prune the log every 45 days and save the log entries, add the following option:

```
schedlogretention 45 S
```

AIX HP-UX Linux Solaris Add the option to the `dsm.sys` file within a server stanza.

Windows Add the option to the client options file, `dsm.opt`.

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. Verify 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 all
```

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.

Back up storage pools and the server database by using Tivoli Storage Manager administrative commands:

1. Back up primary storage pools to copy storage pools by using the **BACKUP STGPOOL** command:

   ```
   backup stgpool primary_pool copy_stg
   ```

   where *primary_pool* specifies the primary storage pool and *copy_stg* specifies the copy storage pool. 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. The preferred method is to use a snapshot backup. A snapshot backup is a full database backup that does not interrupt any scheduled database backups. Issue the command:

   ```
   backup db type=dbsnapshot 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 by 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.

   Tip: Consider making two copies of the backup to protect the backup from media failures. Ensure that at least one full database backup is available onsite. If you must restore the database after a failed upgrade, having an onsite backup database saves time.

Scenario 1: Deleting or renaming the NODELOCK file

To ensure that licensing information is updated during the upgrade process, delete or rename the `NODELOCK` file.

The `NODELOCK` file contains the licensing information from the previous Tivoli Storage Manager installation. To ensure that the licensing information is updated during the upgrade process, delete or rename the `NODELOCK` file before starting the upgrade process. This licensing information will be replaced with new licensing information after the upgrade is completed. The `NODELOCK` file is located in the server instance directory.

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, on a different system from the system that is being upgraded or on offline media, such as a CD. The files are required after the installation of the new software version is complete. You also need these files if you must revert to the previous version after the upgrade.

1. Back up device configuration information by using the Tivoli Storage Manager administrative command:

   ```
   backup devconfig filenames=file_name
   ```

where *file_name* specifies the file in which to store device configuration information.

2. Back up volume history information by using the Tivoli Storage Manager administrative command:

   ```
   backup volhistory filenames=file_name
   ```

   where *file_name* specifies the file in which to store volume history information. 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=dbsnapshot
   ```

   Review the query output to verify that the timestamp for the database backup matches the actual time of the backup.

3. Save copies of the following files, which are in the server instance directory:
   - Server options file, typically named `dsmserv.opt`
   - `dsmserv.dsk`

   Important: The `dsmserv.dsk` file is not available in Tivoli Storage Manager V6.3 or later. Save a copy of the `dsmserv.dsk file` in case you must revert to V5.5.

4. In the server instance directory, look for the accounting log file, `dsmaccnt.log`. If the file exists, save a copy.
5. Back up any scripts that were used to complete 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. Ensure that the files are stored on a different system from the system that is being upgraded, or on offline media.

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 that are being protected, and save the results. For a list of commands, see "Sample commands to run for validation of the database upgrade" on page 535.

Related reference:

"Sample commands to run for validation of the database upgrade" on page 535

Scenario 1: Stopping the server before installing the upgrade

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

To stop the server before you install the upgrade, use Tivoli Storage Manager administrative commands:

1. 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.

For more information about querying and canceling processes, see the **QUERY PROCESS** and **CANCEL PROCESS** commands in the *Administrator's Reference*.

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

```
query mount
dismount volume volume_name
```

For more information about unmounting tapes, see the **QUERY MOUNT** and **DISMOUNT VOLUME** commands in the *Administrator's Reference*.

3. 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 website.

The preferred method is to install the latest available version of the upgrade utilities. For more information about selecting the version, see "Determining the appropriate level for a V5 server before an upgrade" on page 37.

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 104
- Linux "Scenario 1: Installing the upgrade utilities on Linux systems" on page 105
- Solaris "Scenario 1: Installing the upgrade utilities on Oracle Solaris systems" on page 106
- Windows "Scenario 1: Installing the upgrade utilities on Microsoft Windows systems" on page 108

Related concepts:

"**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://public.dhe.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 operating system, 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.

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://public.dhe.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. Navigate to the directory that corresponds to the processor architecture of the operating system.
6. 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**.
7. Select the **INPUT** device. Specify the directory location of the upgrade utilities package on the system.
8. Select **Software to Install**. Press F4 or Esc+4 for the list of available file sets in the directory.
9. Select the file sets for the upgrade utilities, the device driver, and optionally the language package. The file set for the upgrade utilities is `tivoli.tsmupg.server`. Optional language packages include messages for languages other than US English.
10. Set **COMMIT software updates** to `Yes`. Press F4 or Esc+4.
11. Set **SAVE replaced files** to `No`.
12. Ensure that the default settings for the options in the window for all the selected file sets show `success`.
13. Press Enter, and respond to the `ARE YOU SURE?` question by pressing Enter again. The installation begins.
14. When the installation is complete, exit the SMIT program.
15. 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.

16. After the upgrade utilities are installed, continue at "Scenario 1: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 107.

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://public.dhe.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 operating system, 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.
   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. Navigate to the directory that corresponds to the processor architecture of the operating system.
5. 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`.
6. 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.

7. After the upgrade utilities are installed, continue at "Scenario 1: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 107.

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://public.dhe.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 operating system 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.
   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. Navigate to the directory that corresponds to the processor architecture of the operating system, for example, `x86_64`.
5. 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.
6. 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.

7. After the upgrade utilities are installed, continue at "Scenario 1: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 107.

Scenario 1: Installing the upgrade utilities on Oracle 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://public.dhe.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 operating system, 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.
   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. Navigate to the directory that corresponds to the processor architecture of the operating system.
6. 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.

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

Scenario 1: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle 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 **DSMSERV_DIR** variable specifies the installed location of the upgrade utilities. By default, the location is the following directory:

AIX

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

HP-UX Linux Solaris

```
/opt/tivoli/tsm/upgrade/bin
```

Use the appropriate command for your system to set the environment variable for running the utilities. If the shell is in the `ksh` or `bash` family, enter the following command to set the **DSMSERV_DIR** variable:

```
export DSMSERV_DIR=upgrade_utilities_directory
```

If your shell is in the `csh` family, use the following command:

```
setenv DSMSERV_DIR upgrade_utilities_directory
```

where *upgrade_utilities_directory* is the directory where the upgrade utilities are installed.

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

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://public.dhe.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.
   d. Optional: To install messages in a language other than English, install the language package that your installation requires.
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."

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 you extract 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.

Important: The `dsmserv.dsk` file is not available in Tivoli Storage Manager V6.3 or later. Save a copy of the `dsmserv.dsk file` in case you must revert to V5.5.

4. 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. 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
   ```

5. 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.

6. Ensure that the prepare operation is completed successfully before you continue 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 that is being upgraded is a V5.3 or V5.4 server, you might need to restore the database by 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 513

Scenario 1: Uninstalling the V5 program before installing V6.3 or later

For best results when you are upgrading the server to V6.3 or later on the same system where the V5 server is located, uninstall the V5 server program before installing the V6.3 or later 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 111
- Solaris "Scenario 1: Uninstalling the V5 program on Oracle Solaris systems" on page 111
- Windows "Scenario 1: Uninstalling the V5 program on Microsoft Windows systems" on page 111

Scenario 1: Uninstalling the V5 program on AIX systems

AIX

Uninstall the V5 server, server license, and device driver, if available. 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 V6.3 or later server" on page 112.

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

HP-UX

Uninstall the V5 server, server license, and device driver, if available. 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 V6.3 or later server" on page 112.

Scenario 1: Uninstalling the V5 program on Linux systems

Linux

Uninstall the V5 server, server license, and device driver, if available. 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 commands:

   ```
   rpm -e TIVsm-server
   rpm -e TIVsm-license
   rpm -e TIVsm-tsmscsi
   ```

After the V5 server program is uninstalled, continue at "Scenario 1: Installing the V6.3 or later server" on page 112.

Scenario 1: Uninstalling the V5 program on Oracle Solaris systems

Solaris

Uninstall the V5 server, server license, and device driver, if available. 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 V6.3 or later server" on page 112.

Scenario 1: Uninstalling the V5 program on Microsoft Windows systems

Windows

Uninstall the V5 server, server license, and device driver, if available. 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 server component, and then click **Remove**. Repeat for the license and the device driver.

   If you see any messages that suggest that you restart the system, ignore them until the selected Tivoli Storage Manager components are removed.

After the V5 server program is uninstalled, continue at "Scenario 1: Installing the V6.3 or later server" on page 112.

Scenario 1: Installing the V6.3 or later server

You can use an installation wizard to install the server, or install the server by 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.

Starting with V6.3, the IBM Tivoli Storage Manager server installation wizard has a separate license agreement for the following products:

- Tivoli Storage Manager
- IBM Tivoli Storage Manager Extended Edition
- IBM System Storage Archive Manager
- IBM Tivoli Storage Manager for Storage Area Networks

Before you upgrade the Tivoli Storage Manager server, ensure that you retain the installation media from the base release of the installed server. If you installed Tivoli Storage Manager from a DVD, ensure that the DVD is available. If you installed Tivoli Storage Manager from a downloaded package, ensure that the downloaded files are available. If the upgrade fails, and the server license module is uninstalled, the installation media from the server base release are required to reinstall the license.

To verify the system environment and install the server, complete the following steps:

1. For some operating systems, you must check certain system settings before you begin the 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 installation wizard cannot run on your configuration.
   It will now stop.
   For more details about installation error logs,
   enter the phrase "installation log files" in the
   Search field at this site:

   http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3
   ```

   Solaris

   Before you install 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=swg24030521

   Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030527

   System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030530

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=swg24030522

   Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030528

   System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030531

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. Ensure that the system environment meets installation requirements. You can verify the requirements manually or run the prerequisite checker. To run the prerequisite checker, complete the following steps:
   a. AIX HP-UX Linux Solaris Issue this command to start the prerequisite checker with a graphical interface:
      ```
      ./prereqcheck.bin
      ```
      Alternatively, issue this command to start the prerequisite checker with the console method:
      ```
      ./prereqcheck.bin -i console
      ```
   b. Windows Issue this command to start the prerequisite checker with a graphical interface:
      ```
      prereqcheck.exe
      ```
      Alternatively, issue this command to start the prerequisite checker with the console method:
      ```
      prereqcheck.exe -i console
      ```
   c. Select the language for the prerequisite checker user interface.
   d. In the welcome and disclaimer panels, review the statements and accept them.

   If the Prerequisite Results panel shows that your workstation successfully passed the checks, you are ready to start the installation. If an error message is shown in the Prerequisite Results panel, make the required corrections before continuing with the installation. For more information about the prerequisite checker, see "Running the prerequisite checker" on page 38.
6. 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
     ```

   For information about translations that are available for the server, see the server language locales section. For information about the silent installation of the server, see the section on installing Tivoli Storage Manager in silent mode in the *Installation Guide*.
7. Select the language for your installation and follow the wizard, selecting **Next** to step through the wizard.

a. You must accept the license agreement to proceed. Select the product that you are entitled to use and a license agreement is displayed. You can select only one product on the page. If you select Tivoli Storage Manager, Tivoli Storage Manager Extended Edition, or System Storage Archive Manager, you are asked if you will be using LAN-free or library sharing. If you select YES, you must accept the Tivoli Storage Manager for Storage Area Networks license. This is in addition to the license for the product that you chose on the previous page.

b. Select the components that you want to install. Components include the server, languages, license, device driver, and storage agent. There is no default, so you must make a selection. If you previously installed a server, ensure that you select the same directory when you install a language package, license, or device driver. If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver. A server and a storage agent cannot be installed on the same workstation. For information about other components that you can choose to install, see the *Installation Guide*.

The Tivoli Storage Manager client application programming interface (API), DB2 Version 9.7, and Global Security Kit (GSKit) 8 are automatically installed when you select the server component.

8. 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 you continue to the next step.

   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`)

9. Download and apply any applicable fixes that have been released for the server. Go to the product support site at http://www.ibm.com/support/entry/portal/Downloads. Search for server updates.

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

10. 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 that are based on the recommendations in the results from the utility. You might have to restart the system.

    For information about the utility and about modifying kernel parameters, see http://pic.dhe.ibm.com/infocenter/db2luw/v9r7. 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 C, "HP-UX system resource requirements," on page 543.

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://pic.dhe.ibm.com/infocenter/db2luw/v9r7. To find the information, enter a search string such as `modifying kernel parameters`, in the **Search** field at this site.

To run Tivoli Storage Manager with DB2, you might need to set kernel parameter values higher than the suggested minimum values and make other changes to the system. For more details, see the section on tuning kernel parameters for Linux systems in the *Installation Guide*.

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 that are based on the recommendations in the results from the utility. You might have to restart the system.

For information about the utility and about modifying kernel parameters, see http://pic.dhe.ibm.com/infocenter/db2luw/v9r7. 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.

Related concepts:

Appendix E, "Services associated with the Tivoli Storage Manager server," on page 549

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.

Review the information about planning space for the server before you complete this task. See "Worksheet for planning space for the V6.3 or later server" on page 44.

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: In the user ID, only lowercase letters (a-z), numerals (0-9), and the underscore character (_) can be used. The user ID and group name must comply with the following rules:

- The length must be 8 characters or less.
- The user ID and group name cannot start with *ibm*, *sql*, *sys*, or a numeral.
- The user ID and group name cannot be *user*, *admin*, *guest*, *public*, *local*, or any SQL reserved word.

For example, create user ID `tsminst1` in group `tsmsrvrs`. The following examples show how to create this user ID and group by 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
    -s /bin/ksh tsminst1
# passwd tsminst1
```

Linux

```
# groupadd tsmsrvrs
# useradd -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, by using the new user ID and password. Use an interactive login program, such as telnet, so that you are prompted for the password and can change it if necessary.

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

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 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 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 30 characters or less, and cannot start with *ibm*, *sql*, *sys*, or a numeral. The user ID and group name cannot be *user*, *admin*, *guest*, *public*, *local*, or any SQL reserved word.

   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 operating system commands to add the new user ID to the Administrators groups:

   ```
   net localgroup Administrators user_ID /add
   net localgroup DB2ADMNS user_ID /add
   ```

c. Log in to your system, by using the new user ID and password.

d. For all directories that were created for the server instance, ensure that the user ID for the server instance has read/write access. The directories to check include the instance directory and all database and log directories.

2. Create the directories that the server requires. Ensure that you are logged in under the new user ID that you created.

   You need a unique, empty directory for each item in the following table. Create the database directories, the active log directory, and the archive log directory on different physical volumes. For space requirements, see "Worksheet for planning space for the V6.3 or later server" on page 44.

AIX HP-UX Linux Solaris

Table 41. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which will contain files for this server instance, including the server options file	`mkdir /home/user_ID/tsminst1`	

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

Active log directory	`mkdir /home/user_ID/tsmlog`	
Archive log directory	`mkdir /home/user_ID/tsmarchlog`	
Optional: Directory for the log mirror for the active log	`mkdir /home/user_ID/tsmlogmirror`	
Optional: Secondary archive log directory, which is the failover location for the archive log	`mkdir /home/user_ID/tsmarchlogfailover`	

Windows

Table 42. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which will contain files for this server instance, including the server options file	`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, which is the failover location for the archive log	`mkdir k:\tsm\archlogfailover`	

When a server is initially created, with the **DSMSERV FORMAT** utility or with the configuration wizard, a server database and recovery log are created. In addition, files are created to hold database information that is used by the database manager.

3. Create additional logical volumes and mount the volumes on the directories that were created in the previous step.

Continue the upgrade process by using one of the following topics:

"Scenario 1: Upgrading the server by using the upgrade wizard"

"Scenario 1: Upgrading the server manually by using utilities" on page 122

Related tasks:

"Planning space for the upgrade process and the upgraded server" on page 39

Related reference:

"Server naming best practices" on page 72

Scenario 1: Upgrading the server by 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 V6.3 or later 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 V6.3 or later 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. Also ensure that the SSH daemon service has access rights for connecting to the system by using `localhost`.
  - 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 where you installed the V6.3 or later server program must have the Windows server message block (SMB) protocol enabled. 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 the V5 server is on a different system than the V6.3 or later server, that system must also have SMB enabled.
- You must be able to log on to the system that has SMB enabled by using either the user ID that you created for the server instance, or another user ID that exists on the system. When using the wizard, you must provide the user ID and password to access the system.

2. Windows If the system is running on Windows Server 2008 or Windows Vista, complete the following steps to disable User Account Control:
   a. Ensure that the Remote Registry in Windows Services is started, and ports 445, 137, and 139 are unblocked in the firewall.
   b. Configure both the framework server and the targets as members of a Windows domain. Use a user account in that domain, or in a trusted domain, when you connect to the target.
   c. Connect to the target workstation by enabling and using the built-in administrator account. To enable the built-in administrator account, click **Control Panel** > **Administrative Tools** > **Local Security Policy** > **Security Settings** > **Local Policies** > **Security Options**. Double-click the **Accounts: Administrator account status** section. Select **Enable** and click **OK**.
   d. Click **Control Panel** > **Administrative Tools** > **Local Security Policy** > **Security Settings** > **Local Policies** > **Security Options**. Double-click the **User Account Control: Run all administrators in Admin Approval Mode** section. Select **Disable** and click **OK**.
3. Start the upgrade wizard, **dsmupgdx**, from the V6.3 or later 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"
   ```

4. 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 10, "Taking the first steps after upgrade," on page 323.

Scenario 1: Upgrading the server manually by using utilities

Use the utilities to upgrade the server by using a command interface.

Before you begin the upgrade procedure, you must complete all preceding steps to prepare for the upgrade. Ensure that you have installed the upgrade utilities, installed the V6.3 or later server program, and created 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 123
3. "Scenario 1: Loading the extracted data into the new database" on page 128
4. "Scenario 1: Creating a Windows service for the server instance" on page 130
5. "Scenario 1: Configuring the system for database backup" on page 131

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 10, "Taking the first steps after upgrade," on page 323.

Related concepts:

"The manifest file for the data extraction to media" on page 521

"**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 521

Related tasks:

"Scenario 1: Preparing space for the upgrade process" on page 97

Related reference:

"DSMUPGRD EXTRACTDB (Extract data from a V5 server database)" on page 519

Scenario 1: Creating and formatting the new database

Create the server instance and format files for an empty V6.3 or later database.

1. Log on to the system where you installed the V6.3 or later program.

   AIX HP-UX Linux Solaris

   Log in by using the root user ID. Verify the following items:

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

     The instance directory stores the following core files that are generated by the Tivoli Storage Manager server:

     – The server options file, `dsmserv.opt`
     – The server key database file, `cert.kdb`, and the `.arm` files, which are used by clients and other servers to import the Secure Sockets Layer certificates of the server
     – Device configuration file, if the `DEVCONFIG` server option does not specify a fully qualified name

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

- A shell configuration file, for example, `.profile`, exists in the home directory. The root user and instance user ID must have write permission to this file. For more information, go to the DB2 Information Center (http://pic.dhe.ibm.com/infocenter/db2luw/v9r7), and search for information about Linux and UNIX environment variable settings.

Windows

Log on as an administrator.

2. Create a Tivoli Storage Manager instance by 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:

AIX HP-UX Linux Solaris

```
/opt/tivoli/tsm/db2/instance/db2icrt -a server -s ese -u
instance_name instance_name
```

For example, if the user ID for this instance is tsminst1, use the following command to create the instance:

AIX HP-UX Linux Solaris

```
/opt/tivoli/tsm/db2/instance/db2icrt -a server -s ese -u
tsminst1 tsminst1
```

Remember: From this point on, use this new user ID when you configure the 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 V6.3 or later server; this ID is the instance user ID.

```
db2icrt -s ese -u user_account instance_name
```

For example, if the user account is *tsminst1* and the server instance is *Server1*, enter the following command:

```
db2icrt -s ese -u tsminst1 server1
```

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 V6.3 or later server. 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 by using the user ID that owns the V6.3 or later 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, which is 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 V6.3 or later server, copy the files into the following directory:

   AIX HP-UX Linux Solaris `/tsminst1`

   Windows `d:\tsm\server1`

   Ensure that the user ID that owns the V6.3 or later 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 V6.3 or later. For the list of deleted options, see Table 36 on page 69.
   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 V6.3 or later. 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 /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. Modify the library path to use the version of the IBM Global Security Kit (GSKit) that is installed with the Tivoli Storage Manager server:

   AIX Issue the following command:

   ```
   export LIBPATH=/usr/opt/ibm/gsk8_64/lib64:$LIBPATH
   ```

   AIX HP-UX Linux Solaris You must update the following files to set the library path when DB2 or the Tivoli Storage Manager server is started:

   - *instance_directory*`/sqllib/usercshrc`
   - *instance_directory*`/sqllib/userprofile`

   For the *instance_directory*`/sqllib/usercshrc` file, add the following lines:

   - AIX

     ```
     setenv LIBPATH /usr/opt/ibm/gsk8_64/lib64:$LIBPATH
     ```

   - HP-UX Solaris

     ```
     setenv LD_LIBRARY_PATH /opt/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
     ```

   - Linux

     ```
     setenv LD_LIBRARY_PATH /usr/local/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
     ```

   For the *instance_directory*`/sqllib/userprofile` file, add the following lines:

   - AIX

     ```
     LIBPATH=/usr/opt/ibm/gsk8_64/lib64:$LIBPATH
     export LIBPATH
     ```

   - HP-UX Solaris

     ```
     LD_LIBRARY_PATH=/opt/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
     export LD_LIBRARY_PATH
     ```

   - Linux

     ```
     LD_LIBRARY_PATH=/usr/local/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
     export LD_LIBRARY_PATH
     ```

Verify the library path settings and ensure that the GSKit version is 8.0.14.14 or later. Issue the following commands:

- AIX

```
echo $LIBPATH
gsk8capicmd_64 -version
gsk8ver_64
```

- HP-UX Linux Solaris

```
echo $LD_LIBRARY_PATH
gsk8capicmd_64 -version
gsk8ver_64
```

If the GSKit version is not 8.0.14.14 or later, you must reinstall the Tivoli Storage Manager server. The reinstallation ensures that the correct GSKit version is available.

8. Complete this step to set the server code page.

   Set the DB2CODEPAGE system environment variable to 819 for each server instance. Before you issue the **DSMSERV LOADFORMAT** command, log on to the system as the server instance owner and issue this command:

   ```
   db2set -i instance_name DB2CODEPAGE=819
   ```

   For example: AIX HP-UX Linux Solaris

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

   Windows

   ```
   db2set -i server1 DB2CODEPAGE=819
   ```

9. Change to the instance directory that you created for the server.
10. 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 16 GB (16384 MB, the default size), issue the following command, on one line:

    ```
    /opt/tivoli/tsm/server/bin/dsmserv loadformat \
    dbdir=/tsmdb001,/tsmdb002,/tsmdb003,/tsmdb004 \
    activelogsize=16384 activelogdirectory=/tsmlog \
    mirrorlogdirectory=/tsmlogmirror archlogdirectory=/tsmarchlog
    ```

    Windows

    For example, to get an active log size of 16 GB (16384 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=16384 activelogdirectory=h:\tsm\log
    mirrorlogdirectory=j:\tsm\logmirror archlogdirectory=i:\tsm\archlog
    ```

    If the server that you are upgrading is not Server1, 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=16384 activelogdirectory=h:\tsm\log
mirrorlogdirectory=j:\tsm\logmirror archlogdirectory=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).

11. 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 41

Related reference:

DSMSERV LOADFORMAT (Format a database)

"Deleted server commands, utilities, and options" on page 67

Scenario 1: Loading the extracted data into the new database

After you format an empty database by using the **DSMSERV LOADFORMAT** utility, load the data that you extracted from the original server database.

Ensure that the following requirements are met before you begin to load the data:

- 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 V6.3 or later server. The device must be physically attached to the system. The permissions must be set to grant access to the media for the user ID that owns the V6.3 or later server instance.

Complete the following steps:

1. Verify that the V6.3 or later 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 by using a FILE or DISK device class, complete the following steps:
     a. Log on to the system by using the root user ID.
     b. Ensure that the user ID that owns the V6.3 or later server (the instance user ID) has ownership or read/write permission for the extracted files.
2. For the manifest file that was created by the extraction process, ensure that the instance user ID has ownership or read/write permission.
3. Log on with the instance user ID.
4. On the V6.3 or later server, complete the following steps:
   a. Verify that the server options file from the V5 server includes the `DEVCONFIG` option, and that the option specifies the full path of the device configuration file.
   b. Verify that the device configuration file from the V5 server is available in the location that is specified by the `DEVCONFIG` option.
   c. Verify that the permissions on the device configuration file allow read access for the instance user ID.

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 V6.3 or later 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 the contents of the manifest file and edit the file if necessary:
   a. Ensure that the device names in the manifest file are valid for the V6.3 or later system. Device names for the same device might be different on V5 and V6 systems.
   b. Ensure that the manifest file contains a list of volumes to be used when the extracted data is loaded into the new database. For example, if the manifest file contains a list of volumes that belong 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 V6.3 or later 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 error messages, warning messages, and any items that you might need to address. The system displays interim statistics about the process of loading the database. However, there might be time periods when no messages are issued. During this time, DB2 operations are running in the background. The length of time that the process runs depends on the size of the database. For more information, see "Example: Estimating the upgrade time based on the database size" on page 45.

   Optional: Verify that the database is being loaded by monitoring the processor and I/O usage for the server process and the corresponding DB2 process. For example, issue the following command to monitor the process:

   ```
   tail -f insert.out
   ```

   Tip: Windows 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.

   A message in the output of the **DSMSERV INSERTDB** command indicates the status 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.`
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 521

Related reference:

"DSMSERV INSERTDB (Move a server database into an empty database)" on page 529

Scenario 1: Creating a Windows service for the server instance

Windows

A Windows service is created for the Tivoli Storage Manager V6.3 or later 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 by using the Tivoli Storage Manager server instance name and password in the service name. Issue the following command:

   ```
   install "TSM server_instance_name"
    "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
   instance_owner instance_owner_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.

   instance_owner is the instance owner account; this account will own the service.

   instance_owner_password is the password for the instance owner account.

   Example

   To install the Windows service for the server1 server instance, enter the following command on one line. The example uses `rudy` as the instance owner and `s21ret` as the password for the instance owner account.

   ```
   install "TSM server1" "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
   rudy s21ret
   ```

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 329

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 Oracle Solaris systems"
- "Scenario 1: Configuring the system for database backup on Microsoft Windows systems" on page 133

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 10, "Taking the first steps after upgrade," on page 323.

Scenario 1: Configuring the system for database backup on AIX, HP-UX, Linux, and Oracle 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 `/tsminst1` for the Tivoli Storage Manager server instance directory.

1. Set the Tivoli Storage Manager 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 profile of the user ID. 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. In the `userprofile` file in the `/home/tsminst1/sqllib` directory, add or update the following lines:

AIX Korn or Bash shell:

```
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 Korn or Bash shell:

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

AIX Bourne shell:

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

HP-UX Linux Solaris Bourne shell:

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

AIX C shell:

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

HP-UX Linux Solaris C shell:

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

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

   ```
   . ~/.profile
   ```

   Tip: Ensure that you enter a space after the initial dot (.) character.

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

   ```
   SERVERNAME TSMDBMGR_TSMINST1
   ```

   Remember: The name that you use must match your server instance name.

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 $$_TSMDBMGR_$$
   ```

   Tip: Ensure that you enter the same `tcpport` as the server is using. This is specified in the `dsmserv.opt` file.

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 Oracle Solaris systems" on page 325 for the details.
b. Log in using the root user ID.
c. Source the database manager profile by issuing the following command. Ensure that you enter a dot, a space, and the path to the `db2profile` file. If you do not enter the space, the database backup fails.

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

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

d. Change the API password. Use 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 10, "Taking the first steps after upgrade," on page 323.

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 is to go 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
   ```

Tip: Ensure that you enter the same `tcpport` as the server is using. This is specified in the `dsmserv.opt` file.

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 10, “Taking the first steps after upgrade,” on page 323.

Chapter 5. Scenario 2: Same system, network method

Use this procedure if you are upgrading the IBM Tivoli Storage Manager server on the same system as the V5 server, and you are using the network method to move the data.

The procedure for upgrading the server includes the following tasks:

1. "Scenario 2: Preparing for the upgrade"
2. "Scenario 2: Installing the upgrade utilities" on page 143
3. "Scenario 2: Preparing the database of a V5 server for upgrade" on page 150
4. "Scenario 2: Uninstalling the V5 program before installing V6.3 or later" on page 151
5. "Scenario 2: Installing the V6.3 or later server" on page 153
6. "Scenario 2: Creating the directories and the user ID for the upgraded server instance" on page 158
7. Upgrading the server, by using one of the following methods:
   - "Scenario 2: Upgrading the server by using the upgrade wizard" on page 161
   - "Scenario 2: Upgrading the server manually by using utilities" on page 163
8. The following tasks are completed after the upgrade:
   a. "Verifying access to storage pools on disk" on page 323
   b. "Setting up Solaris services for the server instance" on page 324
   c. "Configuring server options for server database maintenance" on page 324
   d. "Starting the server instance after the upgrade" on page 325
   e. "Registering licenses" on page 330
   f. "Backing up the database after upgrading the server" on page 330
   g. "Verifying the upgraded server" on page 331
   h. "Changing the host name for the Tivoli Storage Manager server" on page 332
   i. "Updating automation" on page 333
   j. "Monitoring the upgraded server" on page 334
   k. "Removing GSKit Version 7 after upgrading to Tivoli Storage Manager V6.3 or later" on page 335

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 V6.3 or later 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 have completed all preparation steps. To understand why it is important to complete all preparation steps, review the procedure for reverting an upgraded server to its previous version.

To prepare for the upgrade, complete the following steps:

1. "Scenario 2: Checking the prerequisites for the upgrade"
2. "Scenario 2: Preparing space for the upgrade process" on page 139
3. "Scenario 2: Modifying the server before the upgrade" on page 139
4. "Scenario 2: Disabling sessions" on page 141
5. "Scenario 2: Backing up storage pools and the server database" on page 141
6. "Scenario 2: Deleting or renaming the NODELOCK file" on page 142
7. "Scenario 2: Backing up configuration information" on page 142
8. "Scenario 2: Creating a summary of database contents" on page 143
9. "Scenario 2: Stopping the server before installing the upgrade" on page 143

Related tasks:

"Postupgrade phase: Reverting from V6.3 or later to the previous V5 server version" on page 345

Scenario 2: Checking the prerequisites for the upgrade

Check your system against requirements for the server.

Restriction: If you are upgrading the Tivoli Storage Manager server on the same system, the system must meet the minimum requirements for both the V5 and V6.3 or later servers.

1. Ensure that the server that you plan to upgrade is at version 5.3.6 or later and that the latest interim fix is installed. To optimize the upgrade process and avoid potential issues, consider upgrading the V5 server to the latest available level and install the latest interim fix for that level. Follow the guidelines in "Determining the appropriate level for a V5 server before an upgrade" on page 37. To download the latest server fix pack and latest interim fix, go to the FTP downloads site at ftp://public.dhe.ibm.com/storage/tivoli-storage-management/maintenance/server/. Then, locate the appropriate version of Tivoli Storage Manager.
2. Ensure that the system where the V5 server is located meets the minimum requirements. Review the information in "Hardware and software requirements for the V5 server system that is being upgraded" on page 16 to determine whether you must update your system before you continue.
3. Ensure that the system where you plan to install the V6.3 or later server meets requirements for the operating system type and level. For the latest information about system requirements, see Tivoli Storage Manager Supported Operating Systems (http://www.ibm.com/support/docview.wss?uid=swg21243309). You can verify the installation environment manually now. Alternatively, wait until the installation files are extracted and then run the prerequisite checker, which automatically verifies the system environment. For more information, see "Running the prerequisite checker" on page 38.

   If you are upgrading Tivoli Storage Manager on a different operating system, a limited set of migration paths is available. For instructions about migrating a server that is running on a z/OS operating system, see Part 3, "Migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 on AIX or Linux on System z," on page 433. For instructions about migrating a server that is running on an AIX, HP-UX, or Solaris operating system, see Part 2, "Migrating Tivoli Storage Manager V5 servers on AIX, HP-UX, or Solaris systems to V6.3.4 on Linux," on page 349.

   Some platforms that were supported for earlier versions of the server are not supported for V6.3 or later. If the server that you want to upgrade is running on one of these platforms, you cannot upgrade your server to V6.3 or later on the same platform. For required platforms, see the following table.

Table 43. Required platforms for upgrading from V5 to V6.3 or later

Platform for V5 server	Required platform for upgrade to V6.3 or later
HP-UX running on a PA-RISC system	HP-UX running on an Intel Itanium system
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system
Linux running on an x86_32 system	Linux running on an x86_64 system
Solaris running on an x86_64 system	Linux running on an x86_64 system
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system

If you are upgrading from Tivoli Storage Manager V5 to V6.3 or later on a new system, restrictions apply. Ensure that you install the V6.3 or later server in a compatible hardware and software environment, as described in the following table.

Table 44. Requirements for upgrading from V5 to V6.3 or later on a new system

V5 server	V6.3 or later server	Comments
AIX running on an IBM POWER system	AIX running on an IBM POWER system	
HP-UX running on an Itanium system	HP-UX running on an Itanium system	
HP-UX running on a PA-RISC system	HP-UX running on an Itanium system	HP-UX running on PA-RISC is not supported for V6.3 or later servers.
Linux running on an IBM POWER system	Linux running on an IBM POWER system	
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system	Linux running on Itanium is not supported for V6.3 or later servers.
Linux running on an x86_32 system	Linux running on an x86_64 system	Linux running on x86_32 is not supported for V6.3 or later servers.
Linux on System z	Linux on System z	

Table 44. Requirements for upgrading from V5 to V6.3 or later on a new system (continued)

V5 server	V6.3 or later server	Comments
Solaris running on an x86_64 system	Operating system depends on the migration method	A V6.3 or later server cannot be installed on a Solaris x86_64 system. However, you can migrate a V5 server that is running on a Solaris x86_64 operating system to V6.3.4 or later on a Linux x86_64 operating system. For instructions, see Part 2, "Migrating Tivoli Storage Manager V5 servers on AIX, HP-UX, or Solaris systems to V6.3.4 on Linux," on page 349. Alternatively, you can migrate the Solaris x86_64 system by installing a V6.3 or later server on any operating system that is supported for V6.3 or later. Then, use Tivoli Storage Manager server **EXPORT** and **IMPORT** commands to move the server from the V5 source system to the V6.3 or later target system.
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system	Windows running on Itanium is not supported for V6.3 or later servers.
Windows running on an x86_32 system	Windows running on an x86_64 system	Windows running on x86_32 is not supported for V6.3 or later servers.
z/OS	AIX or Linux on System z	For instructions, see Part 3, "Migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 on AIX or Linux on System z," on page 433.

4. Verify 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. System memory must be large enough to handle these processes.
   - If you plan to run multiple instances of the V6.3 or later server on the system, each instance requires the memory that is listed for one server. Multiply the memory for one server by the number of instances that are planned for the system.

   For specific information about memory requirements, see the section for your operating system:

Table 45. Memory requirements for the V6.3 or later system

Operating system	Memory requirements
AIX AIX	"Server requirements on AIX systems" on page 20
HP-UX HP-UX	"Server requirements on HP-UX systems" on page 23
Linux Linux	"Server requirements on Linux systems" on page 25
Solaris Solaris	"Server requirements on Solaris systems" on page 32
Windows Windows	"Server requirements on Microsoft Windows systems" on page 34

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 V5 server and the V6.3 or later server.

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

Related concepts:

"Hardware and software requirements for upgrading to the V6.3 or later server" on page 16

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 worksheet that you completed with your information. See "Worksheet for planning space for the V6.3 or later server" on page 44.

Related tasks:

"Estimating total space requirements for the upgrade process and upgraded server" on page 41

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 can be useful 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 is completed and you might see error ANR2034E. This error can be ignored. For more information, see Technote 1408895 (http://www.ibm.com/support/docview.wss?uid=swg21408895). 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 you continue the upgrade process.

2. Review the steps for reverting to the earlier version of the server in the section, "Postupgrade phase: Reverting from V6.3 or later to the previous V5 server version" on page 345.

   If you must revert to the earlier version after the upgrade to V6.3 or later, 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 necessary.

      For example, if you want to be able to revert to the original server for up to 30 days after the upgrade to V6.3 or later, set the **REUSEDELAY** parameter to 31 days. Issue the following administrative command:

      ```
      update stgpool sequential_access_storage_pool reusedelay=31
      ```

   b. For each copy storage pool, set the **RECLAIM** parameter to 100 (meaning 100%). Issue the following administrative command:

      ```
      update stgpool copy_storage_pool reclaim=100
      ```

   c. If you typically use a **DELETE VOLHISTORY** command to delete database backups, ensure that the command does not delete database backups too frequently. The interval between backups should be at least the same number of days that you set for the **REUSEDELAY** period for sequential-access storage pools. For example, to delete database backups every 45 days, issue the following administrative command:

      ```
      delete volhist type=dbbackup todate=-45
      ```

   d. For important clients that use the server, verify that the value for the `schedlogretention` client option is set to retain the client schedule log for a sufficient 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.

      For example, to prune the log every 45 days and save the log entries, add the following option:

      ```
      schedlogretention 45 S
      ```

      AIX HP-UX Linux Solaris Add the option to the `dsm.sys` file within a server stanza.

      Windows Add the option to the client options file, `dsm.opt`.

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. Verify 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 all
   ```

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.

Back up storage pools and the server database by using Tivoli Storage Manager administrative commands:

1. Back up primary storage pools to copy storage pools by using the **BACKUP STGPOOL** command:

   ```
   backup stgpool primary_pool copy_stg
   ```

   where *primary_pool* specifies the primary storage pool and *copy_stg* specifies the copy storage pool. 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. The preferred method is to use a snapshot backup. A snapshot backup is a full database backup that does not interrupt any scheduled database backups. Issue the command:

   ```
   backup db type=dbsnapshot 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 by 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.

   Tip: Consider making two copies of the backup to protect the backup from media failures. Ensure that at least one full database backup is available onsite. If you must restore the database after a failed upgrade, having an onsite backup database saves time.

Scenario 2: Deleting or renaming the NODELOCK file

To ensure that licensing information is updated during the upgrade process, delete or rename the `NODELOCK` file.

The `NODELOCK` file contains the licensing information from the previous Tivoli Storage Manager installation. To ensure that the licensing information is updated during the upgrade process, delete or rename the `NODELOCK` file before starting the upgrade process. This licensing information will be replaced with new licensing information after the upgrade is completed. The `NODELOCK` file is located in the server instance directory.

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, on a different system from the system that is being upgraded or on offline media, such as a CD. The files are required after the installation of the new software version is complete. You also need these files if you must revert to the previous version after the upgrade.

1. Back up device configuration information by using the Tivoli Storage Manager administrative command:

   ```
   backup devconfig filenames=file_name
   ```

   where *file_name* specifies the file in which to store device configuration information.
2. Back up volume history information by using the Tivoli Storage Manager administrative command:

   ```
   backup volhistory filenames=file_name
   ```

   where *file_name* specifies the file in which to store volume history information. 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=dbsnapshot
   ```

   Review the query output to verify that the timestamp for the database backup matches the actual time of the backup.
3. Save copies of the following files, which are in the server instance directory:
   - Server options file, typically named `dsmserv.opt`
   - `dsmserv.dsk`

   Important: The `dsmserv.dsk` file is not available in Tivoli Storage Manager V6.3 or later. Save a copy of the `dsmserv.dsk file` in case you must revert to V5.5.
4. In the server instance directory, look for the accounting log file, `dsmaccnt.log`. If the file exists, save a copy.
5. Back up any scripts that were used to complete 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. Ensure that the files are stored on a different system from the system that is being upgraded, or on offline media.

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 that are being protected, and save the results. For a list of commands, see "Sample commands to run for validation of the database upgrade" on page 535.

Related reference:

"Sample commands to run for validation of the database upgrade" on page 535

Scenario 2: Stopping the server before installing the upgrade

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

To stop the server before you install the upgrade, use Tivoli Storage Manager administrative commands:

1. 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.

   For more information about querying and canceling processes, see the **QUERY PROCESS** and **CANCEL PROCESS** commands in the *Administrator's Reference*.
2. After all sessions and processes are stopped, determine whether any tapes are mounted. Unmount any tapes that are mounted. Use the commands:

   ```
   query mount
   dismount volume volume_name
   ```

   For more information about unmounting tapes, see the **QUERY MOUNT** and **DISMOUNT VOLUME** commands in the *Administrator's Reference*.
3. 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 website.

The preferred method is to install the latest available version of the upgrade utilities. For more information about selecting the version, see "Determining the appropriate level for a V5 server before an upgrade" on page 37.

Use the procedure for your operating system:

- AIX "Scenario 2: Installing the upgrade utilities on AIX systems" on page 144
- HP-UX "Scenario 2: Installing the upgrade utilities on HP-UX systems" on page 145

- Linux "Scenario 2: Installing the upgrade utilities on Linux systems" on page 146
- Solaris "Scenario 2: Installing the upgrade utilities on Oracle Solaris systems" on page 148
- Windows "Scenario 2: Installing the upgrade utilities on Microsoft Windows systems" on page 150

Related concepts:

"**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://public.dhe.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 operating system, 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.
   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://public.dhe.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. Navigate to the directory that corresponds to the processor architecture of the operating system.
6. 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**.

7. Select the **INPUT** device. Specify the directory location of the upgrade utilities package on the system.
8. Select **Software to Install**. Press F4 or Esc+4 for the list of available file sets in the directory.
9. Select the file sets for the upgrade utilities, the device driver, and optionally the language package. The file set for the upgrade utilities is `tivoli.tsmupg.server`. Optional language packages include messages for languages other than US English.
10. Set **COMMIT software updates** to `Yes`. Press F4 or Esc+4.
11. Set **SAVE replaced files** to `No`.
12. Ensure that the default settings for the options in the window for all the selected file sets show `success`.
13. Press Enter, and respond to the `ARE YOU SURE?` question by pressing Enter again. The installation begins.
14. When the installation is complete, exit the SMIT program.
15. 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.
16. After the upgrade utilities are installed, continue at "Scenario 2: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 149.

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://public.dhe.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 operating system, 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.

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. Navigate to the directory that corresponds to the processor architecture of the operating system.
5. 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`.
6. 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.
7. After the upgrade utilities are installed, continue at "Scenario 2: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 149.

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://public.dhe.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 operating system 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.

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. Navigate to the directory that corresponds to the processor architecture of the operating system, for example, `x86_64`.
5. 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.

6. 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.

7. After the upgrade utilities are installed, continue at "Scenario 2: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 149.

Scenario 2: Installing the upgrade utilities on Oracle 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://public.dhe.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 operating system, 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.
   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. Navigate to the directory that corresponds to the processor architecture of the operating system.
6. 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.
7. 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.

8. After the upgrade utilities are installed, continue at "Scenario 2: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems."

Scenario 2: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle 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 **DSMSERV_DIR** variable specifies the installed location of the upgrade utilities. By default, the location is the following directory:

AIX

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

HP-UX Linux Solaris

```
/opt/tivoli/tsm/upgrade/bin
```

Use the appropriate command for your system to set the environment variable for running the utilities. If the shell is in the `ksh` or `bash` family, enter the following command to set the **DSMSERV_DIR** variable:

```
export DSMSERV_DIR=upgrade_utilities_directory
```

If your shell is in the `csh` family, use the following command:

```
setenv DSMSERV_DIR upgrade_utilities_directory
```

where *upgrade_utilities_directory* is the directory where the upgrade utilities are installed.

After you set the environment variables, continue at "Scenario 2: Preparing the database of a V5 server for upgrade" on page 150.

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://public.dhe.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.
   d. Optional: To install messages in a language other than English, install the language package that your installation requires.
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."

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 you extract 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.

   Important: The `dsmserv.dsk` file is not available in Tivoli Storage Manager V6.3 or later. Save a copy of the `dsmserv.dsk file` in case you must revert to V5.5.
4. 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. 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
```

5. 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.
6. Ensure that the prepare operation is completed successfully before you continue 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 that is being upgraded is a V5.3 or V5.4 server, you might need to restore the database by 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 513

Scenario 2: Uninstalling the V5 program before installing V6.3 or later

For best results when you are upgrading the server to V6.3 or later on the same system where the V5 server is located, uninstall the V5 server program before installing the V6.3 or later server program.

Use the procedure for your operating system:

- AIX "Scenario 2: Uninstalling the V5 program on AIX systems" on page 152
- HP-UX "Scenario 2: Uninstalling the V5 program on HP-UX systems" on page 152

- Linux "Scenario 2: Uninstalling the V5 program on Linux systems"
- Solaris "Scenario 2: Uninstalling the V5 program on Oracle Solaris systems" on page 153
- Windows "Scenario 2: Uninstalling the V5 program on Microsoft Windows systems" on page 153

Scenario 2: Uninstalling the V5 program on AIX systems

AIX

Uninstall the V5 server, server license, and device driver, if available. 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 V6.3 or later server" on page 153.

Scenario 2: Uninstalling the V5 program on HP-UX systems

HP-UX

Uninstall the V5 server, server license, and device driver, if available. 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 V6.3 or later server" on page 153.

Scenario 2: Uninstalling the V5 program on Linux systems

Linux

Uninstall the V5 server, server license, and device driver, if available. 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 commands:

```
rpm -e TIVsm-server
rpm -e TIVsm-license
rpm -e TIVsm-tsmscsi
```

After the V5 server program is uninstalled, continue at "Scenario 2: Installing the V6.3 or later server."

Scenario 2: Uninstalling the V5 program on Oracle Solaris systems

Solaris

Uninstall the V5 server, server license, and device driver, if available. 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 V6.3 or later server."

Scenario 2: Uninstalling the V5 program on Microsoft Windows systems

Windows

Uninstall the V5 server, server license, and device driver, if available. 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 server component, and then click **Remove**. Repeat for the license and the device driver.

   If you see any messages that suggest that you restart the system, ignore them until the selected Tivoli Storage Manager components are removed.

After the V5 server program is uninstalled, continue at "Scenario 2: Installing the V6.3 or later server."

Scenario 2: Installing the V6.3 or later server

You can use an installation wizard to install the server, or install the server by 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.

Upgrading the server from V5 to V6.3 or later

Starting with V6.3, the IBM Tivoli Storage Manager server installation wizard has a separate license agreement for the following products:

- Tivoli Storage Manager
- IBM Tivoli Storage Manager Extended Edition
- IBM System Storage Archive Manager
- IBM Tivoli Storage Manager for Storage Area Networks

Before you upgrade the Tivoli Storage Manager server, ensure that you retain the installation media from the base release of the installed server. If you installed Tivoli Storage Manager from a DVD, ensure that the DVD is available. If you installed Tivoli Storage Manager from a downloaded package, ensure that the downloaded files are available. If the upgrade fails, and the server license module is uninstalled, the installation media from the server base release are required to reinstall the license.

To verify the system environment and install the server, complete the following steps:

1. For some operating systems, you must check certain system settings before you begin the 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 installation wizard cannot run on your configuration.
   It will now stop.
   For more details about installation error logs,
   enter the phrase "installation log files" in the
   Search field at this site:

   http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3
   ```

   Solaris

   Before you install 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=swg24030521

      Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030527

      System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030530

   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=swg24030522

      Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030528

      System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030531

   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. Ensure that the system environment meets installation requirements. You can verify the requirements manually or run the prerequisite checker. To run the prerequisite checker, complete the following steps:

a. AIX HP-UX Linux Solaris Issue this command to start the prerequisite checker with a graphical interface:

```
./prereqcheck.bin
```

Alternatively, issue this command to start the prerequisite checker with the console method:

```
./prereqcheck.bin -i console
```

b. Windows Issue this command to start the prerequisite checker with a graphical interface:

```
prereqcheck.exe
```

Alternatively, issue this command to start the prerequisite checker with the console method:

```
prereqcheck.exe -i console
```

c. Select the language for the prerequisite checker user interface.

d. In the welcome and disclaimer panels, review the statements and accept them.

If the Prerequisite Results panel shows that your workstation successfully passed the checks, you are ready to start the installation. If an error message is shown in the Prerequisite Results panel, make the required corrections before continuing with the installation. For more information about the prerequisite checker, see "Running the prerequisite checker" on page 38.

6. 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
```

For information about translations that are available for the server, see the server language locales section. For information about the silent installation of the server, see the section on installing Tivoli Storage Manager in silent mode in the *Installation Guide*.

7. Select the language for your installation and follow the wizard, selecting **Next** to step through the wizard.

a. You must accept the license agreement to proceed. Select the product that you are entitled to use and a license agreement is displayed. You can select only one product on the page. If you select Tivoli Storage Manager, Tivoli Storage Manager Extended Edition, or System Storage Archive Manager, you are asked if you will be using LAN-free or library sharing. If you select YES, you

must accept the Tivoli Storage Manager for Storage Area Networks license. This is in addition to the license for the product that you chose on the previous page.

b. Select the components that you want to install. Components include the server, languages, license, device driver, and storage agent. There is no default, so you must make a selection. If you previously installed a server, ensure that you select the same directory when you install a language package, license, or device driver. If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver. A server and a storage agent cannot be installed on the same workstation. For information about other components that you can choose to install, see the *Installation Guide*.

The Tivoli Storage Manager client application programming interface (API), DB2 Version 9.7, and Global Security Kit (GSKit) 8 are automatically installed when you select the server component.

8. 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 you continue to the next step.

   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`)

9. Download and apply any applicable fixes that have been released for the server. Go to the product support site at http://www.ibm.com/support/entry/portal/Downloads. Search for server updates.

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

10. 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 that are based on the recommendations in the results from the utility. You might have to restart the system.

    For information about the utility and about modifying kernel parameters, see http://pic.dhe.ibm.com/infocenter/db2luw/v9r7. 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 C, “HP-UX system resource requirements,” on page 543.

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://pic.dhe.ibm.com/infocenter/db2luw/v9r7. To find the information, enter a search string such as `modifying kernel parameters`, in the **Search** field at this site.

To run Tivoli Storage Manager with DB2, you might need to set kernel parameter values higher than the suggested minimum values and make other changes to the system. For more details, see the section on tuning kernel parameters for Linux systems in the *Installation Guide*.

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 that are based on the recommendations in the results from the utility. You might have to restart the system.

For information about the utility and about modifying kernel parameters, see http://pic.dhe.ibm.com/infocenter/db2luw/v9r7. 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.

Related concepts:

Appendix E, “Services associated with the Tivoli Storage Manager server,” on page 549

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.

Review the information about planning space for the server before you complete this task. See “Worksheet for planning space for the V6.3 or later server” on page 44.

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: In the user ID, only lowercase letters (a-z), numerals (0-9), and the underscore character (_) can be used. The user ID and group name must comply with the following rules:

- The length must be 8 characters or less.
- The user ID and group name cannot start with *ibm*, *sql*, *sys*, or a numeral.
- The user ID and group name cannot be *user*, *admin*, *guest*, *public*, *local*, or any SQL reserved word.

For example, create user ID `tsminst1` in group `tsmsrvrs`. The following examples show how to create this user ID and group by 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
    -s /bin/ksh tsminst1
# passwd tsminst1
```

Linux

```
# groupadd tsmsrvrs
# useradd -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, by using the new user ID and password. Use an interactive login program, such as telnet, so that you are prompted for the password and can change it if necessary.

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

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 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 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 30 characters or less, and cannot start with *ibm*, *sql*, *sys*, or a

numeral. The user ID and group name cannot be *user*, *admin*, *guest*, *public*, *local*, or any SQL reserved word.

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 operating system commands to add the new user ID to the Administrators groups:

```
net localgroup Administrators user_ID /add
net localgroup DB2ADMNS user_ID /add
```

c. Log in to your system, by using the new user ID and password.

d. For all directories that were created for the server instance, ensure that the user ID for the server instance has read/write access. The directories to check include the instance directory and all database and log directories.

2. Create the directories that the server requires. Ensure that you are logged in under the new user ID that you created.

   You need a unique, empty directory for each item in the following table. Create the database directories, the active log directory, and the archive log directory on different physical volumes. For space requirements, see "Worksheet for planning space for the V6.3 or later server" on page 44.

   AIX HP-UX Linux Solaris

Table 46. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which will contain files for this server instance, including the server options file	`mkdir /home/user_ID/tsminst1`	

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

Active log directory	`mkdir /home/user_ID/tsmlog`	
Archive log directory	`mkdir /home/user_ID/tsmarchlog`	
Optional: Directory for the log mirror for the active log	`mkdir /home/user_ID/tsmlogmirror`	
Optional: Secondary archive log directory, which is the failover location for the archive log	`mkdir /home/user_ID/tsmarchlogfailover`	

Windows

Table 47. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which will contain files for this server instance, including the server options file	`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, which is the failover location for the archive log	`mkdir k:\tsm\archlogfailover`	

When a server is initially created, with the **DSMSERV FORMAT** utility or with the configuration wizard, a server database and recovery log are created. In addition, files are created to hold database information that is used by the database manager.

3. Create additional logical volumes and mount the volumes on the directories that were created in the previous step.

Continue the upgrade process by using one of the following topics:

"Scenario 2: Upgrading the server by using the upgrade wizard"

"Scenario 2: Upgrading the server manually by using utilities" on page 163

Related tasks:

"Planning space for the upgrade process and the upgraded server" on page 39

Related reference:

"Server naming best practices" on page 72

Scenario 2: Upgrading the server by 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 V6.3 or later 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 V6.3 or later 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. Also ensure that the SSH daemon service has access rights for connecting to the system by using `localhost`.
  - 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 where you installed the V6.3 or later server program must have the Windows server message block (SMB) protocol enabled. 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 the V5 server is on a different system than the V6.3 or later server, that system must also have SMB enabled.
- You must be able to log on to the system that has SMB enabled by using either the user ID that you created for the server instance, or another user ID that exists on the system. When using the wizard, you must provide the user ID and password to access the system.

2. Windows If the system is running on Windows Server 2008 or Windows Vista, complete the following steps to disable User Account Control:
   a. Ensure that the Remote Registry in Windows Services is started, and ports 445, 137, and 139 are unblocked in the firewall.
   b. Configure both the framework server and the targets as members of a Windows domain. Use a user account in that domain, or in a trusted domain, when you connect to the target.
   c. Connect to the target workstation by enabling and using the built-in administrator account. To enable the built-in administrator account, click **Control Panel** > **Administrative Tools** > **Local Security Policy** > **Security Settings** > **Local Policies** > **Security Options**. Double-click the **Accounts: Administrator account status** section. Select **Enable** and click **OK**.
   d. Click **Control Panel** > **Administrative Tools** > **Local Security Policy** > **Security Settings** > **Local Policies** > **Security Options**. Double-click the **User Account Control: Run all administrators in Admin Approval Mode** section. Select **Disable** and click **OK**.
3. Start the upgrade wizard, **dsmupgdx**, from the V6.3 or later 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"
   ```

4. 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 10, "Taking the first steps after upgrade," on page 323.

Scenario 2: Upgrading the server manually by using utilities

Use the utilities to upgrade the server by using a command interface.

Before you begin the upgrade procedure, you must complete all preceding steps to prepare for the upgrade. Ensure that you have installed the upgrade utilities, installed the V6.3 or later server program, and created 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 168
3. "Scenario 2: Creating a Windows service for the server instance" on page 169
4. "Scenario 2: Configuring the system for database backup" on page 170

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 10, "Taking the first steps after upgrade," on page 323.

Related concepts:

"**DSMUPGRD** upgrade utilities" on page 15

Scenario 2: Creating and formatting the new database

Create the server instance and format files for an empty V6.3 or later database.

1. Log on to the system where you installed the V6.3 or later program.

   AIX HP-UX Linux Solaris

   Log in by using the root user ID. Verify the following items:

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

     The instance directory stores the following core files that are generated by the Tivoli Storage Manager server:

     – The server options file, `dsmserv.opt`
     – The server key database file, `cert.kdb`, and the `.arm` files, which are used by clients and other servers to import the Secure Sockets Layer certificates of the server
     – Device configuration file, if the `DEVCONFIG` server option does not specify a fully qualified name
     – Volume history file, if the `VOLUMEHISTORY` server option does not specify a fully qualified name
     – Volumes for **DEVTYPE=FILE** storage pools, if the directory for the device class is not fully specified, or not fully qualified

  - User exits
  - Trace output, if it is not fully qualified
- A shell configuration file, for example, `.profile`, exists in the home directory. The root user and instance user ID must have write permission to this file. For more information, go to the DB2 Information Center (http://pic.dhe.ibm.com/infocenter/db2luw/v9r7), and search for information about Linux and UNIX environment variable settings.

Windows

Log on as an administrator.

2. Create a Tivoli Storage Manager instance by 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:

AIX HP-UX Linux Solaris

```
/opt/tivoli/tsm/db2/instance/db2icrt -a server -s ese -u
instance_name instance_name
```

For example, if the user ID for this instance is tsminst1, use the following command to create the instance:

AIX HP-UX Linux Solaris

```
/opt/tivoli/tsm/db2/instance/db2icrt -a server -s ese -u
tsminst1 tsminst1
```

Remember: From this point on, use this new user ID when you configure the 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 V6.3 or later server; this ID is the instance user ID.

```
db2icrt -s ese -u user_account instance_name
```

For example, if the user account is *tsminst1* and the server instance is *Server1*, enter the following command:

```
db2icrt -s ese -u tsminst1 server1
```

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 V6.3 or later server. 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 by using the user ID that owns the V6.3 or later 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, which is 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 V6.3 or later server, copy the files into the following directory:

   AIX HP-UX Linux Solaris `/tsminst1`

   Windows `d:\tsm\server1`

   Ensure that the user ID that owns the V6.3 or later 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 V6.3 or later. For the list of deleted options, see Table 36 on page 69.
   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 V6.3 or later. 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 /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. Modify the library path to use the version of the IBM Global Security Kit (GSKit) that is installed with the Tivoli Storage Manager server:

AIX Issue the following command:

```
export LIBPATH=/usr/opt/ibm/gsk8_64/lib64:$LIBPATH
```

AIX HP-UX Linux Solaris You must update the following files to set the library path when DB2 or the Tivoli Storage Manager server is started:

- *instance_directory*`/sqllib/usercshrc`
- *instance_directory*`/sqllib/userprofile`

For the *instance_directory*`/sqllib/usercshrc` file, add the following lines:

- AIX

```
setenv LIBPATH /usr/opt/ibm/gsk8_64/lib64:$LIBPATH
```

- HP-UX Solaris

```
setenv LD_LIBRARY_PATH /opt/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
```

- Linux

```
setenv LD_LIBRARY_PATH /usr/local/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
```

For the *instance_directory*`/sqllib/userprofile` file, add the following lines:

- AIX

```
LIBPATH=/usr/opt/ibm/gsk8_64/lib64:$LIBPATH
export LIBPATH
```

- HP-UX Solaris

```
LD_LIBRARY_PATH=/opt/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
export LD_LIBRARY_PATH
```

- Linux

```
LD_LIBRARY_PATH=/usr/local/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
export LD_LIBRARY_PATH
```

Verify the library path settings and ensure that the GSKit version is 8.0.14.14 or later. Issue the following commands:

- AIX

  ```
  echo $LIBPATH
  gsk8capicmd_64 -version
  gsk8ver_64
  ```

- HP-UX Linux Solaris

  ```
  echo $LD_LIBRARY_PATH
  gsk8capicmd_64 -version
  gsk8ver_64
  ```

If the GSKit version is not 8.0.14.14 or later, you must reinstall the Tivoli Storage Manager server. The reinstallation ensures that the correct GSKit version is available.

8. Complete this step to set the server code page.

   Set the DB2CODEPAGE system environment variable to 819 for each server instance. Before you issue the **DSMSERV LOADFORMAT** command, log on to the system as the server instance owner and issue this command:

   ```
   db2set -i instance_name DB2CODEPAGE=819
   ```

   For example: AIX HP-UX Linux Solaris

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

   Windows

   ```
   db2set -i server1 DB2CODEPAGE=819
   ```

9. Change to the instance directory that you created for the server.
10. 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 16 GB (16384 MB, the default size), issue the following command, on one line:

    ```
    /opt/tivoli/tsm/server/bin/dsmserv loadformat \
    dbdir=/tsmdb001,/tsmdb002,/tsmdb003,/tsmdb004 \
    activelogsize=16384 activelogdirectory=/tsmlog \
    mirrorlogdirectory=/tsmlogmirror archlogdirectory=/tsmarchlog
    ```

    Windows

    For example, to get an active log size of 16 GB (16384 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=16384 activelogdirectory=h:\tsm\log
    mirrorlogdirectory=j:\tsm\logmirror archlogdirectory=i:\tsm\archlog
    ```

    If the server that you are upgrading is not Server1, 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=16384 activelogdirectory=h:\tsm\log
    mirrorlogdirectory=j:\tsm\logmirror archlogdirectory=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).

11. 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 41

Related reference:

DSMSERV LOADFORMAT (Format a database)

"Deleted server commands, utilities, and options" on page 67

Scenario 2: Moving the server database over a network

Move the database by starting the insertion process for the V6.3 or later server to accept the server database. Then, start 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 V6.3 or later 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 V6.3 or later server and directing the process output to `insert.out`, by 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. Some time might pass during which no messages are issued. During this time, DB2 operations are running in the background. Optional: To verify that operations are continuing as expected, monitor the CPU and I/O usage for the server process and the corresponding DB2 process.

2. Monitor the output of the **DSMSERV INSERTDB** 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 V6.3 or later 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 act 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 519

"DSMSERV INSERTDB (Move a server database into an empty database)" on page 529

Scenario 2: Creating a Windows service for the server instance

Windows

A Windows service is created for the Tivoli Storage Manager V6.3 or later 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 by using the Tivoli Storage Manager server instance name and password in the service name. Issue the following command:

```
install "TSM server_instance_name"
 "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
instance_owner instance_owner_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.

instance_owner is the instance owner account; this account will own the service.

instance_owner_password is the password for the instance owner account.

Example

To install the Windows service for the server1 server instance, enter the following command on one line. The example uses `rudy` as the instance owner and `s21ret` as the password for the instance owner account.

```
install "TSM server1" "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
rudy s21ret
```

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 329

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 Oracle Solaris systems"
- "Scenario 2: Configuring the system for database backup on Microsoft Windows systems" on page 173

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 10, "Taking the first steps after upgrade," on page 323.

Scenario 2: Configuring the system for database backup on AIX, HP-UX, Linux, and Oracle 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 `/tsminst1` for the Tivoli Storage Manager server instance directory.

1. Set the Tivoli Storage Manager 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 profile of the user ID. 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. In the `userprofile` file in the `/home/tsminst1/sqllib` directory, add or update the following lines:

AIX Korn or Bash shell:

```
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 Korn or Bash shell:

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

AIX Bourne shell:

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

HP-UX Linux Solaris Bourne shell:

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

AIX C shell:

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

HP-UX Linux Solaris C shell:

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

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

```
. ~/.profile
```

Tip: Ensure that you enter a space after the initial dot (.) character.

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

```
SERVERNAME TSMDBMGR_TSMINST1
```

Remember: The name that you use must match your server instance name.

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 $$_TSMDBMGR_$$
```

Tip: Ensure that you enter the same `tcpport` as the server is using. This is specified in the `dsmserv.opt` file.

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 Oracle Solaris systems" on page 325 for the details.
   b. Log in using the root user ID.
   c. Source the database manager profile by issuing the following command. Ensure that you enter a dot, a space, and the path to the `db2profile` file. If you do not enter the space, the database backup fails.

      Important: Solaris Switch to the Korn shell (/bin/ksh) before issuing the following command.
      ```
      . /home/tsminst1/sqllib/db2profile
      ```
   d. Change the API password. Use 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 10, "Taking the first steps after upgrade," on page 323.

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 is to go 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
   ```

   Tip: Ensure that you enter the same `tcpport` as the server is using. This is specified in the `dsmserv.opt` file.

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 10, “Taking the first steps after

upgrade," on page 323.

Chapter 6. Scenario 3: New system, media method

Use this procedure if you are upgrading the IBM Tivoli Storage Manager server on a different system than your V5 server, and you are using the media method to move the data.

The procedure for upgrading the server includes the following tasks:

1. "Scenario 3: Preparing for the upgrade"
2. "Scenario 3: Installing the upgrade utilities" on page 184
3. Upgrading the server, by using one of the following methods:
   - "Scenario 3: Upgrading the server by using the upgrade wizard" on page 191
   - "Scenario 3: Upgrading the server manually by using utilities" on page 201
4. The following tasks are completed after the upgrade:
   a. "Verifying access to storage pools on disk" on page 323
   b. "Setting up Solaris services for the server instance" on page 324
   c. "Configuring server options for server database maintenance" on page 324
   d. "Starting the server instance after the upgrade" on page 325
   e. "Registering licenses" on page 330
   f. "Backing up the database after upgrading the server" on page 330
   g. "Verifying the upgraded server" on page 331
   h. "Changing the host name for the Tivoli Storage Manager server" on page 332
   i. "Updating automation" on page 333
   j. "Monitoring the upgraded server" on page 334
   k. "Removing GSKit Version 7 after upgrading to Tivoli Storage Manager V6.3 or later" on page 335

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 V6.3 or later 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 have completed all preparation steps. To understand why it is important to complete all preparation steps, review the procedure for reverting an upgraded server to its previous version.

To prepare for the upgrade, complete the following steps:

1. "Scenario 3: Checking the prerequisites for the upgrade" on page 176
2. "Scenario 3: Preparing space for the upgrade process" on page 179
3. "Scenario 3: Modifying the server before the upgrade" on page 180
4. "Scenario 3: Disabling sessions" on page 181
5. "Scenario 3: Backing up storage pools and the server database" on page 182

6. "Scenario 3: Deleting or renaming the NODELOCK file" on page 182
7. "Scenario 3: Backing up configuration information" on page 182
8. "Scenario 3: Creating a summary of database contents" on page 183
9. "Scenario 3: Stopping the server before installing the upgrade" on page 183

Related tasks:

"Postupgrade phase: Reverting from V6.3 or later to the previous V5 server version" on page 345

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 and that the latest interim fix is installed. To optimize the upgrade process and avoid potential issues, consider upgrading the V5 server to the latest available level and install the latest interim fix for that level. Follow the guidelines in "Determining the appropriate level for a V5 server before an upgrade" on page 37. To download the latest server fix pack and latest interim fix, go to the FTP downloads site at ftp://public.dhe.ibm.com/storage/tivoli-storage-management/maintenance/server/. Then, locate the appropriate version of Tivoli Storage Manager.
2. Ensure that the system where the V5 server is located meets the minimum requirements. Review the information in "Hardware and software requirements for the V5 server system that is being upgraded" on page 16 to determine whether you must update your system before you continue.
3. Ensure that the system where you plan to install the V6.3 or later server meets requirements for the operating system type and level. For the latest information about system requirements, see Tivoli Storage Manager Supported Operating Systems (http://www.ibm.com/support/docview.wss?uid=swg21243309). You can verify the installation environment manually now. Alternatively, wait until the installation files are extracted and then run the prerequisite checker, which automatically verifies the system environment. For more information, see "Running the prerequisite checker" on page 38.

   If you are upgrading Tivoli Storage Manager on a different operating system, a limited set of migration paths is available. For instructions about migrating a server that is running on a z/OS operating system, see Part 3, "Migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 on AIX or Linux on System z," on page 433. For instructions about migrating a server that is running on an AIX, HP-UX, or Solaris operating system, see Part 2, "Migrating Tivoli Storage Manager V5 servers on AIX, HP-UX, or Solaris systems to V6.3.4 on Linux," on page 349.

   Some platforms that were supported for earlier versions of the server are not supported for V6.3 or later. If the server that you want to upgrade is running on one of these platforms, you cannot upgrade your server to V6.3 or later on the same platform. For required platforms, see the following table.

Table 48. Required platforms for upgrading from V5 to V6.3 or later

Platform for V5 server	Required platform for upgrade to V6.3 or later
HP-UX running on a PA-RISC system	HP-UX running on an Intel Itanium system
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system
Linux running on an x86_32 system	Linux running on an x86_64 system
Solaris running on an x86_64 system	Linux running on an x86_64 system

Table 48. Required platforms for upgrading from V5 to V6.3 or later (continued)

Platform for V5 server	Required platform for upgrade to V6.3 or later
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system

If you are upgrading from Tivoli Storage Manager V5 to V6.3 or later on a new system, restrictions apply. Ensure that you install the V6.3 or later server in a compatible hardware and software environment, as described in the following table.

Table 49. Requirements for upgrading from V5 to V6.3 or later on a new system

V5 server	V6.3 or later server	Comments
AIX running on an IBM POWER system	AIX running on an IBM POWER system	
HP-UX running on an Itanium system	HP-UX running on an Itanium system	
HP-UX running on a PA-RISC system	HP-UX running on an Itanium system	HP-UX running on PA-RISC is not supported for V6.3 or later servers.
Linux running on an IBM POWER system	Linux running on an IBM POWER system	
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system	Linux running on Itanium is not supported for V6.3 or later servers.
Linux running on an x86_32 system	Linux running on an x86_64 system	Linux running on x86_32 is not supported for V6.3 or later servers.
Linux on System z	Linux on System z	

Table 49. Requirements for upgrading from V5 to V6.3 or later on a new system (continued)

V5 server	V6.3 or later server	Comments
Solaris running on an x86_64 system	Operating system depends on the migration method	A V6.3 or later server cannot be installed on a Solaris x86_64 system. However, you can migrate a V5 server that is running on a Solaris x86_64 operating system to V6.3.4 or later on a Linux x86_64 operating system. For instructions, see Part 2, "Migrating Tivoli Storage Manager V5 servers on AIX, HP-UX, or Solaris systems to V6.3.4 on Linux," on page 349. Alternatively, you can migrate the Solaris x86_64 system by installing a V6.3 or later server on any operating system that is supported for V6.3 or later. Then, use Tivoli Storage Manager server **EXPORT** and **IMPORT** commands to move the server from the V5 source system to the V6.3 or later target system.
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system	Windows running on Itanium is not supported for V6.3 or later servers.
Windows running on an x86_32 system	Windows running on an x86_64 system	Windows running on x86_32 is not supported for V6.3 or later servers.
z/OS	AIX or Linux on System z	For instructions, see Part 3, "Migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 on AIX or Linux on System z," on page 433.

4. Verify that the system memory meets the server requirements. If you plan to run multiple instances of the V6.3 or later server on the system, each instance requires the memory that is listed for one server. Multiply the memory for one server by the number of instances that are planned for the system.

   For specific information about memory requirements, see the section for your operating system:

Table 50. Memory requirements for the V6.3 or later system

Operating system	Memory requirements
AIX AIX	"Server requirements on AIX systems" on page 20
HP-UX HP-UX	"Server requirements on HP-UX systems" on page 23

Table 50. Memory requirements for the V6.3 or later system (continued)

Operating system	Memory requirements
Linux Linux	"Server requirements on Linux systems" on page 25
Solaris Solaris	"Server requirements on Solaris systems" on page 32
Windows Windows	"Server requirements on Microsoft Windows systems" on page 34

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, ensure that the hardware is 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 V6.3 or later server" on page 16

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 worksheet that you completed with your information. See "Worksheet for planning space for the V6.3 or later server" on page 44.
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. View information about devices classes by issuing the command:

      ```
      query devclass format=detailed
      ```

      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.

For example, if the device class is FILE, ensure that the directory has sufficient space for your environment. If the device class is TAPE, ensure that sufficient scratch volumes are available for your environment.

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 V6.3 or later 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 41

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 can be useful 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 is completed and you might see error ANR2034E. This error can be ignored. For more information, see Technote 1408895 (http://www.ibm.com/support/docview.wss?uid=swg21408895). 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 you continue the upgrade process.

2. Review the steps for reverting to the earlier version of the server in the section, "Postupgrade phase: Reverting from V6.3 or later to the previous V5 server version" on page 345.

If you must revert to the earlier version after the upgrade to V6.3 or later, 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 necessary.

For example, if you want to be able to revert to the original server for up to 30 days after the upgrade to V6.3 or later, set the **REUSEDELAY** parameter to 31 days. Issue the following administrative command:

```
update stgpool sequential_access_storage_pool reusedelay=31
```

b. For each copy storage pool, set the **RECLAIM** parameter to 100 (meaning 100%). Issue the following administrative command:

```
update stgpool copy_storage_pool reclaim=100
```

c. If you typically use a **DELETE VOLHISTORY** command to delete database backups, ensure that the command does not delete database backups too frequently. The interval between backups should be at least the same number of days that you set for the **REUSEDELAY** period for sequential-access storage pools. For example, to delete database backups every 45 days, issue the following administrative command:

```
delete volhist type=dbbackup todate=-45
```

d. For important clients that use the server, verify that the value for the `schedlogretention` client option is set to retain the client schedule log for a sufficient 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.

For example, to prune the log every 45 days and save the log entries, add the following option:

```
schedlogretention 45 S
```

AIX HP-UX Linux Solaris Add the option to the `dsm.sys` file within a server stanza.

Windows Add the option to the client options file, `dsm.opt`.

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. Verify 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 all
```

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.

Back up storage pools and the server database by using Tivoli Storage Manager administrative commands:

1. Back up primary storage pools to copy storage pools by using the **BACKUP STGPOOL** command:

   ```
   backup stgpool primary_pool copy_stg
   ```

   where *primary_pool* specifies the primary storage pool and *copy_stg* specifies the copy storage pool. 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. The preferred method is to use a snapshot backup. A snapshot backup is a full database backup that does not interrupt any scheduled database backups. Issue the command:

   ```
   backup db type=dbsnapshot 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 by 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.

   Tip: Consider making two copies of the backup to protect the backup from media failures. Ensure that at least one full database backup is available onsite. If you must restore the database after a failed upgrade, having an onsite backup database saves time.

Scenario 3: Deleting or renaming the NODELOCK file

To ensure that licensing information is updated during the upgrade process, delete or rename the `NODELOCK` file.

The `NODELOCK` file contains the licensing information from the previous Tivoli Storage Manager installation. To ensure that the licensing information is updated during the upgrade process, delete or rename the `NODELOCK` file before starting the upgrade process. This licensing information will be replaced with new licensing information after the upgrade is completed. The `NODELOCK` file is located in the server instance directory.

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, on a different system from the system that is being upgraded or on offline media, such as a CD. The files are required after the installation of the new software version is complete. You also need these files if you must revert to the previous version after the upgrade.

1. Back up device configuration information by using the Tivoli Storage Manager administrative command:

   ```
   backup devconfig filenames=file_name
   ```

where *file_name* specifies the file in which to store device configuration information.

2. Back up volume history information by using the Tivoli Storage Manager administrative command:

   ```
   backup volhistory filenames=file_name
   ```

   where *file_name* specifies the file in which to store volume history information. 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=dbsnapshot
   ```

   Review the query output to verify that the timestamp for the database backup matches the actual time of the backup.

3. Save copies of the following files, which are in the server instance directory:
   - Server options file, typically named `dsmserv.opt`
   - `dsmserv.dsk`

   Important: The `dsmserv.dsk` file is not available in Tivoli Storage Manager V6.3 or later. Save a copy of the `dsmserv.dsk file` in case you must revert to V5.5.

4. In the server instance directory, look for the accounting log file, `dsmaccnt.log`. If the file exists, save a copy.
5. Back up any scripts that were used to complete 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. Ensure that the files are stored on a different system from the system that is being upgraded, or on offline media.

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 that are being protected, and save the results. For a list of commands, see "Sample commands to run for validation of the database upgrade" on page 535.

Related reference:

"Sample commands to run for validation of the database upgrade" on page 535

Scenario 3: Stopping the server before installing the upgrade

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

To stop the server before you install the upgrade, use Tivoli Storage Manager administrative commands:

1. 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.

For more information about querying and canceling processes, see the **QUERY PROCESS** and **CANCEL PROCESS** commands in the *Administrator's Reference*.

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

```
query mount
dismount volume volume_name
```

For more information about unmounting tapes, see the **QUERY MOUNT** and **DISMOUNT VOLUME** commands in the *Administrator's Reference*.

3. 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 website.

The preferred method is to install the latest available version of the upgrade utilities. For more information about selecting the version, see "Determining the appropriate level for a V5 server before an upgrade" on page 37.

Use the procedure for your operating system:

- AIX "Scenario 3: Installing the upgrade utilities on AIX systems"
- HP-UX "Scenario 3: Installing the upgrade utilities on HP-UX systems" on page 186
- Linux "Scenario 3: Installing the upgrade utilities on Linux systems" on page 187
- Solaris "Scenario 3: Installing the upgrade utilities on Oracle Solaris systems" on page 188
- Windows "Scenario 3: Installing the upgrade utilities on Microsoft Windows systems" on page 190

Related concepts:

"**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://public.dhe.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 operating system, 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.

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://public.dhe.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. Navigate to the directory that corresponds to the processor architecture of the operating system.
6. 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**.
7. Select the **INPUT** device. Specify the directory location of the upgrade utilities package on the system.
8. Select **Software to Install**. Press F4 or Esc+4 for the list of available file sets in the directory.
9. Select the file sets for the upgrade utilities, the device driver, and optionally the language package. The file set for the upgrade utilities is `tivoli.tsmupg.server`. Optional language packages include messages for languages other than US English.
10. Set **COMMIT software updates** to `Yes`. Press F4 or Esc+4.
11. Set **SAVE replaced files** to `No`.
12. Ensure that the default settings for the options in the window for all the selected file sets show `success`.
13. Press Enter, and respond to the `ARE YOU SURE?` question by pressing Enter again. The installation begins.
14. When the installation is complete, exit the SMIT program.
15. 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.

16. After the upgrade utilities are installed, continue at "Scenario 3: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 189

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://public.dhe.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 operating system, 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.
   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. Navigate to the directory that corresponds to the processor architecture of the operating system.
5. 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`.
6. 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.

7. After the upgrade utilities are installed, continue at "Scenario 3: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 189

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://public.dhe.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 operating system 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.
   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. Navigate to the directory that corresponds to the processor architecture of the operating system, for example, `x86_64`.
5. 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.
6. 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.

7. After the upgrade utilities are installed, continue at "Scenario 3: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 189

Scenario 3: Installing the upgrade utilities on Oracle 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://public.dhe.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 operating system, 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.
   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. Navigate to the directory that corresponds to the processor architecture of the operating system.

6. 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.
7. 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.
8. After the upgrade utilities are installed, continue at "Scenario 3: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems"

Scenario 3: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle 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 **DSMSERV_DIR** variable specifies the installed location of the upgrade utilities. By default, the location is the following directory:

AIX

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

HP-UX Linux Solaris

```
/opt/tivoli/tsm/upgrade/bin
```

Use the appropriate command for your system to set the environment variable for running the utilities. If the shell is in the `ksh` or `bash` family, enter the following command to set the **DSMSERV_DIR** variable:

```
export DSMSERV_DIR=upgrade_utilities_directory
```

If your shell is in the `csh` family, use the following command:

```
setenv DSMSERV_DIR upgrade_utilities_directory
```

where *upgrade_utilities_directory* is the directory where the upgrade utilities are installed.

After you set the environment variables, continue the upgrade process using one of the following topics:

- "Scenario 3: Upgrading the server by using the upgrade wizard" on page 191
- "Scenario 3: Upgrading the server manually by using utilities" on page 201

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://public.dhe.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.
   d. Optional: To install messages in a language other than English, install the language package that your installation requires.
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 by using the upgrade wizard" on page 191
- "Scenario 3: Upgrading the server manually by using utilities" on page 201

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 by 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 V6.3 or later 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 V6.3 or later 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 V6.3 or later 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 199

Scenario 3, wizard: Installing the V6.3 or later server

You can use an installation wizard to install the server, or install the server by 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.

Starting with V6.3, the IBM Tivoli Storage Manager server installation wizard has a separate license agreement for the following products:

- Tivoli Storage Manager
- IBM Tivoli Storage Manager Extended Edition
- IBM System Storage Archive Manager
- IBM Tivoli Storage Manager for Storage Area Networks

To verify the system environment and install the server, complete the following steps:

1. For some operating systems, you must check certain system settings before you begin the 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 installation wizard cannot run on your configuration.
It will now stop.
For more details about installation error logs,
enter the phrase "installation log files" in the
Search field at this site:

http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3
```

Solaris

Before you install 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=swg24030521

   Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030527

   System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030530

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=swg24030522

Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030528

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030531

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. Ensure that the system environment meets installation requirements. You can verify the requirements manually or run the prerequisite checker. To run the prerequisite checker, complete the following steps:

   a. AIX HP-UX Linux Solaris Issue this command to start the prerequisite checker with a graphical interface:

   ```
   ./prereqcheck.bin
   ```

   Alternatively, issue this command to start the prerequisite checker with the console method:

   ```
   ./prereqcheck.bin -i console
   ```

   b. Windows Issue this command to start the prerequisite checker with a graphical interface:

   ```
   prereqcheck.exe
   ```

   Alternatively, issue this command to start the prerequisite checker with the console method:

   ```
   prereqcheck.exe -i console
   ```

   c. Select the language for the prerequisite checker user interface.

   d. In the welcome and disclaimer panels, review the statements and accept them.

   If the Prerequisite Results panel shows that your workstation successfully passed the checks, you are ready to start the installation. If an error message is shown in the Prerequisite Results panel, make the required corrections before continuing with the installation. For more information about the prerequisite checker, see "Running the prerequisite checker" on page 38.

6. 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`

For information about translations that are available for the server, see the server language locales section. For information about the silent installation of the server, see the section on installing Tivoli Storage Manager in silent mode in the *Installation Guide*.

7. Select the language for your installation and follow the wizard, selecting **Next** to step through the wizard.

   a. You must accept the license agreement to proceed. Select the product that you are entitled to use and a license agreement is displayed. You can select only one product on the page. If you select Tivoli Storage Manager, Tivoli Storage Manager Extended Edition, or System Storage Archive Manager, you are asked if you will be using LAN-free or library sharing. If you select YES, you must accept the Tivoli Storage Manager for Storage Area Networks license. This is in addition to the license for the product that you chose on the previous page.
   b. Select the components that you want to install. Components include the server, languages, license, device driver, and storage agent. There is no default, so you must make a selection. If you previously installed a server, ensure that you select the same directory when you install a language package, license, or device driver. If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver. A server and a storage agent cannot be installed on the same workstation. For information about other components that you can choose to install, see the *Installation Guide*.

   The Tivoli Storage Manager client application programming interface (API), DB2 Version 9.7, and Global Security Kit (GSKit) 8 are automatically installed when you select the server component.
8. 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 you continue to the next step.

   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`)
9. Download and apply any applicable fixes that have been released for the server. Go to the product support site at http://www.ibm.com/support/entry/portal/Downloads. Search for server updates.

   You can also check the FTP downloads site: ftp://public.dhe.ibm.com/storage/tivoli-storage-management/maintenance/server
10. 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 that are based on the recommendations in the results from the utility. You might have to restart the system.

For information about the utility and about modifying kernel parameters, see http://pic.dhe.ibm.com/infocenter/db2luw/v9r7. 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 C, "HP-UX system resource requirements," on page 543.

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://pic.dhe.ibm.com/infocenter/db2luw/v9r7. To find the information, enter a search string such as `modifying kernel parameters`, in the **Search** field at this site.

To run Tivoli Storage Manager with DB2, you might need to set kernel parameter values higher than the suggested minimum values and make other changes to the system. For more details, see the section on tuning kernel parameters for Linux systems in the *Installation Guide*.

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 that are based on the recommendations in the results from the utility. You might have to restart the system.

For information about the utility and about modifying kernel parameters, see http://pic.dhe.ibm.com/infocenter/db2luw/v9r7. 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.

Related concepts:

Appendix E, "Services associated with the Tivoli Storage Manager server," on page 549

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.

Review the information about planning space for the server before you complete this task. See "Worksheet for planning space for the V6.3 or later server" on page 44.

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: In the user ID, only lowercase letters (a-z), numerals (0-9), and the underscore character (_) can be used. The user ID and group name must comply with the following rules:

      - The length must be 8 characters or less.
      - The user ID and group name cannot start with *ibm*, *sql*, *sys*, or a numeral.
      - The user ID and group name cannot be *user*, *admin*, *guest*, *public*, *local*, or any SQL reserved word.

      For example, create user ID `tsminst1` in group `tsmsrvrs`. The following examples show how to create this user ID and group by 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
          -s /bin/ksh tsminst1
      # passwd tsminst1
      ```

      Linux

      ```
      # groupadd tsmsrvrs
      # useradd -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, by using the new user ID and password. Use an interactive login program, such as telnet, so that you are prompted for the password and can change it if necessary.
c. If a configuration profile does not exist for the user ID, create the file. For example, create a `.profile` file if you are using the Korn shell (ksh).

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 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 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 30 characters or less, and cannot start with *ibm*, *sql*, *sys*, or a numeral. The user ID and group name cannot be *user*, *admin*, *guest*, *public*, *local*, or any SQL reserved word.

   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 operating system commands to add the new user ID to the Administrators groups:

   ```
   net localgroup Administrators user_ID /add
   net localgroup DB2ADMNS user_ID /add
   ```
c. Log in to your system, by using the new user ID and password.
d. For all directories that were created for the server instance, ensure that the user ID for the server instance has read/write access. The directories to check include the instance directory and all database and log directories.

2. Create the directories that the server requires. Ensure that you are logged in under the new user ID that you created.

   You need a unique, empty directory for each item in the following table. Create the database directories, the active log directory, and the archive log directory on different physical volumes. For space requirements, see "Worksheet for planning space for the V6.3 or later server" on page 44.

AIX HP-UX Linux Solaris

Table 51. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which will contain files for this server instance, including the server options file	`mkdir /home/user_ID/tsminst1`	

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

Active log directory	`mkdir /home/user_ID/tsmlog`	
Archive log directory	`mkdir /home/user_ID/tsmarchlog`	
Optional: Directory for the log mirror for the active log	`mkdir /home/user_ID/tsmlogmirror`	
Optional: Secondary archive log directory, which is the failover location for the archive log	`mkdir /home/user_ID/tsmarchlogfailover`	

Windows

Table 52. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which will contain files for this server instance, including the server options file	`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, which is the failover location for the archive log	`mkdir k:\tsm\archlogfailover`	

When a server is initially created, with the **DSMSERV FORMAT** utility or with the configuration wizard, a server database and recovery log are created. In addition, files are created to hold database information that is used by the database manager.

3. Create additional logical volumes and mount the volumes on the directories that were created in the previous step.

Related tasks:

"Planning space for the upgrade process and the upgraded server" on page 39

Related reference:

"Server naming best practices" on page 72

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 V6.3 or later 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 V6.3 or later 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 V6.3 or later 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. Also ensure that the SSH daemon service has access rights for connecting to the system by using `localhost`.
  - Remote shell (rsh).
  - Remote Execution Protocol (REXEC).
- You must be able to log in to the V6.3 or later 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 where you installed the V6.3 or later server program must have the Windows server message block (SMB) protocol enabled. 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 the V5 server is on a different system than the V6.3 or later server, that system must also have SMB enabled.
- You must be able to log on to the system that has SMB enabled by using either the user ID that you created for the server instance, or another user ID that exists on the system. When using the wizard, you must provide the user ID and password to access the system.

2. Windows If the system is running on Windows Server 2008 or Windows Vista, complete the following steps to disable User Account Control:
   a. Ensure that the Remote Registry in Windows Services is started, and ports 445, 137, and 139 are unblocked in the firewall.
   b. Configure both the framework server and the targets as members of a Windows domain. Use a user account in that domain, or in a trusted domain, when you connect to the target.
   c. Connect to the target workstation by enabling and using the built-in administrator account. To enable the built-in administrator account, click **Control Panel** > **Administrative Tools** > **Local Security Policy** > **Security Settings** > **Local Policies** > **Security Options**. Double-click the **Accounts: Administrator account status** section. Select **Enable** and click **OK**.
   d. Click **Control Panel** > **Administrative Tools** > **Local Security Policy** > **Security Settings** > **Local Policies** > **Security Options**. Double-click the **User Account Control: Run all administrators in Admin Approval Mode** section. Select **Disable** and click **OK**.
3. Start the upgrade wizard, **dsmupgdx**, from the V6.3 or later 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"
   ```

4. 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 10, "Taking the first steps after upgrade," on page 323.

Scenario 3: Upgrading the server manually by using utilities

Use the utilities to upgrade the server by 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"
2. "Scenario 3: Extracting the data to media" on page 202
3. Scenario 3: Installing the V6.3 or later 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 211
6. "Scenario 3: Loading the extracted data into the new database" on page 216
7. "Scenario 3: Creating a Windows service for the server instance" on page 218
8. "Scenario 3: Configuring the system for database backup" on page 219

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 10, "Taking the first steps after upgrade," on page 323.

Related concepts:

"The manifest file for the data extraction to media" on page 521

"**DSMUPGRD** upgrade utilities" on page 15

Scenario 3: Preparing the database of a V5 server for upgrade

Before you extract 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.

   Important: The `dsmserv.dsk` file is not available in Tivoli Storage Manager V6.3 or later. Save a copy of the `dsmserv.dsk file` in case you must revert to V5.5.
4. 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. 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
```

5. 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.
6. Ensure that the prepare operation is completed successfully before you continue 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 that is being upgraded is a V5.3 or V5.4 server, you might need to restore the database by 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 513

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 521

Related tasks:

"Scenario 3: Preparing space for the upgrade process" on page 179

Related reference:

"DSMUPGRD EXTRACTDB (Extract data from a V5 server database)" on page 519

Scenario 3, manual: Installing the V6.3 or later server

You can use an installation wizard to install the server, or install the server by 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.

To verify the system environment and install the server, complete the following steps:

1. For some operating systems, you must check certain system settings before you begin the 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 installation wizard cannot run on your configuration.
   It will now stop.
   For more details about installation error logs,
   enter the phrase "installation log files" in the
   Search field at this site:

   http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3
   ```

   Solaris

   Before you install 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=swg24030521

Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030527

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030530

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=swg24030522

Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030528

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030531

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. Ensure that the system environment meets installation requirements. You can verify the requirements manually or run the prerequisite checker. To run the prerequisite checker, complete the following steps:

a. AIX HP-UX Linux Solaris Issue this command to start the prerequisite checker with a graphical interface:

```
./prereqcheck.bin
```

Alternatively, issue this command to start the prerequisite checker with the console method:

```
./prereqcheck.bin -i console
```

b. Windows Issue this command to start the prerequisite checker with a graphical interface:

```
prereqcheck.exe
```

Alternatively, issue this command to start the prerequisite checker with the console method:

```
prereqcheck.exe -i console
```

c. Select the language for the prerequisite checker user interface.

d. In the welcome and disclaimer panels, review the statements and accept them.

If the Prerequisite Results panel shows that your workstation successfully passed the checks, you are ready to start the installation. If an error message is shown in the Prerequisite Results panel, make the required corrections before continuing with the installation. For more information about the prerequisite checker, see "Running the prerequisite checker" on page 38.

6. 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
```

For information about translations that are available for the server, see the server language locales section. For information about the silent installation of the server, see the section on installing Tivoli Storage Manager in silent mode in the *Installation Guide*.

7. Select the language for your installation and follow the wizard, selecting **Next** to step through the wizard.

a. You must accept the license agreement to proceed. Select the product that you are entitled to use and a license agreement is displayed. You can select only one product on the page. If you select Tivoli Storage Manager, Tivoli Storage Manager Extended Edition, or System Storage Archive Manager, you are asked if you will be using LAN-free or library sharing. If you select YES, you must accept the Tivoli Storage Manager for Storage Area Networks license. This is in addition to the license for the product that you chose on the previous page.

b. Select the components that you want to install. Components include the server, languages, license, device driver, and storage agent. There is no default, so you must make a selection. If you previously installed a server, ensure that you select the same directory when you install a language package, license, or device

driver. If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver. A server and a storage agent cannot be installed on the same workstation. For information about other components that you can choose to install, see the *Installation Guide*.

The Tivoli Storage Manager client application programming interface (API), DB2 Version 9.7, and Global Security Kit (GSKit) 8 are automatically installed when you select the server component.

8. 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 you continue to the next step.

   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`)

9. Download and apply any applicable fixes that have been released for the server. Go to the product support site at http://www.ibm.com/support/entry/portal/Downloads. Search for server updates.

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

10. 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 that are based on the recommendations in the results from the utility. You might have to restart the system.

    For information about the utility and about modifying kernel parameters, see http://pic.dhe.ibm.com/infocenter/db2luw/v9r7. 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 C, “HP-UX system resource requirements,” on page 543.

    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://pic.dhe.ibm.com/infocenter/db2luw/v9r7. To find the

information, enter a search string such as `modifying kernel parameters`, in the **Search** field at this site.

To run Tivoli Storage Manager with DB2, you might need to set kernel parameter values higher than the suggested minimum values and make other changes to the system. For more details, see the section on tuning kernel parameters for Linux systems in the *Installation Guide*.

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 that are based on the recommendations in the results from the utility. You might have to restart the system.

For information about the utility and about modifying kernel parameters, see http://pic.dhe.ibm.com/infocenter/db2luw/v9r7. 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.

Related concepts:

Appendix E, "Services associated with the Tivoli Storage Manager server," on page 549

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.

Review the information about planning space for the server before you complete this task. See "Worksheet for planning space for the V6.3 or later server" on page 44.

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: In the user ID, only lowercase letters (a-z), numerals (0-9), and the underscore character (_) can be used. The user ID and group name must comply with the following rules:

      - The length must be 8 characters or less.
      - The user ID and group name cannot start with *ibm*, *sql*, *sys*, or a numeral.
      - The user ID and group name cannot be *user*, *admin*, *guest*, *public*, *local*, or any SQL reserved word.

For example, create user ID `tsminst1` in group `tsmsrvrs`. The following examples show how to create this user ID and group by 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
    -s /bin/ksh tsminst1
# passwd tsminst1
```

Linux

```
# groupadd tsmsrvrs
# useradd -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, by using the new user ID and password. Use an interactive login program, such as telnet, so that you are prompted for the password and can change it if necessary.

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

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 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 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 30 characters or less, and cannot start with *ibm*, *sql*, *sys*, or a numeral. The user ID and group name cannot be *user*, *admin*, *guest*, *public*, *local*, or any SQL reserved word.

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 operating system commands to add the new user ID to the Administrators groups:

```
net localgroup Administrators user_ID /add
net localgroup DB2ADMNS user_ID /add
```

c. Log in to your system, by using the new user ID and password.

d. For all directories that were created for the server instance, ensure that the user ID for the server instance has read/write access. The directories to check include the instance directory and all database and log directories.

2. Create the directories that the server requires. Ensure that you are logged in under the new user ID that you created.

   You need a unique, empty directory for each item in the following table. Create the database directories, the active log directory, and the archive log directory on different physical volumes. For space requirements, see "Worksheet for planning space for the V6.3 or later server" on page 44.

   AIX HP-UX Linux Solaris

Table 53. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which will contain files for this server instance, including the server options file	`mkdir /home/user_ID/tsminst1`	

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

Active log directory	`mkdir /home/user_ID/tsmlog`	
Archive log directory	`mkdir /home/user_ID/tsmarchlog`	
Optional: Directory for the log mirror for the active log	`mkdir /home/user_ID/tsmlogmirror`	
Optional: Secondary archive log directory, which is the failover location for the archive log	`mkdir /home/user_ID/tsmarchlogfailover`	

Windows

Table 54. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which will contain files for this server instance, including the server options file	`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, which is the failover location for the archive log	`mkdir k:\tsm\archlogfailover`	

When a server is initially created, with the **DSMSERV FORMAT** utility or with the configuration wizard, a server database and recovery log are created. In addition, files are created to hold database information that is used by the database manager.

3. Create additional logical volumes and mount the volumes on the directories that were created in the previous step.

Related tasks:

"Planning space for the upgrade process and the upgraded server" on page 39

Related reference:

"Server naming best practices" on page 72

Scenario 3: Creating and formatting the new database

Create the server instance and format files for an empty V6.3 or later database.

1. Log on to the system where you installed the V6.3 or later program.

AIX HP-UX Linux Solaris

Log in by using the root user ID. Verify the following items:

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

  The instance directory stores the following core files that are generated by the Tivoli Storage Manager server:

  – The server options file, `dsmserv.opt`
  – The server key database file, `cert.kdb`, and the `.arm` files, which are used by clients and other servers to import the Secure Sockets Layer certificates of the server
  – Device configuration file, if the `DEVCONFIG` server option does not specify a fully qualified name

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

- A shell configuration file, for example, `.profile`, exists in the home directory. The root user and instance user ID must have write permission to this file. For more information, go to the DB2 Information Center (http://pic.dhe.ibm.com/infocenter/db2luw/v9r7), and search for information about Linux and UNIX environment variable settings.

Windows

Log on as an administrator.

2. Create a Tivoli Storage Manager instance by 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:

AIX HP-UX Linux Solaris

```
/opt/tivoli/tsm/db2/instance/db2icrt -a server -s ese -u
instance_name instance_name
```

For example, if the user ID for this instance is tsminst1, use the following command to create the instance:

AIX HP-UX Linux Solaris

```
/opt/tivoli/tsm/db2/instance/db2icrt -a server -s ese -u
tsminst1 tsminst1
```

Remember: From this point on, use this new user ID when you configure the 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 V6.3 or later server; this ID is the instance user ID.

```
db2icrt -s ese -u user_account instance_name
```

For example, if the user account is *tsminst1* and the server instance is *Server1*, enter the following command:

```
db2icrt -s ese -u tsminst1 server1
```

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 V6.3 or later server. 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 by using the user ID that owns the V6.3 or later 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, which is 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 V6.3 or later server, copy the files into the following directory:

   AIX HP-UX Linux Solaris `/tsminst1`

   Windows `d:\tsm\server1`

   Ensure that the user ID that owns the V6.3 or later 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 V6.3 or later. For the list of deleted options, see Table 36 on page 69.
   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 V6.3 or later. 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 /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. Modify the library path to use the version of the IBM Global Security Kit (GSKit) that is installed with the Tivoli Storage Manager server:

   AIX Issue the following command:

   ```
   export LIBPATH=/usr/opt/ibm/gsk8_64/lib64:$LIBPATH
   ```

   AIX HP-UX Linux Solaris You must update the following files to set the library path when DB2 or the Tivoli Storage Manager server is started:

   - *instance_directory*`/sqllib/usercshrc`
   - *instance_directory*`/sqllib/userprofile`

   For the *instance_directory*`/sqllib/usercshrc` file, add the following lines:

   - AIX

     ```
     setenv LIBPATH /usr/opt/ibm/gsk8_64/lib64:$LIBPATH
     ```
   - HP-UX Solaris

     ```
     setenv LD_LIBRARY_PATH /opt/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
     ```
   - Linux

     ```
     setenv LD_LIBRARY_PATH /usr/local/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
     ```

   For the *instance_directory*`/sqllib/userprofile` file, add the following lines:

   - AIX

     ```
     LIBPATH=/usr/opt/ibm/gsk8_64/lib64:$LIBPATH
     export LIBPATH
     ```
   - HP-UX Solaris

     ```
     LD_LIBRARY_PATH=/opt/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
     export LD_LIBRARY_PATH
     ```
   - Linux

     ```
     LD_LIBRARY_PATH=/usr/local/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
     export LD_LIBRARY_PATH
     ```

Verify the library path settings and ensure that the GSKit version is 8.0.14.14 or later. Issue the following commands:

- AIX

```
echo $LIBPATH
gsk8capicmd_64 -version
gsk8ver_64
```

- HP-UX Linux Solaris

```
echo $LD_LIBRARY_PATH
gsk8capicmd_64 -version
gsk8ver_64
```

If the GSKit version is not 8.0.14.14 or later, you must reinstall the Tivoli Storage Manager server. The reinstallation ensures that the correct GSKit version is available.

8. Complete this step to set the server code page.

   Set the DB2CODEPAGE system environment variable to 819 for each server instance. Before you issue the **DSMSERV LOADFORMAT** command, log on to the system as the server instance owner and issue this command:

   ```
   db2set -i instance_name DB2CODEPAGE=819
   ```

   For example: AIX HP-UX Linux Solaris

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

   Windows

   ```
   db2set -i server1 DB2CODEPAGE=819
   ```

9. Change to the instance directory that you created for the server.
10. 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 16 GB (16384 MB, the default size), issue the following command, on one line:

    ```
    /opt/tivoli/tsm/server/bin/dsmserv loadformat \
    dbdir=/tsmdb001,/tsmdb002,/tsmdb003,/tsmdb004 \
    activelogsize=16384 activelogdirectory=/tsmlog \
    mirrorlogdirectory=/tsmlogmirror archlogdirectory=/tsmarchlog
    ```

    Windows

    For example, to get an active log size of 16 GB (16384 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=16384 activelogdirectory=h:\tsm\log
    mirrorlogdirectory=j:\tsm\logmirror archlogdirectory=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=16384 activelogdirectory=h:\tsm\log
mirrorlogdirectory=j:\tsm\logmirror archlogdirectory=i:\tsm\archlog
```

11. 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 41

Related reference:

DSMSERV LOADFORMAT (Format a database)

"Deleted server commands, utilities, and options" on page 67

Scenario 3: Loading the extracted data into the new database

After you format an empty database by using the **DSMSERV LOADFORMAT** utility, load the data that you extracted from the original server database.

Ensure that the following requirements are met before you begin to load the data:

- 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 V6.3 or later server. The device must be physically attached to the system. The permissions must be set to grant access to the media for the user ID that owns the V6.3 or later server instance.

Complete the following steps:

1. Verify that the V6.3 or later 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 by using a FILE or DISK device class, complete the following steps:
     a. Log on to the system by using the root user ID.
     b. Ensure that the user ID that owns the V6.3 or later server (the instance user ID) has ownership or read/write permission for the extracted files.
2. Log on with the instance user ID on the system where you installed the V6.3 or later server.
3. Copy the manifest file that was created by the extraction process to the V6.3 or later system. Ensure that the instance user ID has ownership or read/write permission for the manifest file.
4. On the V6.3 or later server, complete the following steps:
   a. Verify that the server options file from the V5 server includes the `DEVCONFIG` option, and that the option specifies the full path of the device configuration file.
   b. Verify that the device configuration file from the V5 server is available in the location that is specified by the `DEVCONFIG` option.
   c. Verify that the permissions on the device configuration file allow read access for the instance user ID.

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 V6.3 or later 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 the contents of the manifest file and edit the file if necessary:
   a. Ensure that the device names in the manifest file are valid for the V6.3 or later system. Device names for the same device might be different on V5 and V6 systems.
   b. Ensure that the manifest file contains a list of volumes to be used when the extracted data is loaded into the new database. For example, if the manifest file contains a list of volumes that belong 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 V6.3 or later 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 error messages, warning messages, and any items that you might need to address. The system displays interim statistics about the process of loading the database. However, there might be time periods when no messages are issued. During this time, DB2 operations are running in the background. The length of time that the process runs depends on the size of the database. For more information, see "Example: Estimating the upgrade time based on the database size" on page 45.

   Optional: Verify that the database is being loaded by monitoring the processor and I/O usage for the server process and the corresponding DB2 process. For example, issue the following command to monitor the process:

   ```
   tail -f insert.out
   ```

   Tip: Windows 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.

   A message in the output of the **DSMSERV INSERTDB** command indicates the status 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.`
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 521

Related reference:

"DSMSERV INSERTDB (Move a server database into an empty database)" on page 529

Scenario 3: Creating a Windows service for the server instance

Windows

A Windows service is created for the Tivoli Storage Manager V6.3 or later 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 by using the Tivoli Storage Manager server instance name and password in the service name. Issue the following command:

   ```
   install "TSM server_instance_name"
    "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
   instance_owner instance_owner_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.

   instance_owner is the instance owner account; this account will own the service.

   instance_owner_password is the password for the instance owner account.

   Example

   To install the Windows service for the server1 server instance, enter the following command on one line. The example uses `rudy` as the instance owner and `s21ret` as the password for the instance owner account.

   ```
   install "TSM server1" "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
   rudy s21ret
   ```

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 329

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 Oracle Solaris systems"
- "Scenario 3: Configuring the system for database backup on Microsoft Windows systems" on page 221

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 10, "Taking the first steps after upgrade," on page 323.

Scenario 3: Configuring the system for database backup on AIX, HP-UX, Linux, and Oracle 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 `/tsminst1` for the Tivoli Storage Manager server instance directory.

1. Set the Tivoli Storage Manager 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 profile of the user ID. 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. In the `userprofile` file in the `/home/tsminst1/sqllib` directory, add or update the following lines:

AIX Korn or Bash shell:

```
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 Korn or Bash shell:

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

AIX Bourne shell:

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

HP-UX Linux Solaris Bourne shell:

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

AIX C shell:

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

HP-UX Linux Solaris C shell:

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

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

   ```
   . ~/.profile
   ```

   Tip: Ensure that you enter a space after the initial dot (.) character.

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

   ```
   SERVERNAME TSMDBMGR_TSMINST1
   ```

   Remember: The name that you use must match your server instance name.

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 $$_TSMDBMGR_$$
   ```

   Tip: Ensure that you enter the same `tcpport` as the server is using. This is specified in the `dsmserv.opt` file.

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 Oracle Solaris systems" on page 325 for the details.
b. Log in using the root user ID.
c. Source the database manager profile by issuing the following command. Ensure that you enter a dot, a space, and the path to the `db2profile` file. If you do not enter the space, the database backup fails.

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

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

d. Change the API password. Use 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 10, "Taking the first steps after upgrade," on page 323.

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 is to go 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
   ```

Tip: Ensure that you enter the same `tcpport` as the server is using. This is specified in the `dsmserv.opt` file.

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 10, “Taking the first steps after upgrade,” on page 323.

Chapter 7. Scenario 4: New system, network method

Use this procedure if you are upgrading the IBM Tivoli Storage Manager server on a different system than your V5 server, and you are using the network method to move the data.

The procedure for upgrading the server includes the following tasks:

1. "Scenario 4: Preparing for the upgrade"
2. "Scenario 4: Installing the upgrade utilities" on page 231
3. Upgrading the server, by using one of the following methods:
   - "Scenario 4: Upgrading the server by using the upgrade wizard" on page 238
   - "Scenario 4: Upgrading the server manually by using utilities" on page 248
4. The following tasks are completed after the upgrade:
   a. "Verifying access to storage pools on disk" on page 323
   b. "Setting up Solaris services for the server instance" on page 324
   c. "Configuring server options for server database maintenance" on page 324
   d. "Starting the server instance after the upgrade" on page 325
   e. "Registering licenses" on page 330
   f. "Backing up the database after upgrading the server" on page 330
   g. "Verifying the upgraded server" on page 331
   h. "Changing the host name for the Tivoli Storage Manager server" on page 332
   i. "Updating automation" on page 333
   j. "Monitoring the upgraded server" on page 334
   k. "Removing GSKit Version 7 after upgrading to Tivoli Storage Manager V6.3 or later" on page 335

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 V6.3 or later 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 have completed all preparation steps. To understand why it is important to complete all preparation steps, review the procedure for reverting an upgraded server to its previous version.

To prepare for the upgrade, complete the following steps:

1. "Scenario 4: Checking the prerequisites for the upgrade" on page 224
2. "Scenario 4: Preparing space for the upgrade process" on page 227
3. "Scenario 4: Modifying the server before the upgrade" on page 227
4. "Scenario 4: Disabling sessions" on page 228
5. "Scenario 4: Backing up storage pools and the server database" on page 229

6. "Scenario 4: Deleting or renaming the NODELOCK file" on page 229
7. "Scenario 4: Backing up configuration information" on page 230
8. "Scenario 4: Creating a summary of database contents" on page 230
9. "Scenario 4: Stopping the server before installing the upgrade" on page 231

Related tasks:

"Postupgrade phase: Reverting from V6.3 or later to the previous V5 server version" on page 345

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 and that the latest interim fix is installed. To optimize the upgrade process and avoid potential issues, consider upgrading the V5 server to the latest available level and install the latest interim fix for that level. Follow the guidelines in "Determining the appropriate level for a V5 server before an upgrade" on page 37. To download the latest server fix pack and latest interim fix, go to the FTP downloads site at ftp://public.dhe.ibm.com/storage/tivoli-storage-management/maintenance/server/. Then, locate the appropriate version of Tivoli Storage Manager.
2. Ensure that the system where the V5 server is located meets the minimum requirements. Review the information in "Hardware and software requirements for the V5 server system that is being upgraded" on page 16 to determine whether you must update your system before you continue.
3. Ensure that the system where you plan to install the V6.3 or later server meets requirements for the operating system type and level. For the latest information about system requirements, see Tivoli Storage Manager Supported Operating Systems (http://www.ibm.com/support/docview.wss?uid=swg21243309). You can verify the installation environment manually now. Alternatively, wait until the installation files are extracted and then run the prerequisite checker, which automatically verifies the system environment. For more information, see "Running the prerequisite checker" on page 38.

   If you are upgrading Tivoli Storage Manager on a different operating system, a limited set of migration paths is available. For instructions about migrating a server that is running on a z/OS operating system, see Part 3, "Migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 on AIX or Linux on System z," on page 433. For instructions about migrating a server that is running on an AIX, HP-UX, or Solaris operating system, see Part 2, "Migrating Tivoli Storage Manager V5 servers on AIX, HP-UX, or Solaris systems to V6.3.4 on Linux," on page 349.

   Some platforms that were supported for earlier versions of the server are not supported for V6.3 or later. If the server that you want to upgrade is running on one of these platforms, you cannot upgrade your server to V6.3 or later on the same platform. For required platforms, see the following table.

Table 55. Required platforms for upgrading from V5 to V6.3 or later

Platform for V5 server	Required platform for upgrade to V6.3 or later
HP-UX running on a PA-RISC system	HP-UX running on an Intel Itanium system
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system
Linux running on an x86_32 system	Linux running on an x86_64 system
Solaris running on an x86_64 system	Linux running on an x86_64 system

Table 55. Required platforms for upgrading from V5 to V6.3 or later (continued)

Platform for V5 server	Required platform for upgrade to V6.3 or later
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system

If you are upgrading from Tivoli Storage Manager V5 to V6.3 or later on a new system, restrictions apply. Ensure that you install the V6.3 or later server in a compatible hardware and software environment, as described in the following table.

Table 56. Requirements for upgrading from V5 to V6.3 or later on a new system

V5 server	V6.3 or later server	Comments
AIX running on an IBM POWER system	AIX running on an IBM POWER system	
HP-UX running on an Itanium system	HP-UX running on an Itanium system	
HP-UX running on a PA-RISC system	HP-UX running on an Itanium system	HP-UX running on PA-RISC is not supported for V6.3 or later servers.
Linux running on an IBM POWER system	Linux running on an IBM POWER system	
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system	Linux running on Itanium is not supported for V6.3 or later servers.
Linux running on an x86_32 system	Linux running on an x86_64 system	Linux running on x86_32 is not supported for V6.3 or later servers.
Linux on System z	Linux on System z	

Table 56. Requirements for upgrading from V5 to V6.3 or later on a new system (continued)

V5 server	V6.3 or later server	Comments
Solaris running on an x86_64 system	Operating system depends on the migration method	A V6.3 or later server cannot be installed on a Solaris x86_64 system. However, you can migrate a V5 server that is running on a Solaris x86_64 operating system to V6.3.4 or later on a Linux x86_64 operating system. For instructions, see Part 2, "Migrating Tivoli Storage Manager V5 servers on AIX, HP-UX, or Solaris systems to V6.3.4 on Linux," on page 349. Alternatively, you can migrate the Solaris x86_64 system by installing a V6.3 or later server on any operating system that is supported for V6.3 or later. Then, use Tivoli Storage Manager server **EXPORT** and **IMPORT** commands to move the server from the V5 source system to the V6.3 or later target system.
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system	Windows running on Itanium is not supported for V6.3 or later servers.
Windows running on an x86_32 system	Windows running on an x86_64 system	Windows running on x86_32 is not supported for V6.3 or later servers.
z/OS	AIX or Linux on System z	For instructions, see Part 3, "Migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 on AIX or Linux on System z," on page 433.

4. Verify that the system memory meets the server requirements. If you plan to run multiple instances of the V6.3 or later server on the system, each instance requires the memory that is listed for one server. Multiply the memory for one server by the number of instances that are planned for the system.

   For specific information about memory requirements, see the section for your operating system:

Table 57. Memory requirements for the V6.3 or later system

Operating system	Memory requirements
AIX AIX	"Server requirements on AIX systems" on page 20
HP-UX HP-UX	"Server requirements on HP-UX systems" on page 23

Table 57. Memory requirements for the V6.3 or later system (continued)

Operating system	Memory requirements
Linux Linux	"Server requirements on Linux systems" on page 25
Solaris Solaris	"Server requirements on Solaris systems" on page 32
Windows Windows	"Server requirements on Microsoft Windows systems" on page 34

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, ensure that the hardware is 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 V6.3 or later server" on page 16

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 worksheet that you completed with your information. See "Worksheet for planning space for the V6.3 or later server" on page 44.

Related tasks:

"Estimating total space requirements for the upgrade process and upgraded server" on page 41

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 can be useful 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 is completed and you might see error ANR2034E. This error can be ignored. For more information, see Technote 1408895 (http://www.ibm.com/support/docview.wss?uid=swg21408895). 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 you continue the upgrade process.

2. Review the steps for reverting to the earlier version of the server in the section, "Postupgrade phase: Reverting from V6.3 or later to the previous V5 server version" on page 345.

   If you must revert to the earlier version after the upgrade to V6.3 or later, 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 necessary.

      For example, if you want to be able to revert to the original server for up to 30 days after the upgrade to V6.3 or later, set the **REUSEDELAY** parameter to 31 days. Issue the following administrative command:

      ```
      update stgpool sequential_access_storage_pool reusedelay=31
      ```
   b. For each copy storage pool, set the **RECLAIM** parameter to 100 (meaning 100%). Issue the following administrative command:

      ```
      update stgpool copy_storage_pool reclaim=100
      ```
   c. If you typically use a **DELETE VOLHISTORY** command to delete database backups, ensure that the command does not delete database backups too frequently. The interval between backups should be at least the same number of days that you set for the **REUSEDELAY** period for sequential-access storage pools. For example, to delete database backups every 45 days, issue the following administrative command:

      ```
      delete volhist type=dbbackup todate=-45
      ```
   d. For important clients that use the server, verify that the value for the `schedlogretention` client option is set to retain the client schedule log for a sufficient 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.

      For example, to prune the log every 45 days and save the log entries, add the following option:

      ```
      schedlogretention 45 S
      ```

      AIX HP-UX Linux Solaris Add the option to the `dsm.sys` file within a server stanza.

      Windows Add the option to the client options file, `dsm.opt`.

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. Verify 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 all
   ```

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.

Back up storage pools and the server database by using Tivoli Storage Manager administrative commands:

1. Back up primary storage pools to copy storage pools by using the **BACKUP STGPOOL** command:

   ```
   backup stgpool primary_pool copy_stg
   ```

   where *primary_pool* specifies the primary storage pool and *copy_stg* specifies the copy storage pool. 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. The preferred method is to use a snapshot backup. A snapshot backup is a full database backup that does not interrupt any scheduled database backups. Issue the command:

   ```
   backup db type=dbsnapshot 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 by 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.

   Tip: Consider making two copies of the backup to protect the backup from media failures. Ensure that at least one full database backup is available onsite. If you must restore the database after a failed upgrade, having an onsite backup database saves time.

Scenario 4: Deleting or renaming the NODELOCK file

To ensure that licensing information is updated during the upgrade process, delete or rename the `NODELOCK` file.

The `NODELOCK` file contains the licensing information from the previous Tivoli Storage Manager installation. To ensure that the licensing information is updated during the upgrade process, delete or rename the `NODELOCK` file before starting the upgrade process. This licensing information will be replaced with new licensing information after the upgrade is completed. The `NODELOCK` file is located in the server instance directory.

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, on a different system from the system that is being upgraded or on offline media, such as a CD. The files are required after the installation of the new software version is complete. You also need these files if you must revert to the previous version after the upgrade.

1. Back up device configuration information by using the Tivoli Storage Manager administrative command:

   ```
   backup devconfig filenames=file_name
   ```

   where *file_name* specifies the file in which to store device configuration information.
2. Back up volume history information by using the Tivoli Storage Manager administrative command:

   ```
   backup volhistory filenames=file_name
   ```

   where *file_name* specifies the file in which to store volume history information. 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=dbsnapshot
   ```

   Review the query output to verify that the timestamp for the database backup matches the actual time of the backup.
3. Save copies of the following files, which are in the server instance directory:
   - Server options file, typically named `dsmserv.opt`
   - `dsmserv.dsk`

   Important: The `dsmserv.dsk` file is not available in Tivoli Storage Manager V6.3 or later. Save a copy of the `dsmserv.dsk file` in case you must revert to V5.5.
4. In the server instance directory, look for the accounting log file, `dsmaccnt.log`. If the file exists, save a copy.
5. Back up any scripts that were used to complete 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. Ensure that the files are stored on a different system from the system that is being upgraded, or on offline media.

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 that are being protected, and save the results. For a list of commands, see “Sample commands to run for validation of the database upgrade” on page 535.

Related reference:

“Sample commands to run for validation of the database upgrade” on page 535

Scenario 4: Stopping the server before installing the upgrade

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

To stop the server before you install the upgrade, use Tivoli Storage Manager administrative commands:

1. 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.

   For more information about querying and canceling processes, see the **QUERY PROCESS** and **CANCEL PROCESS** commands in the *Administrator's Reference*.
2. After all sessions and processes are stopped, determine whether any tapes are mounted. Unmount any tapes that are mounted. Use the commands:

   ```
   query mount
   dismount volume volume_name
   ```

   For more information about unmounting tapes, see the **QUERY MOUNT** and **DISMOUNT VOLUME** commands in the *Administrator's Reference*.
3. 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 website.

The preferred method is to install the latest available version of the upgrade utilities. For more information about selecting the version, see "Determining the appropriate level for a V5 server before an upgrade" on page 37.

Use the procedure for your operating system:

- AIX "Scenario 4: Installing the upgrade utilities on AIX systems" on page 232
- HP-UX "Scenario 4: Installing the upgrade utilities on HP-UX systems" on page 233
- Linux "Scenario 4: Installing the upgrade utilities on Linux systems" on page 234
- Solaris "Scenario 4: Installing the upgrade utilities on Oracle Solaris systems" on page 235
- Windows "Scenario 4: Installing the upgrade utilities on Microsoft Windows systems" on page 237

Related concepts:

"**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://public.dhe.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 operating system, 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.
   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://public.dhe.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. Navigate to the directory that corresponds to the processor architecture of the operating system.
6. 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**.
7. Select the **INPUT** device. Specify the directory location of the upgrade utilities package on the system.
8. Select **Software to Install**. Press F4 or Esc+4 for the list of available file sets in the directory.

9. Select the file sets for the upgrade utilities, the device driver, and optionally the language package. The file set for the upgrade utilities is `tivoli.tsmupg.server`. Optional language packages include messages for languages other than US English.
10. Set **COMMIT software updates** to `Yes`. Press F4 or Esc+4.
11. Set **SAVE replaced files** to `No`.
12. Ensure that the default settings for the options in the window for all the selected file sets show `success`.
13. Press Enter, and respond to the `ARE YOU SURE?` question by pressing Enter again. The installation begins.
14. When the installation is complete, exit the SMIT program.
15. 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.
16. After the upgrade utilities are installed, continue at "Scenario 4: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 237.

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://public.dhe.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 operating system, 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.
   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. Navigate to the directory that corresponds to the processor architecture of the operating system.
5. 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.
6. 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.
7. After the upgrade utilities are installed, continue at "Scenario 4: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 237.

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://public.dhe.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 operating system 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.

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. Navigate to the directory that corresponds to the processor architecture of the operating system, for example, `x86_64`.
5. 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.

6. 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.
7. After the upgrade utilities are installed, continue at "Scenario 4: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 237.

Scenario 4: Installing the upgrade utilities on Oracle 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://public.dhe.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 operating system, 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.

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. Navigate to the directory that corresponds to the processor architecture of the operating system.
6. 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.

7. 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.

8. After the upgrade utilities are installed, continue at "Scenario 4: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 237.

Scenario 4: Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle 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 **DSMSERV_DIR** variable specifies the installed location of the upgrade utilities. By default, the location is the following directory:

AIX

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

HP-UX Linux Solaris

```
/opt/tivoli/tsm/upgrade/bin
```

Use the appropriate command for your system to set the environment variable for running the utilities. If the shell is in the `ksh` or `bash` family, enter the following command to set the **DSMSERV_DIR** variable:

```
export DSMSERV_DIR=upgrade_utilities_directory
```

If your shell is in the `csh` family, use the following command:

```
setenv DSMSERV_DIR upgrade_utilities_directory
```

where *upgrade_utilities_directory* is the directory where the upgrade utilities are installed.

After you set the environment variables, continue the upgrade process using one of the following topics:

- "Scenario 4: Upgrading the server by using the upgrade wizard" on page 238
- "Scenario 4: Upgrading the server manually by using utilities" on page 248

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://public.dhe.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.

d. Optional: To install messages in a language other than English, install the language package that your installation requires.

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 by using the upgrade wizard"
- "Scenario 4: Upgrading the server manually by using utilities" on page 248

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 by 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 V6.3 or later 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 V6.3 or later 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 V6.3 or later 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 246

Scenario 4, wizard: Installing the V6.3 or later server

You can use an installation wizard to install the server, or install the server by 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.

Starting with V6.3, the IBM Tivoli Storage Manager server installation wizard has a separate license agreement for the following products:

- Tivoli Storage Manager
- IBM Tivoli Storage Manager Extended Edition

- IBM System Storage Archive Manager
- IBM Tivoli Storage Manager for Storage Area Networks

To verify the system environment and install the server, complete the following steps:

1. For some operating systems, you must check certain system settings before you begin the 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 installation wizard cannot run on your configuration.
   It will now stop.
   For more details about installation error logs,
   enter the phrase "installation log files" in the
   Search field at this site:

   http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3
   ```

   Solaris

   Before you install 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=swg24030521

      Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030527

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030530

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=swg24030522

Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030528

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030531

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. Ensure that the system environment meets installation requirements. You can verify the requirements manually or run the prerequisite checker. To run the prerequisite checker, complete the following steps:

a. AIX HP-UX Linux Solaris Issue this command to start the prerequisite checker with a graphical interface:

```
./prereqcheck.bin
```

Alternatively, issue this command to start the prerequisite checker with the console method:

```
./prereqcheck.bin -i console
```

b. Windows Issue this command to start the prerequisite checker with a graphical interface:

```
prereqcheck.exe
```

Alternatively, issue this command to start the prerequisite checker with the console method:

```
prereqcheck.exe -i console
```

c. Select the language for the prerequisite checker user interface.

d. In the welcome and disclaimer panels, review the statements and accept them.

If the Prerequisite Results panel shows that your workstation successfully passed the checks, you are ready to start the installation. If an error message is shown in the Prerequisite Results panel, make the required corrections before continuing with the installation. For more information about the prerequisite checker, see "Running the prerequisite checker" on page 38.

6. 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
```

For information about translations that are available for the server, see the server language locales section. For information about the silent installation of the server, see the section on installing Tivoli Storage Manager in silent mode in the *Installation Guide*.

7. Select the language for your installation and follow the wizard, selecting **Next** to step through the wizard.

a. You must accept the license agreement to proceed. Select the product that you are entitled to use and a license agreement is displayed. You can select only one product on the page. If you select Tivoli Storage Manager, Tivoli Storage Manager Extended Edition, or System Storage Archive Manager, you are asked if you will be using LAN-free or library sharing. If you select YES, you must accept the Tivoli Storage Manager for Storage Area Networks license. This is in addition to the license for the product that you chose on the previous page.

b. Select the components that you want to install. Components include the server, languages, license, device driver, and storage agent. There is no default, so you must make a selection. If you previously installed a server, ensure that you select the same directory when you install a language package, license, or device driver. If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver. A server and a storage agent cannot be installed on the same workstation. For information about other components that you can choose to install, see the *Installation Guide*.

The Tivoli Storage Manager client application programming interface (API), DB2 Version 9.7, and Global Security Kit (GSKit) 8 are automatically installed when you select the server component.

8. 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 you continue to the next step.

   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`)

9. Download and apply any applicable fixes that have been released for the server. Go to the product support site at http://www.ibm.com/support/entry/portal/Downloads. Search for server updates.

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

10. 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 that are based on the recommendations in the results from the utility. You might have to restart the system.

    For information about the utility and about modifying kernel parameters, see http://pic.dhe.ibm.com/infocenter/db2luw/v9r7. 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 C, “HP-UX system resource requirements,” on page 543.

    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://pic.dhe.ibm.com/infocenter/db2luw/v9r7. To find the information, enter a search string such as `modifying kernel parameters`, in the **Search** field at this site.

    To run Tivoli Storage Manager with DB2, you might need to set kernel parameter values higher than the suggested minimum values and

make other changes to the system. For more details, see the section on tuning kernel parameters for Linux systems in the *Installation Guide*.

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 that are based on the recommendations in the results from the utility. You might have to restart the system.

For information about the utility and about modifying kernel parameters, see http://pic.dhe.ibm.com/infocenter/db2luw/v9r7. 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.

Related concepts:

Appendix E, "Services associated with the Tivoli Storage Manager server," on page 549

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.

Review the information about planning space for the server before completing this task. See "Worksheet for planning space for the V6.3 or later server" on page 44.

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: In the user ID, only lowercase letters (a-z), numerals (0-9), and the underscore character (_) can be used. The user ID and group name must comply with the following rules:

      - The length must be 8 characters or less.
      - The user ID and group name cannot start with *ibm*, *sql*, *sys*, or a numeral.
      - The user ID and group name cannot be *user*, *admin*, *guest*, *public*, *local*, or any SQL reserved word.

      For example, create user ID `tsminst1` in group `tsmsrvrs`. The following examples show how to create this user ID and group by 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
    -s /bin/ksh tsminst1
# passwd tsminst1
```

Linux

```
# groupadd tsmsrvrs
# useradd -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, by using the new user ID and password. Use an interactive login program, such as telnet, so that you are prompted for the password and can change it if necessary.

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

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 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 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 30 characters or less, and cannot start with *ibm*, *sql*, *sys*, or a numeral. The user ID and group name cannot be *user*, *admin*, *guest*, *public*, *local*, or any SQL reserved word.

   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 operating system commands to add the new user ID to the Administrators groups:

   ```
   net localgroup Administrators user_ID /add
   net localgroup DB2ADMNS user_ID /add
   ```

c. Log in to your system, by using the new user ID and password.

d. For all directories that were created for the server instance, ensure that the user ID for the server instance has read/write access. The directories to check include the instance directory and all database and log directories.

2. Create the directories that the server requires. Ensure that you are logged in under the new user ID that you created.

   You need a unique, empty directory for each item in the following table. Create the database directories, the active log directory, and the archive log directory on different physical volumes. For space requirements, see "Worksheet for planning space for the V6.3 or later server" on page 44.

   AIX HP-UX Linux Solaris

Table 58. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which will contain files for this server instance, including the server options file	`mkdir /home/user_ID/tsminst1`	

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

Active log directory	`mkdir /home/user_ID/tsmlog`	
Archive log directory	`mkdir /home/user_ID/tsmarchlog`	
Optional: Directory for the log mirror for the active log	`mkdir /home/user_ID/tsmlogmirror`	
Optional: Secondary archive log directory, which is the failover location for the archive log	`mkdir /home/user_ID/tsmarchlogfailover`	

Windows

Table 59. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which will contain files for this server instance, including the server options file	`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, which is the failover location for the archive log	`mkdir k:\tsm\archlogfailover`	

When a server is initially created, with the **DSMSERV FORMAT** utility or with the configuration wizard, a server database and recovery log are created. In addition, files are created to hold database information that is used by the database manager.

3. Create additional logical volumes and mount the volumes on the directories that were created in the previous step.

Related tasks:

"Planning space for the upgrade process and the upgraded server" on page 39

Related reference:

"Server naming best practices" on page 72

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 V6.3 or later 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 V6.3 or later 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 V6.3 or later 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. Also ensure that the SSH daemon service has access rights for connecting to the system by using `localhost`.
  - Remote shell (rsh).
  - Remote Execution Protocol (REXEC).
- You must be able to log in to the V6.3 or later 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 where you installed the V6.3 or later server program must have the Windows server message block (SMB) protocol enabled. 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 the V5 server is on a different system than the V6.3 or later server, that system must also have SMB enabled.
- You must be able to log on to the system that has SMB enabled by using either the user ID that you created for the server instance, or another user ID that exists on the system. When using the wizard, you must provide the user ID and password to access the system.

2. Windows If the system is running on Windows Server 2008 or Windows Vista, complete the following steps to disable User Account Control:
   a. Ensure that the Remote Registry in Windows Services is started, and ports 445, 137, and 139 are unblocked in the firewall.
   b. Configure both the framework server and the targets as members of a Windows domain. Use a user account in that domain, or in a trusted domain, when you connect to the target.
   c. Connect to the target workstation by enabling and using the built-in administrator account. To enable the built-in administrator account, click **Control Panel** > **Administrative Tools** > **Local Security Policy** > **Security Settings** > **Local Policies** > **Security Options**. Double-click the **Accounts: Administrator account status** section. Select **Enable** and click **OK**.
   d. Click **Control Panel** > **Administrative Tools** > **Local Security Policy** > **Security Settings** > **Local Policies** > **Security Options**. Double-click the **User Account Control: Run all administrators in Admin Approval Mode** section. Select **Disable** and click **OK**.
3. Start the upgrade wizard, **dsmupgdx**, from the V6.3 or later 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"
   ```

4. 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 10, "Taking the first steps after upgrade," on page 323.

Scenario 4: Upgrading the server manually by using utilities

Use the utilities to upgrade the server by 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 V6.3 or later 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 257
5. "Scenario 4: Moving the server database over a network" on page 262
6. "Scenario 4: Creating a Windows service for the server instance" on page 263
7. "Scenario 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 10, "Taking the first steps after upgrade," on page 323.

Related concepts:

"**DSMUPGRD** upgrade utilities" on page 15

Scenario 4: Preparing the database of a V5 server for upgrade

Before you extract 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.

   Important: The `dsmserv.dsk` file is not available in Tivoli Storage Manager V6.3 or later. Save a copy of the `dsmserv.dsk file` in case you must revert to V5.5.
4. 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. 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
```

5. 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.

6. Ensure that the prepare operation is completed successfully before you continue 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 that is being upgraded is a V5.3 or V5.4 server, you might need to restore the database by 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 513

Scenario 4, manual: Installing the V6.3 or later server

You can use an installation wizard to install the server, or install the server by 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.

Starting with V6.3, the IBM Tivoli Storage Manager server installation wizard has a separate license agreement for the following products:

- Tivoli Storage Manager
- IBM Tivoli Storage Manager Extended Edition
- IBM System Storage Archive Manager

- IBM Tivoli Storage Manager for Storage Area Networks

To verify the system environment and install the server, complete the following steps:

1. For some operating systems, you must check certain system settings before you begin the 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 installation wizard cannot run on your configuration.
   It will now stop.
   For more details about installation error logs,
   enter the phrase "installation log files" in the
   Search field at this site:

   http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3
   ```

   Solaris

   Before you install 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=swg24030521

      Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030527

      System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030530

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=swg24030522

Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030528

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030531

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. Ensure that the system environment meets installation requirements. You can verify the requirements manually or run the prerequisite checker. To run the prerequisite checker, complete the following steps:

a. AIX HP-UX Linux Solaris Issue this command to start the prerequisite checker with a graphical interface:

```
./prereqcheck.bin
```

Alternatively, issue this command to start the prerequisite checker with the console method:

```
./prereqcheck.bin -i console
```

b. Windows Issue this command to start the prerequisite checker with a graphical interface:

```
prereqcheck.exe
```

Alternatively, issue this command to start the prerequisite checker with the console method:

```
prereqcheck.exe -i console
```

c. Select the language for the prerequisite checker user interface.

d. In the welcome and disclaimer panels, review the statements and accept them.

If the Prerequisite Results panel shows that your workstation successfully passed the checks, you are ready to start the installation. If an error message is shown in the Prerequisite Results panel, make the required corrections before continuing with the installation. For more information about the prerequisite checker, see "Running the prerequisite checker" on page 38.

6. 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
  ```

For information about translations that are available for the server, see the server language locales section. For information about the silent installation of the server, see the section on installing Tivoli Storage Manager in silent mode in the *Installation Guide*.

7. Select the language for your installation and follow the wizard, selecting **Next** to step through the wizard.

   a. You must accept the license agreement to proceed. Select the product that you are entitled to use and a license agreement is displayed. You can select only one product on the page. If you select Tivoli Storage Manager, Tivoli Storage Manager Extended Edition, or System Storage Archive Manager, you are asked if you will be using LAN-free or library sharing. If you select YES, you must accept the Tivoli Storage Manager for Storage Area Networks license. This is in addition to the license for the product that you chose on the previous page.

   b. Select the components that you want to install. Components include the server, languages, license, device driver, and storage agent. There is no default, so you must make a selection. If you previously installed a server, ensure that you select the same directory when you install a language package, license, or device driver. If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver. A server and a storage agent cannot be installed on the same workstation. For information about other components that you can choose to install, see the *Installation Guide*.

The Tivoli Storage Manager client application programming interface (API), DB2 Version 9.7, and Global Security Kit (GSKit) 8 are automatically installed when you select the server component.

8. 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 you continue to the next step.

   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`)

9. Download and apply any applicable fixes that have been released for the server. Go to the product support site at http://www.ibm.com/support/entry/portal/Downloads. Search for server updates.

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

10. 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 that are based on the recommendations in the results from the utility. You might have to restart the system.

    For information about the utility and about modifying kernel parameters, see http://pic.dhe.ibm.com/infocenter/db2luw/v9r7. 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 C, “HP-UX system resource requirements,” on page 543.

    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://pic.dhe.ibm.com/infocenter/db2luw/v9r7. To find the information, enter a search string such as `modifying kernel parameters`, in the **Search** field at this site.

    To run Tivoli Storage Manager with DB2, you might need to set kernel parameter values higher than the suggested minimum values and

make other changes to the system. For more details, see the section on tuning kernel parameters for Linux systems in the *Installation Guide*.

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 that are based on the recommendations in the results from the utility. You might have to restart the system.

For information about the utility and about modifying kernel parameters, see http://pic.dhe.ibm.com/infocenter/db2luw/v9r7. 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.

Related concepts:

Appendix E, "Services associated with the Tivoli Storage Manager server," on page 549

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.

Review the information about planning space for the server before you complete this task. See "Worksheet for planning space for the V6.3 or later server" on page 44.

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: In the user ID, only lowercase letters (a-z), numerals (0-9), and the underscore character (_) can be used. The user ID and group name must comply with the following rules:

      - The length must be 8 characters or less.
      - The user ID and group name cannot start with *ibm*, *sql*, *sys*, or a numeral.
      - The user ID and group name cannot be *user*, *admin*, *guest*, *public*, *local*, or any SQL reserved word.

      For example, create user ID `tsminst1` in group `tsmsrvrs`. The following examples show how to create this user ID and group by 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
    -s /bin/ksh tsminst1
# passwd tsminst1
```

Linux

```
# groupadd tsmsrvrs
# useradd -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, by using the new user ID and password. Use an interactive login program, such as telnet, so that you are prompted for the password and can change it if necessary.

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

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 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 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 30 characters or less, and cannot start with *ibm*, *sql*, *sys*, or a numeral. The user ID and group name cannot be *user*, *admin*, *guest*, *public*, *local*, or any SQL reserved word.

   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 operating system commands to add the new user ID to the Administrators groups:

   ```
   net localgroup Administrators user_ID /add
   net localgroup DB2ADMNS user_ID /add
   ```

c. Log in to your system, by using the new user ID and password.

d. For all directories that were created for the server instance, ensure that the user ID for the server instance has read/write access. The directories to check include the instance directory and all database and log directories.

2. Create the directories that the server requires. Ensure that you are logged in under the new user ID that you created.

   You need a unique, empty directory for each item in the following table. Create the database directories, the active log directory, and the archive log directory on different physical volumes. For space requirements, see "Worksheet for planning space for the V6.3 or later server" on page 44.

   AIX HP-UX Linux Solaris

Table 60. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which will contain files for this server instance, including the server options file	`mkdir /home/user_ID/tsminst1`	

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

Active log directory	`mkdir /home/user_ID/tsmlog`	
Archive log directory	`mkdir /home/user_ID/tsmarchlog`	
Optional: Directory for the log mirror for the active log	`mkdir /home/user_ID/tsmlogmirror`	
Optional: Secondary archive log directory, which is the failover location for the archive log	`mkdir /home/user_ID/tsmarchlogfailover`	

Windows

Table 61. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which will contain files for this server instance, including the server options file	`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, which is the failover location for the archive log	`mkdir k:\tsm\archlogfailover`	

When a server is initially created, with the **DSMSERV FORMAT** utility or with the configuration wizard, a server database and recovery log are created. In addition, files are created to hold database information that is used by the database manager.

3. Create additional logical volumes and mount the volumes on the directories that were created in the previous step.

Related tasks:

"Planning space for the upgrade process and the upgraded server" on page 39

Related reference:

"Server naming best practices" on page 72

Scenario 4: Creating and formatting the new database

Create the server instance and format files for an empty V6.3 or later database.

1. Log on to the system where you installed the V6.3 or later program.

AIX HP-UX Linux Solaris

Log in by using the root user ID. Verify the following items:

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

  The instance directory stores the following core files that are generated by the Tivoli Storage Manager server:

  – The server options file, `dsmserv.opt`
  – The server key database file, `cert.kdb`, and the `.arm` files, which are used by clients and other servers to import the Secure Sockets Layer certificates of the server
  – Device configuration file, if the `DEVCONFIG` server option does not specify a fully qualified name

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

- A shell configuration file, for example, `.profile`, exists in the home directory. The root user and instance user ID must have write permission to this file. For more information, go to the DB2 Information Center (http://pic.dhe.ibm.com/infocenter/db2luw/v9r7), and search for information about Linux and UNIX environment variable settings.

Windows

Log on as an administrator.

2. Create a Tivoli Storage Manager instance by 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:

AIX HP-UX Linux Solaris

```
/opt/tivoli/tsm/db2/instance/db2icrt -a server -s ese -u
instance_name instance_name
```

For example, if the user ID for this instance is tsminst1, use the following command to create the instance:

AIX HP-UX Linux Solaris

```
/opt/tivoli/tsm/db2/instance/db2icrt -a server -s ese -u
tsminst1 tsminst1
```

Remember: From this point on, use this new user ID when you configure the 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 V6.3 or later server; this ID is the instance user ID.

```
db2icrt -s ese -u user_account instance_name
```

For example, if the user account is *tsminst1* and the server instance is *Server1*, enter the following command:

```
db2icrt -s ese -u tsminst1 server1
```

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 V6.3 or later server. 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 by using the user ID that owns the V6.3 or later 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, which is 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 V6.3 or later server, copy the files into the following directory:

   AIX HP-UX Linux Solaris `/tsminst1`

   Windows `d:\tsm\server1`

   Ensure that the user ID that owns the V6.3 or later 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 V6.3 or later. For the list of deleted options, see Table 36 on page 69.
   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 V6.3 or later. 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 /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. Modify the library path to use the version of the IBM Global Security Kit (GSKit) that is installed with the Tivoli Storage Manager server:

   AIX Issue the following command:

   ```
   export LIBPATH=/usr/opt/ibm/gsk8_64/lib64:$LIBPATH
   ```

   AIX HP-UX Linux Solaris You must update the following files to set the library path when DB2 or the Tivoli Storage Manager server is started:

   - *instance_directory*`/sqllib/usercshrc`
   - *instance_directory*`/sqllib/userprofile`

   For the *instance_directory*`/sqllib/usercshrc` file, add the following lines:

   - AIX

     ```
     setenv LIBPATH /usr/opt/ibm/gsk8_64/lib64:$LIBPATH
     ```
   - HP-UX Solaris

     ```
     setenv LD_LIBRARY_PATH /opt/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
     ```
   - Linux

     ```
     setenv LD_LIBRARY_PATH /usr/local/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
     ```

   For the *instance_directory*`/sqllib/userprofile` file, add the following lines:

   - AIX

     ```
     LIBPATH=/usr/opt/ibm/gsk8_64/lib64:$LIBPATH
     export LIBPATH
     ```
   - HP-UX Solaris

     ```
     LD_LIBRARY_PATH=/opt/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
     export LD_LIBRARY_PATH
     ```
   - Linux

     ```
     LD_LIBRARY_PATH=/usr/local/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
     export LD_LIBRARY_PATH
     ```

Verify the library path settings and ensure that the GSKit version is 8.0.14.14 or later. Issue the following commands:

- AIX

```
echo $LIBPATH
gsk8capicmd_64 -version
gsk8ver_64
```

- HP-UX Linux Solaris

```
echo $LD_LIBRARY_PATH
gsk8capicmd_64 -version
gsk8ver_64
```

If the GSKit version is not 8.0.14.14 or later, you must reinstall the Tivoli Storage Manager server. The reinstallation ensures that the correct GSKit version is available.

8. Complete this step to set the server code page.

   Set the DB2CODEPAGE system environment variable to 819 for each server instance. Before you issue the **DSMSERV LOADFORMAT** command, log on to the system as the server instance owner and issue this command:

   ```
   db2set -i instance_name DB2CODEPAGE=819
   ```

   For example: AIX HP-UX Linux Solaris

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

   Windows

   ```
   db2set -i server1 DB2CODEPAGE=819
   ```

9. Change to the instance directory that you created for the server.
10. 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 16 GB (16384 MB, the default size), issue the following command, on one line:

    ```
    /opt/tivoli/tsm/server/bin/dsmserv loadformat \
    dbdir=/tsmdb001,/tsmdb002,/tsmdb003,/tsmdb004 \
    activelogsize=16384 activelogdirectory=/tsmlog \
    mirrorlogdirectory=/tsmlogmirror archlogdirectory=/tsmarchlog
    ```

    Windows

    For example, to get an active log size of 16 GB (16384 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=16384 activelogdirectory=h:\tsm\log
    mirrorlogdirectory=j:\tsm\logmirror archlogdirectory=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=16384 activelogdirectory=h:\tsm\log
mirrorlogdirectory=j:\tsm\logmirror archlogdirectory=i:\tsm\archlog
```

11. 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 41

Related reference:

DSMSERV LOADFORMAT (Format a database)

"Deleted server commands, utilities, and options" on page 67

Scenario 4: Moving the server database over a network

Move the database by starting the insertion process for the V6.3 or later server to accept the server database. Then, start 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. Verify that there is a good network connection between the two systems.
2. Start the insertion process on the V6.3 or later 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 V6.3 or later server and directing the process output to `insert.out`, by 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. Some time might pass during which no messages are issued. During this time, DB2 operations are running in the background. Optional: To verify that operations are continuing as expected, monitor the CPU and I/O usage for the server process and the corresponding DB2 process.
3. Monitor the output of the **DSMSERV INSERTDB** 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 V6.3 or later 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 act 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 519

"DSMSERV INSERTDB (Move a server database into an empty database)" on page 529

Scenario 4: Creating a Windows service for the server instance

Windows

A Windows service is created for the Tivoli Storage Manager V6.3 or later 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 by using the Tivoli Storage Manager server instance name and password in the service name. Issue the following command:

```
install "TSM server_instance_name"
 "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
instance_owner instance_owner_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.

instance_owner is the instance owner account; this account will own the service.

instance_owner_password is the password for the instance owner account.

Example

To install the Windows service for the server1 server instance, enter the following command on one line. The example uses `rudy` as the instance owner and `s21ret` as the password for the instance owner account.

```
install "TSM server1" "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
rudy s21ret
```

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 329

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 Oracle Solaris systems"
- "Scenario 4: Configuring the system for database backup on Microsoft Windows systems" on page 267

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 10, "Taking the first steps after upgrade," on page 323.

Scenario 4: Configuring the system for database backup on AIX, HP-UX, Linux, and Oracle 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 `/tsminst1` for the Tivoli Storage Manager server instance directory.

1. Set the Tivoli Storage Manager 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 profile of the user ID. 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. In the `userprofile` file in the `/home/tsminst1/sqllib` directory, add or update the following lines:

AIX Korn or Bash shell:

```
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 Korn or Bash shell:

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

AIX Bourne shell:

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

HP-UX Linux Solaris Bourne shell:

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

AIX C shell:

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

HP-UX Linux Solaris C shell:

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

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

```
. ~/.profile
```

Tip: Ensure that you enter a space after the initial dot (.) character.

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

```
SERVERNAME TSMDBMGR_TSMINST1
```

Remember: The name that you use must match your server instance name.

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 $$_TSMDBMGR_$$
```

Tip: Ensure that you enter the same `tcpport` as the server is using. This is specified in the `dsmserv.opt` file.

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 Oracle Solaris systems" on page 325 for the details.
   b. Log in using the root user ID.
   c. Source the database manager profile by issuing the following command. Ensure that you enter a dot, a space, and the path to the `db2profile` file. If you do not enter the space, the database backup fails.

      Important: Solaris Switch to the Korn shell (/bin/ksh) before issuing the following command.
      ```
      . /home/tsminst1/sqllib/db2profile
      ```
   d. Change the API password. Use 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 10, "Taking the first steps after upgrade," on page 323.

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 is to go 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
   ```

   Tip: Ensure that you enter the same `tcpport` as the server is using. This is specified in the `dsmserv.opt` file.

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 10, “Taking the first steps after

upgrade," on page 323.

Chapter 8. Clustered environments: Upgrade procedures

To upgrade an IBM Tivoli Storage Manager server from V5 to V6.3 or later in a clustered environment, you must complete planning, preparation, installation, and configuration tasks. The procedures vary, depending on the operating system and release.

Follow the procedure for your operating system, source release, and target release:

Operating system	Source and target release	Procedure
AIX	From V5.5 to V6.3 or later	"Upgrading the server to V6.3 or later in an AIX clustered environment"
Windows	From V5.5 to V6.3.3 or later	"Upgrading the server to V6.3.3 or later in a Windows clustered environment" on page 270
Windows	From V5.5 to V6.3.2 or earlier	"Upgrading the server to V6.3.2 or earlier in a Windows clustered environment" on page 273

For information about upgrading the server from V6.1 or V6.2 to V6.3 or later in a clustered environment, see the *Installation Guide*.

For information about Linux clustered environments, see the *Installation Guide*.

Upgrading the server to V6.3 or later in an AIX clustered environment

AIX

To upgrade Tivoli Storage Manager from Version V5.5 to V6.3 or later in a high availability clustered environment on an AIX operating system, several steps are required.

Complete the following steps:

1. Mount all shared resources on a single node. This is the primary node. If your environment includes multiple instances of Tivoli Storage Manager, shared resources for all instances must be accessible to the primary node during the upgrade.
2. Upgrade the server instance from V5 to V6.3 or later. Use one of the following methods for each instance:
   - Chapter 4, "Scenario 1: Same system, media method," on page 93
   - Chapter 5, "Scenario 2: Same system, network method," on page 135
   - Chapter 6, "Scenario 3: New system, media method," on page 175
   - Chapter 7, "Scenario 4: New system, network method," on page 223

   When you create and set up DB2 instances, use either the upgrade wizard or the manual method. Ensure that you do not configure the server instance to start automatically following a system restart. Upon completion of the upgrade wizard, the instance is started.

3. Adjust the cluster start and stop scripts to use the correct instance directories. Each instance requires its own set of scripts. Tivoli Storage Manager V6.3 uses a different start and stop script framework than V5.5. Use the following V6.3 framework:
   - `/opt/tivoli/tsm/server/bin/startserver`
   - `/opt/tivoli/tsm/server/bin/stopserver`
4. Test the start and stop scripts to ensure that they work as expected.
5. On the primary node, stop all server instances.
6. For each secondary node, complete the following tasks:
   a. Install the V6.3 or later server. For information, see "Installing the V6.3 or later server" on page 298.
   b. Create the directories and the user ID for the upgraded server instance. For information, see "Creating the directories and the user ID for the upgraded server instance" on page 303.
   c. Mount all shared resources for all server instances on the secondary node.
   d. As root user, run the configuration wizard: `/opt/tivoli/tsm/server/bin/dsmicfgx`. Specify the correct instance directory for each server instance. Select the box to indicate that the server instance is being configured for a secondary node of a high availability cluster. By selecting this box, you create the required database instances and catalog the database in each instance.
   e. Adjust the cluster start and stop scripts to use the correct instance directories. Each instance requires its own set of scripts. Use the following V6.3 framework:

      `/opt/tivoli/tsm/server/bin/startserver`

      `/opt/tivoli/tsm/server/bin/stopserver`
   f. Test the start and stop scripts to ensure that they work as expected.

After the upgrade, complete verification and configuration tasks. For more information, see Chapter 10, "Taking the first steps after upgrade," on page 323.

For information about setting up clustered environments, see the section about configuring an AIX clustered environment in the *Administrator's Guide*.

Upgrading the server to V6.3.3 or later in a Windows clustered environment

Windows

To upgrade the Tivoli Storage Manager server from V5.5 to V6.3.3 or later in a clustered environment on a Windows system, review the planning guidelines. Then, install the V6.3.3 or later server on all nodes in the cluster. Finally, run the upgrade wizard, which inserts the new database and configures the system.

Complete the following tasks:

1. Plan the upgrade, as described in "Planning the upgrade" on page 271.
2. Prepare the system and run the upgrade wizard, as described in "Preparing the system and running the upgrade wizard" on page 271.

For information about setting up a Windows clustered environment, see the section on configuring a Windows clustered environment in the *Administrator's Guide*.

Planning the upgrade

Windows

Before you upgrade the server from V5.5 to V6.3.3 or later in a clustered environment on a Windows system, plan the upgrade.

Complete the following steps:

1. Review the cluster setup instructions. If you are upgrading on the same system, ensure that the clustered environment is set up correctly. If you are upgrading on a new system, set up the nodes for the cluster and create a resource group. For details, see the section about configuring clustered environments in the *Administrator's Guide*. You can find information about clustering requirements, installation instructions for the server, and directory locations.
2. Determine whether to upgrade the server by using the network method or media method. For a comparison of the network and media methods, see "Comparison of upgrading on an existing system and a new system" on page 12.

After you plan the upgrade, complete the steps in "Preparing the system and running the upgrade wizard."

Preparing the system and running the upgrade wizard

Windows

To prepare the system for the upgrade, install the V6.3.3 or later server on all nodes in the cluster and create the directories and the user ID for the upgraded server instance. Then, run the upgrade wizard, which inserts the new database and configures the system.

Before you upgrade the Tivoli Storage Manager server, ensure that you retain the installation media from the base release of the installed server. If you installed Tivoli Storage Manager from a DVD, ensure that the DVD is available. If you installed Tivoli Storage Manager from a downloaded package, ensure that the downloaded files are available. If the upgrade fails, and the server license module is uninstalled, the installation media from the server base release are required to reinstall the license.

You can upgrade the server on the same system or migrate the server to a new target system with a new operating system. Before you upgrade or migrate the server, ensure that Microsoft Windows Server 2008, Microsoft Windows Server 2008 R2, or Microsoft Windows Server 2012 is installed on the target system. You can use Windows Server 2012 only if you are upgrading or migrating the system to Tivoli Storage Manager V6.3.4 or later.

To prepare the system and run the upgrade wizard, complete the following steps:

1. If you are upgrading or migrating a server to Windows Server 2012, install the failover cluster automation server and the failover cluster command interface. To install these components, issue the following commands from Windows 2.0 PowerShell:

   ```
   Install-WindowsFeature -Name RSAT-Clustering-AutomationServer
   Install-WindowsFeature -Name RSAT-Clustering-CmdInterface
   ```

2. Ensure that the V5.5 server has volume history and device configuration files.
3. If you are upgrading on the same system, delete the V5.5 cluster resources:

a. Ensure that the primary node owns the cluster resources.
b. Record the values of the TCP/IP address and the network name of the server items in the group by using Microsoft Failover Cluster Manager. The cluster group includes Tivoli Storage Manager server resources and disk resources. The server resources are the network name in the **Server Name** section and the Tivoli Storage Manager instance in the **Other Resources** section.
c. Delete the Tivoli Storage Manager resource and the network name.

4. If you are upgrading on the same system, uninstall the V5.5 server. For each node in the cluster, uninstall the V5.5 server, server license, and device driver. Do not remove the database, recovery log, server options file, or any other related files or directories.

   For information about uninstalling the server, see "Uninstalling the V5 program on Microsoft Windows systems" on page 298.

5. Edit the V5.5 server options file:
   a. Remove any options that are not supported for V6.3. For a list of deleted options, see "Deleted server commands, utilities, and options" on page 67.
   b. Ensure that the server options file contains at least one `VOLUMEHISTORY` option and at least one `DEVCONFIG` option. A volume history file and a device configuration file are required when you restore the database.
   c. Determine whether the server options file includes the `TXNGROUPMAX` option with a value. If the option is included and the value is less than 4096, consider increasing the value, or removing the option so that the server uses the new default value. The increased value can improve the performance for data movement operations such as storage pool migration and storage pool backup.
6. Use an installation wizard or the console to install the Tivoli Storage Manager V6.3.3 or later server on all nodes that are to be clustered. For details, see "Installing the V6.3 or later server" on page 298.
7. Prepare the system for upgrade by creating the directories and the user ID for the upgraded server instance. The user ID for the instance must be defined to the domain controller. For more information, see "Creating the directories and the user ID for the upgraded server instance" on page 303. Create the directories that the server instance requires for database and recovery logs only on shared drives as identified in the table in that section. Perform this operation on the primary node.
8. Start the upgrade wizard on the primary node by issuing the following command:

   ```
   "c:\Program Files\Tivoli\TSM\server\dsmupgdx.exe"
   ```

   Follow the steps in the upgrade wizard. When prompted to enter a user ID for the server service logon, enter the domain and user ID in this format: `domain\userid`. When prompted to select the nodes for the cluster, select the primary node and any other nodes to be included. When prompted to specify directories for the instance, database, and logs, specify directories that are on a shared disk. Review the selections in the Summary panel. If they are correct, click **Next** to format and insert the database.
9. If the system includes more than one server instance to be upgraded, run the upgrade wizard for each instance.

   After you have followed the steps in the upgrade wizard, the upgrade is complete and the system is configured. The server is started automatically.
10. Optional: If the upgrade was done on the existing system, delete the Tivoli Storage Manager V5.5 database files.

Upgrading the server to V6.3.2 or earlier in a Windows clustered environment

Windows

To upgrade the Tivoli Storage Manager server from V5.5 to V6.3.2 or earlier in a clustered environment on a Windows system, several tasks must be completed.

Complete the tasks that are described in the following topics:

1. "Planning the upgrade"
2. "Preparing for the upgrade"
3. "Installing the server and loading the database" on page 275
4. "Configuring the server" on page 277

For information about setting up a Windows clustered environment, see the section on configuring a Windows clustered environment in the *Administrator's Guide*.

Planning the upgrade

Windows

To plan the upgrade of a server from V5.5 to V6.3.2 or earlier in a clustered environment on a Windows operating system, review the cluster setup instructions and the manual upgrade procedures. Then, select the upgrade method and scenario.

1. Review the cluster setup instructions. For details, see the section about configuring clustered environments in the *Administrator's Guide*. You can find information about clustering requirements, installation instructions, and directory locations.
2. Review the manual upgrade procedures. For information about manual upgrades, see "Upgrading the server manually by using utilities" on page 308.
3. Determine whether to upgrade the server by using the network method or media method. For a comparison of the network and media methods, see "Comparison of upgrading on an existing system and a new system" on page 12.
4. Select an upgrade scenario. For more information about upgrade scenarios, see Chapter 3, "Upgrade scenarios overview," on page 75.

After you plan the upgrade, complete the steps described in "Preparing for the upgrade."

Preparing for the upgrade

Windows

To prepare the system for an upgrade from V5.5 to V6.3.2 or earlier in a clustered environment on a Windows system, delete the V5.5 cluster resources, install the upgrade utilities, prepare the V5 database, and uninstall the V5.5 server.

To prepare the system for upgrade, complete the following steps:

1. Ensure that the V5.5 server has valid volume history and device configuration files.

2. For your selected scenario, locate the information about preparing for an upgrade: “Scenario 1: Preparing for the upgrade” on page 93, “Scenario 2: Preparing for the upgrade” on page 135, “Scenario 3: Preparing for the upgrade” on page 175, or “Scenario 4: Preparing for the upgrade” on page 223. From the primary node, complete the following steps for your scenario:
   a. "Checking the prerequisites for the upgrade"
   b. "Preparing space for the upgrade process"
   c. "Modifying the server before the upgrade"
   d. "Disabling sessions"
   e. "Backing up storage pools and the server database"
   f. "Backing up configuration information"

   Record the names of the database and log volumes. You can delete them after a successful upgrade.
3. Delete the V5.5 cluster resources:
   a. Ensure that the primary node owns the cluster resources.
   b. By using Microsoft Failover Cluster Manager, record the values of the TCP/IP address and the network name of the server items in the group. The cluster group includes Tivoli Storage Manager server resources and disk resources. The server resources are the network name in the **Server Name** section and the Tivoli Storage Manager instance in the **Other Resources** section.
   c. Delete the Tivoli Storage Manager instance and the network name.
4. Follow the instructions for your scenario:
   a. "Installing the upgrade utilities on Microsoft Windows systems"
   b. "Preparing the database of a V5 server for upgrade"

   Before extracting the data from the database, use the **DSMUPGRD PREPARE** utility to prepare the server database. If you have multiple servers on a single system, repeat this task for each server.
5. From each node in the cluster, use the Microsoft Management Console (MMC) to delete the server instance. Do not delete file or disk volumes, only the service and registry entries. After the server setup is completed, you can delete the database files that are no longer used. Close the MMC.

   Tip: When you run the MMC, you might get error message ANRU1203E. The MMC expects a response from the server that is not fully initialized. To continue, click **OK** and **NEXT**. This operation might require several attempts.
6. Uninstall the V5.5 server. For information about uninstalling the server, see “Uninstalling the V5 program on Microsoft Windows systems” on page 298.

   For each node in the cluster, uninstall the V5.5 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.
7. Remove the **TSM Server** resource type from the cluster:
   a. Exit Microsoft Failover Cluster Manager.
   b. On one node in the cluster, on the command line, issue the following command:

      ```
      cluster resourcetype "TSM Server" /delete
      ```
8. On each node, delete the `tsmsvrrsc` DLL files from the Windows Cluster directory, `C:\Windows\Cluster`. For example: `TsmSrvRscExX64.dll` and `TsmSrvRscX64.dll`. Two or three DLL files might exist.
9. Restart all systems in the cluster.

10. Copy and retain the `dsmserv.opt` file and the file that is named in the `DEVCONFIG` option. The initial cluster configuration for Tivoli Storage Manager V6.3 or later changes these files. You must have the original server values to load the Tivoli Storage Manager V5.5 database.
11. Edit the saved server options file:
    a. Remove any options that are not supported for V6.3 or later. For a list of deleted options, see "Deleted server commands, utilities, and options" on page 67.
    b. Ensure that the server options file contains at least one `VOLUMEHISTORY` option and at least one `DEVCONFIG` option. A volume history file and a device configuration file are required when you restore the database.
    c. Determine whether the server options file includes the `TXNGROUPMAX` option with a value. If the option is included and the value is less than 4096, consider increasing the value, or removing the option so that the server uses the new default value. The increased value can improve the performance for data movement operations such as storage pool migration and storage pool backup.

After you prepare the server for the upgrade, complete the tasks that are described in "Installing the server and loading the database."

Installing the server and loading the database

Windows

After you prepare the system for an upgrade from V5.5 to V6.3.2 or earlier in a Windows clustered environment, install the V6.3.2 or earlier server and load the database.

Before you upgrade the Tivoli Storage Manager server, ensure that you retain the installation media from the base release of the installed server. If you installed Tivoli Storage Manager from a DVD, ensure that the DVD is available. If you installed Tivoli Storage Manager from a downloaded package, ensure that the downloaded files are available. If the upgrade fails, and the server license module is uninstalled, the installation media from the server base release are required to reinstall the license.

Tip: Some steps in this procedure require you to run the Microsoft Management Console (MMC). When you do so, you might get error message ANRU1203E. The MMC expects a response from the server that is not fully initialized. To continue, click **OK** and **NEXT**. This operation might require several attempts.

To install the V6.3.2 or earlier server and load the database, complete the following steps:

1. Use an installation wizard or the console to install the server on all nodes that are to be clustered. For details, see "Installing the V6.3 or later server" on page 298.
2. Create the directories and the user ID for the upgraded server instance. The user ID for the instance must be defined to the domain controller. For more information, see "Creating the directories and the user ID for the upgraded server instance" on page 303. Create the directories that the server instance requires for database and recovery logs only on shared drives as identified in the table. Perform this operation on only one node.

   For the remaining steps, you must log in with the *`domain\userid`* user ID.

3. If you are using the media method, complete the steps in your selected scenario for extracting the data to media.
4. Before you enter the MMC to configure the server on the primary node, ensure that the user ID that owns the V6.3.2 or earlier server (the instance user ID) has ownership or read/write permission for the copied files. The instance user ID must have administrative authority on the system and must be a member of the DB2ADMNS and DB2USERS groups.
5. For multiple instances, you must create the server instances in the same order as they were created originally. The MMC names the first server instance SERVER1, the second server instance SERVER2, and so on.

   The V6.3 or later MMC uses the same server instance directory that was specified in the V5.5 server. Therefore, you must save the directory contents elsewhere. Replace the `dsmserv.opt` file with the `dsmserv.opt` file that you edited and saved. Keep the saved file; it must be replaced again.
6. Before you use the MMC to configure the primary node, ensure that all nodes are running. All nodes must be running for the DB2 cluster setup to work.
7. On the primary node, open the MMC to begin configuring the primary node. If the **Initial Configuration Task List** does not immediately open, right-click the system under **Tivoli Storage Manager** and select **Add a New TSM Server**. Proceed through the server initialization panels to configure, initialize, and cluster the server. On the Server Service Logon Parameters panel, enter *domain\userid*. On the Server Name and Password panel, enter the original cluster name. Proceed through the cluster configuration panels until you reach the Device Configuration Wizard window. Click **Cancel**. Do not configure devices or client nodes now.
8. Remove the newly created database and load the previous database:
   a. Update the cluster so that failover does not occur automatically and so that the service does not start automatically. In the cluster manager, open the Instance properties pane. Note the settings, which will be reset in a later step. Clear the **Auto Start** option. In the **Failover** tab, set the number of maximum failures in the specified period to 0.
   b. The wizard might leave the Tivoli Storage Manager server service running. View the services menu. If the server service is running, right-click the server and select **Stop**.
   c. To remove the newly created database, use the **DSMSERV REMOVEDB** utility.
   d. Empty the database, active log, mirror log, archive log, and archive failover log directories.
   e. In the instance directory, replace the device configuration files and the `dsmserv.opt` file with the V5.5 device configuration files and the updated `dsmserv.opt` file, which was saved during the preparation phase.
   f. Manually run the **DSMSERV LOADFORMAT** utility by using the parameters in the `initserv.bat` file in the instance directory for the **DSMSERV FORMAT** utility.
9. Load the data into the database.
   - If you are using the media method, follow these instructions: "Loading the extracted data into the new database" on page 314.
   - If you are using the network method, follow these instructions: "Moving the server database over a network" on page 316. For the network method, the **DSMUPGRD EXTRACTDB** command must specify the system IP address, not the cluster address.

After you install the server and load the database, complete the steps that are described in "Configuring the server" on page 277.

Configuring the server

Windows

After installing the Tivoli Storage Manager V6.3.2 server and loading the database, run the Microsoft Management Console (MMC) to configure the nodes. Then, ensure that the server is configured for database backup and operates normally. Finally, update the cluster to allow for failover and automatic starts.

To configure the new system, complete the following steps:

1. Run the Cluster Configuration wizard on each node in the cluster. To run the wizard on a node, move the cluster resources to that node and open the MMC. In the **Wizards** section, double-click the Cluster Configuration wizard.
2. To verify that the server is configured for database backup, complete the following steps:
   a. Issue the **db2set db2_vendor_ini** command.
   b. Ensure that the `DB2_VENDOR_INI` value is set to the `tsmdbmgr.env` file.
3. If the server is not configured for database backup, follow the steps in your selected scenario to configure the system for database backup on a Microsoft Windows system.
4. Verify that the server was successfully upgraded and can operate normally. The verification includes starting the server from the Microsoft Failover Cluster Manager, registering licenses, and backing up the database.
5. Update the cluster to allow for failover and automatic starts, by using the original settings that you noted previously.

   The V6.3 or later MMC initial instance creation leaves an extra disk storage pool volume undefined to Tivoli Storage Manager on the shared disk. The `tsm1.dat` file in the instance directory has that name.
6. Optional: Delete or define to the server the disk storage pool volume, `*.dat`.
7. Optional: Delete the Tivoli Storage Manager V5.5 database files.

Chapter 9. General procedures for upgrading a server to V6.3 or later

Utilities and a wizard are provided to assist in the upgrade of the IBM Tivoli Storage Manager server. 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.

The procedure for upgrading the server includes the following tasks:

1. "Preparing for the upgrade"
2. "Installing the upgrade utilities on the original server" on page 288
3. "Preparing the database of a V5 server for upgrade" on page 295
4. Same-system upgrade only: "Uninstalling the V5 program before installing V6.3 or later" on page 296
5. "Installing the V6.3 or later server" on page 298
6. "Creating the directories and the user ID for the upgraded server instance" on page 303
7. Upgrading the server by using one of the following methods:
   - "Upgrading the server by using the upgrade wizard" on page 306
   - "Upgrading the server manually by using utilities" on page 308
8. The following tasks are completed after the upgrade:
   a. "Verifying access to storage pools on disk" on page 323
   b. "Setting up Solaris services for the server instance" on page 324
   c. "Configuring server options for server database maintenance" on page 324
   d. "Starting the server instance after the upgrade" on page 325
   e. "Registering licenses" on page 330
   f. "Backing up the database after upgrading the server" on page 330
   g. "Verifying the upgraded server" on page 331
   h. "Changing the host name for the Tivoli Storage Manager server" on page 332
   i. "Updating automation" on page 333
   j. "Monitoring the upgraded server" on page 334
   k. "Removing GSKit Version 7 after upgrading to Tivoli Storage Manager V6.3 or later" on page 335

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 V6.3 or later 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 have completed all preparation steps. To understand why it is important to complete all preparation steps, review the procedure for reverting an upgraded server to its previous version.

To prepare for the upgrade, complete the following steps:

1. "Checking the prerequisites for the upgrade"
2. "Preparing space for the upgrade process" on page 283
3. "Modifying the server before the upgrade" on page 284
4. "Disabling sessions" on page 286
5. "Backing up storage pools and the server database" on page 286
6. "Deleting or renaming the NODELOCK file" on page 287
7. "Backing up configuration information" on page 287
8. "Creating a summary of database contents" on page 288
9. "Stopping the server before installing the upgrade" on page 288

Related tasks:

"Postupgrade phase: Reverting from V6.3 or later to the previous V5 server version" on page 345

Checking the prerequisites for the upgrade

Check your system against requirements for the server.

Restriction: If you are upgrading the Tivoli Storage Manager server on the same system, the system must meet the minimum requirements for both the V5 and V6.3 or later servers.

1. Ensure that the server that you plan to upgrade is at version 5.3.6 or later and that the latest interim fix is installed. To optimize the upgrade process and avoid potential issues, consider upgrading the V5 server to the latest available level and install the latest interim fix for that level. Follow the guidelines in "Determining the appropriate level for a V5 server before an upgrade" on page 37. To download the latest server fix pack and latest interim fix, go to the FTP downloads site at ftp://public.dhe.ibm.com/storage/tivoli-storage-management/maintenance/server/. Then, locate the appropriate version of Tivoli Storage Manager.
2. Ensure that the system where the V5 server is located meets the minimum requirements. Review the information in "Hardware and software requirements for the V5 server system that is being upgraded" on page 16 to determine whether you must update your system before you continue.
3. Ensure that the system where you plan to install the V6.3 or later server meets requirements for the operating system type and level. For the latest information about system requirements, see Tivoli Storage Manager Supported Operating Systems (http://www.ibm.com/support/docview.wss?uid=swg21243309). You can verify the installation environment manually now. Alternatively, wait until the installation files are extracted and then run the prerequisite checker, which automatically verifies the system environment. For more information, see "Running the prerequisite checker" on page 38.

   If you are upgrading Tivoli Storage Manager on a different operating system, a limited set of migration paths is available. For instructions about migrating a server that is running on a z/OS operating system, see Part 3, "Migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 on AIX or Linux on System z," on page 433. For instructions about migrating a server that is running on an

AIX, HP-UX, or Solaris operating system, see Part 2, "Migrating Tivoli Storage Manager V5 servers on AIX, HP-UX, or Solaris systems to V6.3.4 on Linux," on page 349.

Some platforms that were supported for earlier versions of the server are not supported for V6.3 or later. If the server that you want to upgrade is running on one of these platforms, you cannot upgrade your server to V6.3 or later on the same platform. For required platforms, see the following table.

Table 62. Required platforms for upgrading from V5 to V6.3 or later

Platform for V5 server	Required platform for upgrade to V6.3 or later
HP-UX running on a PA-RISC system	HP-UX running on an Intel Itanium system
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system
Linux running on an x86_32 system	Linux running on an x86_64 system
Solaris running on an x86_64 system	Linux running on an x86_64 system
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system

If you are upgrading from Tivoli Storage Manager V5 to V6.3 or later on a new system, restrictions apply. Ensure that you install the V6.3 or later server in a compatible hardware and software environment, as described in the following table.

Table 63. Requirements for upgrading from V5 to V6.3 or later on a new system

V5 server	V6.3 or later server	Comments
AIX running on an IBM POWER system	AIX running on an IBM POWER system	
HP-UX running on an Itanium system	HP-UX running on an Itanium system	
HP-UX running on a PA-RISC system	HP-UX running on an Itanium system	HP-UX running on PA-RISC is not supported for V6.3 or later servers.
Linux running on an IBM POWER system	Linux running on an IBM POWER system	
Linux running on an Itanium system (IA64)	Linux running on an x86_64 system	Linux running on Itanium is not supported for V6.3 or later servers.
Linux running on an x86_32 system	Linux running on an x86_64 system	Linux running on x86_32 is not supported for V6.3 or later servers.
Linux on System z	Linux on System z	

Table 63. Requirements for upgrading from V5 to V6.3 or later on a new system (continued)

V5 server	V6.3 or later server	Comments
Solaris running on an x86_64 system	Operating system depends on the migration method	A V6.3 or later server cannot be installed on a Solaris x86_64 system. However, you can migrate a V5 server that is running on a Solaris x86_64 operating system to V6.3.4 or later on a Linux x86_64 operating system. For instructions, see Part 2, "Migrating Tivoli Storage Manager V5 servers on AIX, HP-UX, or Solaris systems to V6.3.4 on Linux," on page 349. Alternatively, you can migrate the Solaris x86_64 system by installing a V6.3 or later server on any operating system that is supported for V6.3 or later. Then, use Tivoli Storage Manager server **EXPORT** and **IMPORT** commands to move the server from the V5 source system to the V6.3 or later target system.
Windows running on an Itanium system (IA64)	Windows running on an x86_64 system	Windows running on Itanium is not supported for V6.3 or later servers.
Windows running on an x86_32 system	Windows running on an x86_64 system	Windows running on x86_32 is not supported for V6.3 or later servers.
z/OS	AIX or Linux on System z	For instructions, see Part 3, "Migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 on AIX or Linux on System z," on page 433.

4. Verify 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, system memory must be sufficient to run two servers.

     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. System memory must be large enough to handle these processes.
   - If you plan to run multiple instances of the V6.3 or later server on the system, each instance requires the memory that is listed for one server. Multiply the memory for one server by the number of instances that are planned for the system.

   For specific information about memory requirements, see the section for your operating system:

Table 64. Memory requirements for the V6.3 or later system

Operating system	Memory requirements
AIX AIX	"Server requirements on AIX systems" on page 20
HP-UX HP-UX	"Server requirements on HP-UX systems" on page 23
Linux Linux	"Server requirements on Linux systems" on page 25
Solaris Solaris	"Server requirements on Solaris systems" on page 32
Windows Windows	"Server requirements on Microsoft Windows systems" on page 34

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, ensure that the hardware is 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 V5 server and the V6.3 or later server.
   - After you back up the V5 database and extract the data to media, reconfigure the disk subsystem that is 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 servers.
6. If you are moving the server to a new system, ensure that the V6.3 or later system can access the storage devices that are used on the V5 system. These storage devices include the disk and tape devices that are used to store client data.

   If you are moving the database by using the media method, it might be necessary to leave a storage device attached to the original system to extract the database. Then, move the storage device to the new system.

Related concepts:

"Hardware and software requirements for upgrading to the V6.3 or later server" on page 16

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 worksheet that you completed with your information. See "Worksheet for planning space for the V6.3 or later server" on page 44.
2. If you plan to extract the original server 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. View information about devices classes by issuing the command:

```
query devclass format=detailed
```

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.

For example, if the device class is FILE, ensure that the directory has sufficient space for your environment. If the device class is TAPE, ensure that sufficient scratch volumes are available for your environment.

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 V6.3 or later 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 41

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 can be useful 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 is completed and you might see error ANR2034E. This error can be ignored. For more information, see Technote 1408895 (http://www.ibm.com/support/docview.wss?uid=swg21408895). 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 you continue the upgrade process.

2. Review the steps for reverting to the earlier version of the server in the section, "Postupgrade phase: Reverting from V6.3 or later to the previous V5 server version" on page 345.

   If you must revert to the earlier version after the upgrade to V6.3 or later, 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 necessary.

      For example, if you want to be able to revert to the original server for up to 30 days after the upgrade to V6.3 or later, set the **REUSEDELAY** parameter to 31 days. Issue the following administrative command:

      ```
      update stgpool sequential_access_storage_pool reusedelay=31
      ```

   b. For each copy storage pool, set the **RECLAIM** parameter to 100 (meaning 100%). Issue the following administrative command:

      ```
      update stgpool copy_storage_pool reclaim=100
      ```

   c. If you typically use a **DELETE VOLHISTORY** command to delete database backups, ensure that the command does not delete database backups too frequently. The interval between backups should be at least the same number of days that you set for the **REUSEDELAY** period for sequential-access storage pools. For example, to delete database backups every 45 days, issue the following administrative command:

      ```
      delete volhist type=dbbackup todate=-45
      ```

   d. For important clients that use the server, verify that the value for the `schedlogretention` client option is set to retain the client schedule log for a sufficient 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.

      For example, to prune the log every 45 days and save the log entries, add the following option:

      ```
      schedlogretention 45 S
      ```

      AIX HP-UX Linux Solaris Add the option to the `dsm.sys` file within a server stanza.

      Windows Add the option to the client options file, `dsm.opt`.

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. Verify 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 all
   ```

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.

Back up storage pools and the server database by using Tivoli Storage Manager administrative commands:

1. Back up primary storage pools to copy storage pools by using the **BACKUP STGPOOL** command:

   ```
   backup stgpool primary_pool copy_stg
   ```

   where *primary_pool* specifies the primary storage pool and *copy_stg* specifies the copy storage pool. 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. The preferred method is to use a snapshot backup. A snapshot backup is a full database backup that does not interrupt any scheduled database backups. Issue the command:

   ```
   backup db type=dbsnapshot 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 by 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.

   Tip: Consider making two copies of the backup to protect the backup from media failures. Ensure that at least one full database backup is available onsite. If you must restore the database after a failed upgrade, having an onsite backup database saves time.

Deleting or renaming the NODELOCK file

To ensure that licensing information is updated during the upgrade process, delete or rename the `NODELOCK` file.

The `NODELOCK` file contains the licensing information from the previous Tivoli Storage Manager installation. To ensure that the licensing information is updated during the upgrade process, delete or rename the `NODELOCK` file before starting the upgrade process. This licensing information will be replaced with new licensing information after the upgrade is completed. The `NODELOCK` file is located in the server instance directory.

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, on a different system from the system that is being upgraded or on offline media, such as a CD. The files are required after the installation of the new software version is complete. You also need these files if you must revert to the previous version after the upgrade.

1. Back up device configuration information by using the Tivoli Storage Manager administrative command:

   ```
   backup devconfig filenames=file_name
   ```

   where *file_name* specifies the file in which to store device configuration information.
2. Back up volume history information by using the Tivoli Storage Manager administrative command:

   ```
   backup volhistory filenames=file_name
   ```

   where *file_name* specifies the file in which to store volume history information. 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=dbsnapshot
   ```

   Review the query output to verify that the timestamp for the database backup matches the actual time of the backup.
3. Save copies of the following files, which are in the server instance directory:
   - Server options file, typically named `dsmserv.opt`
   - `dsmserv.dsk`

   Important: The `dsmserv.dsk` file is not available in Tivoli Storage Manager V6.3 or later. Save a copy of the `dsmserv.dsk file` in case you must revert to V5.5.
4. In the server instance directory, look for the accounting log file, `dsmaccnt.log`. If the file exists, save a copy.
5. Back up any scripts that were used to complete 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. Ensure that the files are stored on a different system from the system that is being upgraded, or on offline media.

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 that are being protected, and save the results. For a list of commands, see "Sample commands to run for validation of the database upgrade" on page 535.

Related reference:

"Sample commands to run for validation of the database upgrade" on page 535

Stopping the server before installing the upgrade

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

To stop the server before you install the upgrade, use Tivoli Storage Manager administrative commands:

1. 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.

   For more information about querying and canceling processes, see the **QUERY PROCESS** and **CANCEL PROCESS** commands in the *Administrator's Reference*.
2. After all sessions and processes are stopped, determine whether any tapes are mounted. Unmount any tapes that are mounted. Use the commands:

   ```
   query mount
   dismount volume volume_name
   ```

   For more information about unmounting tapes, see the **QUERY MOUNT** and **DISMOUNT VOLUME** commands in the *Administrator's Reference*.
3. 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 website.

The preferred method is to install the latest available version of the upgrade utilities. For more information about selecting the version, see "Determining the appropriate level for a V5 server before an upgrade" on page 37.

Use the procedure for your operating system:

- AIX "Installing the upgrade utilities on AIX systems" on page 289
- HP-UX "Installing the upgrade utilities on HP-UX systems" on page 290
- Linux "Installing the upgrade utilities on Linux systems" on page 291
- Solaris "Installing the upgrade utilities on Oracle Solaris systems" on page 292

- Windows "Installing the upgrade utilities on Microsoft Windows systems" on page 294

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://public.dhe.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 operating system, 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.
   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://public.dhe.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. Navigate to the directory that corresponds to the processor architecture of the operating system.
6. 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**.
7. Select the **INPUT** device. Specify the directory location of the upgrade utilities package on the system.
8. Select **Software to Install**. Press F4 or Esc+4 for the list of available file sets in the directory.

9. Select the file sets for the upgrade utilities, the device driver, and optionally the language package. The file set for the upgrade utilities is `tivoli.tsmupg.server`. Optional language packages include messages for languages other than US English.
10. Set **COMMIT software updates** to `Yes`. Press F4 or Esc+4.
11. Set **SAVE replaced files** to `No`.
12. Ensure that the default settings for the options in the window for all the selected file sets show `success`.
13. Press Enter, and respond to the `ARE YOU SURE?` question by pressing Enter again. The installation begins.
14. When the installation is complete, exit the SMIT program.
15. 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.
16. After the upgrade utilities are installed, continue at "Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 294.

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://public.dhe.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 operating system, 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.
   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. Navigate to the directory that corresponds to the processor architecture of the operating system.
5. 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`.
6. 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.
7. After the upgrade utilities are installed, continue at "Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 294.

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://public.dhe.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 operating system 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.

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. Navigate to the directory that corresponds to the processor architecture of the operating system, for example, `x86_64`.
5. 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.

6. 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.
7. After the upgrade utilities are installed, continue at "Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 294.

Installing the upgrade utilities on Oracle 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://public.dhe.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 operating system, 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.

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. Navigate to the directory that corresponds to the processor architecture of the operating system.
6. 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.

7. 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.

8. After the upgrade utilities are installed, continue at "Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle Solaris systems" on page 294.

Setting environment variables for the upgrade utilities on AIX, HP-UX, Linux, and Oracle 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 **DSMSERV_DIR** variable specifies the installed location of the upgrade utilities. By default, the location is the following directory:

AIX

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

HP-UX Linux Solaris

```
/opt/tivoli/tsm/upgrade/bin
```

Use the appropriate command for your system to set the environment variable for running the utilities. If the shell is in the `ksh` or `bash` family, enter the following command to set the **DSMSERV_DIR** variable:

```
export DSMSERV_DIR=upgrade_utilities_directory
```

If your shell is in the `csh` family, use the following command:

```
setenv DSMSERV_DIR upgrade_utilities_directory
```

where *upgrade_utilities_directory* is the directory where the upgrade utilities are installed.

After you set the environment variable, continue at "Preparing the database of a V5 server for upgrade" on page 295.

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://public.dhe.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.
   d. Optional: To install messages in a language other than English, install the language package that your installation requires.
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."

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 V6.3 or later 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 you extract 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 by 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. After you upgrade the server to V6.3 or later, if you decide to revert to the earlier version, you must reinstall the earlier version of the server code. Then, you must 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.

   Important: The `dsmserv.dsk` file is not available in Tivoli Storage Manager V6.3 or later. Save a copy of the `dsmserv.dsk file` in case you must revert to V5.5.
4. 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. 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
```

5. 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.
6. Ensure that the prepare operation is completed successfully before you continue 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 that is being upgraded is a V5.3 or V5.4 server, you might need to restore the database by 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 513

Uninstalling the V5 program before installing V6.3 or later

For best results when you are upgrading the server to V6.3 or later on the same system where the V5 server is located, uninstall the V5 server program before installing the V6.3 or later server program.

Uninstalling the V5 program on AIX systems

AIX

Uninstall the V5 server, server license, and device driver, if available. 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 V6.3 or later server" on page 298.

Uninstalling the V5 program on HP-UX systems

HP-UX

Uninstall the V5 server, server license, and device driver, if available. 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 V6.3 or later server" on page 298.

Uninstalling the V5 program on Linux systems

Linux

Uninstall the V5 server, server license, and device driver, if available. 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 commands:

```
rpm -e TIVsm-server
rpm -e TIVsm-license
rpm -e TIVsm-tsmscsi
```

After the V5 server program is uninstalled, continue at "Installing the V6.3 or later server" on page 298.

Uninstalling the V5 program on Oracle Solaris systems

Solaris

Uninstall the V5 server, server license, and device driver, if available. 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 V6.3 or later server."

Uninstalling the V5 program on Microsoft Windows systems

Windows

Uninstall the V5 server, server license, and device driver, if available. 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 server component, and then click **Remove**. Repeat for the license and the device driver.

   If you see any messages that suggest that you restart the system, ignore them until the selected Tivoli Storage Manager components are removed.

After the V5 server program is uninstalled, continue at "Installing the V6.3 or later server."

Installing the V6.3 or later server

You can use an installation wizard to install the server, or install the server by using the console.

If you are installing the V6.3 or later server on the same system as the V5 server, ensure that you have completed all upgrade preparation steps, including the database backup, before you begin the installation. The server that you are upgrading will not be available until after installation and upgrade steps are completed.

Starting with V6.3, the IBM Tivoli Storage Manager server installation wizard has a separate license agreement for the following products:

- Tivoli Storage Manager
- IBM Tivoli Storage Manager Extended Edition
- IBM System Storage Archive Manager
- IBM Tivoli Storage Manager for Storage Area Networks

Before you upgrade the Tivoli Storage Manager server, ensure that you retain the installation media from the base release of the installed server. If you installed Tivoli Storage Manager from a DVD, ensure that the DVD is available. If you

installed Tivoli Storage Manager from a downloaded package, ensure that the downloaded files are available. If the upgrade fails, and the server license module is uninstalled, the installation media from the server base release are required to reinstall the license.

To verify the system environment and install the server, complete the following steps:

1. For some operating systems, you must check certain system settings before you begin the 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 installation wizard cannot run on your configuration.
   It will now stop.
   For more details about installation error logs,
   enter the phrase "installation log files" in the
   Search field at this site:

   http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3
   ```

   Solaris

   Before you install 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=swg24030521

Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030527

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030530

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=swg24030522

Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030528

System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030531

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. Ensure that the system environment meets installation requirements. You can verify the requirements manually or run the prerequisite checker. To run the prerequisite checker, complete the following steps:

a. AIX HP-UX Linux Solaris Issue this command to start the prerequisite checker with a graphical interface:

```
./prereqcheck.bin
```

Alternatively, issue this command to start the prerequisite checker with the console method:

```
./prereqcheck.bin -i console
```

b. Windows Issue this command to start the prerequisite checker with a graphical interface:

```
prereqcheck.exe
```

Alternatively, issue this command to start the prerequisite checker with the console method:

```
prereqcheck.exe -i console
```

c. Select the language for the prerequisite checker user interface.

d. In the welcome and disclaimer panels, review the statements and accept them.

If the Prerequisite Results panel shows that your workstation successfully passed the checks, you are ready to start the installation. If an error message is shown in the Prerequisite Results panel, make the required corrections before continuing with the installation. For more information about the prerequisite checker, see "Running the prerequisite checker" on page 38.

6. 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
```

For information about translations that are available for the server, see the server language locales section. For information about the silent installation of the server, see the section on installing Tivoli Storage Manager in silent mode in the *Installation Guide*.

7. Select the language for your installation and follow the wizard, selecting **Next** to step through the wizard.

a. You must accept the license agreement to proceed. Select the product that you are entitled to use and a license agreement is displayed. You can select only one product on the page. If you select Tivoli Storage Manager, Tivoli Storage Manager Extended Edition, or System Storage Archive Manager, you are asked if you will be using LAN-free or library sharing. If you select YES, you must accept the Tivoli Storage Manager for Storage Area Networks license. This is in addition to the license for the product that you chose on the previous page.

b. Select the components that you want to install. Components include the server, languages, license, device driver, and storage agent. There is no default, so you must make a selection. If you previously installed a server, ensure that you select the same directory when you install a language package, license, or device driver. If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver. A server and a storage agent cannot be installed on the same

workstation. For information about other components that you can choose to install, see the *Installation Guide*.

The Tivoli Storage Manager client application programming interface (API), DB2 Version 9.7, and Global Security Kit (GSKit) 8 are automatically installed when you select the server component.

8. 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 you continue to the next step.

   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`)

9. Download and apply any applicable fixes that have been released for the server. Go to the product support site at http://www.ibm.com/support/entry/portal/Downloads. Search for server updates.

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

10. 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 that are based on the recommendations in the results from the utility. You might have to restart the system.

    For information about the utility and about modifying kernel parameters, see http://pic.dhe.ibm.com/infocenter/db2luw/v9r7. 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 C, “HP-UX system resource requirements,” on page 543.

    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://pic.dhe.ibm.com/infocenter/db2luw/v9r7. To find the information, enter a search string such as `modifying kernel parameters`, in the **Search** field at this site.

To run Tivoli Storage Manager with DB2, you might need to set kernel parameter values higher than the suggested minimum values and make other changes to the system. For more details, see the section on tuning kernel parameters for Linux systems in the *Installation Guide*.

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 that are based on the recommendations in the results from the utility. You might have to restart the system.

For information about the utility and about modifying kernel parameters, see http://pic.dhe.ibm.com/infocenter/db2luw/v9r7. 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.

Related concepts:

Appendix E, "Services associated with the Tivoli Storage Manager server," on page 549

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 you complete this task. See "Worksheet for planning space for the V6.3 or later server" on page 44.

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: In the user ID, only lowercase letters (a-z), numerals (0-9), and the underscore character (_) can be used. The user ID and group name must comply with the following rules:

      - The length must be 8 characters or less.
      - The user ID and group name cannot start with *ibm*, *sql*, *sys*, or a numeral.
      - The user ID and group name cannot be *user*, *admin*, *guest*, *public*, *local*, or any SQL reserved word.

      For example, create user ID `tsminst1` in group `tsmsrvrs`. The following examples show how to create this user ID and group by 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
    -s /bin/ksh tsminst1
# passwd tsminst1
```

Linux

```
# groupadd tsmsrvrs
# useradd -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, by using the new user ID and password. Use an interactive login program, such as telnet, so that you are prompted for the password and can change it if necessary.

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

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 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 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 30 characters or less, and cannot start with *ibm*, *sql*, *sys*, or a numeral. The user ID and group name cannot be *user*, *admin*, *guest*, *public*, *local*, or any SQL reserved word.

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 operating system commands to add the new user ID to the Administrators groups:

```
net localgroup Administrators user_ID /add
net localgroup DB2ADMNS user_ID /add
```

c. Log in to your system, by using the new user ID and password.

d. For all directories that were created for the server instance, ensure that the user ID for the server instance has read/write access. The directories to check include the instance directory and all database and log directories.

2. Create the directories that the server requires. Ensure that you are logged in under the new user ID that you created.

   You need a unique, empty directory for each item in the following table. Create the database directories, the active log directory, and the archive log directory on different physical volumes. For space requirements, see "Worksheet for planning space for the V6.3 or later server" on page 44.

   AIX HP-UX Linux Solaris

Table 65. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which will contain files for this server instance, including the server options file	`mkdir /home/user_ID/tsminst1`	

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

Active log directory	`mkdir /home/user_ID/tsmlog`	
Archive log directory	`mkdir /home/user_ID/tsmarchlog`	
Optional: Directory for the log mirror for the active log	`mkdir /home/user_ID/tsmlogmirror`	
Optional: Secondary archive log directory, which is the failover location for the archive log	`mkdir /home/user_ID/tsmarchlogfailover`	

Windows

Table 66. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which will contain files for this server instance, including the server options file	`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, which is the failover location for the archive log	`mkdir k:\tsm\archlogfailover`	

When a server is initially created, with the **DSMSERV FORMAT** utility or with the configuration wizard, a server database and recovery log are created. In addition, files are created to hold database information that is used by the database manager.

3. Create additional logical volumes and mount the volumes on the directories that were created in the previous step.

Continue the upgrade process by using one of the following topics:

"Upgrading the server by using the upgrade wizard"

"Upgrading the server manually by using utilities" on page 308

Related tasks:

"Planning space for the upgrade process and the upgraded server" on page 39

Related reference:

"Server naming best practices" on page 72

Upgrading the server by 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 V6.3 or later 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 V6.3 or later 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 V6.3 or later 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. Also ensure that the SSH daemon service has access rights for connecting to the system by using `localhost`.
  - Remote shell (rsh).
  - Remote Execution Protocol (REXEC).

  If the V5 server is located on a different system than the V6.3 or later server, that system must also have one of the protocols enabled.
- You must be able to log in to the V6.3 or later system with the user ID that you created for the server instance, by 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 where you installed the V6.3 or later server program must have the Windows server message block (SMB) protocol enabled. 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 the V5 server is on a different system than the V6.3 or later server, that system must also have SMB enabled.
- You must be able to log on to the system that has SMB enabled by using either the user ID that you created for the server instance, or another user ID that exists on the system. When using the wizard, you must provide the user ID and password to access the system.

2. Windows If the system is running on Windows Server 2008 or Windows Vista, complete the following steps to disable User Account Control:
   a. Ensure that the Remote Registry in Windows Services is started, and ports 445, 137, and 139 are unblocked in the firewall.
   b. Configure both the framework server and the targets as members of a Windows domain. Use a user account in that domain, or in a trusted domain, when you connect to the target.
   c. Connect to the target workstation by enabling and using the built-in administrator account. To enable the built-in administrator account, click **Control Panel** > **Administrative Tools** > **Local Security Policy** > **Security Settings** > **Local Policies** > **Security Options**. Double-click the **Accounts: Administrator account status** section. Select **Enable** and click **OK**.
   d. Click **Control Panel** > **Administrative Tools** > **Local Security Policy** > **Security Settings** > **Local Policies** > **Security Options**. Double-click the **User Account Control: Run all administrators in Admin Approval Mode** section. Select **Disable** and click **OK**.
3. Start the upgrade wizard, **dsmupgdx**, from the V6.3 or later 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"
```

4. 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 10, "Taking the first steps after upgrade," on page 323.

Related tasks:

"Upgrading the server manually by using utilities"

Upgrading the server manually by using utilities

Use the utilities to upgrade the server by using a command interface.

Before you begin the upgrade procedure, you must complete all preceding steps to prepare for the upgrade. Ensure that you have installed the upgrade utilities, installed the V6.3 or later server program, and created the directories and user ID for the server instance.

Complete the following steps:

1. "Creating and formatting the new database"
2. Use one of the following methods to move the database:
   - "Moving the server database using media" on page 313
   - "Moving the server database over a network" on page 316
3. "Creating a Windows service for the server instance" on page 318
4. "Configuring the system for database backup" on page 319

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 10, "Taking the first steps after upgrade," on page 323.

Related concepts:

"**DSMUPGRD** upgrade utilities" on page 15

Creating and formatting the new database

Create the server instance and format files for an empty V6.3 or later database.

1. Log on to the system where you installed the V6.3 or later program.

   AIX HP-UX Linux Solaris

   Log in by using the root user ID. Verify the following items:

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

     The instance directory stores the following core files that are generated by the Tivoli Storage Manager server:

     – The server options file, `dsmserv.opt`

- The server key database file, `cert.kdb`, and the `.arm` files, which are used by clients and other servers to import the Secure Sockets Layer certificates of the server
- Device configuration file, if the `DEVCONFIG` server option does not specify a fully qualified name
- Volume history file, if the `VOLUMEHISTORY` server option does not specify a fully qualified name
- Volumes for **DEVTYPE=FILE** storage pools, if the directory for the device class is not fully specified, or not fully qualified
- User exits
- Trace output, if it is not fully qualified

• A shell configuration file, for example, `.profile`, exists in the home directory. The root user and instance user ID must have write permission to this file. For more information, go to the DB2 Information Center (http://pic.dhe.ibm.com/infocenter/db2luw/v9r7), and search for information about Linux and UNIX environment variable settings.

Windows

Log on as an administrator.

2. Create a Tivoli Storage Manager instance by 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:

AIX HP-UX Linux Solaris

```
/opt/tivoli/tsm/db2/instance/db2icrt -a server -s ese -u
instance_name instance_name
```

For example, if the user ID for this instance is tsminst1, use the following command to create the instance:

AIX HP-UX Linux Solaris

```
/opt/tivoli/tsm/db2/instance/db2icrt -a server -s ese -u
tsminst1 tsminst1
```

Remember: From this point on, use this new user ID when you configure the 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 V6.3 or later server; this ID is the instance user ID.

```
db2icrt -s ese -u user_account instance_name
```

For example, if the user account is *tsminst1* and the server instance is *Server1*, enter the following command:

```
db2icrt -s ese -u tsminst1 server1
```

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 V6.3 or later server. 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 by using the user ID that owns the V6.3 or later 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, which is 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 V6.3 or later server, copy the files into the following directory:

   AIX HP-UX Linux Solaris `/tsminst1`

   Windows `d:\tsm\server1`

   Ensure that the user ID that owns the V6.3 or later 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 V6.3 or later. For the list of deleted options, see Table 36 on page 69.
   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 V6.3 or later. 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 /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. Modify the library path to use the version of the IBM Global Security Kit (GSKit) that is installed with the Tivoli Storage Manager server:

AIX Issue the following command:

```
export LIBPATH=/usr/opt/ibm/gsk8_64/lib64:$LIBPATH
```

AIX HP-UX Linux Solaris You must update the following files to set the library path when DB2 or the Tivoli Storage Manager server is started:

- *instance_directory*`/sqllib/usercshrc`
- *instance_directory*`/sqllib/userprofile`

For the *instance_directory*`/sqllib/usercshrc` file, add the following lines:

- AIX

```
setenv LIBPATH /usr/opt/ibm/gsk8_64/lib64:$LIBPATH
```

- HP-UX Solaris

```
setenv LD_LIBRARY_PATH /opt/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
```

- Linux

```
setenv LD_LIBRARY_PATH /usr/local/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
```

For the *instance_directory*`/sqllib/userprofile` file, add the following lines:

- AIX

```
LIBPATH=/usr/opt/ibm/gsk8_64/lib64:$LIBPATH
export LIBPATH
```

- HP-UX Solaris

```
LD_LIBRARY_PATH=/opt/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
export LD_LIBRARY_PATH
```

- Linux

```
LD_LIBRARY_PATH=/usr/local/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
export LD_LIBRARY_PATH
```

Verify the library path settings and ensure that the GSKit version is 8.0.14.14 or later. Issue the following commands:

- AIX

```
echo $LIBPATH
gsk8capicmd_64 -version
gsk8ver_64
```

- HP-UX Linux Solaris

```
echo $LD_LIBRARY_PATH
gsk8capicmd_64 -version
gsk8ver_64
```

If the GSKit version is not 8.0.14.14 or later, you must reinstall the Tivoli Storage Manager server. The reinstallation ensures that the correct GSKit version is available.

8. Complete this step to set the server code page.

   Set the DB2CODEPAGE system environment variable to 819 for each server instance. Before you issue the **DSMSERV LOADFORMAT** command, log on to the system as the server instance owner and issue this command:

   ```
   db2set -i instance_name DB2CODEPAGE=819
   ```

   For example: AIX HP-UX Linux Solaris

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

   Windows

   ```
   db2set -i server1 DB2CODEPAGE=819
   ```

9. Change to the instance directory that you created for the server.
10. 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 16 GB (16384 MB, the default size), issue the following command, on one line:

    ```
    /opt/tivoli/tsm/server/bin/dsmserv loadformat \
    dbdir=/tsmdb001,/tsmdb002,/tsmdb003,/tsmdb004 \
    activelogsize=16384 activelogdirectory=/tsmlog \
    mirrorlogdirectory=/tsmlogmirror archlogdirectory=/tsmarchlog
    ```

    Windows

    For example, to get an active log size of 16 GB (16384 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=16384 activelogdirectory=h:\tsm\log
    mirrorlogdirectory=j:\tsm\logmirror archlogdirectory=i:\tsm\archlog
    ```

    If the server that you are upgrading is not Server1, 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=16384 activelogdirectory=h:\tsm\log
mirrorlogdirectory=j:\tsm\logmirror archlogdirectory=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).

11. Monitor the process for errors and warning messages. The final message indicates success or failure of the operation.

Continue the upgrade process by following the instructions in one of the following topics:

"Moving the server database using media"

"Moving the server database over a network" on page 316

Related tasks:

"Estimating total space requirements for the upgrade process and upgraded server" on page 41

Related reference:

DSMSERV LOADFORMAT (Format a database)

"Deleted server commands, utilities, and options" on page 67

Moving the server database using media

Use media to move the server database if the V6.3 or later server is installed on a different system and no network connection is available. Also, use the media method 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 314

Related concepts:

"The manifest file for the data extraction to media" on page 521

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 521

Related tasks:

"Preparing space for the upgrade process" on page 283

Related reference:

"DSMUPGRD EXTRACTDB (Extract data from a V5 server database)" on page 519

Loading the extracted data into the new database

After you format an empty database by using the **DSMSERV LOADFORMAT** utility, load the data that you extracted from the original server database.

Ensure that the following requirements are met before you begin to load the data:

- 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 V6.3 or later server. The device must be physically attached to the system. The permissions must be set to grant access to the media for the user ID that owns the V6.3 or later server instance.

Complete the following steps:

1. Verify that the V6.3 or later 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 by using a FILE or DISK device class, complete the following steps:
     a. Log on to the system by using the root user ID.
     b. Ensure that the user ID that owns the V6.3 or later server (the instance user ID) has ownership or read/write permission for the extracted files.
2. Ensure that the instance user ID has ownership or read/write permission for the manifest file that was created by the extraction process.
3. Log on with the instance user ID on the system where you installed the V6.3 or later server.
4. If the V6.3 or later server is on a different system than the original server, copy the manifest file that was created by the extraction process to the V6.3 or later system.
5. On the V6.3 or later server, complete the following steps:
   a. Verify that the server options file from the V5 server includes the `DEVCONFIG` option, and that the option specifies the full path of the device configuration file.
   b. Verify that the device configuration file from the V5 server is available in the location that is specified by the `DEVCONFIG` option.
   c. Verify that the permissions on the device configuration file allow read access for the instance user ID.
6. 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 V6.3 or later 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.
7. Verify the contents of the manifest file and edit the file if necessary:
   a. Ensure that the device names in the manifest file are valid for the V6.3 or later system. Device names for the same device might be different on V5 and V6 systems.
   b. Ensure that the manifest file contains a list of volumes to be used when the extracted data is loaded into the new database. For example, if the manifest file contains a list of volumes that belong to a FILE device class, ensure that the fully qualified path to the volumes is correct for the system.
8. Issue the **DSMSERV INSERTDB** command to load an extracted server database into the prepared, empty V6.3 or later 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
```

9. Monitor the process for error messages, warning messages, and any items that you might need to address. The system displays interim statistics about the process of loading the database. However, there might be time periods when no messages are issued. During this time, DB2 operations are running in the background. The length of time that the process runs depends on the size of the database. For more information, see "Example: Estimating the upgrade time based on the database size" on page 45.

   Optional: Verify that the database is being loaded by monitoring the processor and I/O usage for the server process and the corresponding DB2 process. For example, issue the following command to monitor the process:

   ```
   tail -f insert.out
   ```

   Tip: Windows 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.

   A message in the output of the **DSMSERV INSERTDB** command indicates the status 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.`

10. If you used the media method to upgrade the system *and* used a tape device, after the data is loaded into the database, 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 database-loading operation again.

Continue the upgrade process by completing the steps in "Creating a Windows service for the server instance" on page 318.

Related concepts:

"The manifest file for the data extraction to media" on page 521

Related reference:

"DSMSERV INSERTDB (Move a server database into an empty database)" on page 529

Moving the server database over a network

Move the database by starting the insertion process for the V6.3 or later server to accept the server database. Then, start 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. Verify that there is a good network connection between the two systems.
2. On the V6.3 or later server, complete the following steps:
   a. Verify that the server options file from the V5 server includes the `DEVCONFIG` option, and that the option specifies the full path of the device configuration file.
   b. Verify that the device configuration file from the V5 server is available in the location that is specified by the `DEVCONFIG` option.

c. Verify that the permissions on the device configuration file allow read access for the instance user ID.

3. Start the insertion process on the V6.3 or later 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 V6.3 or later server and directing the process output to `insert.out`, by 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. Some time might pass during which no messages are issued. During this time, DB2 operations are running in the background. Optional: To verify that operations are continuing as expected, monitor the CPU and I/O usage for the server process and the corresponding DB2 process.

4. Monitor the output of the **DSMSERV INSERTDB** 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 V6.3 or later 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 act 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 519

"DSMSERV INSERTDB (Move a server database into an empty database)" on page 529

Creating a Windows service for the server instance

Windows

A Windows service is created for the Tivoli Storage Manager V6.3 or later 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 by using the Tivoli Storage Manager server instance name and password in the service name. Issue the following command:

   ```
   install "TSM server_instance_name"
    "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
   instance_owner instance_owner_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.

   instance_owner is the instance owner account; this account will own the service.

   instance_owner_password is the password for the instance owner account.

   Example

   To install the Windows service for the server1 server instance, enter the following command on one line. The example uses `rudy` as the instance owner and `s21ret` as the password for the instance owner account.

   ```
   install "TSM server1" "C:\Program Files\Tivoli\TSM\server\dsmsvc.exe"
   rudy s21ret
   ```

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 329

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 Oracle Solaris systems"
- "Configuring the system for database backup on Microsoft Windows systems" on page 321

After configuring the system for database backup, complete the upgrade by performing the steps described in Chapter 10, "Taking the first steps after upgrade," on page 323.

Configuring the system for database backup on AIX, HP-UX, Linux, and Oracle 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 `/tsminst1` for the Tivoli Storage Manager server instance directory.

1. Set the Tivoli Storage Manager 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 profile of the user ID. 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. In the `userprofile` file in the `/home/tsminst1/sqllib` directory, add or update the following lines:

      AIX Korn or Bash shell:

```
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 Korn or Bash shell:

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

      AIX Bourne shell:

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

HP-UX Linux Solaris Bourne shell:

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

AIX C shell:

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

HP-UX Linux Solaris C shell:

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

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

   ```
   . ~/.profile
   ```

   Tip: Ensure that you enter a space after the initial dot (.) character.

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

   ```
   SERVERNAME TSMDBMGR_TSMINST1
   ```

   Remember: The name that you use must match your server instance name.

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 $$_TSMDBMGR_$$
   ```

   Tip: Ensure that you enter the same `tcpport` as the server is using. This is specified in the `dsmserv.opt` file.

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 Oracle Solaris systems" on page 325 for the details.
b. Log in using the root user ID.
c. Source the database manager profile by issuing the following command. Ensure that you enter a dot, a space, and the path to the `db2profile` file. If you do not enter the space, the database backup fails.

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

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

d. Change the API password. Use 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 10, "Taking the first steps after upgrade," on page 323.

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 is to go 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
   ```

Tip: Ensure that you enter the same `tcpport` as the server is using. This is specified in the `dsmserv.opt` file.

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 10, “Taking the first steps after upgrade,” on page 323.

Chapter 10. Taking the first steps after upgrade

Verify that the server was upgraded successfully and can operate normally. The verification steps include starting the server, registering licenses, and backing up the database. Also, configure available server options.

Complete the tasks that are described in the following sections:

1. "Verifying access to storage pools on disk"
2. "Setting up Solaris services for the server instance" on page 324
3. "Configuring server options for server database maintenance" on page 324
4. "Starting the server instance after the upgrade" on page 325
5. "Registering licenses" on page 330
6. "Backing up the database after upgrading the server" on page 330
7. "Verifying the upgraded server" on page 331
8. "Changing the host name for the Tivoli Storage Manager server" on page 332
9. "Updating automation" on page 333
10. "Monitoring the upgraded server" on page 334
11. "Removing GSKit Version 7 after upgrading to Tivoli Storage Manager V6.3 or later" on page 335

After you upgrade the server to V6.3.3 or later, you can authenticate passwords with the LDAP directory server, or authenticate passwords with the IBM Tivoli Storage Manager server. Passwords that are authenticated with the LDAP directory server can provide enhanced system security. For details, see the section about managing passwords and logon procedures in the *Administrator's Guide*.

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 server instance has ownership or read/write permission. Also ensure that the instance user ID has access to all devices that are used, including raw logical devices.

1. Display information about FILE device classes and DISK volumes.

   AIX HP-UX Linux Solaris In each path that is listed for the FILE device class or DISK volume, run the following command:

   ```
   ls -l
   ```

   Windows In each directory that is listed for the FILE device class or DISK volume, run the following command:

   ```
   dir /Q
   ```

2. Verify that the owner of the FILE device class or DISK volume is the server instance owner and that permissions are set to allow the owner to read and write the files.

Setting up Solaris services for the server instance

Solaris

If you are running a Tivoli Storage Manager server on a Solaris system, you can use the Solaris Service Management Facility (SMF) to set up and control the Tivoli Storage Manager server as a service.

For more information, see Technote 7021102 (http://www.ibm.com/support/docview.wss?uid=swg27021102).

Configuring server options for server database maintenance

To help avoid problems with database growth and server performance, the server automatically monitors its database tables and reorganizes them when needed. Before starting the server for production use, set server options to control when reorganization runs. If you plan to use deduplication, ensure that the option to run index reorganization is enabled.

Table and index reorganization requires significant processor resources, active log space, and archive log space. Because database backup takes precedence over reorganization, select the time and duration for reorganization to ensure that the processes do not overlap and reorganization can complete. For more information about scheduling reorganization, see *Administrator's Guide*.

If you update these server options while the server is running, you must stop and restart the server before the updated values take effect.

1. Modify the server options.

   AIX HP-UX Linux Solaris Edit the server options file, `dsmserv.opt`, in the server instance directory. Follow these guidelines when editing the server options file:

   - To activate an option, remove the asterisk at the beginning of the line.
   - Begin entering an option on any line.
   - Enter only one option per line. The entire option with its value must be on one line.
   - If you have multiple entries for an option in the file, the server uses the last entry.
   - To view available server options, see the sample file, `dsmserv.opt.smp`, in the `/opt/tivoli/tsm/server/bin` directory.

   Windows You can modify server options by using the options file editor included in the IBM Tivoli Storage Manager Console. The options file editor is the preferred way to change server options, but you can also use a text editor.
2. If you plan to use deduplication, enable the **ALLOWREORGINDEX** server option. Add the following option and value to the server options file:

   ```
   allowreorgindex yes
   ```
3. Set two server options that control when reorganization starts and how long it runs. Select a time and duration so that reorganization runs when you expect that the server is least busy. These server options control both table and index reorganization processes.

a. Set the time for reorganization to start by using the **REORGBEGINTIME** server option. Specify the time by using the 24-hour system. For example, to set the start time for reorganization as 8:30 p.m., specify the following option and value in the server options file:

```
reorgbegintime 20:30
```

b. Set the interval during which the server can start reorganization. For example, to specify that the server can start reorganization for four hours after the time set by the **REORGBEGINTIME** server option, specify the following option and value in the server options file:

```
reorgduration 4
```

4. If the server was running while you updated the server options file, stop and restart the server.

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 Oracle Solaris systems

AIX HP-UX Linux Solaris

You have various options for starting the Tivoli Storage Manager server, depending on which operating system the server is running on. Before you start the server, ensure that access rights and ulimit values are set correctly.

The standard way to start the server is by using the instance user ID. By using the instance user ID, you simplify the setup process and avoid potential issues. However, in some cases, it might be necessary to use another user ID to start the server. For example, you might want to use the root user ID to ensure that the server can access specific devices. To allow a user other than the instance user ID to start the server, the user ID must have sufficient authority to issue the start command for the server and database manager, and the user ID must belong to the SYSADM_GROUP group. The user ID must have authority to access the server database and to use all files, directories, and devices required by the server. Before starting the server, explicitly grant server database authority to the user ID and verify all other authorities for the user ID.

Important: Linux Solaris When the Tivoli Storage Manager server is started, the dsmserv process is started as the instance owner. On Linux and Solaris operating systems, the device special file names are owned by root. They normally have read/write permission for the root user, and read-only permission for group and world access. Because the Tivoli Storage Manager server is started as a non-root user, it might not have permission to access the device special files in read/write mode. To correct this situation, change permission settings on the device special files (for example, `/dev/rmtX`) to grant read/write access to the instance user. Changing permission settings can be done in several ways:

- If the system is dedicated to Tivoli Storage Manager and only the Tivoli Storage Manager administrator has access, make the device special file world writable.

- If the system has multiple users, you can restrict access by making the Tivoli Storage Manager instance user the owner of the special device files.
- If multiple user instances are running on the same system, change the group name, for example TAPEUSERS, and add each Tivoli Storage Manager instance user ID to that group. Then, change the ownership of the device special files to belong to the group TAPEUSERS, and make them group writable:

  ```
  chmod g+w /dev/rmtX
  ```

AIX HP-UX Linux Solaris When you start the Tivoli Storage Manager server, the server attempts to change certain ulimit values to unlimited. In general, this server action helps to ensure optimal performance and facilitates debugging. If you are a non-root user when you start the server, attempts to change the ulimit values might fail. To ensure correct server operation if you are running the server as a non-root user, set the ulimit values as high as possible before you start the server.

When you specify ulimit values, ensure that you set DB2 user limits as high as possible. DB2 relies on private data memory for sort memory allocations during SQL processing. Insufficient shared heap memory can lead to Tivoli Storage Manager server failures during interaction with DB2. For more information about setting the appropriate values, see Technote 1212174 (http://www.ibm.com/support/docview.wss?uid=swg21212174).

For guidance in setting ulimit values, see the following table:

Table 67. Ulimit values

Ulimit type	Standard value
Maximum size of core files created	Unlimited
Maximum size of a data segment for a process	Unlimited
Maximum file size	Unlimited
Maximum number of open files	• For servers on which replication, data deduplication, or both are enabled, specify a minimum value of 16384. • For all other servers, specify a minimum value of 8192.
Maximum amount of processor time in seconds	Unlimited

For instructions about setting ulimit values, see the documentation for your operating system.

Linux The default value for the user limit of maximum user processes (nproc) has changed on some distributions and versions of the Linux operating system. The new default value is 1024. This value can cause unexpected behavior in the Tivoli Storage Manager server. For the Red Hat Enterprise Linux (RHEL) 6 operating system, the default value for nproc was decreased to 1024. This value might have changed in other versions and distributions of Linux that are supported by the Tivoli Storage Manager server. Increase the user limit of maximum user processes to the minimum suggested value of 16384. If the value is not updated, the server might display unexpected behavior, including hangs or failures. To verify the current user limit, issue the following command as the instance user:

```
ulimit -u
```

For example:

```
[user@Machine ~]$ ulimit -u
16384
```

To display the current values of all user limits, issue the following command:

```
ulimit -a
```

For example:

```
[user@Machine ~]$ ulimit -a
core file size          (blocks, -c) 0
data seg size           (kbytes, -d) unlimited
scheduling priority             (-e) 0
file size               (blocks, -f) unlimited
pending signals                 (-i) 128098
max locked memory       (kbytes, -l) 64
max memory size         (kbytes, -m) unlimited
open files                      (-n) 1024
pipe size            (512 bytes, -p) 8
POSIX message queues     (bytes, -q) 819200
real-time priority              (-r) 0
stack size              (kbytes, -s) 10240
cpu time               (seconds, -t) unlimited
max user processes              (-u) 16384
virtual memory          (kbytes, -v) unlimited
file locks                      (-x) unlimited
```

To update the user limit of maximum user processes, add a line to the `/etc/security/limits.conf` file. On the RHEL 6 operating system, the user limit for `nproc` is set in the `/etc/security/limits.d/90-nproc.conf` file. This file overrides the settings in the `/etc/security/limits.conf` file. To update the user limit on the RHEL 6 operating system, you must either edit the file in the `/etc/security/limits.d` directory or remove the file and add a line to the `/etc/security/limits.conf` file.

Related concepts:

"Startup of server instances (AIX, HP-UX, Linux, Solaris)" on page 8

Starting the server from the instance user ID

AIX HP-UX Linux Solaris

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

1. Log in by using the instance user ID.

   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 instance user ID, if that profile exists.

   If you log in using the instance user ID 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
   ```

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 `/tsminst1`. To start tsminst1, issue the following commands:

```
cd /tsminst1
/opt/tivoli/tsm/server/bin/dsmserv
```

To start the server in the background, issue the following commands:

```
cd /tsminst1
/opt/tivoli/tsm/server/bin/dsmserv -q &
```

Starting the server from the root user ID

AIX HP-UX Linux Solaris

The standard way to start the server is by using the instance user ID. However, in some cases, it might be necessary to use another user ID to start the server. For example, you might want to use the root user ID to ensure that the server can access specific devices.

For more information about starting the server from the root user ID, see the *Administrator's Guide*.

Automatically starting servers

AIX HP-UX Linux Solaris

You can configure servers to start automatically at system startup. If the server is installed on an AIX, HP-UX, or Solaris operating system, use the `rc.dsmserv` script, which is provided for this purpose.

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

Linux If the server is installed on a Linux operating system, you must use the `dsmserv.rc` script to automatically start the server.

Linux For more information, see the section about automatically starting servers on Linux in the *Installation Guide*.

Tip: AIX HP-UX Solaris 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, an entry for the server was added to the `/etc/inittab` file.

AIX HP-UX Solaris

To automatically start the server on system startup, complete the following steps:

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. Ensure that the run level in the

/etc/inittab file matches the run level of the operating system. 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.

To verify correct syntax, see the documentation for your operating system.

AIX HP-UX Solaris

Example: Automatically starting a server instance

In this example, the instance owner is tsminst1; the server instance directory is /home/tsminst1/tsminst1; the run level is 3; and the process ID is tsm1. Add the following entry to /etc/inittab file, on one line:

```
tsm1:3:once:/opt/tivoli/tsm/server/bin/rc.dsmserv -u tsminst1
   -i /home/tsminst1/tsminst1 -q >/dev/console 2>&1
```

Example: Automatically starting several server instances

If you have more than one server instance that you want to run, add an entry for each server instance. This example uses the following instance owner IDs:

- tsminst1
- tsminst2

This example uses the following instance directories:

- /home/tsminst1/tsminst1
- /home/tsminst2/tsminst2

This example uses the following process IDs:

- tsm1
- tsm2

The run level is 3. Add the following entries to the /etc/inittab file. Ensure that each entry is on one line.

```
tsm1:3:once:/opt/tivoli/tsm/server/bin/rc.dsmserv -u tsminst1
   -i /home/tsminst1/tsminst1 -q >/dev/console 2>&1
tsm2:3: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 535

Starting the server on Windows systems

Windows

You can use the **DSMSERV** utility to start the server.

Navigate to the directory where the server is installed and issue the following command:

```
dsmserv -k server_instance
```

where *server_instance* is the name of the server instance. Server1 is the default for the first instance of the Tivoli Storage Manager server on a system.

Related concepts:

"Startup of server instances (Windows)" on page 9

Appendix E, "Services associated with the Tivoli Storage Manager server," on page 549

Registering licenses

Immediately register any Tivoli Storage Manager licensed functions that you purchased so that you do not lose data after you begin to use the server. To ensure that both previous and new licenses are registered, complete the following steps:

1. In the server instance directory of your installation, ensure that the `NODELOCK` file was deleted or renamed. The `NODELOCK` file contains the previous licensing information for your installation.
2. Reregister previously registered licenses by using the **REGISTER LICENSE** command. For more information about the **REGISTER LICENSE** command, see the REGISTER LICENSE section in the *Administrator's Reference*.
3. Register new licenses by using the **REGISTER LICENSE** command.

   Restriction: You cannot register licenses for IBM Tivoli Storage Manager for Mail, IBM Tivoli Storage Manager for Databases, IBM Tivoli Storage Manager for Enterprise Resource Planning, and IBM Tivoli Storage Manager for Space Management.

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.
4. Back up the deployment engine by issuing the following commands:

   AIX | HP-UX | Linux | Solaris

```
. /var/ibm/common/acsi/setenv.sh
cd /usr/ibm/common/acsi/bin
./de_backupdb
```

Windows

```
cd "C:\Program Files\IBM\Common\acsi"
setenv.cmd
cd "C:\Program Files\IBM\Common\acsi\bin"
de_backupdb.cmd
```

Related tasks:

"Configuring the system for database backup" on page 319

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.

Related reference:

"Sample commands to run for validation of the database upgrade" on page 535

Changing the host name for the Tivoli Storage Manager server

If you must change the host name of the Tivoli Storage Manager V6.3 or later server, ensure that you also update the database configuration. If you fail to update the database configuration, the Tivoli Storage Manager server might not start.

Changing the host name for a server running on AIX, HP-UX, Linux, or Solaris systems

AIX HP-UX Linux Solaris

To change the host name of a Tivoli Storage Manager server running on an AIX, HP-UX, Linux, or Solaris system, several steps are required.

1. Stop any Tivoli Storage Manager servers that are running on the system.
2. Change the host name by using the procedures defined for your operating system.
3. From the root user ID on the system, issue the following command:

   ```
   db2set -g DB2SYSTEM=newhostname
   ```

   where *newhostname* is the new host name for the server.

   Tip: The **db2set** command is in the `/opt/tivoli/tsm/db2/adm` directory.
4. Verify that the `DB2SYSTEM` value was changed by issuing the following command:

   ```
   db2set -all
   ```

   This command displays all configuration settings that are used by the database.
5. In the *instance directory*`/sqllib` directory, locate the `db2nodes.cfg` file. The file contains an entry that shows the previous host name, for example:

   ```
   0 tsmmon TSMMON 0
   ```

   a. Update the entry with the new host name. The entry is similar to the following entry:

      ```
      0 tsmnew newhostname 0
      ```

   b. Save and close the changed file.

Changing the host name for a server running on Windows

Windows

To change the host name of a Tivoli Storage Manager server running on a Windows system, back up the database, stop the server, edit the DB2 configuration file, and restart the server.

1. Back up the Tivoli Storage Manager database.
2. Stop the Tivoli Storage Manager server.
3. Change the startup service of the Tivoli Storage Manager server to manual startup:
   a. In the Tivoli Storage Management Console, expand the tree until the server is displayed. Then, expand the server node and the **Reports** node under the selected server.
   b. Select **Service Information.**
   c. Select the server in the right pane and right-click it. Then, click **Properties.**
   d. In the **Startup type** field, select **Manual.**

4. Issue the following commands from the DB2 command prompt window to update the DB2SYSTEM registry variable, turn off extended security, and verify settings:

   ```
   db2set -g DB2SYSTEM=new_host_name
   db2set -g DB2_EXTSECURITY=NO
   db2set -all
   ```

   Tip: The **DB2_EXTSECURITY** parameter is reset to YES when you restart the system.
5. Check for the presence of the db2nodes.cfg file. Depending on your version of Windows, the db2nodes.cfg file may be in one of the following directories:
   - Windows 2008 or later:

     ```
     C:\ProgramData\IBM\DB2\DB2TSM1\<DB2 Instance name>
     ```
   - Other versions of Windows:

     ```
     C:\Documents and Settings\All Users\Application Data\IBM\DB2\DB2TSM1\
     <DB2 Instance name>
     ```

   Tip: The db2nodes.cfg file is a hidden file. Ensure that you show all files by going to Windows Explorer and selecting **Tools** > **Folder Options** and specifying to view hidden files.

   If the db2nodes.cfg file does not exist on your system, proceed to the next step. If the file does exist, issue the following command to update the host name:

   ```
   db2nchg /n:0 /i:<instance> /h:<new host name>
   ```
6. Change the Windows host name, as described in the documentation for the Windows system that you are using.
7. Restart the server.
8. Update the security settings by running the following command:

   ```
   db2extsec -a new_host_name\DB2ADMNS -u new_host_name\DB2USERS
   ```
9. Start the Tivoli Storage Manager server.
10. Reset the startup service for Tivoli Storage Manager server to be automatic:
    a. In the Tivoli Storage Management Console, expand the tree until the server is displayed. Then, expand the server node and the **Reports** node under the selected server.
    b. Select **Service Information.**
    c. Select the server in the right pane and right-click it. Then, click **Properties.**
    d. In the **Startup type** field, select **Automatic.**

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 to use the upgraded server in production operation, monitor the space that is used by the server to ensure that the amount of space is adequate. Adjust the space if 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 reaches its typical expected level, the space that is used by the active log is 80% - 90% of the space that is available to the active log directory. At that point, you might need to increase the amount of space. Whether you must increase the space depends on the types of transactions in the server workload. 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 are completed quickly. The transactions might use a large amount of space in the active log, but for a short 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. The transactions might use a small amount of space in the active log, but for a long time.
   - Network connection types
     - Backup operations that occur over fast network connections cause transactions that are completed more quickly. The transactions use space in the active log for a shorter time.
     - Backup operations that occur over relatively slower connections cause transactions that take a longer time to be completed. The transactions use space in the active log for a longer time.

   If the server is handling transactions with a wide variety of characteristics, the space that is used for the active log might increase and decrease significantly 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 long time.

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 stops. The goal is to make enough space available to the archive log so that it never uses all 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 that is 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, decreases, and then might grow again. Over time, as normal operations continue, the amount of space that is 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. You might need to move the archive log to a different file system.

  For information about moving the archive log, see the *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 are 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 to use the archive failover log only under unusual conditions, not in normal operation.

Related concepts:

"Recovery log space requirements" on page 41

"Database operations" on page 4

Removing GSKit Version 7 after upgrading to Tivoli Storage Manager V6.3 or later

Windows

The Tivoli Storage Manager installation wizard upgrades GSKit Version 8 and later. GSKit Version 7 is not removed or upgraded when you upgrade to Tivoli Storage Manager Version 6.3 or later, even if it was installed with an earlier version of Tivoli Storage Manager.

If you no longer need GSKit Version 7 and want to free up space on your system, you can remove it after the upgrade to Tivoli Storage Manager Version 6.3 or later.

Attention: Removing GSKit Version 7 might affect other programs on your system that rely on it.

1. Back up your registry.
   a. Click **Start**, and then click **Run**.
   b. Type **Regedit**. Click **OK**.
   c. To save a copy of your registry, select **File** > **Export**.
   d. If you must later restore the registry, select **File** > **Import**.

   For additional details, see your Windows documentation.
2. Locate the directory where the GSKit is installed. The default directory is `C:\Program Files\IBM\gsk7\`.
3. Remove the GSKit installation directory, `gsk7`, and all subfiles and directories. Right-click the folder and click **Delete**.
4. Remove the GSKit Version 7 registry key and all subkeys and values.

   Attention: Removing the wrong key can cause system problems such as not being able to restart the workstation.
   a. Click **Start**, and then click **Run**.
   b. Type **Regedit**. Click **OK**.

c. The GSKit registry key is located in this directory: `HKEY_LOCAL_MACHINE\SOFTWARE\IBM`. Right-click the registry key, `HKEY_LOCAL_MACHINE\SOFTWARE\IBM\GSK7`, and click **Delete**.

Chapter 11. 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.

For the latest information about issues that might occur during an upgrade and how to resolve them, go to the IBM Tivoli Storage Manager support site: http://www.ibm.com/support/entry/portal/Overview/Software/Tivoli/Tivoli_Storage_Manager.

Server upgrade phase: Warnings about unsupported server options

When you run 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 are displayed, 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 V6.3 or later 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 you start the V6.3 or later server, edit the server options file and remove any options that are not valid for V6.3 or later.

Database extraction phase: Connection refusal message

When you use the network method to move the V5 server database to the V6 server database, connection refusal messages are received when you start 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 you try 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 by 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 is 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 you issue 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
  ```

Database formatting phase: Failure with `rc=499`

Windows

When the upgrade wizard is used to upgrade a Tivoli Storage Manager server on Windows from V5 to V6.3 or later, the system fails to format the new database.

Symptoms

The database formatting operation fails with the return code `rc=499`.

Causes

This issue might be caused by a Sophos antivirus program. If a Sophos antivirus program is installed on the system that is being upgraded, the program might scan the Tivoli Storage Manager instance database during the upgrade. The scanning operation can affect the creation of database files.

Resolving the problem

To diagnose the problem, review the `dsmupgdx.trc` file in the `c:\Program Files\Tivoli\TSM` directory. If you see the `rc=499` message, the database was not correctly formatted. The following example shows trace output with the `rc=499` message:

```
timestamp com.tivoli.dsm.ServerConfig.ServerDB$FormatThread.run(): Issuing cmd:
 "C:\Program Files\Tivoli\TSM\Server\dsmserv" -k Server1 LOADFORMAT dbfile=\
"C:\Program Files\Tivoli\TSM\server1\dbfile.1\" activelogdir=\"D:\ActiveLog\"
archlogdir=\"E:\ArchiveLog\" activelogsize=16384 >Format.Out 2>&1 on id tsminst1
timestamp com.tivoli.dsm.ServerConfig.ProcessMonitor.run(): enter, Monitoring file
C:\Program Files\Tivoli\TSM\server1\Format.Out
timestamp 2012 com.tivoli.dsm.ServerConfig.ProcessMonitor.read(): File
C:\Program Files\Tivoli\TSM\server1\Format.Out not created yet.
timestamp com.tivoli.dsm.ServerConfig.ProcessMonitor.read(): File C:\Program Files
```

```
\Tivoli\TSM\server1\Format.Out now being read. ...
timestamp com.tivoli.dsm.ServerConfig.ProcessMonitor.read(): File C:\Program Files
\Tivoli\TSM\server1\Format.Out now being read.
timestamp com.tivoli.dsm.ServerConfig.ServerDB$FormatThread.run(): Format rc: 9994
timestamp  com.tivoli.dsm.ServerConfig.ServerDB$FormatThread.run(): format stderr:
timestamp  com.tivoli.dsm.ServerConfig.ProcessMonitor.cancel(): enter
timestamp  com.tivoli.dsm.ServerConfig.ProcessMonitor.read(): File C:\Program
Files\Tivoli\TSM\server1\Format.Out now being read.
timestamp  com.tivoli.dsm.ServerConfig.ProcessMonitor.run(): exit
timestamp  com.tivoli.dsm.ServerConfig.ProcessMonitor.cancel(): exit
timestamp  com.tivoli.dsm.ConfigWizard.DoFormatPanel.signalEvent(): enter,
event=formatDone, rc=499
```

If the `dsmupgdx.trc` file is not available, review the `db2diaglog` file to see whether the following error is reported:

```
Invalid collation ID
```

The following sample `db2diaglog` file indicates a failure to format the database:

```
timestamp LEVEL: Severe
PID : 2304 TID : 2008 PROC : db2syscs.exe
INSTANCE: SERVER1 NODE : 000 DB : TSMDB1
APPHDL : 0-8 APPID: *LOCAL.SERVER1.121107195909
AUTHID : TSMINST1
EDUID : 2008 EDUNAME: db2agent (TSMDB1) 0
FUNCTION: DB2 UDB, relation data serv, sqlrr_dump_ffdc, probe:300
DATA #1 : SQLCA, PD_DB2_TYPE_SQLCA, 136 bytes
sqlcaid : SQLCA sqlcabc: 136 sqlcode: -901 sqlerrml: 20
sqlerrmc: Invalid collation ID
sqlerrp : SQLNQB6E
sqlerrd : (1) 0x00000000 (2) 0x00000000 (3) 0x00000000
(4) 0x00000000 (5) 0xFFFFFF9C (6) 0x00000000
sqlwarn : (1) (2) (3) (4) (5) (6)
(7) (8) (9) (10) (11)
sqlstate:
```

If you determine that the database was not correctly formatted, and if the Sophos antivirus program is installed, complete the following steps:

1. To ensure that the antivirus program does not affect the database formatting operation, complete one of the following steps:
   - Configure the antivirus program to ensure that it does not scan the Tivoli Storage Manager instance database or files.
   - Disable the antivirus program for a limited time so that it does not affect the database formatting process.

   Remember: Before you reconfigure or disable the antivirus program, review the antivirus product documentation so that you are aware of potential risks and how to mitigate them.
2. Run the upgrade wizard again.
3. If you disabled the antivirus program, reenable it.

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 **DSMSERV 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.

Database insertion phase: Problems with restarting the upgrade process

After the upgrade process fails at the database insertion step, restarting the process results in errors.

Symptoms

When you try to restart the process, by using either the upgrade wizard (`dsmupgdx`) or commands, you receive messages that the database 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 ID 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 take 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.

Server startup phase: Error ANR0162W

Windows

After the Tivoli Storage Manager server is upgraded from V5 to V6.3 or later on a Windows operating system, the server instance fails to start.

Symptoms

The server startup fails with error message ANR0162W.

Causes

This issue might be caused by a Sophos antivirus program. If a Sophos antivirus program is installed on the system that is being upgraded, the antivirus program might scan the Tivoli Storage Manager instance database during the upgrade. The scanning operation can affect the startup of the server instance.

Resolving the problem

To diagnose the problem, attempt to start the server. To start the server from the default directory, `C:\Program Files\Tivoli\TSM\server`, issue the following command:

```
dsmserv -k server_instance
```

where *server_instance* is the name of the server instance. `Server1` is the default for the first instance of the Tivoli Storage Manager server.

If the server fails to start, the output includes message ANR0162W, as shown in the following example:

```
C:\Program Files\Tivoli\TSM\server>dsmserv -k server1
ANR7800I DSMSERV generated at 02:08:06 on Jul 26 2012.
Tivoli Storage Manager for Windows
Version 6, Release 3, Level 2.000
Licensed Materials - Property of IBM
(C) Copyright IBM Corporation 1990, 2011.
All rights reserved.
U.S. Government Users Restricted Rights - Use, duplication or disclosure
restricted by GSA ADP Schedule Contract with IBM Corporation.
ANR0900I Processing options file c:\Program Files\Tivoli\TSM\server1\dsmserv.opt.
ANR4726I The ICC support module has been loaded.
ANR0990I Server restart-recovery in progress.
...
ANR0984I Process 1 for AUDIT LICENSE started in the BACKGROUND at 13:14:09.
ANR2820I Automatic license audit started as process 1.
ANR2560I Schedule manager started.
ANR0162W Supplemental database diagnostic information: -1:42884:-440
([IBM][CLI Driver][DB2/NT64] SQL0440N No authorized routine named "COLLATIONNAME"
of type "FUNCTION" having compatible arguments was found. SQLSTATE=42884).
ANR0162W Supplemental database diagnostic information: -1:42884:-440
([IBM][CLI Driver][DB2/NT64]
...
ANR0171I tbtbl.c(14146): Error detected on x:y, database in evaluation mode.
...
ANR9999D_3937368011 LmLcAuditThread(lmlcaud.c:864) Thread<31>: Error in committing
audit license transaction.
ANR9999D Thread<31> issued message 9999 from:
```

```
ANR9999D Thread<31> 000007FEE95CE599 OutDiagToCons()+159
ANR9999D Thread<31> 000007FEE95C7FFC outDiagfExt()+fc
ANR9999D Thread<31> 000007FEE91EC95B LmLcAuditThread()+13fb
ANR9999D Thread<31> 000007FEE8DE6384 startThread()+124
ANR9999D Thread<31> 0000000071F41D9F endthreadex()+43
ANR9999D Thread<31> 0000000071F41E3B endthreadex()+df
ANR9999D Thread<31> 0000000076C2BE3D BaseThreadInitThunk()+d
ANR9999D Thread<31> 0000000076E36A51 RtlUserThreadStart()+21
...
ANR0369I Stopping the database manager because of a server shutdown.
ANR0991I Server shutdown complete.
```

If you determine that the server instance failed to start, and the Sophos antivirus program is installed, complete the following steps:

1. To ensure that the antivirus program does not affect the startup of the server instance, take one of the following actions:
   - Configure the antivirus program to ensure that it does not scan the Tivoli Storage Manager instance database or files.
   - Disable the antivirus program for a limited time so that the server instance can be started.

   Remember: Before you reconfigure or disable the antivirus program, review the antivirus product documentation so that you are aware of potential risks and how to mitigate them.
2. Start the server instance again.
3. If you disabled the antivirus program, reenable it.

Server startup phase: Warnings about unsupported server options

When you start the V6.3 or later server, you receive warning messages about server options that are not supported. However, the options are not displayed in the list of server options that were deleted for V6.3 or later.

Symptoms

ANR0902W messages about the server options are displayed, but the server starts.

Causes

V5 releases tolerated the presence of some server options that were not supported by the server. The V6.3 or later server flags such options by issuing warning messages.

The list of server options that were deleted for V6.3 or later contains options that 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 in 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 67

Postupgrade phase: dsmserv.dsk file no longer available

After running the upgrade wizard or one of the upgrade utilities, you cannot locate the `dsmserv.dsk` file.

Symptoms

The `dsmserv.dsk` file is no longer in the default directory for the server.

Causes

The `dsmserv.dsk` file is not used in Tivoli Storage Manager V6.3 or later.

Resolving the problem

No action is required. However, if you are planning to upgrade the server from V5 to V6.3 or later, you might want to save the `dsmserv.dsk` file in case you need to revert to Tivoli Storage Manager V5.

Postupgrade phase: VARY command fails

After completing an upgrade of Tivoli Storage Manager server, the **VARY** command fails.

Symptoms

You are unable to use this command to bring a random access storage pool online for the Tivoli Storage Manager server.

Causes

This issue can have various causes. One possible cause is that the user ID that is running the server does not have write access to the server disks.

Resolving the problem

Ensure that the user ID that will be used to run the server has write access to the server disks. Then, run the **VARY** command again.

Postupgrade phase: Reverting from V6.3 or later to the previous V5 server version

If you must revert the Tivoli Storage Manager server to the previous version after an upgrade, you must have a full database backup. You also must have the server installation media from your original version, and key configuration files. By carefully following the preparation steps before you upgrade the server, it might be possible to revert to the previous version of the 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

Attention: Specify the **REUSEDELAY** parameter to help prevent backup-archive client data loss when you revert the server to a previous version.

Complete the following steps on the system that has the V6.3 or later server:

Steps for reverting to the previous server version

1. Back up the V6.3 or later 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 must return to the V6.3 or later server.
2. Remove the database from the database manager, and 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 must 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 V6.3 or later server. Uninstallation removes the server and the database manager software 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 V6.3 or later. 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. After that, you must install 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 V6.3 or later.
   b. Reinstall any fix packs that were installed on the base server version before the upgrade to V6.3 or later.
5. Copy the following files 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 by using the backup that was created in the preparation steps before the upgrade.
8. If you enabled data deduplication for any FILE storage pools that existed before the upgrade, or if you moved data that existed before the upgrade into new storage pools while using the V6.3 or later server, you must complete

more steps. See "Additional recovery steps if you created new storage pools or enabled data deduplication."

9. If the **REUSEDELAY** setting on storage pools is less than the age of the database that you restored, 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 by using the **AUDIT VOLUME** command, and specifying 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 by using the V6.3 or later 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 you upgraded the server to V6.3 or later, re-create the pools.

    The amount of time that is required to re-create the active-data pools might be significant, depending on the number and size of the active-data pools to be re-created.

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 storage pools, or did both while your server was running as a V6.3 or later server, you must complete more steps to return the server to the previous version.

Use this information if you did either or both of the following actions while your server was running as a V6.3 or later server:

- You enabled the data deduplication function for any storage pools that existed before the upgrade to V6.3 or later. Data deduplication applies only to storage pools that use a FILE device type.
- You created primary storage pools after the upgrade, *and* moved data that was stored in other storage pools into the new storage pools.

Perform these steps after the server is restored to V5.

- For each storage pool for which you enabled 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 V6.3 or later.
- 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 storage pools into a new storage pool, space that was occupied by the data that was moved was probably reused. Therefore, you must restore the original V5 storage pools by using the storage pool backups that were created before the upgrade to V6.3 or later.

    If *no* data was moved from V5 DISK storage pools into a new storage pool, audit the storage pool volumes in these DISK storage pools.

  – If data was moved from V5 sequential-access storage pools into a new storage pool, that data might exist and be usable in storage pool volumes on the restored V5 server. The data might 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 V6.3 or later server. If any volumes were reclaimed while the server was running as a V6.3 or later server, restore those volumes from storage pool backups that were created before the upgrade to V6.3 or later.

Part 2. Migrating Tivoli Storage Manager V5 servers on AIX, HP-UX, or Solaris systems to V6.3.4 on Linux

A Tivoli Storage Manager V5 server that runs on an AIX, HP-UX, or Solaris operating system can be migrated to V6.3.4 or later on a Linux x86_64 operating system.

Depending on your hardware and software environment, this migration procedure might be useful for achieving server consolidation, load balancing, or standardization on the Linux operating system.

Chapter 12. Migration overview

Before you migrate the server, review the migration options, the migration roadmap, the scenarios for migration, and related information.

You can use one of the following migration options:

- Follow the cross-platform migration procedure, starting with the "Migration roadmap."
- Follow the cross-platform migration procedure, starting with the "Migration roadmap," and facilitate the process by using Migration Engine from Butterfly Software.

  Migration Engine from Butterfly Software automates the process of migrating backup data from one or more Tivoli Storage Manager V5 servers to a Tivoli Storage Manager V6 server. Migration Engine from Butterfly Software also provides planning options for migration and real-time reports about migration progress. Only IBM Software Services and IBM Business Partners are authorized to use Migration Engine from Butterfly Software. For more information, contact IBM Software Services or your IBM Business Partner.

Migration roadmap

The migration roadmap provides links to information to help you plan, prepare, and complete the migration process.

To plan the migration, complete the following steps:

1. Review the migration scenarios. See "Scenarios for migrating a server from an AIX, HP-UX, or Solaris system to V6.3.4 on Linux" on page 352.
2. Become familiar with the commands and utilities that you can use during the migration process. See "Utilities and commands for data migration" on page 357.
3. Review the guidelines for moving data that cannot be accessed or is not readable by the target system. See "Data movement" on page 357.
4. Review the information about migrating devices. See "Device availability" on page 358.
5. Review the guidelines about protecting client data and the server during the migration process. See "Protection for client data and the server during the process" on page 358.
6. Select the migration method to use, and plan for the hardware, software, and storage space requirements for your server and environment. See Chapter 13, "Planning the migration," on page 359.

To prepare for the migration, see Chapter 14, "Preparing for the migration," on page 367.

To migrate the system, see Chapter 15, "Migrating the server database to the V6.3.4 or later server," on page 379.

To prepare the system for operation, see Chapter 16, "Taking the first steps after migration," on page 417.

Scenarios for migrating a server from an AIX, HP-UX, or Solaris system to V6.3.4 on Linux

Several scenarios are available for migrating a Tivoli Storage Manager server from V5 on an AIX, HP-UX, or Solaris operating system to V6.3.4 or later on a Linux x86_64 operating system. In addition to migrating the server, you must migrate data from the V5 database to the V6.3.4 or later database.

Review the scenarios so that you can select the one that works best in your hardware and software environment.

The following scenarios are available:

- Migration scenario 1: Media method, upgrade wizard
- Migration scenario 2: Media method, command line
- Migration scenario 3: Network method, upgrade wizard
- Migration scenario 4: Network method, command line

To migrate the server database, you can use one of the following methods:

Media method
You extract data from the original database to media, and then load the data into the new database.

Network method
You simultaneously extract data from the original database and load the data into the new database over a network connection.

For information about when to use the media method and when to use the network method, see "Comparison of methods for moving data to the V6.3 or later database" on page 14.

To migrate the server, you can use the upgrade wizard or the command line:

Upgrade wizard
The wizard guides you through the process. You can avoid some steps that are complex when done manually.

Command line
You issue administrative commands to upgrade the system manually.

Migration scenario 1: Media method, upgrade wizard

The following figure illustrates how to migrate a server by using the media method and the upgrade wizard.

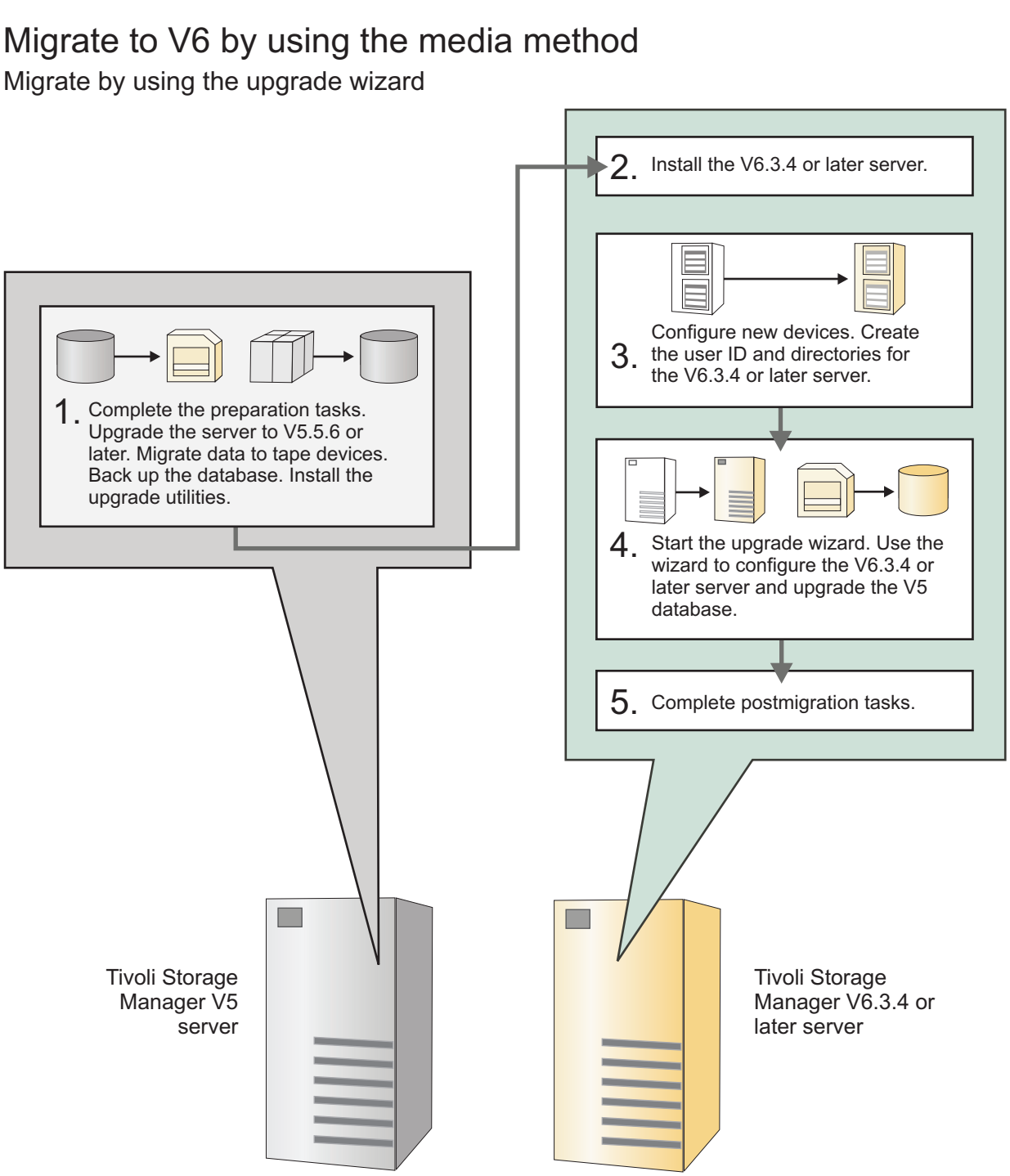

Figure 9. Migration scenario 1

For information about selecting an appropriate level for a V5 server before a migration, see "Determining the appropriate level for a V5 server before an upgrade" on page 37.

Migration scenario 2: Media method, command line

The following figure illustrates how to migrate a server by using the media method and the command line.

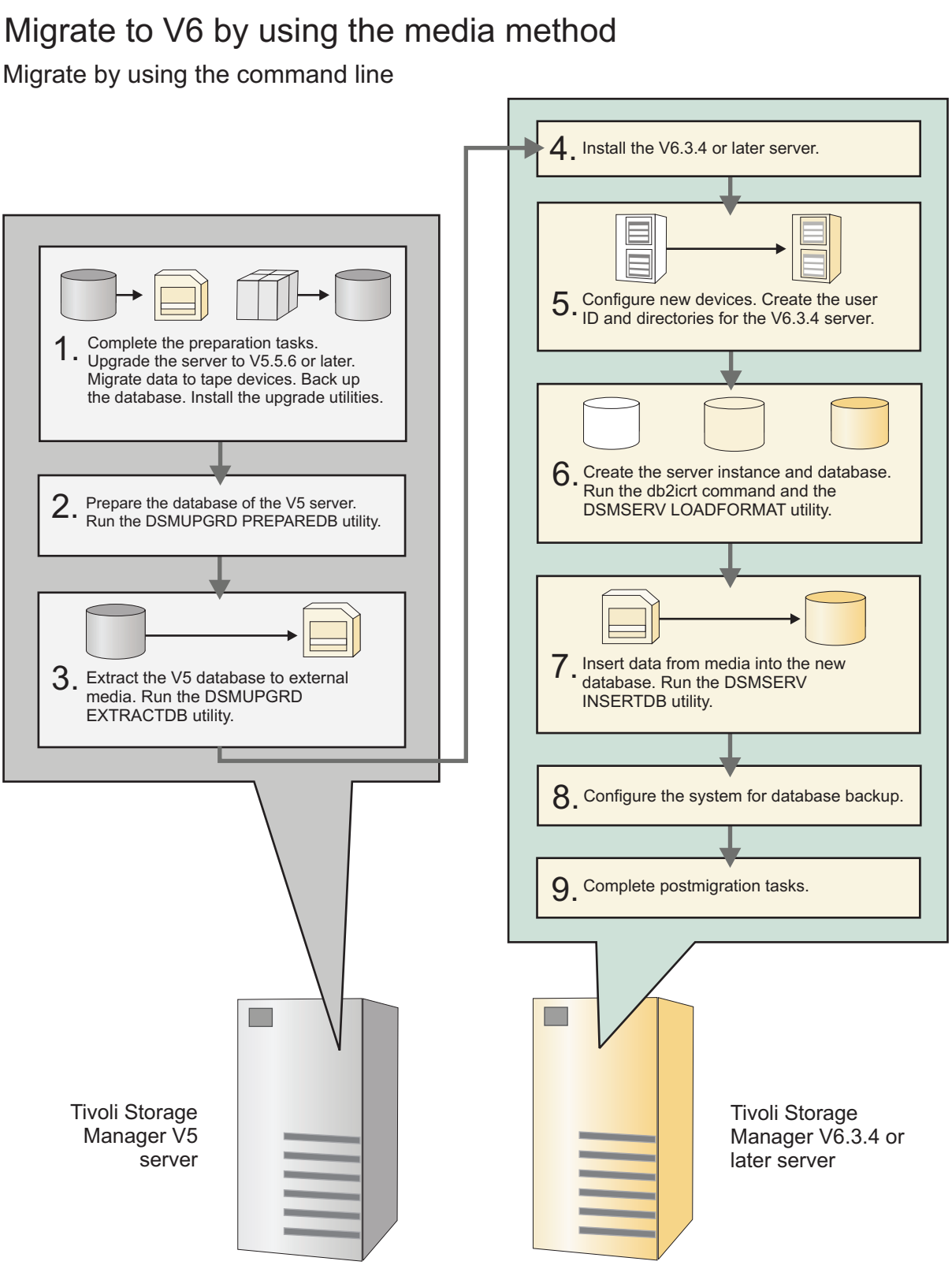

Figure 10. Migration scenario 2

For information about selecting an appropriate level for a V5 server before a migration, see "Determining the appropriate level for a V5 server before an upgrade" on page 37.

Migration scenario 3: Network method, upgrade wizard

The following figure illustrates how to migrate a server by using the network method and the upgrade wizard.

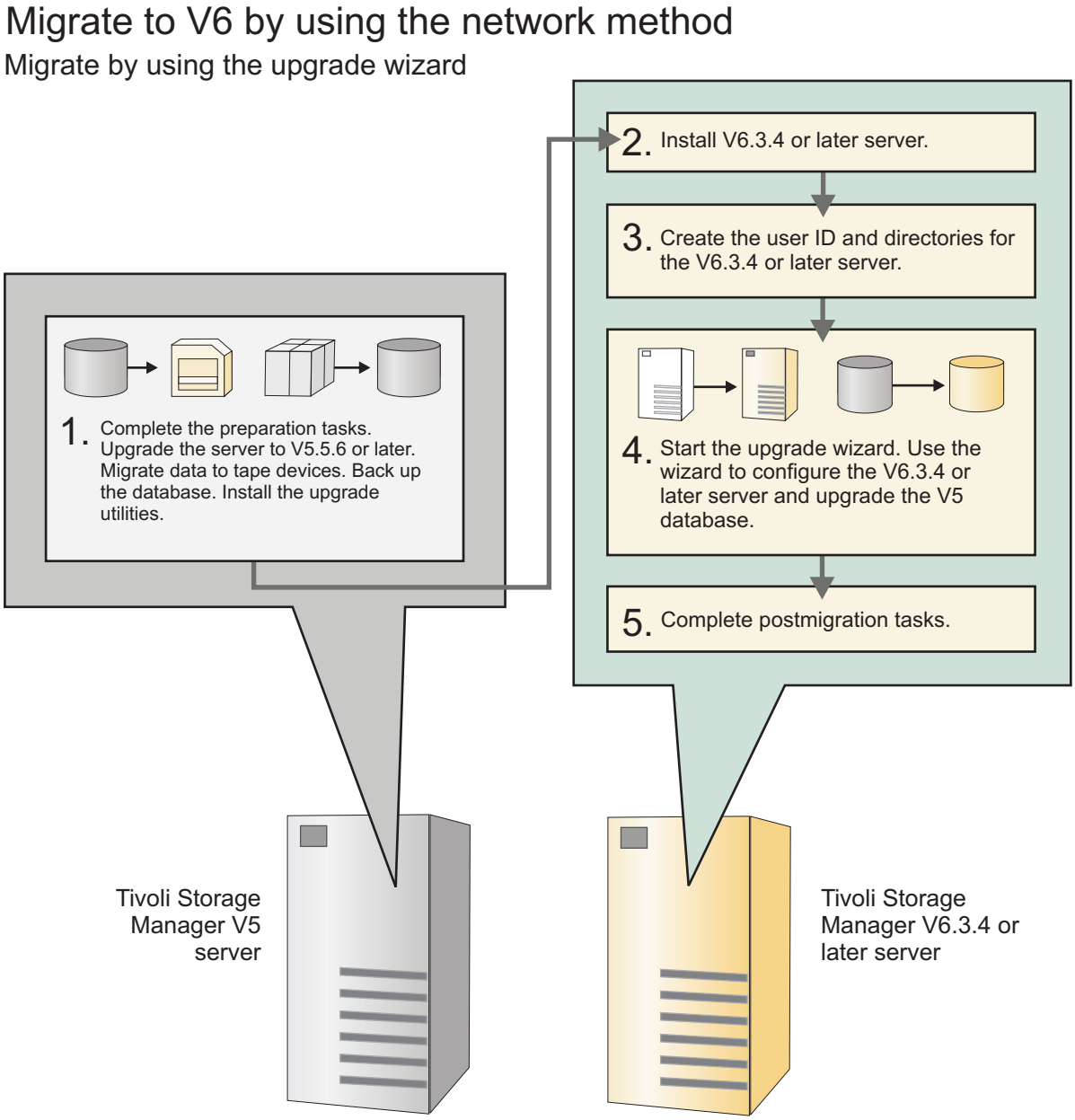

Figure 11. Migration scenario 3

For information about selecting an appropriate level for a V5 server before a migration, see "Determining the appropriate level for a V5 server before an upgrade" on page 37.

Migration scenario 4: Network method, command line

The following figure illustrates how to migrate a server by using the network method and the command line.

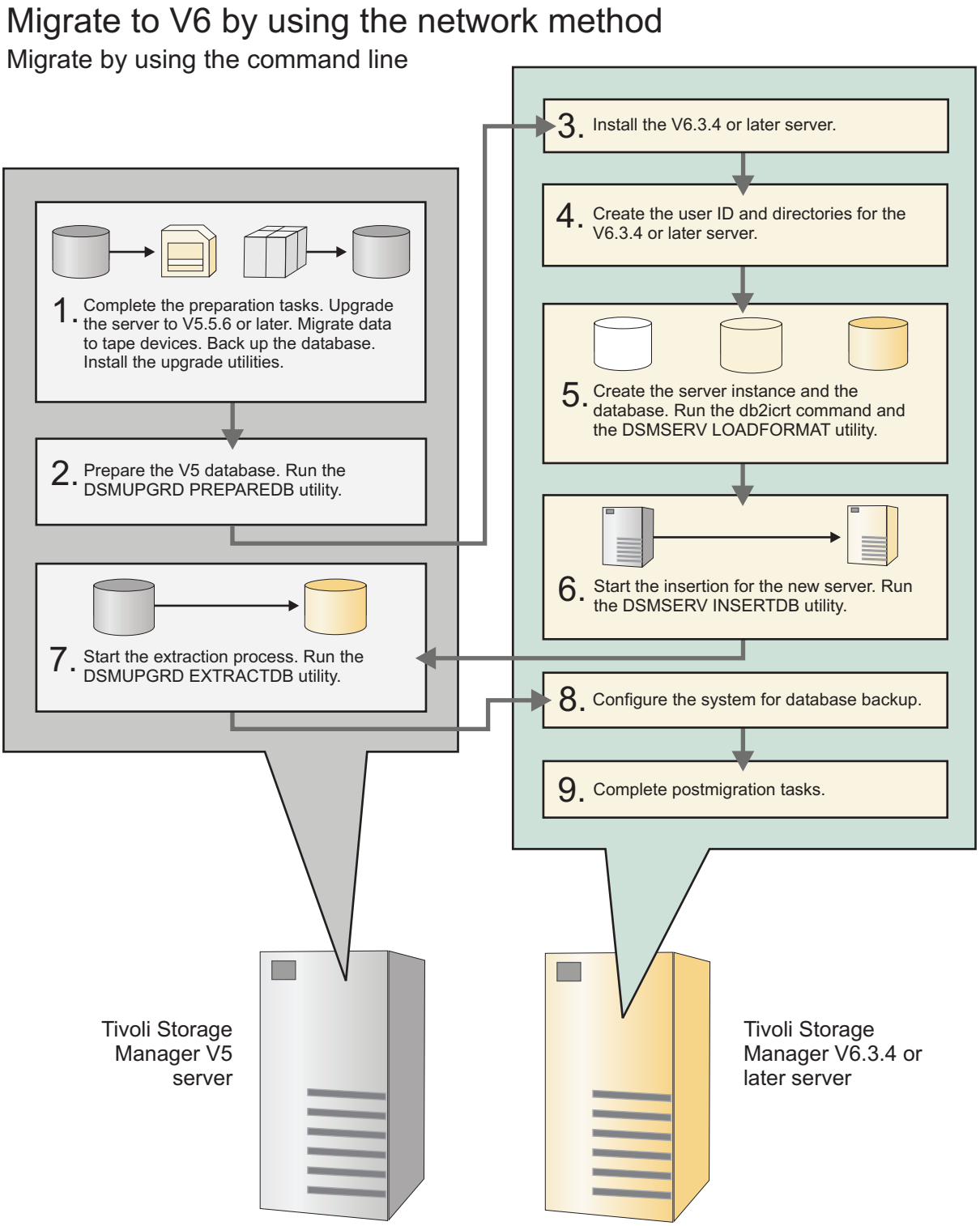

Figure 12. Migration scenario 4

For information about selecting an appropriate level for a V5 server before a migration, see "Determining the appropriate level for a V5 server before an upgrade" on page 37.

The migration process

You can use utilities and commands to facilitate the migration process. Restrictions apply to the movement of data during the migration process and to device availability afterward. During the migration process, you must take care to protect client data and the server.

Utilities and commands for data migration

Tivoli Storage Manager provides utilities and commands to help you move data from a V5 system that is running on AIX, HP-UX, or Solaris to V6.3.4 or later on Linux x86_64.

You can use the following utilities for data migration:

DSMUPGRD QUERYDB
The **DSMUPGRD QUERYDB** utility displays information about the database and recovery log for a V5 server.

DSMUPGRD PREPAREDB
The **DSMUPGRD PREPAREDB** utility prepares the database for migration by verifying that all premigration tasks are completed.

DSMUPGRD EXTRACTDB
The **DSMUPGRD EXTRACTDB** utility extracts data from the server database.

DSMSERV LOADFORMAT
The **DSMSERV LOADFORMAT** utility formats an empty database in preparation for inserting extracted data into the empty database.

DSMSERV INSERTDB
The **DSMSERV INSERTDB** utility moves extracted data into a new database.

Many of the utilities and commands that are used for server upgrade are also used for server migration. For more information, see Appendix A, "Utilities, scripts, and commands for server upgrade and migration," on page 511.

You can run commands to validate the database upgrade. For more information, see "Sample commands to run for validation of the database upgrade" on page 535.

Data movement

In some cases, data that is stored on a V5 system might not be readable and accessible on a V6.3.4 or later system. You can take steps to ensure that this data is readable and accessible.

The following restrictions apply to data movement:

- Raw logical volumes that are used on a V5 system will not be available on a V6.3.4 or later system. Raw logical volumes cannot be used on Linux systems.
- Data that is stored on GENERICTAPE devices will not be available on a V6.3.4 or later system. GENERICTAPE devices cannot be used on Linux systems.
- Volumes that are stored on DISK and FILE devices might not be available on a V6.3.4 or later system, depending on target system restrictions.

- A device driver that is required to access a specific type of storage hardware might not be supported on a V6.3.4 or later system.
- Storage hardware that is attached to a V5 system might not be compatible with a V6.3.4 or later system.

The most reliable way to move data to the new system is to migrate the data to a non-GENERICTAPE tape device. The tape device must be accessible to both V5 and V6.3.4 or later systems. After the migration, you can migrate data from tape to any DISK or FILE devices that are compatible with a V6.3.4 or later system.

Device availability

Devices that are used on a V5 system might not be accessible to a V6.3.4 or later server database.

If a device cannot be accessed, you must plan for migrating the data from the V5 device to a device that is accessible to a V6.3.4 or later server database.

For a list of devices and operating systems that you can use, see the following websites:

AIX HP-UX Solaris IBM Tivoli Storage Manager Supported Devices website for AIX, HP-UX, Solaris, and Windows systems (http://www.ibm.com/software/sysmgmt/products/support/IBM_TSM_Supported_Devices_for_AIXHPSUNWIN.html)

Linux IBM Tivoli Storage Manager Supported Devices website for Linux systems (http://www.ibm.com/software/sysmgmt/products/support/IBM_TSM_Supported_Devices_for_Linux.html)

Protection for client data and the server during the process

To protect client data and the server, you must complete several tasks during the preparation phase. Plan to back up or migrate some types of data to non-GENERICTAPE tape devices and back up the server database.

Backing up data is required to ensure that you can revert to the previous Tivoli Storage Manager version if necessary.

For information about backup tasks, see the following topics:

- “Backing up or migrating data stored on DISK and FILE devices” on page 369
- “Migrating data that is stored on GENERICTAPE devices” on page 369
- “Moving backup sets that are stored on FILE devices” on page 370
- “Backing up the server database” on page 371
- “Creating a summary of database contents” on page 371

Tip: When you back up the database, make two copies to protect the backup from media failures. Ensure that at least one full database backup is available onsite. If you must restore the database, you can save time by having a backup that is immediately available.

Do not uninstall the V5 server until you verify that the migration to V6.3.4 or later was successful.

For more information about protecting the database, see “Database protection and recovery” on page 5.

Chapter 13. Planning the migration

Plan the migration carefully to minimize the time during which the Tivoli Storage Manager system will be unavailable. During the migration, you must install the new software and move the contents of the V5 server database into the new V6.3.4 or later database.

Moving data from an original V5 server database to the V6.3.4 or later database uses a large percentage of processing capacity. The move also requires a high amount of I/O activity.

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

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 migrating one server first to get experience with how the migration process will work for your data. Use the results of the first migration process to plan for migrating the remaining servers.

To plan the migration, complete the following steps:

1. Select a migration scenario. For more information, see "Scenarios for migrating a server from an AIX, HP-UX, or Solaris system to V6.3.4 on Linux" on page 352.
2. Review the hardware and software requirements. For more information, see "Hardware and software requirements for the V5 and V6.3.4 or later servers" on page 360.
3. Complete the following tasks:
   a. "Estimating database and recovery log requirements" on page 360
   b. "Estimating the time required for migration" on page 361
   c. "Planning data movement" on page 362
   d. "Planning for upgrading multiple servers and components" on page 362
   e. "Preparing for operational changes" on page 362
   f. "Estimating storage and device requirements" on page 363
4. To help you plan the migration, review the following information:
   - "Performance tips for the V5 database extraction process" on page 363
   - "Performance tips for inserting data into the V6.3.4 or later database" on page 364
   - "Reference information for planning the migration" on page 365
5. Optional: Test the migration process in a limited or nonproduction environment.

Hardware and software requirements for the V5 and V6.3.4 or later servers

Review the hardware and software requirements for the V5 and V6.3.4 or later servers. During the server installation step, you can use a prerequisite checker to confirm the system requirements for the V6.3.4 or later server.

During the migration process, you must upgrade the V5 server to V5.5.6 or later. To optimize the migration process and avert potential issues, consider upgrading the V5 server to the latest available level and installing the latest interim fix for that level. Follow the guidelines in "Determining the appropriate level for a V5 server before an upgrade" on page 37. For information about the V5.5 server, see the Tivoli Storage Manager V5.5 Information Center at http://publib.boulder.ibm.com/infocenter/tivihelp/v1r1.

For information about hardware and software requirements for a V6.3.4 or later server on Linux x86_64, see "Server requirements for Linux on x86_64 systems" on page 28. For the latest information about hardware and software requirements, see the Tivoli Storage Manager product support site at http://www.ibm.com/support/docview.wss?uid=swg21243309.

For information about the prerequisite checker, see "Running the prerequisite checker" on page 38.

A manual tape drive or a tape library with at least one tape drive must be installed. The tape device must be supported on both the source and target operating systems.

Estimating database and recovery log requirements

Plan the space requirements for the migration process, and the space requirements for the server databases and recovery log for the V6.3.4 or later server. The space requirements for a cross-platform migration from V5 to V6.3.4 or later are similar to the space requirements for an upgrade from V5 to V6.3 or later on the same operating system.

To estimate the database and recovery log requirements, complete the following steps.

1. Estimate the space requirements for the V5 server system. For details, see "Space requirements for the V5 server system" on page 39.
2. Estimate the space requirements for the V6.3.4 or later server system. For details, see "Space requirements for the V6 server system" on page 39.
3. Estimate the total space for the migration process and the V6.3.4 or later server. For details, see "Estimating total space requirements for the upgrade process and upgraded server" on page 41.
4. Optional: Use a worksheet to plan the amount and location of space for the V6.3.4 or later server. For details, see "Worksheet for planning space for the V6.3 or later server" on page 44.

Estimating the time required for migration

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

The following factors can affect the migration time:

- The size of the database that is being migrated.
- The number and speed of system processors.
- The configuration of storage devices. If new hardware is being introduced, time is required to define the new devices to the server, test the configuration, and adjust storage pools.
- The method for moving the data from the V5 database to the V6 database: media or network. The network method for data movement overlaps the extraction time with the insertion time. Using the network method might help reduce the total time that is required for the migration 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 long file names, can cause a relatively longer migration time.

Data is available on upgrades from Tivoli Storage Manager V5 to V6.3 or later on the same operating system. This information might help you estimate the time that is required for a cross-platform migration. In benchmark environments in IBM labs, upgrade operations 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 that is required for migration 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 that is called a *tree*, with database records stored in the endpoints, called the *leaves* of the tree. The extraction ignores the branches and extracts information only 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 that is 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 requires.

Your environment might produce different results than the results that were obtained in the labs. Testing migration operations in your environment is especially important for Tivoli Storage Manager servers that are used by essential systems.

Planning data movement

Any data that is stored on DISK or FILE devices must be migrated or backed up to non-GENERICTAPE tape devices before the migration begins. Data that is stored on GENERICTAPE devices must be migrated to non-GENERICTAPE tape devices.

As you plan the data movement, ensure that you have tape volumes available for backing up and storing data:

- At a minimum, tape volumes must be available to back up the primary storage pool.
- The tape devices must be accessible to both the V5 and the V6 system.
- The tape devices must be usable on both the V5 and the V6 system. For information about the devices that can be used, see the website for your operating system:
  - AIX HP-UX Solaris Supported Devices for AIX, HP-UX, Solaris, and Windows systems (http://www.ibm.com/software/sysmgmt/products/support/IBM_TSM_Supported_Devices_for_AIXHPSUNWIN.html)
  - Linux Supported Devices for Linux systems (http://www.ibm.com/software/sysmgmt/products/support/IBM_TSM_Supported_Devices_for_Linux.html)
- To optimize the process, tape volumes should be available to create a second, onsite backup of the primary storage pool. By creating one backup storage pool offsite and another onsite, you fulfill disaster recovery requirements for offsite storage. At the same time, volumes from the second pool are available onsite to restore data immediately after migration.

Planning for upgrading multiple servers and components

If your environment includes multiple servers and storage agents, evaluate the compatibility of the current versions with an upgraded V6.3.4 or later server. Plan to upgrade one server first in a test environment. Then, stage the upgrade of additional servers and storage agents.

For information about storage-agent and library client compatibility with Tivoli Storage Manager V6.3 or later servers, see Technote 1302789 (http://www.ibm.com/support/docview.wss?uid=swg21302789).

Preparing for operational changes

As you migrate your system from V5 to V6.3.4 or later, the method for backing up and monitoring the server database changes.

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

- Plan to back 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. For best results, consider scheduling more frequent backups for the V6.3.4 or later database than you did for the V5 database. To ensure that archive log space is pruned, consider scheduling more full database backups and fewer incremental backups.

  For more information about scheduling database backups, see the section about backing up the database in the *Administrator's Guide*.

- Understand how database and recovery log space is used, and how monitoring will change.
- Verify scripts and administrative schedules. Starting with the Tivoli Storage Manager V6 server, new commands were added, some commands were changed, and some commands that were no longer needed were deleted. These changes will affect your automated operations. For information about new and changed commands, see "Command and option changes" on page 53.
- Verify the **SELECT** commands that you use regularly. Some parameters and syntax that were previously allowed are not accepted by the database manager program. For information about **SELECT** command updates, see "Changes to the **SELECT** command" on page 70. To resolve problems that are related to **SELECT** commands, see Technote 1380830 (http://www.ibm.com/support/docview.wss?uid=swg21380830).
- If you use products from independent software vendors to interface with the server, ensure that the products are compatible with the V6.3.4 or later server.

To use the new functions that are available in Tivoli Storage Manager V6.3 or later, install the latest version of the Administration Center.

Estimating storage and device requirements

Estimate the amount of space that will be required for data storage on the new Tivoli Storage Manager V6.3.4 or later system. Plan the devices to be used for storage.

To plan for storage and devices, complete the following steps:

1. Estimate the storage requirements for the new Tivoli Storage Manager V6.3.4 or later system. For details, see the section that describes estimating space needs for sequential-access storage pools in the *Administrator's Guide*.
2. Plan the device requirements for the new Tivoli Storage Manager V6.3.4 or later system. For details, see the device configuration planning section in the *Administrator's Guide*.

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 is approximately as long as the time required for a full backup of the database.

Do not reorganize the Tivoli Storage Manager V5 database before the upgrade. Faster throughput can be achieved when the source database does not contain long sequences of pages that are allocated to a single database table. Follow this guideline for both the media method and the network method.

The following performance tips depend on the method that you choose for moving the data from the V5 database:

Media method
If you are using the media method, and are extracting the data to tape, consider using a high-speed tape device.

Network method
If you are using the network method, consider using a high-speed link. For upgrading a database greater than 2 - 3 GB, use at least a 1 Gb Ethernet network.

Performance tips for inserting data into the V6.3.4 or later database

The process for inserting the V5 extracted data into the V6.3.4 or later database is the longest-running part of a migration process, and is the most sensitive to the configuration of the system.

On a system that meets the minimum requirements, the insertion process runs, 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 use multiple processors or cores. The insertion process typically performs better on a system with a relatively small number of fast processors. If the system has many slow processors, you might experience reduced performance levels.

Disk storage
The insertion process is designed to use 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 redundant arrays of independent disks (RAIDs) 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.

Table 68. Example of LUN usage

LUN	Usage
1	Active log
2	Archive log
3, 4, 5	Database directories
6	Extracted V5 database, required only if the media method is used to extract the V5 database to a sequential 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.

Reference information for planning the migration

Information about new, changed, and deleted administrative commands, server options, and server messages can help you plan the migration.

For more information, see “Reference information for planning” on page 53.

Chapter 14. Preparing for the migration

To prepare your system for the server migration from V5 to V6.3.4 or later, you must complete several steps. Ensure that you verify the prerequisites for the migration, and upgrade the V5 server to V5.5.6 or later. Then, prepare data that is stored on DISK, FILE, and GENERICTAPE devices for migration and back up the server database.

Preparing space for the migration process

Verify that you have sufficient space on the V6.3.4 or later system for the migration process.

1. Verify that the system has the amount of space that was estimated in the planning step. Use the planning worksheet that you completed with your information.
2. If you plan to extract the original server database to media for later insertion into the new database, ensure that you have enough storage space. Storage space is required for the database and the manifest file that the extraction process creates. Complete the following steps:
   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 sequential, and the device class type must be tape. The tape device must be compatible with the V5 and the V6.3.4 or later system. Define a new device class if necessary.
   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. Verify that the access permissions are correct for the location that you plan to specify for the manifest file.

      When the data is later inserted into the V6.3.4 or later database, the instance user ID that you use for the upgraded server must have access permission for the manifest file.

      The manifest file might be less than 1 KB. However, for a complex configuration, it might exceed 1 KB.

Upgrading the V5 server to V5.5.6 or later

Upgrade the V5 server to V5.5.6 or later so that you can use the utilities that are designed to aid in preparing for the migration.

The Tivoli Storage Manager server must not be running during installation of the V5.5.6 or later fix pack.

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

Before you upgrade the Tivoli Storage Manager server, ensure that you retain the installation media from the base release of the installed server. If you installed Tivoli Storage Manager from a DVD, ensure that the DVD is available. If you installed Tivoli Storage Manager from a downloaded package, ensure that the downloaded files are available. If the upgrade fails, and the server license module is uninstalled, the installation media from the server base release are required to reinstall the license.

1. Obtain the package file for the V5.5.6 or later fix pack from the Tivoli Storage Manager FTP downloads site at ftp://public.dhe.ibm.com/storage/tivoli-storage-management/maintenance/server/v5r5/MVS/LATEST .
2. For installation information, review the `README.txt` file, which is available in the V5.5.6 or later package file.
3. Install the V5.5.6 or later fix pack.

For more information about the Tivoli Storage Manager server V5.5 release, see the Tivoli Storage Manager V5.5 information center at http://publib.boulder.ibm.com/infocenter/tivihelp/v1r1/index.jsp.

Disabling sessions

In preparation for the migration, 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.

To disable sessions, complete the following steps:

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
   ```

   For more information about the **DISABLE SESSIONS** command and other administrative commands, see the *Administrator's Reference*.
2. Prevent administrative activity from any user ID other than the administrator ID that is being used for the migration preparation. Lock out other administrator IDs, if necessary. Use the command:

   ```
   lock admin administrator_name
   ```

   where *administrator_name* specifies the name of the administrator.
3. Determine whether server processes are running. Either cancel processes, or allow them to complete. Use the commands:

   ```
   query process
   cancel process process_number
   ```

   where *process_number* specifies the number of the process. Allow time for the processes to be stopped. Some processes, such as storage pool migration, might require considerable time.
4. Verify whether sessions exist, and notify the users that the server will be stopped. To detect existing sessions, use the command:

   ```
   query session
   ```
5. Cancel sessions that are still running. Use the command:

   ```
   cancel session all
   ```

Backing up or migrating data stored on DISK and FILE devices

Before you migrate the server, ensure that all data that is stored on DISK or FILE devices is backed up or migrated to non-GENERICTAPE tape devices. This step is required because data that is stored on DISK and FILE devices cannot be migrated as part of the cross-platform migration.

To back up data to tape and mark the original volumes as destroyed, complete the following steps:

1. Create a copy storage pool for a tape device by issuing the **DEFINE STGPOOL** command. For example, to create a copy storage pool named `ltocopypool`, which is assigned to the LTOCLASS device class, issue the following command:

   ```
   define stgpool ltocopypool ltoclass pooltype=copy
   ```

   For more information about the **DEFINE STGPOOL** command and other Tivoli Storage Manager administrative commands, see the *Administrator's Reference*.
2. Back up a primary storage pool on a DISK or FILE device by issuing the **BACKUP STGPOOL** command. For example, to back up a primary storage pool named `primary_pool` to a copy storage pool named `ltocopypool`, issue the following command:

   ```
   backup stgpool primary_pool ltocopypool
   ```
3. Vary any disk-based primary storage pool volumes offline by using the **VARY** command. For example, to vary a storage pool named `primary_disk_pool` offline, issue the following command:

   ```
   vary offline primary_disk_pool
   ```
4. To mark the original volumes as destroyed, change the access mode of each volume of primary storage pools to destroyed. Use the **UPDATE VOLUME** command. For example, if the name of the primary storage pool is `primary_pool`, mark the volumes in the pool as destroyed by issuing the following command:

   ```
   update volume * wherestgpool=primary_pool access=destroyed
   ```

If you prefer to migrate the data, you can use the **MIGRATE STGPOOL** command, the **MOVE DATA** command, or the **MOVE NODEDATA** command, depending on where the data is stored and how you plan to move it. For more information, see the section about migrating data from disk to tape in the *Administrator's Guide*.

After the server is migrated to V6.3.4 or later, you can move the data from tape back to a storage pool that has faster access to data. For example, you can migrate the data to a random-access storage pool that uses a DISK device class. You can also migrate or restore the data to a storage pool that uses a FILE device class.

Migrating data that is stored on GENERICTAPE devices

Before you migrate the server, migrate all data that is stored on GENERICTAPE devices to non-GENERICTAPE tape devices. This step is required because data that is stored on GENERICTAPE devices cannot be migrated as part of the cross-platform migration.

To migrate data that is stored on GENERICTAPE devices, complete the following steps:

1. Create a primary sequential-access storage pool on a non-GENERICTAPE tape device by issuing the **DEFINE STGPOOL** command.

For example, to create a storage pool named `ltopool` that is assigned to the LTOCLASS device class, issue the following command:

```
define stgpool ltopool ltoclass
```

For more information about creating storage pools, see the **DEFINE STGPOOL** command in the *Administrator's Reference*.

2. To provide a location for the files that will be migrated, set up the next primary storage pool. Use the **UPDATE STGPOOL** command.

   For example, to update a primary storage pool named `gentapepool` by adding a next storage pool named `ltopool` with a high migration threshold of 100, issue the following command:

   ```
   update stgpool gentapepool nextstgpool=ltopool highmig=100
   ```

   For more information about setting up the next primary storage pool, see the **UPDATE STGPOOL** command in the *Administrator's Reference*.

3. Migrate the data from the GENERICTAPE storage pool to the non-GENERICTAPE storage pool by using the **MIGRATE STGPOOL** command. For example, to migrate a storage pool named `gentapepool` to the next storage pool and specify a low migration threshold of 0, issue the following command:

   ```
   migrate stgpool gentapepool lowmig=0
   ```

   For more information about migrating storage pools, see the section that describes how to move data in the *Administrator's Guide*. Also, see the **MIGRATE STGPOOL** command in the *Administrator's Reference*.

Moving backup sets that are stored on FILE devices

Before you migrate the server, move any backup sets that are stored on FILE devices to the system where you plan to install the V6.3.4 or later server.

To identify the backup sets that are stored on FILE devices and move them to the target system, complete the following steps:

1. Obtain a detailed list of the volumes that are associated with a backup set by issuing the **QUERY BACKUPSET** command:

   ```
   query backupset f=d
   ```

   For more information about obtaining a list of volumes, see the **QUERY BACKUPSET** command in the *Administrator's Reference*.

2. Review the output to determine which backup sets are stored on FILE devices.
3. Copy the volumes that are associated with backup sets on FILE devices to the target system. For example, copy the volumes to an FTP server on the target system. The volumes must be copied to a location where they can be accessed by the server instance user ID. If possible, retain the file structure that was used on the source system. If it is not possible to retain the file structure from the source system, copy the volumes to any location on the target system.

   Remember: If you cannot retain the file structure that was used on the source system, you must complete more steps after the server migration. Use the **DELETE BACKUPSET** command to remove the previous volume entries from the database, and then the **DEFINE BACKUPSET** command to re-create the backup sets by using the volumes in their new location.

Backing up the server database

Immediately before you migrate the Tivoli Storage Manager server, back up the server database to a non-GENERICTAPE tape device.

Run a snapshot backup, which provides a full backup of the database without interrupting any scheduled backups. Use the following command:

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

where *type* specifies the type of database backup and *device_class_name* specifies the name of the device class. The device class that you specify must exist and have volumes that are available to it.

For example, to back up a database by using scratch volumes to a device that belongs to the TAPECLASS device class, issue the command:

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

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

Tip: To protect the backup from media failures, make two copies of the backup. Ensure that at least one full database backup is available onsite. If you must restore the original database, having an onsite backup saves time because it is immediately available.

For more information about backing up databases, see the **BACKUP DB** command in the *Administrator's Reference*.

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 that are being protected, and save the results. For a list of commands, see "Sample commands to run for validation of the database upgrade" on page 535.

Modifying the server to prevent potential issues

To prevent potential issues during and after the migration, modify the V5 server.

Before you modify the server, review the steps for reverting to the earlier version of the server in the section, "Reverting from V6.3.4 or later to the previous V5 server version" on page 431.

1. To prevent an issue with UNIX System Services file spaces, 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 is completed and you might see error ANR2034E. This error can be ignored. For

more information, see Technote 1408895 (http://www.ibm.com/support/docview.wss?uid=swg21408895). If the problem exists in your database, the command might take some time to run.

Important: If you do not run this command, the **DSMUPGRD PREPAREDB** utility might fail. You must then restart the V5 server and run the **CONVERT USSFILESPACE** command before you continue the upgrade process.

2. Make the following adjustments to settings on your server and clients. These adjustments must be done so that you can revert your system to the original server after the migration, if a problem occurs.
   a. For each sequential-access storage pool on tape, use the **UPDATE STGPOOL** command to set the **REUSEDELAY** parameter. Set the parameter to the number of days during which you want to be able to revert to the original server, if necessary.

      For example, if you want to be able to revert to the original server for up to 30 days after the migration, set the **REUSEDELAY** parameter to 31 days:

      ```
      update stgpool sequential_access_storage_pool reusedelay=31
      ```

      where *sequential_access_storage_pool* specifies the name of the storage pool. For more information about setting the **REUSEDELAY** parameter, see the **UPDATE STGPOOL** command in the *Administrator's Reference*.
   b. For each copy storage pool on tape, use the **QUERY STGPOOL** command to determine the value of the **RECLAIM** parameter. Note the value for future reference. If you must revert to the V5 server at any time during the migration process, it is useful to know the value of the **RECLAIM** parameter so that you can restore the setting. Issue the following command:

      ```
      query stgpool sequential_access_storage_pool format=detailed
      ```

      where *sequential_access_storage_pool* specifies the name of the copy storage pool. In the system output, the value of the **RECLAIM** parameter can be found in the `Reclamation Threshold` field. For more information about determining the value of the **RECLAIM** parameter, see the **QUERY STGPOOL** command in the *Administrator's Reference*.
   c. For each copy storage pool on tape, use the **UPDATE STGPOOL** command to set the **RECLAIM** parameter to 100, meaning 100%. For example, issue the following command:

      ```
      update stgpool copy_storage_pool reclaim=100
      ```

      where *copy_storage_pool* specifies the name of the copy storage pool.
   d. For all tape volumes that were used by the V5 server, specify the `read-only` access mode. Issue the following administrative command:

      ```
      update volume tape_volume access=readonly
      ```

      where *tape_volume* specifies the name of the tape volume. For more information about specifying `read-only` access mode, see the **UPDATE VOLUME** command in the *Administrator's Reference*.
   e. For clients that play an essential role in your system, verify that the value for the `schedlogretention` client option is set to retain the client schedule log for a sufficient time.

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

For example, to prune the log every 45 days and save the log entries, add the following option:

```
schedlogretention 45 S
```

where 45 specifies the number of days and S specifies that the entries will be saved.

Add the `schedlogretention` client option to the `dsm.sys` file within a server stanza.

For more information about pruning the log, see the `schedlogretention` client option in the *Backup-Archive Clients Installation and User's Guide*.

Stopping the server before the migration

On the Tivoli Storage Manager V5.5.6 or later server, stop all server processes. Then, unmount any tapes that are mounted and stop the server.

To stop the server before you install the upgrade, use Tivoli Storage Manager administrative commands:

1. 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.

   For more information about querying and canceling processes, see the **QUERY PROCESS** and **CANCEL PROCESS** commands in the *Administrator's Reference*.
2. After all sessions and processes are stopped, determine whether any tapes are mounted. Unmount any tapes that are mounted. Use the commands:

   ```
   query mount
   dismount volume volume_name
   ```

   For more information about unmounting tapes, see the **QUERY MOUNT** and **DISMOUNT VOLUME** commands in the *Administrator's Reference*.
3. Stop the server. Use the command:

   ```
   halt
   ```

Installing the upgrade utilities

You must install the upgrade utilities on the system where the V5 server is located. The upgrade utilities prepare and extract data from a V5 server database for insertion into an empty V6 server database.

Use the procedure for your operating system:

- AIX "Installing the upgrade utilities on AIX systems" on page 374
- HP-UX "Installing the upgrade utilities on HP-UX systems" on page 375
- Solaris "Installing the upgrade utilities on Oracle Solaris systems" on page 376

Installing the upgrade utilities on AIX systems

AIX

You must install the V5.5.6 or later 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://public.dhe.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the `AIX` directory. From that directory, open the 5.5.6.x or later directory. The level must be the same as or later than the level of the V5 server that you are upgrading.
   c. Download the package 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.
   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://public.dhe.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. Navigate to the directory that corresponds to the processor architecture of the operating system.
6. 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**.
7. Select the **INPUT** device. Specify the directory location of the upgrade utilities package on the system.
8. Select **Software to Install**. Press F4 or Esc+4 for the list of available file sets in the directory.
9. Select the file sets for the upgrade utilities, the device driver, and optionally the language package. The file set for the upgrade utilities is `tivoli.tsmupg.server`. Optional language packages include messages for languages other than US English.
10. Set **COMMIT software updates** to `Yes`. Press F4 or Esc+4.

11. Set **SAVE replaced files** to `No`.
12. Ensure that the default settings for the options in the window for all the selected file sets show `success`.
13. Press Enter, and respond to the `ARE YOU SURE?` question by pressing Enter again. The installation begins.
14. When the installation is complete, exit the SMIT program.
15. 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.

Installing the upgrade utilities on HP-UX systems

HP-UX

You must install the V5.5.6 or later 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://public.dhe.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the `HP-UX` directory. From that directory, open the 5.5.6.x or later directory. The level must be the same as or later than the level of the V5 server that you are upgrading.
   c. Download the package 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.
   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. Navigate to the directory that corresponds to the processor architecture of the operating system.
5. 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`.

6. 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.

Installing the upgrade utilities on Oracle Solaris systems

Solaris

You must install the V5.5.6 or later 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://public.dhe.ibm.com/storage/tivoli-storage-management/maintenance/server-upgrade/v5r5/
   b. Navigate to the `Solaris` directory. From that directory, open the 5.5.6.x or later directory. The level must be the same as or later than the level of the V5 server that you are upgrading.
   c. Download the package 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.
   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. Navigate to the directory that corresponds to the processor architecture of the operating system.

6. 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.
7. 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.

Chapter 15. Migrating the server database to the V6.3.4 or later server

Migrate the server database by using the scenario that works best for your hardware and software environment. The original server cannot be running while the data is being extracted from the server database.

For an overview of migration scenarios, see "Scenarios for migrating a server from an AIX, HP-UX, or Solaris system to V6.3.4 on Linux" on page 352.

Follow the instructions for your selected scenario:

- "Migration scenario 1: Using the media method and the upgrade wizard"
- "Migration scenario 2: Using the media method and the command line" on page 385
- "Migration scenario 3: Using the network method and the upgrade wizard" on page 399
- "Migration scenario 4: Using the network method and the command line" on page 405

Migration scenario 1: Using the media method and the upgrade wizard

Use this procedure if you are upgrading the server by using the media method and the upgrade wizard. By applying the media method, you extract data from the original database to media, and then load the data into the new database. By using the wizard, you simplify the configuration process.

To migrate the system by using Migration scenario 1, complete the following steps:

1. Ensure that you have completed the planning tasks. See Chapter 13, "Planning the migration," on page 359.
2. Ensure that you have completed the preparation tasks. See Chapter 14, "Preparing for the migration," on page 367.
3. Complete the tasks that are described in the following topics:
   a. "Migration scenario 1: Installing the V6.3.4 or later server" on page 380
   b. "Migration scenario 1: Setting up devices" on page 382
   c. "Migration scenario 1: Creating the user ID and directories for the server instance" on page 383
   d. "Migration scenario 1: Running the upgrade wizard" on page 384

After you complete the planning, preparation, and migration steps, complete the post migration tasks. See Chapter 16, "Taking the first steps after migration," on page 417.

Migration scenario 1: Installing the V6.3.4 or later server

You can use an installation wizard to install the server, or install the server by using the console.

Starting with V6.3, the IBM Tivoli Storage Manager server installation wizard has a separate license agreement for the following products:

- Tivoli Storage Manager
- IBM Tivoli Storage Manager Extended Edition
- IBM System Storage Archive Manager
- IBM Tivoli Storage Manager for Storage Area Networks

To verify the system environment and install the server, complete the following steps:

1. For some operating systems, you must check certain system settings before you begin the installation.

   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 is completed.

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

   ```
   The installation wizard cannot run on your configuration.
   It will now stop.
   For more details about installation error logs,
   enter the phrase "installation log files" in the
   Search field at this site:

   http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3
   ```

2. Log in to the system by using the root user ID.
3. If you have the product DVD, insert the Tivoli Storage Manager DVD into a DVD drive. Ensure that the DVD is mounted on directory `/dvdrom` and change to that directory.
4. If you downloaded the program from Passport Advantage as an executable file, complete the following steps:
   a. Verify that you have enough space to store the installation files when they are extracted from the product package. For space requirements, see the download document:

      Tivoli Storage Manager: http://www.ibm.com/support/docview.wss?uid=swg24030521

      Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030527

      System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030530

   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.

5. Ensure that the system environment meets installation requirements. You can verify the requirements manually or run the prerequisite checker. To run the prerequisite checker, complete the following steps:
   a. Issue this command to start the prerequisite checker with a graphical user interface:

      ```
      ./prereqcheck.bin
      ```

      Alternatively, issue this command to start the prerequisite checker with the console method:

      ```
      ./prereqcheck.bin -i console
      ```

   b. Select the language for the prerequisite checker user interface.
   c. In the welcome and disclaimer panels, review the statements and accept them.

   If the Prerequisite Results panel shows that your workstation successfully passed the checks, you are ready to start the installation. If an error message is shown in the Prerequisite Results panel, make the required corrections before you continue with the installation. For more information about the prerequisite checker, see "Running the prerequisite checker" on page 38.
6. 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.
   - Start the graphical wizard:

     ```
     ./install.bin
     ```

   - Start the console wizard:

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

   For information about translations that are available for the server, see the server language locales section in the Appendix. For information about the silent installation of the server, see the section on installing Tivoli Storage Manager in silent mode in the *Installation Guide*.
7. Select the language for your installation and follow the wizard, selecting **Next** to step through the wizard.
   a. You must accept the license agreement to proceed. Select the product that you are entitled to use and a license agreement is displayed. You can select only one product on the page. If you select Tivoli Storage Manager, Tivoli Storage Manager Extended Edition, or System Storage Archive Manager, you are asked if you will be using LAN-free or library sharing. If you select YES, you must accept the Tivoli Storage Manager for Storage Area Networks license. This license is in addition to the license for the product that you chose on the previous page.
   b. Select the components that you want to install. Components include the server, languages, license, device driver, and storage agent. There is no default, so you must make a selection. If you previously installed a server, ensure that you select the same directory when you install a language package, license, or device driver. If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver. A server and a storage agent cannot be installed on the same workstation. For information about other components that you can choose to install, see the *Installation Guide*.

The Tivoli Storage Manager client application programming interface (API), DB2 Version 9.7, and Global Security Kit (GSKit) 8 are automatically installed when you select the server component.

8. 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 you continue to the next step.

   The installation log is in the `/var/tivoli/tsm` directory.

9. Download and apply any applicable fixes that have been released for the server. Go to the FTP downloads site at ftp://public.dhe.ibm.com/storage/tivoli-storage-management/maintenance/server. Alternatively, go to the product support site at http://www.ibm.com/support/entry/portal/ Downloads and search for server updates.

10. Modify kernel parameter values, if necessary.

    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 the DB2 information center (http://pic.dhe.ibm.com/infocenter/db2luw/v9r7). To find the information, enter a search string such as `modifying kernel parameters` in the **Search** field at this site.

    To run Tivoli Storage Manager with DB2, you might need to set kernel parameter values higher than the suggested minimum values and make other changes to the system. For more details, see the section on tuning kernel parameters for Linux systems in the *Installation Guide*.

Migration scenario 1: Setting up devices

Set up the storage devices that you plan to use with the V6.3.4 or later server. Ensure that you set access permissions correctly for users and groups.

To set up storage devices, follow these instructions:

- If the devices that you plan to use are controlled by the IBM device driver, complete the following steps:
  1. Install the IBM device driver and configure devices. Follow the instructions in the *IBM Tape Device Drivers Installation and User's Guide* at http://www.ibm.com/support/docview.wss?uid=ssg1S7002972.
  2. To set access permissions, complete one of the following actions:
     - If the system is dedicated to Tivoli Storage Manager and only the Tivoli Storage Manager administrator has access, make the device special files readable and writable to all users. Issue the following command:

       ```
       chmod a+rw /dev/IBMtapex
       ```

     - Restrict access to a group by creating a group and adding each instance user ID for Tivoli Storage Manager to that group. Then, change the ownership of the device special files to belong to the group, and make the device special files readable and writable to the group. Issue the following command:

       ```
       chmod g+rw /dev/IBMtapex
       ```

- If the devices that you plan to use are controlled by the Tivoli Storage Manager device driver, complete the following steps:
  1. Log in as the root user.

2. Grant read and write access.
   - To grant read and write access to all users, issue the following command:
     ```
     /opt/tivoli/tsm/devices/bin/autoconf -a
     ```
   - To grant read and write access to only the group, issue the following command:
     ```
     /opt/tivoli/tsm/devices/bin/autoconf -g
     ```

For more information about setting up devices, see the section about attaching devices to the server in the *Administrator's Guide*.

Migration scenario 1: Creating the user ID and directories for the server instance

Create the user ID that will own the server instance. Also, create the directories that the server instance will use for database and recovery logs.

Before you begin, to review the information about planning space for the server, see "Estimating database and recovery log requirements" on page 360.

To create the user ID, group, and directories for the migrated server instance, complete the following steps:

1. Create a user ID and group that will be the owner of the Tivoli Storage Manager server instance. You will use this user ID when you create the server instance in a later step.

   Restriction: In the user ID, only lowercase letters (a-z), numerals (0-9), and the underscore character (_) can be used. The user ID and group name must comply with the following rules:
   - The length must be 8 characters or less.
   - The user ID and group name cannot start with `ibm`, `sql`, `sys`, or a numeral.
   - The user ID and group name cannot be `user`, `admin`, `guest`, `public`, `local`, or any SQL reserved word.

   For example, create user ID `tsminst1` in group `tsmsrvrs`. The following examples show how to create this user ID and group by using operating system commands.
   ```
   # groupadd tsmsrvrs
   # useradd -d /home/tsminst1 -m -g tsmsrvrs -s /bin/bash tsminst1
   # passwd tsminst1
   ```
2. Log out, then log in to your system, by using the new user ID and password. Use an interactive login program, such as telnet, so that you are prompted for the password and can change it if necessary.
3. 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).
4. Ensure that you are logged in with the user ID that you created. Then, create the directories that the server requires.

   Unique, empty directories are required for each item that is shown in the following table. Create the database directories, the active log directory, and the archive log directory on different physical volumes. For space requirements, see "Worksheet for planning space for the V6.3 or later server" on page 44.

Table 69. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The instance directory for the server, which will contain files for this server instance, including the server options file	`mkdir /home/user_ID/tsminst1`	

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

Active log directory	`mkdir /home/user_ID/tsmlog`	
Archive log directory	`mkdir /home/user_ID/tsmarchlog`	
Optional: Directory for the log mirror for the active log	`mkdir /home/user_ID/tsmlogmirror`	
Optional: Secondary archive log directory, which is the failover location for the archive log	`mkdir /home/user_ID/tsmarchlogfailover`	

When a server is initially created, with the **DSMSERV FORMAT** utility or with the configuration wizard, a server database and recovery log are created. In addition, files are created to hold database information that is used by the database manager.

5. Create more logical volumes and mount the volumes on the directories that were created in the previous step.

Migration scenario 1: Running the upgrade wizard

The wizard offers a guided approach to upgrading a server. Start the wizard on the system where you installed the V6.3.4 or later server program.

Before you start the upgrade wizard, complete all preceding steps to prepare for the upgrade. Ensure that you backed up the server database and configuration files. Also, ensure that you installed the V6.3.4 or later server program, and created the directories and user ID for the server instance.

1. Verify that the following requirements are met:
   - The system where you installed the V6.3.4 or later server program must have the X Window client. You also must 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. Also, ensure that the SSH daemon service has access rights for connecting to the system by using `localhost`.
     - Remote shell (rsh).
     - Remote Execution Protocol (REXEC).

     The V5 server also must have one of the protocols enabled.

- You must be able to log in to the V6.3.4 or later system with the user ID that you created for the server instance by using the SSH, rsh, or REXEC protocol. When you use the wizard, you must provide this user ID and password to access that system.

2. Start the upgrade wizard, **dsmupgdx**, from the V6.3.4 or later server installation directory. Log in by using the root user ID and issue this command:

   ```
   /opt/tivoli/tsm/server/bin/dsmupgdx
   ```

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. Read all messages that are displayed for each phase of the upgrade process in the message display area within the wizard. Informational messages might require your attention.

Migration scenario 2: Using the media method and the command line

Use this procedure if you are migrating the server database by using the media method and the command line. By applying the media method, you extract data from the original database to media and load the data into the new database. By using the command line, you issue administrative commands to upgrade the system manually.

To migrate the system by using Migration scenario 2, complete the following steps:

1. Ensure that you have completed the planning tasks. See Chapter 13, “Planning the migration,” on page 359.
2. Ensure that you have completed the preparation tasks. See Chapter 14, “Preparing for the migration,” on page 367.
3. Complete the tasks that are described in the following topics:
   a. “Migration scenario 2: Preparing the database of the V5 server” on page 386
   b. “Migration scenario 2: Extracting the data to media” on page 386
   c. “Migration scenario 2: Installing the V6.3.4 or later server” on page 387
   d. “Migration scenario 2: Setting up devices” on page 390
   e. “Migration scenario 2: Configuring devices” on page 390
   f. “Migration scenario 2: Creating the user ID and directories for the server instance” on page 392
   g. “Migration scenario 2: Creating the server instance and database” on page 393
   h. “Migration scenario 2: Loading the extracted data into the V6.3.4 or later database” on page 396
   i. “Migration scenario 2: Configuring the system for database backup” on page 397

After you complete the planning, preparation, and migration steps, complete the post migration tasks. See Chapter 16, “Taking the first steps after migration,” on page 417.

Migration scenario 2: Preparing the database of the V5 server

Before you extract the data from the V5 server database, you must prepare the 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 V5 system.

1. Ensure that you completed the initial preparation steps. For instructions, see Chapter 14, "Preparing for the migration," on page 367.
2. Log in by using the root user ID on the V5 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. Prepare the database. Direct the output of the process to a file for monitoring. 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`:

   AIX

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

   HP-UX Solaris

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

5. Monitor the process for errors and warning messages. The final message indicates the 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
   ```

Ensure that the prepare operation is completed successfully before you continue to the next step. If the prepare operation fails, you might have to restart the V5 server to fix the problem and run the prepare operation again. If the server that is being upgraded is a V5.3 or V5.4 server, you might have to restore the database by using a backup. Then, you can restart the server to correct the problem.

Migration scenario 2: Extracting the data to media

Use the **DSMUPGRD** utility to extract data from the V5 server database and store it on a tape device.

1. Log in by using the root user ID on the system that has the V5 server.
2. Ensure that the storage device 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=tape manifest=./manifest.txt >extract.out 2>&1 &
   ```

   HP-UX Solaris

   ```
   nohup /opt/tivoli/tsm/upgrade/bin/dsmupgrd extractdb \
   devclass=tape manifest=./manifest.txt >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 might require attention. A message near the end of the process output indicates the 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 database size. The time is approximately the length of time that is required for a full database backup.

Migration scenario 2: Installing the V6.3.4 or later server

You can use an installation wizard to install the server, or install the server by using the console.

Starting with V6.3, the IBM Tivoli Storage Manager server installation wizard has a separate license agreement for the following products:

- Tivoli Storage Manager
- IBM Tivoli Storage Manager Extended Edition
- IBM System Storage Archive Manager
- IBM Tivoli Storage Manager for Storage Area Networks

To verify the system environment and install the server, complete the following steps:

1. For some operating systems, you must check certain system settings before you begin the installation.

   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 is completed.

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

   ```
   The installation wizard cannot run on your configuration.
   It will now stop.
   For more details about installation error logs,
   enter the phrase "installation log files" in the
   Search field at this site:

   http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3
   ```

2. Log in to the system by using the root user ID.
3. If you have the product DVD, insert the Tivoli Storage Manager DVD into a DVD drive. Ensure that the DVD is mounted on directory `/dvdrom` and change to that directory.
4. If you downloaded the program from Passport Advantage as an executable file, complete the following steps:

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

   Tivoli Storage Manager: http://www.ibm.com/support/docview.wss?uid=swg24030521

   Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030527

   System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030530

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.

5. Ensure that the system environment meets installation requirements. You can verify the requirements manually or run the prerequisite checker. To run the prerequisite checker, complete the following steps:

   a. Issue this command to start the prerequisite checker with a graphical user interface:

      ```
      ./prereqcheck.bin
      ```

      Alternatively, issue this command to start the prerequisite checker with the console method:

      ```
      ./prereqcheck.bin -i console
      ```

   b. Select the language for the prerequisite checker user interface.

   c. In the welcome and disclaimer panels, review the statements and accept them.

   If the Prerequisite Results panel shows that your workstation successfully passed the checks, you are ready to start the installation. If an error message is shown in the Prerequisite Results panel, make the required corrections before you continue with the installation. For more information about the prerequisite checker, see "Running the prerequisite checker" on page 38.

6. 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.

   - Start the graphical wizard:

     ```
     ./install.bin
     ```

   - Start the console wizard:

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

   For information about translations that are available for the server, see the server language locales section in the Appendix. For information about the silent installation of the server, see the section on installing Tivoli Storage Manager in silent mode in the *Installation Guide*.

7. Select the language for your installation and follow the wizard, selecting **Next** to step through the wizard.
   a. You must accept the license agreement to proceed. Select the product that you are entitled to use and a license agreement is displayed. You can select only one product on the page. If you select Tivoli Storage Manager, Tivoli Storage Manager Extended Edition, or System Storage Archive Manager, you are asked if you will be using LAN-free or library sharing. If you select YES, you must accept the Tivoli Storage Manager for Storage Area Networks license. This license is in addition to the license for the product that you chose on the previous page.
   b. Select the components that you want to install. Components include the server, languages, license, device driver, and storage agent. There is no default, so you must make a selection. If you previously installed a server, ensure that you select the same directory when you install a language package, license, or device driver. If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver. A server and a storage agent cannot be installed on the same workstation. For information about other components that you can choose to install, see the *Installation Guide*.

   The Tivoli Storage Manager client application programming interface (API), DB2 Version 9.7, and Global Security Kit (GSKit) 8 are automatically installed when you select the server component.
8. 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 you continue to the next step.

   The installation log is in the `/var/tivoli/tsm` directory.
9. Download and apply any applicable fixes that have been released for the server. Go to the FTP downloads site at ftp://public.dhe.ibm.com/storage/tivoli-storage-management/maintenance/server. Alternatively, go to the product support site at http://www.ibm.com/support/entry/portal/Downloads and search for server updates.
10. Modify kernel parameter values, if necessary.

    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 the DB2 information center (http://pic.dhe.ibm.com/infocenter/db2luw/v9r7). To find the information, enter a search string such as `modifying kernel parameters` in the **Search** field at this site.

    To run Tivoli Storage Manager with DB2, you might need to set kernel parameter values higher than the suggested minimum values and make other changes to the system. For more details, see the section on tuning kernel parameters for Linux systems in the *Installation Guide*.

Migration scenario 2: Setting up devices

Set up the storage devices that you plan to use with the V6.3.4 or later server. Ensure that you set access permissions correctly for users and groups.

To set up storage devices, follow these instructions:

- If the devices that you plan to use are controlled by the IBM device driver, complete the following steps:
  1. Install the IBM device driver and configure devices. Follow the instructions in the *IBM Tape Device Drivers Installation and User's Guide* at http://www.ibm.com/support/docview.wss?uid=ssg1S7002972.
  2. To set access permissions, complete one of the following actions:
     - If the system is dedicated to Tivoli Storage Manager and only the Tivoli Storage Manager administrator has access, make the device special files readable and writable to all users. Issue the following command:

       ```
       chmod a+rw /dev/IBMtapex
       ```
     - Restrict access to a group by creating a group and adding each instance user ID for Tivoli Storage Manager to that group. Then, change the ownership of the device special files to belong to the group, and make the device special files readable and writable to the group. Issue the following command:

       ```
       chmod g+rw /dev/IBMtapex
       ```
- If the devices that you plan to use are controlled by the Tivoli Storage Manager device driver, complete the following steps:
  1. Log in as the root user.
  2. Grant read and write access.
     - To grant read and write access to all users, issue the following command:

       ```
       /opt/tivoli/tsm/devices/bin/autoconf -a
       ```
     - To grant read and write access to only the group, issue the following command:

       ```
       /opt/tivoli/tsm/devices/bin/autoconf -g
       ```

For more information about setting up devices, see the section about attaching devices to the server in the *Administrator's Guide*.

Migration scenario 2: Configuring devices

On the Tivoli Storage Manager V6.3.4 or later server, configure the devices that you plan to use. Obtain the library device names and the drive device names for the V6.3.4 or later server. Then, update the manifest file with the names.

Complete the following steps to configure the devices:

1. Obtain the library serial numbers from the manifest file on the V5 system.

   Tip: The manifest file was created in an earlier step, "Migration scenario 2: Extracting the data to media" on page 386.

   The following example is from the manifest file on a V5 server:

   ```
   DEFINE LIBRARY LTO_LIB LIBTYPE=SCSI WWN="500143800329CAD8"
   SERIAL="DEC91503HW" SHARED=NO AUTOLABEL=NO RESETDRIVE=NO
   ```

   In the preceding example, the library serial number is `DEC91503HW`.
2. Obtain the library device names:

- If the devices are controlled by the Tivoli Storage Manager device driver, take the following actions:
  a. On the V6 system, issue the command:
     ```
     cat /dev/tsmscsi/lbinfo
     ```
     In the output, look for any library serial numbers that you identified in Step 1 on page 390.
     The following sample output is from a V6 server:
     ```
     Index Minor Host CHN ID  LUN Type Vendor_ID Device_Serial_Number product_ID    Rev.
     000   006   001  000 003 001 008  HP        DEC91503HW           MSL G3 Series 5.80
     ```
     In the sample output, the library serial number is `DEC91503HW` and the index number is `000`.
  b. Use the index number to define the library name.
     A library name has the following format:
     `/dev/tsmscsi/lb`*x*
     where *x* is the index number without leading zeros. In this example, the index number is `000`. When the leading zeros are removed, the number becomes `0`, and the library name is defined as `/dev/tsmscsi/lb0`.
- If the devices are controlled by IBM tape device drivers, obtain library device names by following the instructions in the *IBM Tape Device Drivers Installation and User's Guide*:
  http://www.ibm.com/support/docview.wss?uid=ssg1S7002972
  The names of library devices that are controlled by an IBM device driver on a Linux system have the following format:
  `/dev/IBMchanger`*x*
  where *x* is an integer. For example, a library device can be named `/dev/IBMchanger0`.

3. Obtain the serial numbers for the drive devices from the manifest file on the V5 system. The following example is from the manifest file of a V5 server:
   ```
   DEFINE DRIVE LTO_LIB LTO_DRIVE ELEMENT=1 ONLINE=Yes
   WWN="500143800329CAD9" SERIAL="HU171200NG"
   ```
   In the preceding example, the serial number is `HU171200NG`.
4. Obtain the names of the device drives:
   - If the devices are controlled by the Tivoli Storage Manager device driver, take the following actions:
     a. On the V6 system, issue the following command:
        ```
        cat /dev/tsmscsi/mtinfo
        ```
        In the output, look for the device serial numbers that you identified in Step 3.
        The following sample output is from a V6 server:
        ```
        Index Minor Host CHN ID  LUN Type Vendor_ID Device_Serial_Number Product_ID       Rev.
        000   005   001  000 003 000 001  HP        HU171200NG           Ultrium 4-SCSI   H68W
        ```
        In the sample output, the index number is `000`.
     b. Use the index number from the output in Step 4a to define the name of the device drive. The name of a device drive has the following format:
        `/dev/tsmscsi/mt`*x*

where *x* is the index number without leading zeros. In this example, the index number is `000`. After you remove the leading zeros, the number is `0`, and the name of the device drive is defined as `/dev/tsmscsi/mt0`.

- If the devices are controlled by IBM tape device drivers, obtain drive device names by following the instructions in the *IBM Tape Device Drivers Installation and User's Guide*:

  http://www.ibm.com/support/docview.wss?uid=ssg1S7002972

  Names of device drives that are controlled by IBM tape device drivers have the following format:

  ```
  /dev/IBMtapex
  ```

  where *x* is a number that is assigned to a device. For example, a device drive can be named `/dev/IBMtape0`, where `0` is the device number.

5. Update the manifest file with the library device names and drive device names, and save the file.

Migration scenario 2: Creating the user ID and directories for the server instance

Create the user ID that will own the server instance. Also, create the directories that the server instance will use for database and recovery logs.

Before you begin, to review the information about planning space for the server, see "Estimating database and recovery log requirements" on page 360.

To create the user ID, group, and directories for the migrated server instance, complete the following steps:

1. Create a user ID and group that will be the owner of the Tivoli Storage Manager server instance. You will use this user ID when you create the server instance in a later step.

   Restriction: In the user ID, only lowercase letters (a-z), numerals (0-9), and the underscore character (_) can be used. The user ID and group name must comply with the following rules:

   - The length must be 8 characters or less.
   - The user ID and group name cannot start with `ibm`, `sql`, `sys`, or a numeral.
   - The user ID and group name cannot be `user`, `admin`, `guest`, `public`, `local`, or any SQL reserved word.

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

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

2. Log out, then log in to your system, by using the new user ID and password. Use an interactive login program, such as telnet, so that you are prompted for the password and can change it if necessary.
3. 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).
4. Ensure that you are logged in with the user ID that you created. Then, create the directories that the server requires.

   Unique, empty directories are required for each item that is shown in the following table. Create the database directories, the active log directory, and the

archive log directory on different physical volumes. For space requirements, see "Worksheet for planning space for the V6.3 or later server" on page 44.

Table 70. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The instance directory for the server, which will contain files for this server instance, including the server options file	`mkdir /home/user_ID/tsminst1`	

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

Active log directory	`mkdir /home/user_ID/tsmlog`	
Archive log directory	`mkdir /home/user_ID/tsmarchlog`	
Optional: Directory for the log mirror for the active log	`mkdir /home/user_ID/tsmlogmirror`	
Optional: Secondary archive log directory, which is the failover location for the archive log	`mkdir /home/user_ID/tsmarchlogfailover`	

When a server is initially created, with the **DSMSERV FORMAT** utility or with the configuration wizard, a server database and recovery log are created. In addition, files are created to hold database information that is used by the database manager.

5. Create more logical volumes and mount the volumes on the directories that were created in the previous step.

Migration scenario 2: Creating the server instance and database

Create the server instance and format files for an empty V6.3.4 or later database. Later, you can migrate data from the V5 server database to the new V6.3.4 or later database.

1. Log in to the system where you installed the V6.3.4 or later program by using the root user ID.

   Verify the following items:

   - The home directory for the user, `/home/tsminst1`, exists. If there is no home directory, you must create it.
   - The instance directory stores the following core files that are generated by the Tivoli Storage Manager server:
     - The server options file, `dsmserv.opt`
     - The server key database file, `cert.kdb`, and the `.arm` files, which are used by clients and other servers to import the Secure Sockets Layer certificates of the server
     - 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 storage pools of the FILE device type, if the directory for the device class is not fully specified, or not fully qualified
- User exits
- Trace output, if it is not fully qualified

- A shell configuration file, for example, a .profile file, exists in the home directory. The root user and instance user ID must have write permission to this file. For more information, go to the DB2 information center and search for information about Linux and UNIX environment variable settings.

2. Create a Tivoli Storage Manager instance by using the **db2icrt** command.

   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 -s ese -u
   user_id 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 -s ese -u
   tsminst1 tsminst1
   ```

   Remember: From this point on, use this new user ID when you configure the Tivoli Storage Manager server. Log out of the root user ID, and log in by using the user ID that is the instance owner.

3. Log in to the system by using the user ID that owns the V6.3.4 or later 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:
   - The device configuration file
   - The server options file, which is typically named dsmserv.opt

   For example, if you created the instance directory that is shown in the example in the step to create directories, copy the files into the following directory:

   ```
   /tsminst1
   ```

   Ensure that 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 V6.3 or later. For the list of deleted options, see Table 36 on page 69.
   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. In this way, you can help ensure that the files are available when needed.
   c. Verify that 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 V6.3 or later. 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, 4096.
- If the server options file includes a value for this option, the server uses the 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 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 /tsminst1
   ```

7. Modify the library path to use the version of the IBM Global Security Kit (GSKit) that is installed with the Tivoli Storage Manager server.

   You must update the following files to set the library path when DB2 or the Tivoli Storage Manager server is started:

   - *instance_directory*/sqllib/usercshrc
   - *instance_directory*/sqllib/userprofile

   For the *instance_directory*/sqllib/usercshrc file, add the following line:

   ```
   setenv LD_LIBRARY_PATH /usr/local/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
   ```

   For the *instance_directory*/sqllib/userprofile file, add the following lines:

   ```
   LD_LIBRARY_PATH=/usr/local/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
   export LD_LIBRARY_PATH
   ```

   Verify the library path settings and ensure that the GSKit version is 8.0.14.14 or later. Issue the following commands from the instance home directory, for example, /home/tsminst1:

   ```
   echo $LD_LIBRARY_PATH
   gsk8capicmd_64 -version
   gsk8ver_64
   ```

   If the GSKit version is not 8.0.14.14 or later, you must reinstall the Tivoli Storage Manager server. The reinstallation ensures that the correct GSKit version is available.

8. Complete this step to set the server code page.

   Set the DB2CODEPAGE system environment variable to 819 for each server instance. Before you issue the **DSMSERV LOADFORMAT** command, log in to the system as the server instance owner and issue this command:

   ```
   db2set -i instance_name DB2CODEPAGE=819
   ```

   For example:

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

9. Change to the instance directory that you created for the server.
10. Create and format the database and recovery logs by using the **DSMSERV LOADFORMAT** command. In the command, specify the directories that you created for the database and logs. The directories must be empty.

    For example, to get an active log size of 16 GB or 16384 MB, which is the default size, issue the following command, on one line:

```
/opt/tivoli/tsm/server/bin/dsmserv loadformat \
dbdir=/tsmdb001,/tsmdb002,/tsmdb003,/tsmdb004 \
activelogsize=16384 activelogdirectory=/tsmlog \
mirrorlogdirectory=/tsmlogmirror archlogdirectory=/tsmarchlog
```

For more information about creating and formatting a database, see Appendix A, "Utilities, scripts, and commands for server upgrade and migration," on page 511.

11. Monitor the process for errors and warning messages. The final message indicates the success or failure of the operation.

Migration scenario 2: Loading the extracted data into the V6.3.4 or later database

After you format an empty database by using the **DSMSERV LOADFORMAT** utility, load the data that you extracted from the original server database.

Ensure that the following requirements are met before you begin to load the data:

- 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 V6.3.4 or later server. The device must be physically attached to the system. The permissions must be set to grant access to the media for the user ID that owns the V6.3.4 or later server instance.

Complete the following steps:

1. Verify that the V6.3.4 or later server can access the extracted data. The tape drive that is used for the extracted data must be physically attached to the V6.3.4 or later system.
2. Ensure that the instance user ID has ownership or read/write permission for the manifest file that was created by the extraction process.
3. Log in with the instance user ID on the system where you installed the V6.3.4 or later server.
4. Copy the manifest file that was created by the extraction process to the V6.3.4 or later system.
5. On the V6.3.4 or later server, complete the following steps:
   a. Verify that the server options file from the V5 server includes the `DEVCONFIG` option, and that the option specifies the full path of the device configuration file.
   b. Verify that the device configuration file from the V5 server is available in the location that is specified by the `DEVCONFIG` option.
   c. Verify that the permissions on the device configuration file allow read access for the instance user ID.
6. 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 V6.3.4 or later system. Verify entries for tape. For example, the device names might have changed.
7. Verify the contents of the manifest file and edit the file if necessary:
   a. Ensure that the device names in the manifest file are valid for the V6.3.4 or later system. Device names for the same device might be different on V5 and V6.3.4 or later systems.

b. Ensure that the manifest file contains a list of volumes to be used when the extracted data is loaded into the new database.

8. To load an extracted server database into the prepared, empty V6.3.4 or later database, issue the **DSMSERV INSERTDB** command. Direct the output of the process to a file for monitoring. For example, enter the following command on one line:

```
nohup /opt/tivoli/tsm/server/bin/dsmserv insertdb \
manifest=./manifest.txt >insert.out 2>&1 &
```

For more information about loading an extracted database into a new database, see Appendix A, "Utilities, scripts, and commands for server upgrade and migration," on page 511.

9. Monitor the process for error messages, warning messages, and any items that might require your attention. The system displays interim statistics about the process of loading the database. However, there might be time periods when no messages are issued. During this time, DB2 operations are running in the background. The length of time that the process runs depends on the size of the database. For more information, see "Example: Estimating the upgrade time based on the database size" on page 45.

Optional: Verify that the database is being loaded by monitoring the processor and I/O usage for the server process and the corresponding DB2 process. For example, issue the following command to monitor the process:

```
tail -f insert.out
```

A message in the output of the **DSMSERV INSERTDB** command indicates the status 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.`

10. If you used the media method to upgrade the system, after the data is loaded into the database, 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 database-loading operation again.

Migration scenario 2: Configuring the system for database backup

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 `/tsminst1` for the Tivoli Storage Manager server instance directory.

1. Set the Tivoli Storage Manager API environment-variable configuration for the database instance:

a. Log in by using the `tsminst1` user ID.

b. When user `tsminst1` is logged in, ensure that the DB2 environment is correctly initialized. The DB2 environment is initialized by running the `/home/tsminst1/sqllib/db2profile` script, which normally runs automatically from the profile of the user ID. If `/home/tsminst1/.profile` does not run the **db2profile** script, such as when you are using the Korn shell (`/bin/ksh`), add the following lines to `/home/tsminst1/.profile`:

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

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

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

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

```
. ~/.profile
```

Tip: Ensure that you enter a space after the initial dot (.) character.

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

```
SERVERNAME TSMDBMGR_TSMINST1
```

Remember: The name that you use must match the server instance name.

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

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

Avoid placing the server name, TSMDBMGR_TSMINST1, first in the `dsm.sys` file because the server name 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 $$_TSMDBMGR_$$
```

Tip: Ensure that you enter the same `tcpport` value as the server is using. The `tcpport` value is specified in the `dsmserv.opt` file.

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. For details, see "Starting the server" on page 418.
   b. Log in by using the root user ID.
   c. Source the database manager profile by running the following command. Ensure that you enter a dot, a space, and the path to the `db2profile` file. If you do not enter the space, the database backup fails.

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

   d. Change the API password. Use 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
```

Migration scenario 3: Using the network method and the upgrade wizard

Use this procedure if you are migrating the server by using the network method and the upgrade wizard. By applying the network method, you simultaneously extract data from the original database and load the data into the new database over a network connection. By using the wizard, you simplify the configuration process.

To migrate the system by using Migration scenario 3, complete the following steps:

1. Ensure that you have completed the planning tasks. See Chapter 13, "Planning the migration," on page 359.
2. Ensure that you have completed the preparation tasks. See Chapter 14, "Preparing for the migration," on page 367.
3. Complete the tasks that are described in the following topics:
   a. "Migration scenario 3: Installing the V6.3.4 or later server"
   b. "Migration scenario 3: Setting up devices" on page 402
   c. "Migration scenario 3: Creating the user ID and directories for the server instance" on page 403
   d. "Migration scenario 3: Running the upgrade wizard" on page 404

After you complete the planning, preparation, and migration steps, complete the post migration tasks. See Chapter 16, "Taking the first steps after migration," on page 417.

Migration scenario 3: Installing the V6.3.4 or later server

You can use an installation wizard to install the server, or install the server by using the console.

Starting with V6.3, the IBM Tivoli Storage Manager server installation wizard has a separate license agreement for the following products:

- Tivoli Storage Manager
- IBM Tivoli Storage Manager Extended Edition
- IBM System Storage Archive Manager
- IBM Tivoli Storage Manager for Storage Area Networks

To verify the system environment and install the server, complete the following steps:

1. For some operating systems, you must check certain system settings before you begin the installation.

   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 is completed.

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

```
The installation wizard cannot run on your configuration.
It will now stop.
For more details about installation error logs,
enter the phrase "installation log files" in the
Search field at this site:

http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3
```

2. Log in to the system by using the root user ID.
3. If you have the product DVD, insert the Tivoli Storage Manager DVD into a DVD drive. Ensure that the DVD is mounted on directory `/dvdrom` and change to that directory.
4. If you downloaded the program from Passport Advantage as an executable file, complete the following steps:
   a. Verify that you have enough space to store the installation files when they are extracted from the product package. For space requirements, see the download document:

      Tivoli Storage Manager: http://www.ibm.com/support/docview.wss?uid=swg24030521

      Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030527

      System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030530
   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.
5. Ensure that the system environment meets installation requirements. You can verify the requirements manually or run the prerequisite checker. To run the prerequisite checker, complete the following steps:
   a. Issue this command to start the prerequisite checker with a graphical user interface:

      ```
      ./prereqcheck.bin
      ```

      Alternatively, issue this command to start the prerequisite checker with the console method:

      ```
      ./prereqcheck.bin -i console
      ```
   b. Select the language for the prerequisite checker user interface.
   c. In the welcome and disclaimer panels, review the statements and accept them.

   If the Prerequisite Results panel shows that your workstation successfully passed the checks, you are ready to start the installation. If an error message is shown in the Prerequisite Results panel, make the required corrections

before you continue with the installation. For more information about the prerequisite checker, see "Running the prerequisite checker" on page 38.

6. 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.
   - Start the graphical wizard:
     ```
     ./install.bin
     ```
   - Start the console wizard:
     ```
     ./install.bin -i console
     ```

   For information about translations that are available for the server, see the server language locales section in the Appendix. For information about the silent installation of the server, see the section on installing Tivoli Storage Manager in silent mode in the *Installation Guide*.
7. Select the language for your installation and follow the wizard, selecting **Next** to step through the wizard.
   a. You must accept the license agreement to proceed. Select the product that you are entitled to use and a license agreement is displayed. You can select only one product on the page. If you select Tivoli Storage Manager, Tivoli Storage Manager Extended Edition, or System Storage Archive Manager, you are asked if you will be using LAN-free or library sharing. If you select YES, you must accept the Tivoli Storage Manager for Storage Area Networks license. This license is in addition to the license for the product that you chose on the previous page.
   b. Select the components that you want to install. Components include the server, languages, license, device driver, and storage agent. There is no default, so you must make a selection. If you previously installed a server, ensure that you select the same directory when you install a language package, license, or device driver. If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver. A server and a storage agent cannot be installed on the same workstation. For information about other components that you can choose to install, see the *Installation Guide*.

   The Tivoli Storage Manager client application programming interface (API), DB2 Version 9.7, and Global Security Kit (GSKit) 8 are automatically installed when you select the server component.
8. 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 you continue to the next step.

   The installation log is in the `/var/tivoli/tsm` directory.
9. Download and apply any applicable fixes that have been released for the server. Go to the FTP downloads site at ftp://public.dhe.ibm.com/storage/tivoli-storage-management/maintenance/server. Alternatively, go to the product support site at http://www.ibm.com/support/entry/portal/Downloads and search for server updates.
10. Modify kernel parameter values, if necessary.

    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 the DB2 information center (http://pic.dhe.ibm.com/infocenter/db2luw/v9r7). To find the information, enter a search string such as `modifying kernel parameters` in the **Search** field at this site.

To run Tivoli Storage Manager with DB2, you might need to set kernel parameter values higher than the suggested minimum values and make other changes to the system. For more details, see the section on tuning kernel parameters for Linux systems in the *Installation Guide*.

Migration scenario 3: Setting up devices

Set up the storage devices that you plan to use with the V6.3.4 or later server. Ensure that you set access permissions correctly for users and groups.

To set up storage devices, follow these instructions:

- If the devices that you plan to use are controlled by the IBM device driver, complete the following steps:
  1. Install the IBM device driver and configure devices. Follow the instructions in the *IBM Tape Device Drivers Installation and User's Guide* at http://www.ibm.com/support/docview.wss?uid=ssg1S7002972.
  2. To set access permissions, complete one of the following actions:
     - If the system is dedicated to Tivoli Storage Manager and only the Tivoli Storage Manager administrator has access, make the device special files readable and writable to all users. Issue the following command:

       ```
       chmod a+rw /dev/IBMtapex
       ```
     - Restrict access to a group by creating a group and adding each instance user ID for Tivoli Storage Manager to that group. Then, change the ownership of the device special files to belong to the group, and make the device special files readable and writable to the group. Issue the following command:

       ```
       chmod g+rw /dev/IBMtapex
       ```
- If the devices that you plan to use are controlled by the Tivoli Storage Manager device driver, complete the following steps:
  1. Log in as the root user.
  2. Grant read and write access.
     - To grant read and write access to all users, issue the following command:

       ```
       /opt/tivoli/tsm/devices/bin/autoconf -a
       ```
     - To grant read and write access to only the group, issue the following command:

       ```
       /opt/tivoli/tsm/devices/bin/autoconf -g
       ```

For more information about setting up devices, see the section about attaching devices to the server in the *Administrator's Guide*.

Migration scenario 3: Creating the user ID and directories for the server instance

Create the user ID that will own the server instance. Also, create the directories that the server instance will use for database and recovery logs.

Before you begin, to review the information about planning space for the server, see "Estimating database and recovery log requirements" on page 360.

To create the user ID, group, and directories for the migrated server instance, complete the following steps:

1. Create a user ID and group that will be the owner of the Tivoli Storage Manager server instance. You will use this user ID when you create the server instance in a later step.

   Restriction: In the user ID, only lowercase letters (a-z), numerals (0-9), and the underscore character (_) can be used. The user ID and group name must comply with the following rules:
   - The length must be 8 characters or less.
   - The user ID and group name cannot start with `ibm`, `sql`, `sys`, or a numeral.
   - The user ID and group name cannot be `user`, `admin`, `guest`, `public`, `local`, or any SQL reserved word.

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

   ```
   # groupadd tsmsrvrs
   # useradd -d /home/tsminst1 -m -g tsmsrvrs -s /bin/bash tsminst1
   # passwd tsminst1
   ```
2. Log out, then log in to your system, by using the new user ID and password. Use an interactive login program, such as telnet, so that you are prompted for the password and can change it if necessary.
3. 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).
4. Ensure that you are logged in with the user ID that you created. Then, create the directories that the server requires.

   Unique, empty directories are required for each item that is shown in the following table. Create the database directories, the active log directory, and the archive log directory on different physical volumes. For space requirements, see "Worksheet for planning space for the V6.3 or later server" on page 44.

Table 71. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The instance directory for the server, which will contain files for this server instance, including the server options file	`mkdir /home/user_ID/tsminst1`	

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

Active log directory	`mkdir /home/user_ID/tsmlog`	
Archive log directory	`mkdir /home/user_ID/tsmarchlog`	
Optional: Directory for the log mirror for the active log	`mkdir /home/user_ID/tsmlogmirror`	
Optional: Secondary archive log directory, which is the failover location for the archive log	`mkdir /home/user_ID/tsmarchlogfailover`	

When a server is initially created, with the **DSMSERV FORMAT** utility or with the configuration wizard, a server database and recovery log are created. In addition, files are created to hold database information that is used by the database manager.

5. Create more logical volumes and mount the volumes on the directories that were created in the previous step.

Migration scenario 3: Running the upgrade wizard

The wizard offers a guided approach to upgrading a server. Start the wizard on the system where you installed the V6.3.4 or later server program.

Before you start the upgrade wizard, complete all preceding steps to prepare for the upgrade. Ensure that you backed up the server database and configuration files. Also, ensure that you installed the V6.3.4 or later server program, and created the directories and user ID for the server instance.

1. Verify that the following requirements are met:
   - The system where you installed the V6.3.4 or later server program must have the X Window client. You also must 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. Also, ensure that the SSH daemon service has access rights for connecting to the system by using `localhost`.
     - Remote shell (rsh).
     - Remote Execution Protocol (REXEC).

     The V5 server also must have one of the protocols enabled.

- You must be able to log in to the V6.3.4 or later system with the user ID that you created for the server instance by using the SSH, rsh, or REXEC protocol. When you use the wizard, you must provide this user ID and password to access that system.

2. Start the upgrade wizard, **dsmupgdx**, from the V6.3.4 or later server installation directory. Log in by using the root user ID and issue this command:

   ```
   /opt/tivoli/tsm/server/bin/dsmupgdx
   ```

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. Read all messages that are displayed for each phase of the upgrade process in the message display area within the wizard. Informational messages might require your attention.

Migration scenario 4: Using the network method and the command line

Use this procedure if you are migrating the server database by using the network method and the command line. By applying the network method, you simultaneously extract data from the original database and load the data into the new database over a network connection. By using administrative commands, you migrate the system manually.

To migrate the system by using Migration scenario 4, complete the following steps:

1. Ensure that you have completed the planning tasks. See Chapter 13, “Planning the migration,” on page 359.
2. Ensure that you have completed the preparation tasks. See Chapter 14, “Preparing for the migration,” on page 367.
3. Complete the tasks that are described in the following topics:
   a. “Migration scenario 4: Preparing the database of the V5 server” on page 406
   b. “Migration scenario 4: Installing the V6.3.4 or later server” on page 406
   c. “Migration scenario 4: Setting up devices” on page 409
   d. “Migration scenario 4: Creating the user ID and directories for the server instance” on page 410
   e. “Migration scenario 4: Creating the server instance and database” on page 411
   f. “Migration scenario 4: Moving the server database over a network” on page 414
   g. “Migration scenario 4: Configuring the system for database backup” on page 415

After you complete the planning, preparation, and migration steps, complete the post migration tasks. See Chapter 16, “Taking the first steps after migration,” on page 417.

Migration scenario 4: Preparing the database of the V5 server

Before you extract the data from the V5 server database, you must prepare the 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 V5 system.

1. Ensure that you completed the initial preparation steps. For instructions, see Chapter 14, "Preparing for the migration," on page 367.
2. Log in by using the root user ID on the V5 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. Prepare the database. Direct the output of the process to a file for monitoring. 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`:

   AIX

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

   HP-UX Solaris

   ```
   nohup /opt/tivoli/tsm/upgrade/bin/dsmupgrd preparedb >prepare.out 2>&1 &
   ```
5. Monitor the process for errors and warning messages. The final message indicates the 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
   ```

Ensure that the prepare operation is completed successfully before you continue to the next step. If the prepare operation fails, you might have to restart the V5 server to fix the problem and run the prepare operation again. If the server that is being upgraded is a V5.3 or V5.4 server, you might have to restore the database by using a backup. Then, you can restart the server to correct the problem.

Migration scenario 4: Installing the V6.3.4 or later server

You can use an installation wizard to install the server, or install the server by using the console.

Starting with V6.3, the IBM Tivoli Storage Manager server installation wizard has a separate license agreement for the following products:

- Tivoli Storage Manager
- IBM Tivoli Storage Manager Extended Edition
- IBM System Storage Archive Manager
- IBM Tivoli Storage Manager for Storage Area Networks

To verify the system environment and install the server, complete the following steps:

1. For some operating systems, you must check certain system settings before you begin the installation.

   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 is completed.

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

```
The installation wizard cannot run on your configuration.
It will now stop.
For more details about installation error logs,
enter the phrase "installation log files" in the
Search field at this site:

http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3
```

2. Log in to the system by using the root user ID.
3. If you have the product DVD, insert the Tivoli Storage Manager DVD into a DVD drive. Ensure that the DVD is mounted on directory `/dvdrom` and change to that directory.
4. If you downloaded the program from Passport Advantage as an executable file, complete the following steps:
   a. Verify that you have enough space to store the installation files when they are extracted from the product package. For space requirements, see the download document:

      Tivoli Storage Manager: http://www.ibm.com/support/docview.wss?uid=swg24030521

      Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030527

      System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030530
   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.
5. Ensure that the system environment meets installation requirements. You can verify the requirements manually or run the prerequisite checker. To run the prerequisite checker, complete the following steps:
   a. Issue this command to start the prerequisite checker with a graphical user interface:

      ```
      ./prereqcheck.bin
      ```

      Alternatively, issue this command to start the prerequisite checker with the console method:

      ```
      ./prereqcheck.bin -i console
      ```
   b. Select the language for the prerequisite checker user interface.
   c. In the welcome and disclaimer panels, review the statements and accept them.

   If the Prerequisite Results panel shows that your workstation successfully passed the checks, you are ready to start the installation. If an error message

is shown in the Prerequisite Results panel, make the required corrections before you continue with the installation. For more information about the prerequisite checker, see "Running the prerequisite checker" on page 38.

6. 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.
   - Start the graphical wizard:
     ```
     ./install.bin
     ```
   - Start the console wizard:
     ```
     ./install.bin -i console
     ```

   For information about translations that are available for the server, see the server language locales section in the Appendix. For information about the silent installation of the server, see the section on installing Tivoli Storage Manager in silent mode in the *Installation Guide*.
7. Select the language for your installation and follow the wizard, selecting **Next** to step through the wizard.
   a. You must accept the license agreement to proceed. Select the product that you are entitled to use and a license agreement is displayed. You can select only one product on the page. If you select Tivoli Storage Manager, Tivoli Storage Manager Extended Edition, or System Storage Archive Manager, you are asked if you will be using LAN-free or library sharing. If you select YES, you must accept the Tivoli Storage Manager for Storage Area Networks license. This license is in addition to the license for the product that you chose on the previous page.
   b. Select the components that you want to install. Components include the server, languages, license, device driver, and storage agent. There is no default, so you must make a selection. If you previously installed a server, ensure that you select the same directory when you install a language package, license, or device driver. If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver. A server and a storage agent cannot be installed on the same workstation. For information about other components that you can choose to install, see the *Installation Guide*.

   The Tivoli Storage Manager client application programming interface (API), DB2 Version 9.7, and Global Security Kit (GSKit) 8 are automatically installed when you select the server component.
8. 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 you continue to the next step.

   The installation log is in the `/var/tivoli/tsm` directory.
9. Download and apply any applicable fixes that have been released for the server. Go to the FTP downloads site at ftp://public.dhe.ibm.com/storage/tivoli-storage-management/maintenance/server. Alternatively, go to the product support site at http://www.ibm.com/support/entry/portal/Downloads and search for server updates.
10. Modify kernel parameter values, if necessary.

    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 the DB2 information center (http://pic.dhe.ibm.com/infocenter/db2luw/v9r7). To find the information, enter a search string such as `modifying kernel parameters` in the **Search** field at this site.

To run Tivoli Storage Manager with DB2, you might need to set kernel parameter values higher than the suggested minimum values and make other changes to the system. For more details, see the section on tuning kernel parameters for Linux systems in the *Installation Guide*.

Migration scenario 4: Setting up devices

Set up the storage devices that you plan to use with the V6.3.4 or later server. Ensure that you set access permissions correctly for users and groups.

To set up storage devices, follow these instructions:

- If the devices that you plan to use are controlled by the IBM device driver, complete the following steps:
  1. Install the IBM device driver and configure devices. Follow the instructions in the *IBM Tape Device Drivers Installation and User's Guide* at http://www.ibm.com/support/docview.wss?uid=ssg1S7002972.
  2. To set access permissions, complete one of the following actions:
     - If the system is dedicated to Tivoli Storage Manager and only the Tivoli Storage Manager administrator has access, make the device special files readable and writable to all users. Issue the following command:

       ```
       chmod a+rw /dev/IBMtapex
       ```
     - Restrict access to a group by creating a group and adding each instance user ID for Tivoli Storage Manager to that group. Then, change the ownership of the device special files to belong to the group, and make the device special files readable and writable to the group. Issue the following command:

       ```
       chmod g+rw /dev/IBMtapex
       ```
- If the devices that you plan to use are controlled by the Tivoli Storage Manager device driver, complete the following steps:
  1. Log in as the root user.
  2. Grant read and write access.
     - To grant read and write access to all users, issue the following command:

       ```
       /opt/tivoli/tsm/devices/bin/autoconf -a
       ```
     - To grant read and write access to only the group, issue the following command:

       ```
       /opt/tivoli/tsm/devices/bin/autoconf -g
       ```

For more information about setting up devices, see the section about attaching devices to the server in the *Administrator's Guide*.

Migration scenario 4: Creating the user ID and directories for the server instance

Create the user ID that will own the server instance. Also, create the directories that the server instance will use for database and recovery logs.

Before you begin, to review the information about planning space for the server, see "Estimating database and recovery log requirements" on page 360.

To create the user ID, group, and directories for the migrated server instance, complete the following steps:

1. Create a user ID and group that will be the owner of the Tivoli Storage Manager server instance. You will use this user ID when you create the server instance in a later step.

   Restriction: In the user ID, only lowercase letters (a-z), numerals (0-9), and the underscore character (_) can be used. The user ID and group name must comply with the following rules:

   - The length must be 8 characters or less.
   - The user ID and group name cannot start with `ibm`, `sql`, `sys`, or a numeral.
   - The user ID and group name cannot be `user`, `admin`, `guest`, `public`, `local`, or any SQL reserved word.

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

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

2. Log out, then log in to your system, by using the new user ID and password. Use an interactive login program, such as telnet, so that you are prompted for the password and can change it if necessary.
3. 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).
4. Ensure that you are logged in with the user ID that you created. Then, create the directories that the server requires.

   Unique, empty directories are required for each item that is shown in the following table. Create the database directories, the active log directory, and the archive log directory on different physical volumes. For space requirements, see "Worksheet for planning space for the V6.3 or later server" on page 44.

Table 72. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The instance directory for the server, which will contain files for this server instance, including the server options file	`mkdir /home/user_ID/tsminst1`	

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

Active log directory	`mkdir /home/user_ID/tsmlog`	
Archive log directory	`mkdir /home/user_ID/tsmarchlog`	
Optional: Directory for the log mirror for the active log	`mkdir /home/user_ID/tsmlogmirror`	
Optional: Secondary archive log directory, which is the failover location for the archive log	`mkdir /home/user_ID/tsmarchlogfailover`	

When a server is initially created, with the **DSMSERV FORMAT** utility or with the configuration wizard, a server database and recovery log are created. In addition, files are created to hold database information that is used by the database manager.

5. Create more logical volumes and mount the volumes on the directories that were created in the previous step.

Migration scenario 4: Creating the server instance and database

Create the server instance and format files for an empty V6.3.4 or later database.

1. Log in to the system where you installed the V6.3.4 or later program by using the root user ID.

   Verify the following items:

   - The home directory for the user, `/home/tsminst1`, exists. If there is no home directory, you must create it.
   - The instance directory stores the following core files that are generated by the Tivoli Storage Manager server:
     - The server options file, `dsmserv.opt`
     - The server key database file, `cert.kdb`, and the `.arm` files, which are used by clients and other servers to import the Secure Sockets Layer certificates of the server
     - 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 storage pools of the FILE device type, if the directory for the device class is not fully specified, or not fully qualified
- User exits
- Trace output, if it is not fully qualified

- A shell configuration file, for example, a `.profile` file, exists in the home directory. The root user and instance user ID must have write permission to this file. For more information, go to the DB2 information center and search for information about Linux and UNIX environment variable settings.

2. Create a Tivoli Storage Manager instance by using the **db2icrt** command.

   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 -s ese -u
   user_id 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 -s ese -u
   tsminst1 tsminst1
   ```

   Remember: From this point on, use this new user ID when you configure the Tivoli Storage Manager server. Log out of the root user ID, and log in by using the user ID that is the instance owner.

3. Log in to the system by using the user ID that owns the V6.3.4 or later server instance (the instance user ID).
4. Copy the server options file from the V5 server to the instance directory that you created for the V6.3.4 or later server. The server options file is typically named `dsmserv.opt`. For example, if you created the instance directory that is shown in the example for creating directories, copy the file into the following directory:

   ```
   /tsminst1
   ```

   Ensure that the instance user ID has ownership of or read/write permission for the server options file.

5. Edit the server options file.
   a. Remove any options that are not supported for V6.3 or later. For the list of deleted options, see Table 36 on page 69.
   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. In this way, you can help ensure that the files are available when needed.
   c. Verify that 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 V6.3 or later. 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, 4096.

- If the server options file includes a value for this option, the server uses the 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 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 /tsminst1
   ```

7. Modify the library path to use the version of the IBM Global Security Kit (GSKit) that is installed with the Tivoli Storage Manager server.

   You must update the following files to set the library path when DB2 or the Tivoli Storage Manager server is started:

   - *instance_directory*/sqllib/usercshrc
   - *instance_directory*/sqllib/userprofile

   For the *instance_directory*/sqllib/usercshrc file, add the following line:

   ```
   setenv LD_LIBRARY_PATH /usr/local/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
   ```

   For the *instance_directory*/sqllib/userprofile file, add the following lines:

   ```
   LD_LIBRARY_PATH=/usr/local/ibm/gsk8_64/lib64:$LD_LIBRARY_PATH
   export LD_LIBRARY_PATH
   ```

   Verify the library path settings and ensure that the GSKit version is 8.0.14.14 or later. Issue the following commands from the instance home directory, for example, /home/tsminst1:

   ```
   echo $LD_LIBRARY_PATH
   gsk8capicmd_64 -version
   gsk8ver_64
   ```

   If the GSKit version is not 8.0.14.14 or later, you must reinstall the Tivoli Storage Manager server. The reinstallation ensures that the correct GSKit version is available.

8. Complete this step to set the server code page.

   Set the DB2CODEPAGE system environment variable to 819 for each server instance. Before you issue the **DSMSERV LOADFORMAT** command, log in to the system as the server instance owner and issue this command:

   ```
   db2set -i instance_name DB2CODEPAGE=819
   ```

   For example:

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

9. Change to the instance directory that you created for the server.
10. Create and format the database and recovery logs by using the **DSMSERV LOADFORMAT** command. In the command, specify the directories that you created for the database and logs. The directories must be empty.

    For example, to get an active log size of 16 GB or 16384 MB, which is the default size, issue the following command, on one line:

    ```
    /opt/tivoli/tsm/server/bin/dsmserv loadformat \
    dbdir=/tsmdb001,/tsmdb002,/tsmdb003,/tsmdb004 \
    activelogsize=16384 activelogdirectory=/tsmlog \
    mirrorlogdirectory=/tsmlogmirror archlogdirectory=/tsmarchlog
    ```

For more information about creating and formatting a database, see Appendix A, "Utilities, scripts, and commands for server upgrade and migration," on page 511.

11. Monitor the process for errors and warning messages. The final message indicates the success or failure of the operation.

Migration scenario 4: Moving the server database over a network

Move the database by starting the insertion process for the V6.3.4 or later server to accept the server database. Then, start the extraction process for the V5 server to extract and send the database.

Before you start this procedure, ensure that both the V5 server and the new server are not running.

To move the server database over a network, complete the following steps:

1. Verify that there is a good network connection between the two systems.
2. Start the insertion process on the V6.3.4 or later server to accept the database. Use the **DSMSERV INSERTDB** command. To monitor the process, direct the output of the process to a file. For example, to start the server, allow the default time of 60 minutes for the V5 server to contact the V6.3.4 or later server, and direct the process output to the `insert.out` file, use this command:

   ```
   nohup /opt/tivoli/tsm/server/bin/dsmserv insertdb \
   sesswait=60 >insert.out 2>&1 &
   ```

   For more information about inserting data, see Appendix A, "Utilities, scripts, and commands for server upgrade and migration," on page 511.

   The server starts and waits up to 60 minutes to be contacted by the original server. Some time might pass during which no messages are issued. During this time, DB2 operations are running in the background. Optional: To verify that operations are continuing as expected, monitor the processor and I/O usage for the server process and the corresponding DB2 process.
3. Monitor the output of the **DSMSERV INSERTDB** process. Verify that the **DSMSERV INSERTDB** process issues the following message before you continue 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
   ```
4. Start the data extraction from the original server by using the **DSMUPGRD EXTRACTDB** command. Issue the command from the V5 server directory. Specify the TCP/IP address and port for the V6.3.4 or later 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=9.11.25.124 lladdress=1500 >extract.out 2>&1 &
   ```

   HP-UX Solaris

   ```
   nohup /opt/tivoli/tsm/upgrade/bin/dsmupgrd extractdb \
   hladdress=9.11.25.124 lladdress=1500 >extract.out 2>&1 &
   ```

For more information about extracting data, see Appendix A, "Utilities, scripts, and commands for server upgrade and migration," on page 511.

5. Monitor the processes for errors and warning messages, and for items that might require attention. 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, 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.`

Migration scenario 4: Configuring the system for database backup

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 `/tsminst1` for the Tivoli Storage Manager server instance directory.

1. Set the Tivoli Storage Manager API environment-variable configuration for the database instance:
   a. Log in by using the `tsminst1` user ID.
   b. When user `tsminst1` is logged in, ensure that the DB2 environment is correctly initialized. The DB2 environment is initialized by running the `/home/tsminst1/sqllib/db2profile` script, which normally runs automatically from the profile of the user ID. If `/home/tsminst1/.profile` does not run the **db2profile** script, such as when you are using the Korn shell (`/bin/ksh`), add the following lines to `/home/tsminst1/.profile`:

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

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

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

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

   ```
   . ~/.profile
   ```

   Tip: Ensure that you enter a space after the initial dot (.) character.

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

   ```
   SERVERNAME TSMDBMGR_TSMINST1
   ```

Remember: The name that you use must match the server instance name.

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

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

   Avoid placing the server name, TSMDBMGR_TSMINST1, first in the `dsm.sys` file because the server name 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 $$_TSMDBMGR_$$
   ```

   Tip: Ensure that you enter the same `tcpport` value as the server is using. The `tcpport` value is specified in the `dsmserv.opt` file.

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. For details, see "Starting the server" on page 418.
   b. Log in by using the root user ID.
   c. Source the database manager profile by running the following command. Ensure that you enter a dot, a space, and the path to the `db2profile` file. If you do not enter the space, the database backup fails.

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

   d. Change the API password. Use 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
      ```

Chapter 16. Taking the first steps after migration

Verify that the server was migrated and can operate normally. The steps include starting the server, registering licenses, and backing up the database. After you complete those steps, you can begin operations and monitor the migrated server.

Complete the following tasks:

1. "Configuring server options for server database maintenance"
2. "Starting the server" on page 418
3. "Verifying the migration results" on page 421
4. "Registering licenses" on page 422
5. "Updating device path information" on page 422
6. "Backing up the database" on page 422
7. "Changing the host name for the Tivoli Storage Manager server" on page 423
8. "Updating the `tcpserveraddress` option" on page 424
9. "Setting the IP address of the server" on page 424
10. "Migrating data from tape to DISK or FILE devices" on page 426
11. "Restoring backup sets" on page 427
12. "Updating automation" on page 427
13. "Beginning operations and monitoring the server" on page 427

After you migrate the server to V6.3.4 or later, you can authenticate passwords with the LDAP directory server, or authenticate passwords with the Tivoli Storage Manager server. Passwords that are authenticated with the LDAP directory server can provide enhanced system security. For details, see the section about managing passwords and logon procedures in the *Administrator's Guide*.

Configuring server options for server database maintenance

To help avoid problems with database growth and server performance, the server automatically monitors its database tables and reorganizes them when needed. Before starting the server for production use, set server options to control when reorganization runs. If you plan to use deduplication, ensure that the option to run index reorganization is enabled.

Table and index reorganization requires significant processor resources, active log space, and archive log space. Because database backup takes precedence over reorganization, select the time and duration for reorganization to ensure that the processes do not overlap and reorganization can be completed. For more information about scheduling reorganization, see the *Administrator's Guide*.

1. Modify the server options.

   Edit the server options file, `dsmserv.opt`, in the server instance directory. Follow these guidelines when you edit the server options file:

   - To activate an option, remove the asterisk at the beginning of the line.
   - Begin entering an option on any line.
   - Enter only one option per line. The entire option with its value must be on one line.

- If you have multiple entries for an option in the file, the server uses the last entry.
- To view available server options, see the sample file, `dsmserv.opt.smp`, in the `/opt/tivoli/tsm/server/bin` directory.

2. If you plan to use data deduplication, enable the `ALLOWREORGINDEX` server option. Add the following option and value to the server options file:

   ```
   allowreorgindex yes
   ```

3. Set two server options that control when reorganization starts and how long it runs. Select a time and duration so that reorganization runs when you expect that the server is least busy. These server options control both table and index reorganization processes.
   a. Set the time for reorganization to start by using the `REORGBEGINTIME` server option. Specify the time by using the 24-hour system. For example, to set the start time for reorganization as 8:30 p.m., specify the following option and value in the server options file:

      ```
      reorgbegintime 20:30
      ```

   b. Set the interval during which the server can start reorganization. For example, to specify that the server can start reorganization for four hours after the time set by the `REORGBEGINTIME` server option, specify the following option and value in the server options file:

      ```
      reorgduration 4
      ```

4. Optionally, enable the SAN discovery function:

   ```
   sandiscovery on
   ```

   Tip: By using SAN discovery, the server can automatically correct the special file name for a device if it was changed for a specified tape device.

Starting the server

Before you start the server, ensure that access rights and ulimit values are set correctly. Then, start the V6.3.4 or later server so that you can verify that it is correctly set up.

Restriction: If you do not have the permissions to use the DSMSERV program, you cannot start the server. If you do not have authority to read or write files in the instance directory, you cannot start that instance of the server.

The standard way to start the server is by using the instance user ID. By using the instance user ID, you simplify the setup process and avoid potential issues. However, in some cases, it might be necessary to use another user ID to start the server. For example, you might want to use the root user ID to ensure that the server can access specific devices. To allow a user other than the instance user ID to start the server, the user ID must have sufficient authority to issue the start command for the server and database manager, and the user ID must belong to the SYSADM_GROUP group. The user ID must have authority to access the server database and to use all files, directories, and devices required by the server. Before starting the server, explicitly grant server database authority to the user ID and verify all other authorities for the user ID.

When you start the Tivoli Storage Manager server, the server attempts to change certain ulimit values to unlimited. In general, this server action helps to ensure optimal performance and facilitates debugging. If you are a non-root user when you start the server, attempts to change the ulimit values might fail. To ensure

correct server operation if you are running the server as a non-root user, set the ulimit values as high as possible before you start the server.

When you specify ulimit values, ensure that you set DB2 user limits as high as possible. DB2 relies on private data memory for sort memory allocations during SQL processing. Insufficient shared heap memory can lead to Tivoli Storage Manager server failures during interaction with DB2. For more information about setting the appropriate operating system values, see Technote 1212174 (http://www.ibm.com/support/docview.wss?uid=swg21212174).

For guidance in setting ulimit values, see the following table:

Table 73. Ulimit values

Ulimit type	Standard value
Maximum size of core files created	Unlimited
Maximum size of a data segment for a process	Unlimited
Maximum file size	Unlimited
Maximum number of open files	• For servers on which replication, data deduplication, or both are enabled, specify a minimum value of `16384`. • For all other servers, specify a minimum value of `8192`.
Maximum amount of processor time in seconds	Unlimited

For instructions about setting ulimit values, see the documentation for your operating system.

The default value for the user limit of maximum user processes (`nproc`) has changed on some distributions and versions of the Linux operating system. The new default value is 1024. This value can cause unexpected behavior in the Tivoli Storage Manager server. For the Red Hat Enterprise Linux (RHEL) 6 operating system, the default value for `nproc` was decreased to 1024. This value might have changed in other versions and distributions of Linux that are supported by the Tivoli Storage Manager server. Increase the user limit of maximum user processes to the minimum suggested value of 16384. If the value is not updated, the server might display unexpected behavior, including hangs or failures. To verify the current user limit, issue the following command as the instance user:

```
ulimit -u
```

For example:

```
[user@Machine ~]$ ulimit -u
16384
```

To display the current values of all user limits, issue the following command:

```
ulimit -a
```

For example:

```
[user@Machine ~]$ ulimit -a
core file size          (blocks, -c) 0
data seg size           (kbytes, -d) unlimited
scheduling priority             (-e) 0
file size               (blocks, -f) unlimited
```

```
pending signals                 (-i) 128098
max locked memory       (kbytes, -l) 64
max memory size         (kbytes, -m) unlimited
open files                      (-n) 1024
pipe size            (512 bytes, -p) 8
POSIX message queues     (bytes, -q) 819200
real-time priority              (-r) 0
stack size              (kbytes, -s) 10240
cpu time               (seconds, -t) unlimited
max user processes              (-u) 16384
virtual memory          (kbytes, -v) unlimited
file locks                      (-x) unlimited
```

To update the user limit of maximum user processes, add a line to the `/etc/security/limits.conf` file. On the RHEL 6 operating system, the user limit for `nproc` is set in the `/etc/security/limits.d/90-nproc.conf` file. This file overrides the settings in the `/etc/security/limits.conf` file. To update the user limit on the RHEL 6 operating system, you must either edit the file in the `/etc/security/limits.d` directory or remove the file and add a line to the `/etc/security/limits.conf` file.

Starting the server from the instance user ID

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

1. Log in by using the instance user ID.

   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 instance user ID, if that profile exists.

   If you log in using the instance user ID 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
   ```

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 `/tsminst1`. To start tsminst1, issue the following commands:

```
cd /tsminst1
/opt/tivoli/tsm/server/bin/dsmserv
```

To start the server in the background, issue the following commands:

```
cd /tsminst1
/opt/tivoli/tsm/server/bin/dsmserv -q &
```

Starting the server from the root user ID

The standard way to start the server is by using the instance user ID. However, in some cases, it might be necessary to use another user ID to start the server. For example, you might want to use the root user ID to ensure that the server can access specific devices.

For more information about starting the server from the root user ID, see the *Administrator's Guide*.

Automatically starting servers

Linux

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

For instructions, see the information about automatically starting servers on the Linux operating system in the *Installation Guide*.

Verifying the migration results

After the migration, verify the operation of the V6.3.4 or later server. Monitor the server for error and warning messages, verify that storage devices are accessible to the server, and conduct tests to ensure that the system is operating as planned.

1. Monitor the messages that the server issues as it starts. Watch for error and warning messages.
2. Verify the following items:
   a. Ensure that the storage devices of the original server 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. For instructions, see "Updating device path information" on page 422.
   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 by 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 database migration.

   Tip: For more information about the commands that are run before a database migration, see "Creating a summary of database contents" on page 371.
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.

If the server is operating as expected and you must not revert to the previous version, return any settings that you changed to prepare for the migration back to the original values.

Registering licenses

Immediately register any Tivoli Storage Manager licensed functions that you purchased so that you do not lose data after you begin to use the server.

Register the licenses for the Tivoli Storage Manager server components that are installed on your system by issuing the **REGISTER LICENSE** command, a Tivoli Storage Manager administrative command:

```
register license file=*.lic
```

For more information about registering licenses, see the **REGISTER LICENSE** command in the *Administrator's Reference*.

Restriction: You cannot register licenses for IBM Tivoli Storage Manager for Mail, IBM Tivoli Storage Manager for Databases, IBM Tivoli Storage Manager for Enterprise Resource Planning, and IBM Tivoli Storage Manager for Space Management.

Updating device path information

If the storage area network (SAN) discovery function is not enabled, update the device path information for all drives and libraries. This step is required to ensure that storage devices can be accessed by the new system.

The `SANDISCOVERY` server option is available to automatically correct a special file name for a device if the file name changed because of changes in a SAN environment. If the `SANDISCOVERY` server option is set to `OFF`, update the device path information manually.

For instructions to update device path information, see the **UPDATE PATH** command in the *Administrator's Reference*.

If the `SANDISCOVERY` server option is set to `ON`, device path information for drives and libraries should be updated automatically when the V6.3.4 or later server is started.

Backing up the database

After you migrate the data, perform a full backup of the database as soon as possible. Also, back up the volume history.

1. Complete the following steps:
   a. If you did not use the instance configuration wizard to configure 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 V6.3.4 or later server is operating correctly 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. From the Tivoli Storage Manager administrative command line, issue the following command:

   ```
   set dbrecovery device_class_name
   ```

   where *device_class_name* is the name of the device class to be used by the database manager for all automatic database backups.

   For more information about selecting a device class for automatic backups, see the **SET DBRECOVERY** command in the *Administrator's Reference*.
3. Back up the database by issuing the following command:

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

   where *device_class_name* is the name of the device class. You can specify the device class to 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.

   For more information about backing up the database, see the **BACKUP DB** command in the *Administrator's Reference*.
4. Back up the volume history by issuing the following command:

   ```
   backup volhistory filenames=file_name
   ```

   where *file_name* is the name of the file where volume history information will be stored.

   For more information about backing up volume history, see the **BACKUP VOLHISTORY** command in the *Administrator's Reference*.

Changing the host name for the Tivoli Storage Manager server

If you must change the host name of the Tivoli Storage Manager V6.3.4 or later server, ensure that you also update the database configuration. If you fail to update the database configuration, the Tivoli Storage Manager server might not start.

1. Stop any Tivoli Storage Manager servers that are running on the system.
2. Change the host name by using the procedures defined for your operating system.
3. From the root user ID on the system, issue the following command:

   ```
   db2set -g DB2SYSTEM=newhostname
   ```

   where *newhostname* is the new host name for the server.

   Tip: The **db2set** command is in the `/opt/tivoli/tsm/db2/adm` directory.
4. Verify that the `DB2SYSTEM` value was changed by issuing the following command:

   ```
   db2set -all
   ```

   This command displays all configuration settings that are used by the database.
5. In the *instance directory*`/sqllib` directory, locate the `db2nodes.cfg` file. The file contains an entry that shows the previous host name, for example:

   ```
   0 tsmmon TSMMON 0
   ```

   a. Update the entry with the new host name. The entry is similar to the following entry:

      ```
      0 tsmnew newhostname 0
      ```

b. Save and close the changed file.

Updating the `tcpserveraddress` option

To ensure that all clients and servers in the system can access the V6.3.4 or later server, you must update the `tcpserveraddress` client option.

Set the `tcpserveraddress` option for all Tivoli Storage Manager clients that access the migrated server. Set the option for all other servers that communicate with the migrated server.

For instructions, see the *Backup-Archive Clients Installation and User's Guide*.

Setting the IP address of the server

If you plan to use server-to-server communications, ensure that other servers in the system can communicate with the V6.3.4 or later server. Update the high-level IP address of the V6.3.4 or later server and set the IP addresses of the other servers in the system accordingly.

To update IP addresses for server-to-server communications, use Tivoli Storage Manager administrative commands:

1. Update the IP address of the V6.3.4 or later server by using the **SET SERVERHLADDRESS** command. For example, to set the IP address to 9.230.99.66, issue the following command:

   ```
   set serverhladdress 9.230.99.66
   ```

   For more information about updating an IP address, see the **SET SERVERHLADDRESS** command in the *Administrator's Reference*.
2. For each Tivoli Storage Manager server that will communicate with the V6.3.4 or later server, update the **HLAddress** parameter by issuing the **UPDATE SERVER** command. For example, to set the server IP address to 9.230.99.66, issue the following command:

   ```
   update server server2 hladdress=9.230.99.66
   ```

   For more information about updating an **HLAddress** parameter, see the **UPDATE SERVER** command in the *Administrator's Reference*.
3. If you are sharing libraries, complete the following steps:
   a. Verify that the V6.3.4 or later server is operating as expected. For details, see "Verifying the migration results" on page 421.

      In the following three substeps, you are required to define the V6.3.4 or later server for the library manager server and delete the V5 server definition. As a result, you will not be able to revert to the V5 system.
   b. On the library client server, define the V6.3.4 or later server for the library manager server. For example, to define a server with an IP address of 9.230.99.66 and a low-level address of 1500, issue the following command:

      ```
      define server new_server_name serverpass=new_server_pass
      hla=9.230.99.66_address lla=1500
      ```

      where *new_server_name* specifies the name of the V6.3.4 or later server.

      For more information about defining a server, see the **DEFINE SERVER** command in the *Administrator's Reference*.
   c. On the library client server, update the shared library by using the **UPDATE LIBRARY** command:

```
update library library_name primarylibmanager=new_server_name
```

where *library_name* specifies the name of the shared library and *new_server_name* specifies the name of the V6.3.4 or later server.

For more information about updating a shared library, see the **UPDATE LIBRARY** command in the *Administrator's Reference*.

d. On the library client server, delete the previous library manager server definition by using the **DELETE SERVER** command:

```
delete server v5_server_name
```

where *v5_server_name* specifies the name of the Tivoli Storage Manager V5 server.

For more information about deleting a library manager server definition, see the **DELETE SERVER** command in the *Administrator's Reference*.

e. On the library client server, set the password for communication between servers by using the **SET SERVERPASSWORD** command:

```
set serverpassword lc_password
```

where *lc_password* specifies a password for the library client server.

For more information about setting a password for server-to-server communications, see the **SET SERVERPASSWORD** command in the *Administrator's Reference*.

f. On the library client server, reset the server verification key by using the **UPDATE SERVER** command:

```
update server * forcesync=yes
```

For more information about resetting a server verification key, see the **UPDATE SERVER** command in the *Administrator's Reference*.

g. Optional: On the library client server, verify that the library client server can communicate with the library manager server by using the **AUDIT LIBRARY** command:

```
audit library library_name checklabel=barcode
```

where *library_name* specifies the name of the shared library.

For more information about verifying communications between a library client server and a library manager server, see the **AUDIT LIBRARY** command in the *Administrator's Reference*.

4. If you plan to use LAN-free data movement, configure the storage agent to ensure that it can communicate with the V6.3.4 or later server. Use the **DSMSTA SETSTORAGESERVER** command. For example, issue the following command:

```
dsmsta setstorageserver myname=storagnt mypassword=fun4me
myhladdress=agent.example.com servername=new_server_name
serverpassword=new_server_password
hladdress=high_level_address lladdress=low_level_address
```

In this example, the following variables are used:

- *new_server_name* specifies the name of the V6.3.4 or later server.
- *new_server_password* specifies the password for the V6.3.4 or later server.
- *high_level_address* specifies the high-level address of the V6.3.4 or later server.
- *low_level_address* specifies the low-level address of the V6.3.4 or later server.

For more information about configuring a storage agent to communicate with a server, see the **DSMSTA SETSTORAGESERVER** command in the *Storage Agent User's Guide*.

Migrating data from tape to DISK or FILE devices

After the server migration, you can move the data from a tape device to a DISK or FILE device. In this way, you might be able to provide faster access to the data.

To move the data from tape to a DISK or FILE device, complete the following steps:

1. If you are moving data to a FILE device, define a FILE device class by using the Tivoli Storage Manager administrative command **DEFINE DEVCLASS**. For example, to define a device class named FILECLASS with a FILE device type and a maximum capacity of 50 MB, issue the following command:

   ```
   define devclass fileclass devtype=file maxcapacity=50m
   ```

   For more information about defining a FILE device class, see the **DEFINE DEVCLASS** command in the *Administrator's Reference*.
2. Define a storage pool by using the Tivoli Storage Manager administrative command **DEFINE STGPOOL**.
   - For example, if you are moving data to a DISK device, to define a primary storage pool named BACKUPPOOL, issue the following command:

     ```
     define stgpool backuppool disk cache=yes nextstgpool=prog2
     ```

     In this example, caching is enabled and PROG2 is specified as the primary storage pool to which files are migrated.
   - For example, if you are moving data to a FILE device, to define a primary storage pool named FILEPOOL, issue the following command:

     ```
     define stgpool filepool fileclass nextstgpool=prog3
     ```

     In this example, PROG3 is specified as the primary storage pool to which files are migrated.

   For more information about defining a storage pool, see the **DEFINE STGPOOL** command in the *Administrator's Reference*.
3. Define a volume by using the administrative command **DEFINE VOLUME**. For example, to define a volume of 4 MB named /home/tsminst1/jamesvol.dsm in a storage pool named BACKUPPOOL, issue the following command:

   ```
   define volume backuppool /home/tsminst1/jamesvol.dsm formatsize=4
   ```

   For more information about defining a volume, see the **DEFINE VOLUME** command in the *Administrator's Reference*.
4. To migrate data from tape to a DISK device, use the Tivoli Storage Manager administrative commands **MOVE DATA** or **MOVE NODEDATA**, depending on where the data is stored and how you want to move it. For example, to move files from a storage pool volume named STGVOL.1 to storage pool BACKUPPOOL, issue the following command:

   ```
   move data stgvol.1 stgpool=backuppool
   ```

   For more information about moving data, see the **MOVE DATA** and **MOVE NODEDATA** commands in the *Administrator's Reference*.
5. To migrate data from tape to a FILE device, use the Tivoli Storage Manager administrative commands **UPDATE STGPOOL** and **MIGRATE STGPOOL**. For example, to migrate data from the storage pool named LTOPOOL to the FILEPOOL storage pool, issue the following commands:

   ```
   update stgpool ltopool nextstgpool=filepool highmig=100
   migrate stgpool ltopool lowmig=0
   ```

For more information about moving data, see the **UPDATE STGPOOL** and **MIGRATE STGPOOL** commands in the *Administrator's Reference*. Alternatively, you can use the **MOVE DATA** or **MOVE NODEDATA** commands to move the data to a FILE device, depending on how the data is stored and how you want to move it.

Restoring backup sets

If you copied backup sets to a temporary location before the migration, you might want to move the backup sets to another location after the migration. You must remove existing entries in the server database and then re-create the backup sets in their new location.

To restore backup sets to a new location, complete the following steps:

1. Delete the backup set entries from the server database by issuing the Tivoli Storage Manager administrative command **DELETE BACKUPSET**. For example, to delete a backup set entry named `PERS_DATA.3099`, issue the following command:

   ```
   delete backupset pers_data.3099
   ```

   For more information about deleting backup set entries, see the **DELETE BACKUPSET** command in the *Administrator's Reference*.
2. Re-create a backup set by issuing the Tivoli Storage Manager administrative command **DEFINE BACKUPSET**. For example, to define the PERS_DATA backup set that belongs to client node JANE, issue the following command:

   ```
   define backupset jane pers_data devclass=agadm
   volumes=vol1,vol2 retention=50
   description="sector 7 base image"
   ```

   In this example, volumes VOL001 and VOL002 contain the data for the backup set. The backup set is retained on the server for 50 days. The volumes are to be read by a device that is assigned to the AGADM device class. A description, `sector 7 base image`, is included.

   For more information about re-creating backup sets, see the **DEFINE BACKUPSET** command in the *Administrator's Reference*.

Updating automation

After you migrate the data, you might need to modify administrative schedules that were defined in V5 because of changes in command syntax. Implement and verify changes to any automation or scripts that were identified as requiring modification in the planning process.

Important: Ensure that automation includes a backup of the database. Back up the database at least once per day.

Beginning operations and monitoring the server

When you start running the Tivoli Storage Manager V6.3.4 or later server, monitor the space that is used by the server. Ensure that the amount of space is adequate.

To monitor the V6.3.4 or later server and make any required adjustments, complete the following steps:

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 reaches its typical expected level, the space that is used by the active log is 80% - 90% of the space that is available to the active

log directory. At that point, you might need to increase the amount of space. Whether you must increase the space depends on the types of transactions in the server workload. 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 are completed quickly. The transactions might use a large amount of space in the active log, but for a short 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. The transactions might use a small amount of space in the active log, but for a long time.
- Network connection types
  - Backup operations that occur over fast network connections cause transactions that are completed more quickly. The transactions use space in the active log for a shorter time.
  - Backup operations that occur over relatively slower connections cause transactions that take a longer time to be completed. The transactions use space in the active log for a longer time.

If the server is handling transactions with a wide variety of characteristics, the space that is used for the active log might increase and decrease significantly 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 long time.

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 stops. The goal is to make enough space available to the archive log so that it never uses all 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 that is 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, decreases, and then might grow again. Over time, as normal operations continue, the amount of space that is 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. You might need to move the archive log to a different file system.

     For information about moving the archive log, see the *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 are 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 to use the archive failover log only under unusual conditions, not in normal operation.

Chapter 17. Troubleshooting the migration of a V5 server from AIX, HP-UX, or Solaris

In case you encounter issues during or after the migration, instructions are available for reverting the server to its previous version.

Reverting from V6.3.4 or later to the previous V5 server version

If you follow the steps in the migration procedure, you can revert to the V5 server at any point along the migration path.

Requirement: The V5 server must remain installed on the original system throughout the migration process.

To restore the V5 server, complete the following steps:

1. On the V5 system, for each sequential-access storage pool on tape, set the **REUSEDELAY** parameter to the number of days during which you want to be able to revert to the V6.3.4 or later server, if necessary.

   For example, if you want to be able to revert to the V6.3.4 or later server for up to 30 days after you revert to V5, set the **REUSEDELAY** parameter to 31 days. Issue the following administrative command:

   ```
   update stgpool sequential_access_storage_pool reusedelay=31
   ```

   where *sequential_access_storage_pool* specifies the name of the storage pool. By specifying the **REUSEDELAY** parameter, you can help prevent backup-archive client data loss.

   For more information about setting the **REUSEDELAY** parameter, see the **UPDATE STGPOOL** command in the *Administrator's Reference*.
2. For all tape volumes that were used by the V5 server, specify `readwrite` access mode. Issue the following administrative command:

   ```
   update volume tape_volume access=readwrite
   ```

   where *tape_volume* specifies the name of the tape volume.

   For more information about specifying `readwrite` access mode, see the **UPDATE VOLUME** command in the *Administrator's Reference*.
3. For each copy storage pool that was used by the V5 server, change the value of the **RECLAIM** parameter from 100 to the value that was set before the migration. Issue the following administrative command:

   ```
   update stgpool copy_storage_pool reclaim=reclaim_value
   ```

   where *copy_storage_pool* is the name of the copy storage pool and *reclaim_value* is the reclamation value that was used before the migration.

   For more information about setting the **RECLAIM** parameter, see the **UPDATE STGPOOL** command in the *Administrator's Reference*.
4. Start the V5 server by issuing the following administrative command:

   ```
   ./dsmserv
   ```

Part 3. Migrating Tivoli Storage Manager V5 servers on z/OS systems to V6 on AIX or Linux on System z

An IBM Tivoli Storage Manager V5 server that runs on a z/OS system can be migrated to a V6.3 or later server that runs on AIX or Linux on System z. During the migration, IBM Tivoli Storage Manager for z/OS Media must be installed on the V5 server to ensure continued access to data stored on the z/OS system.

The cross-platform migration offers the following advantages:

- Client data that is stored on the z/OS system can be accessed from the Tivoli Storage Manager V6.3 or later server through Tivoli Storage Manager for z/OS Media. You can retain existing storage hardware that uses Fiber Connector (FICON) channel technology.
- The Tivoli Storage Manager V6.3 or later system can be expanded by using either z/OS or UNIX storage systems.

The process for migrating the Tivoli Storage Manager server from a z/OS operating system to AIX or Linux on System z is similar to the upgrade process from Tivoli Storage Manager V5 to V6.3 or later on the same operating system. For the cross-platform migration, you must complete additional steps to ensure that data on z/OS systems can be accessed from the Tivoli Storage Manager V6.3 or later server.

Chapter 18. Migration overview

Before starting the cross-platform migration, review the migration road map, the scenarios for migration, and related information so that you can plan the migration process.

Migration road map

The migration road map provides links to information to help you plan, prepare, and complete the migration process.

To plan and prepare for the migration process, complete the following steps:

1. Review information about the Tivoli Storage Manager for z/OS Media product. For details, see the *Tivoli Storage Manager for z/OS Media Installation and Configuration Guide*.
2. Review the migration scenarios: Scenarios for migrating a server from a z/OS system to AIX or Linux on System z.
3. Familiarize yourself with the major phases in the migration process: "The migration process" on page 439.
4. Read about the changes that can be expected in the system following the migration: "Operational changes and requirements" on page 449.
5. Review the guidelines for planning the migration: Chapter 19, "Planning the migration," on page 451.
6. Select the migration method to use, and plan for the hardware, software, and storage space requirements for your server and environment.
7. Complete the preparation steps: Chapter 20, "Preparing for the migration," on page 469.

To migrate and configure the system, complete the following steps:

1. Follow the migration instructions: Chapter 21, "Migrating the z/OS server database to the V6.3 or later server," on page 485.
2. Configure the z/OS media server devices: Chapter 22, "Configuring the z/OS media server devices on the new server," on page 491.
3. Complete the migration process: Chapter 23, "Taking the first steps after the migration," on page 493.

Scenarios for migrating a server from a z/OS system to AIX or Linux on System z

You can migrate the server by using the media method, the network method, or a hybrid upgrade-migration method.

With the media method, you extract data from the original database to media, and then load the data into the new database. The following figure illustrates the media method.

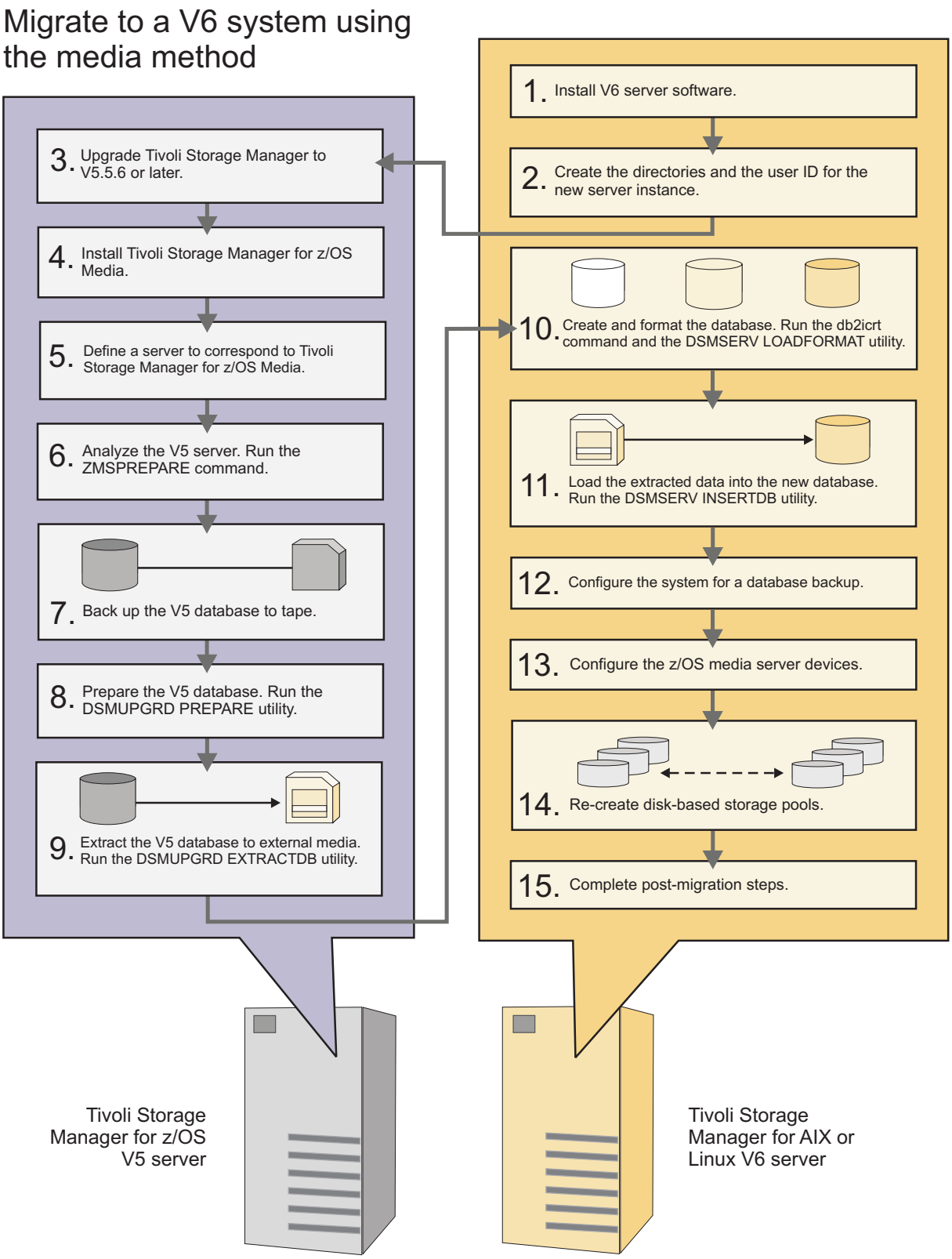

Figure 13. Migrating the server by using the media method

For information about selecting an appropriate level for a V5 server before a migration, see "Determining the appropriate level for a V5 server before an upgrade" on page 37.

Migrating V5 servers on z/OS systems to V6 on AIX or Linux systems

With the network method, you simultaneously extract data from the original database and load the data into the new database. The following figure illustrates the network method.

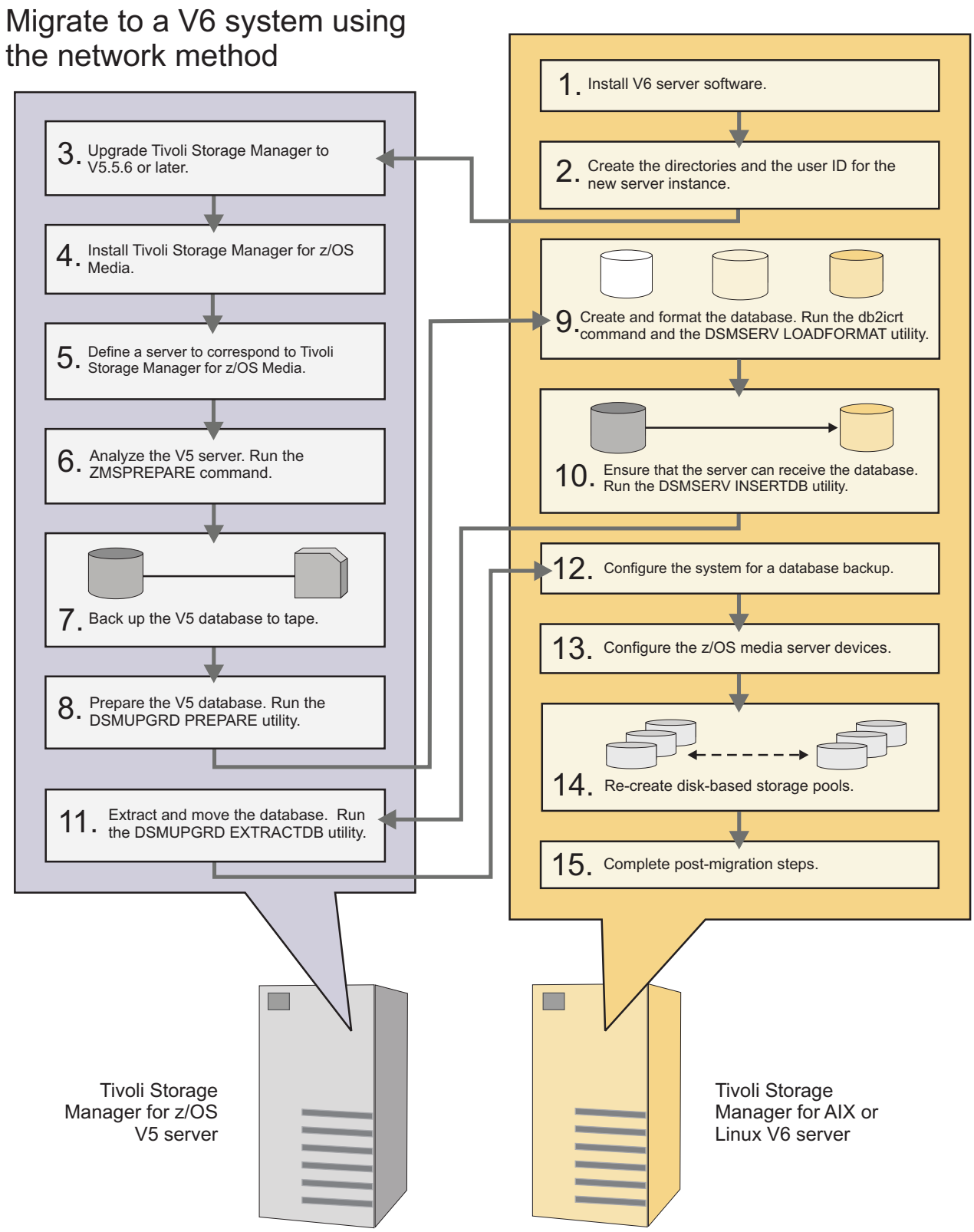

Figure 14. Migrating the server by using the network method

For information about selecting an appropriate level for a V5 server before a migration, see "Determining the appropriate level for a V5 server before an upgrade" on page 37.

Expert users might want to use a third option, the hybrid upgrade-migration method, for migrating the server. The hybrid upgrade-migration method uses a combination of export and import operations along with standard V6 upgrade methods. For information about the hybrid upgrade-migration method, and for a comparison of all three options, see "Comparison of database migration methods" on page 448.

After completing the cross-platform migration steps, you have more flexibility in terms of data storage. You can select from the following main options:

- You can continue to use the z/OS system for data storage. In this case, the data is stored on tape volumes, and the contents are accessed by using FICON attached storage devices.
- You can gradually move the data from the z/OS storage system, and use the V6.3 or later system on AIX or Linux on System z for data storage.

Related concepts:

"Migration process overview" on page 440

"Key tasks in the migration process" on page 442

"Comparison of database migration methods" on page 448

Tivoli Storage Manager for z/OS Media overview

With IBM Tivoli Storage Manager for z/OS Media, you can use a Tivoli Storage Manager V6.3 or later system to access data stored on a z/OS system.

The Tivoli Storage Manager for z/OS Media server gives the Tivoli Storage Manager server access to sequential storage media on the z/OS system. The z/OS media server manages the tape storage that was used by the Tivoli Storage Manager V5 server running on the z/OS system.

Only Tivoli Storage Manager V6.3 or later servers running on AIX or Linux on System z operating systems can work with Tivoli Storage Manager for z/OS Media.

For more information about Tivoli Storage Manager for z/OS Media, see the *Tivoli Storage Manager for z/OS Media Installation and Configuration Guide.*

Related concepts:

"Migration process overview" on page 440

The migration process

Migrating from Tivoli Storage Manager V5 running on z/OS to V6.3 or later on AIX or Linux on System z requires considerable planning. Before you begin, familiarize yourself with the migration overview, the key tasks in the migration process, and the utilities that are used for migration.

Migration process overview

Before starting the migration process, be aware of the restrictions that apply, and review the descriptions of system operations before and after the migration.

The following restrictions apply to the migration:

- The V5 server running on z/OS can be migrated only to an AIX or Linux on System z system.
- Client data that is stored in server storage pools on tape can remain on the existing z/OS system, but database information must be migrated. Client data that is stored on random-access disks or existing FILE storage pools must be moved to tape before the migration begins.

Before the migration, the Tivoli Storage Manager V5 server uses FICON attached storage devices to access z/OS storage media.

The following figure illustrates operations before the migration.

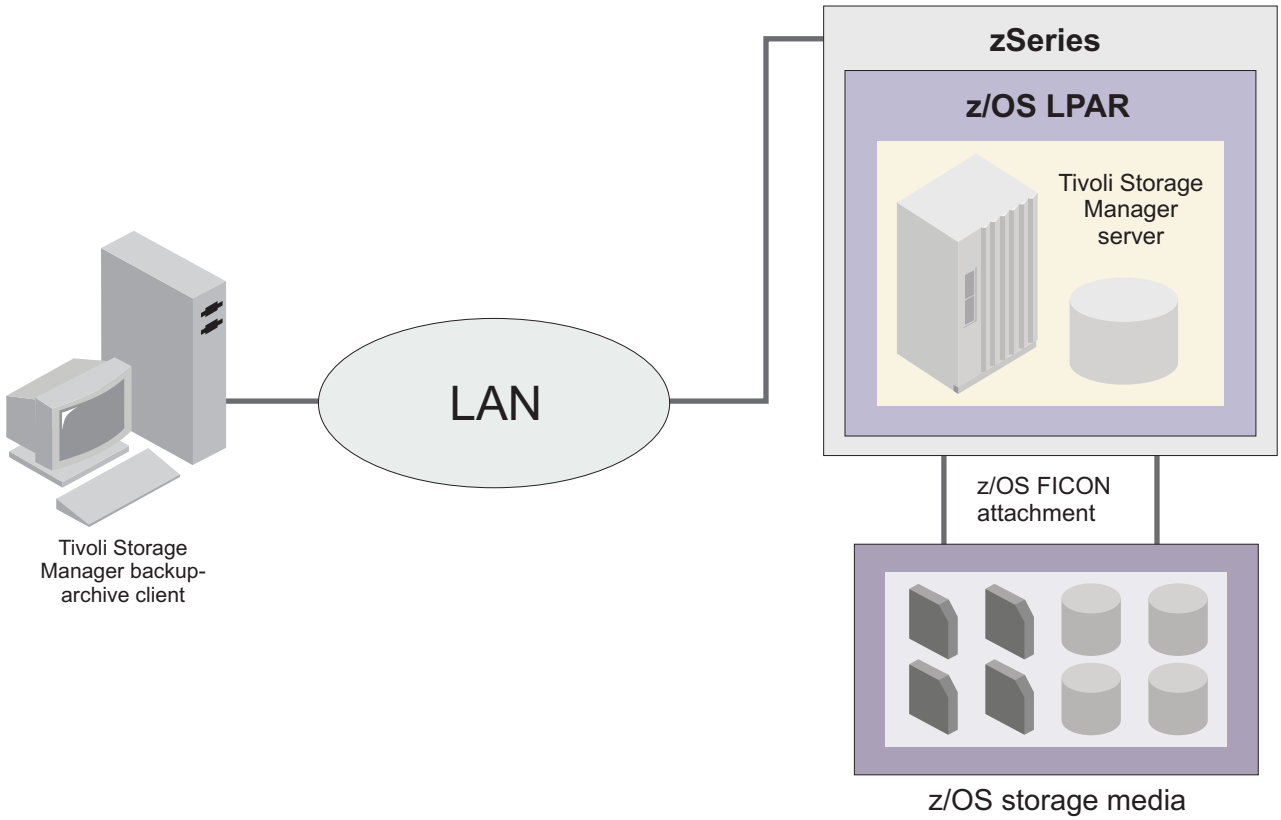

Figure 15. Operations before the migration

After you migrate your system to a V6.3 or later server on AIX, the Tivoli Storage Manager V6.3 or later server uses Tivoli Storage Manager for z/OS Media to access z/OS storage media.

The following figure illustrates the system after migration to a V6.3 or later server on AIX.

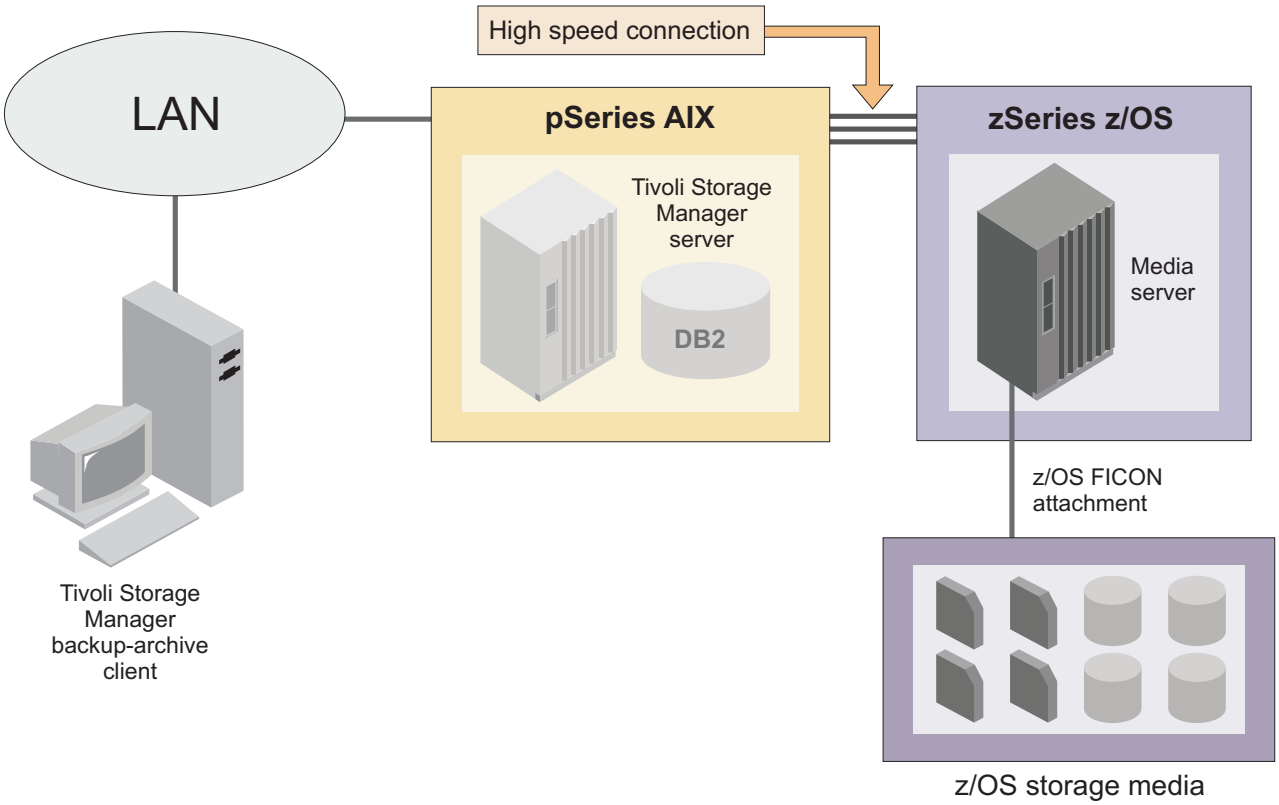

Figure 16. Operations after migration to a V6.3 or later server running on AIX

After you migrate your system to a V6.3 or later server on Linux on System z, the Tivoli Storage Manager V6.3 or later server uses Tivoli Storage Manager for z/OS Media to access z/OS storage media.

The following figure illustrates the system after the migration to a V6.3 or later server on Linux on System z.

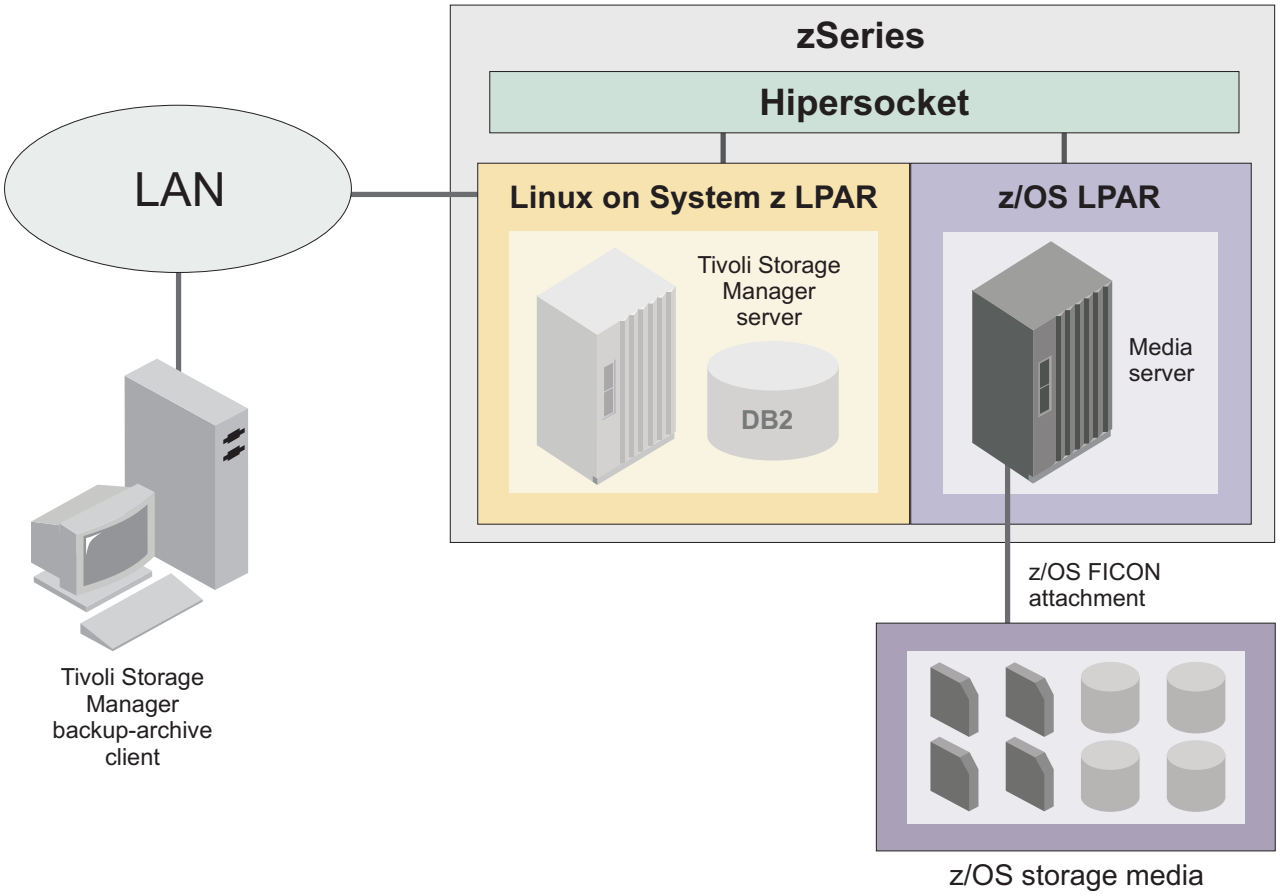

Figure 17. Operations after migration to a V6.3 or later server running on Linux on System z

Related concepts:

"Key tasks in the migration process"
"Device migration" on page 444
"Comparison of database migration methods" on page 448

Key tasks in the migration process

The migration process includes installing Tivoli Storage Manager for z/OS Media on the V5 source server and installing Tivoli Storage Manager V6.3 or later on the target server. Other tasks include backing up data, and then migrating data from the V5 source server to the V6.3 or later target server.

1. Prepare the system for migration.
   a. On the target server, install Tivoli Storage Manager V6.3 or later and configure a database instance.
   b. On the source server, upgrade Tivoli Storage Manager to V5.5.6 or later.
   c. On the source server, install Tivoli Storage Manager for z/OS Media.
   d. On the source server, use the **ZMSPREPARE** command to analyze the server and generate a report. The information in the report will help to identify the steps that must be completed before migration.
   e. Back up, move, or delete data that is stored on DISK or FILE storage pools. Prevent new data from being stored on DISK or FILE storage pools.
   f. Back up the source server database to tape.

Important: Ensure that a full database backup is available onsite. A backup is essential if the migration process is interrupted or rolled back. The backup must be stored on tape because FILE volumes cannot be in use during the migration process.

2. Move the data from the source database to the target database.
3. Complete device configuration and related tasks.
   a. Add new devices to the target server as needed by the Tivoli Storage Manager for z/OS Media server.
   b. Define new DISK and FILE storage pools on the target server. Restore data from the backups of the DISK and FILE storage pools that were on the z/OS system.
   c. If any z/OS DISK or FILE volumes were marked as destroyed, delete those volumes.

Utilities and commands for data migration

Tivoli Storage Manager provides utilities and a command to help you move data from a V5 system running on z/OS to the Tivoli Storage Manager V6.3 or later system running on AIX or Linux on System z.

Use the following utilities for data migration:

DSMUPGRD EXTRACTDB
The **DSMUPGRD EXTRACTDB** utility extracts data from the server database.

DSMSERV INSERTDB
The **DSMSERV INSERTDB** utility moves extracted data into a new database.

DSMSERV LOADFORMAT
The **DSMSERV LOADFORMAT** utility formats an empty database in preparation for inserting extracted data into the empty database.

DSMUPGRD PREPAREDB
The **DSMUPGRD PREPAREDB** utility prepares the database for migration by verifying that all premigration tasks are completed.

Use the following command for data migration:

ZMSPREPARE
The **ZMSPREPARE** command analyzes the V5 server and provides data to help you identify steps to be completed before the migration.

Many of the utilities and commands that are used for server upgrade are also used for server migration. For more information, see Appendix A, “Utilities, scripts, and commands for server upgrade and migration,” on page 511.

Related reference:

“ZMSPREPARE (Prepare a server on a z/OS system for migration)” on page 532

Related information:

DSMUPGRD EXTRACTDB

DSMUPGRD PREPAREDB (Prepare a server database for upgrade)

Device migration

You must migrate devices to ensure that the Tivoli Storage Manager V6.3 or later server running on AIX or Linux on System z can access files stored on a z/OS system. An overview of device migration is provided.

The process for device migration varies, depending on the device type and the type of data that is stored:

- Migrate tape devices by using utilities.
- Migrate data that is stored on disks and data that is written to FILE device classes by completing manual steps. The manual steps include backing up data and deleting the volumes and pools that are no longer required.

Backing up primary storage pools on disk

Ensure that you have tape volumes available for backing up data that is stored by using DISK or FILE devices:

- At a minimum, tape volumes must be available for backing up the primary storage pool.
- To optimize the process, create a second, onsite backup of the primary storage pool. By creating one backup storage pool offsite and another onsite, you fulfill disaster recovery requirements for offsite storage. At the same time, volumes from the second pool are available onsite to restore data immediately after migration.

After the disk primary storage pool volumes are backed up, mark them as destroyed. By taking this step, you will make it possible to implement backup and restore procedures that minimize migration time. In addition, it will be easier to revert to the V5 system if necessary.

Backing up non-primary storage pools on disk

For copy storage pools and active-data storage pools that are written to FILE device classes, you will back up or reassign the data to new storage pools. Then, you will delete the data on disks.

For non-storage pool data that is written to FILE device classes, you will remove the following types of data: database backups, database snapshots, database memory dumps, recovery plan files, export volumes, and backup sets. You will not remove sequential storage pool volumes.

Conversion of z/OS device classes

As part of the migration process, the **DSMSERV INSERTDB** utility converts z/OS device classes into AIX or Linux on System z device classes. The conversion of device classes takes place in the following way:

- The DISK device class is mapped to the predefined DISK device class for the AIX or Linux on System z server.
- All device classes with the device type SERVER are converted to the AIX or Linux on System z equivalent.
- FILE device class attributes that are specific to the z/OS operating system are discarded during migration because the newly installed z/OS media server does not support the previously used FILE device type. Instead, new FILE device classes must be defined after the migration to use sequential FILE storage via the z/OS media server.

- Tape and FILE device classes are set up to use the z/OS media server in the following way:
  - Tape device classes that are not configured for LAN-free access are updated to use the z/OS media server. The **DSMSERV INSERTDB** utility defines a new library and path for each device class, and sets up the libraries to access the z/OS media server.
  - Tape device classes that are configured for LAN-free access do *not* remain configured for LAN-free access. These tape device classes all have shared or external libraries that are associated with them. The libraries are deleted and replaced with libraries and paths that support access through the z/OS media server. After the migration, tape device classes that were configured for LAN-free access use the z/OS media server to communicate by using a LAN. The Tivoli Storage Manager storage agent facilitates this communication.
  - Device class attributes that are common across z/OS, AIX, and Linux on System z platforms are preserved.
  - Device class attributes that are used only for z/OS are carried over into new device class attributes used by the z/OS media server.
  - Device class attributes that are used on AIX and Linux on System z systems, but that did not exist on the z/OS system, are set to usable default values.

Role of Tivoli Storage Manager for z/OS Media

After the migration, Tivoli Storage Manager for z/OS Media takes over the management of tape data that was stored on the V5 server running on z/OS. For this reason, you must install Tivoli Storage Manager for z/OS Media on the V5 server during the preparation phase. In addition, you must use the **DEFINE SERVER** command to define a new server on the V5 server to correspond to the z/OS media server. The new server is used during the migration phase to access upgrade media. After the migration is complete, the server is used to access client data stored on tape.

The following graphic illustrates how Tivoli Storage Manager uses the z/OS media server to access z/OS storage media.

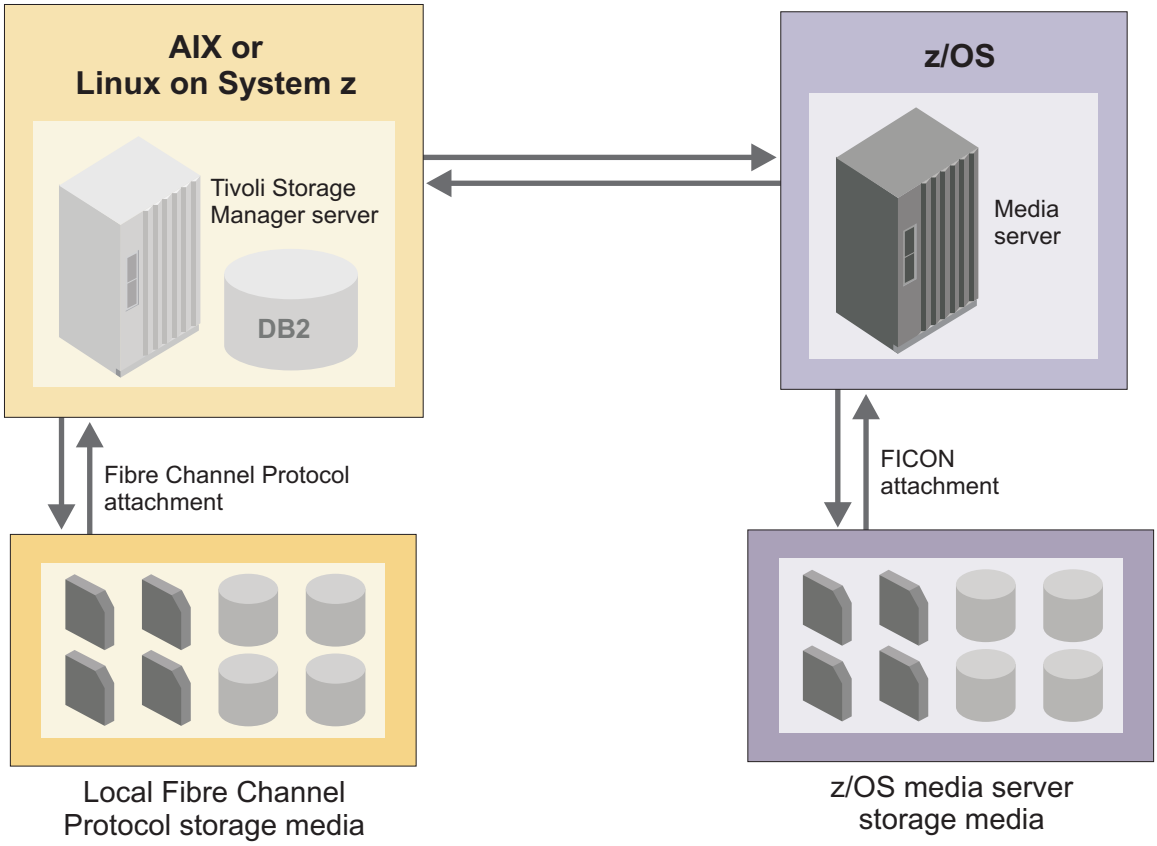

Figure 18. Role of z/OS media server in the migrated system

Status of tape volumes

The **DSMSERV INSERTDB** utility changes the status of all tape volumes whose status is FILLING to FULL. This change is required because the z/OS media server cannot append to tape volumes that were originally written by Tivoli Storage Manager running on z/OS.

Backup sets

Review the backup set information to understand which backup sets defined on the V5 server before the migration are usable after the migration.

Backup sets that use tape devices are migrated automatically.

Backup sets that use FILE device classes are not migrated. Backup sets that use FILE device classes cannot be regenerated, moved, or accessed after the migration.

During the migration process, you can use the **ZMSPREPARE** command to generate a list of backup sets that use FILE device classes. After that, you can use the **DELETE BACKUPSET** command to delete each backup set that uses a FILE device class.

Related reference:

"ZMSPREPARE (Prepare a server on a z/OS system for migration)" on page 532

Effects of migration on storage agents

After the system is migrated, a storage agent that is installed on a Tivoli Storage Manager client can send data to and receive data from storage devices that are attached to a z/OS media server.

LAN-free data movement to and from z/OS storage devices is not possible. Instead, the storage agent that is installed on the Tivoli Storage Manager client communicates with the z/OS media server by using a LAN. Client data can be read or written by using z/OS media server file or tape storage without the data passing through the Tivoli Storage Manager server. The following figure illustrates the communication channels.

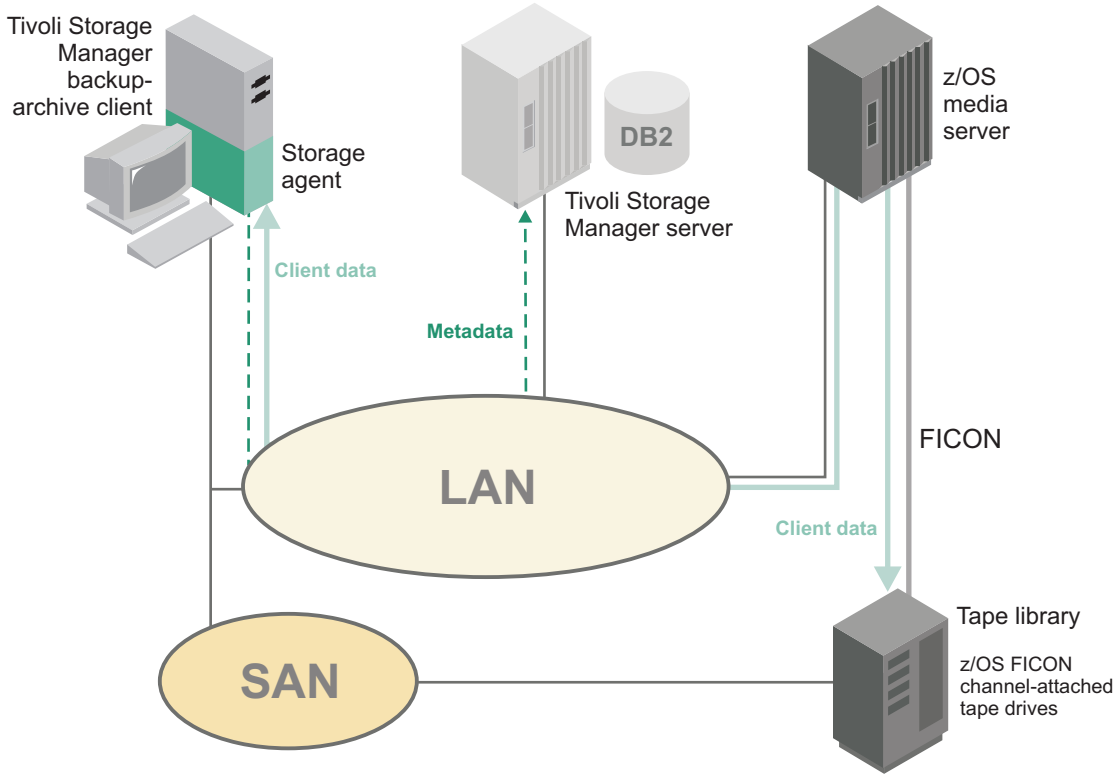

Figure 19. Storage agent communicating with the z/OS media server by using a LAN

Requirement: To connect to a V6.3 or later server in a system that uses the z/OS media server, storage agents must be at V6.3 or later. If you have storage agents at earlier versions, upgrade them to V6.3 or later as part of the migration process.

For more information about data movement in a z/OS media server environment, see the *Storage Agent User's Guide*.

Protection for client data and the server during the process

To protect client data and the server, ensure that you back up storage pools and the server database before starting the migration process. You will need these files if you must revert to the previous Tivoli Storage Manager version.

The server migration instructions provide detailed information about the backup tasks that must be completed. The two main backup tasks are listed here:

- "Backing up configuration information" on page 470
- "Backing up the server database" on page 483

Tip: When you back up the database, make two copies to protect the backup from media failures. Ensure that at least one full database backup is available onsite. If you must restore the database after a failed upgrade, having an onsite backup saves time.

For more information about protecting the database, see "Database protection and recovery" on page 5.

Important: Do not uninstall the V5 server on the z/OS system until you verify that the migration to V6.3 or later was successful.

Comparison of database migration methods

You can move the V5 database to the new V6.3 or later system by using the media method, the network method, or the hybrid upgrade-migration method. The hybrid upgrade-migration method combines database migration with export and import operations.

Comparison of the media and network methods

The standard way to migrate the database is to use the media method or the network method:

Media method
: You must extract data from the original database to media, and later load the data into the new database.

  Use this method if you cannot connect the V5 system and the V6.3 or later system by using a high speed network.

Network method
: You must simultaneously extract data from the original database and load the data into the new database.

  Use this method if your system requires maximum performance from the upgrade utility, and the systems are connected by a high speed network.

With either method, the original server cannot be running while the data is being extracted. You can expect the Tivoli Storage Manager server to be unavailable for hours or days. The downtime depends on several factors, including the size of the database and the performance of the disk system containing the previous database and new database.

Hybrid upgrade-migration method

If it is important to migrate the system with a minimum of downtime, you might want to use the hybrid upgrade-migration method. This method uses a combination of export and import operations, along with the standard V6 upgrade methods. It requires detailed planning.

Before deciding to employ the hybrid upgrade-migration method, estimate the time that it takes to migrate the data by using one of the standard methods versus the hybrid method. The standard method applicable to your situation might take less time than the hybrid upgrade-migration method.

For a description of the hybrid upgrade-migration method, see the white paper in the Tivoli Storage Manager wiki at http://www.ibm.com/developerworks/mydeveloperworks/wikis/home/wiki/Tivoli Storage Manager/page/Tivoli Storage Manager Version 6 Hybrid Upgrade Migration Method.

Related concepts:

"Scenarios for migrating a server from a z/OS system to AIX or Linux on System z" on page 435

Operational changes and requirements

To prepare for changes in the Tivoli Storage Manager system following the migration, review the operational changes and requirements.

For a general description of operational changes following an upgrade to V6.3 or later, see "Operation changes" on page 4. For a description of changes that are specific to a migration from z/OS to a system running on AIX or Linux on System z, see the following topics.

Automated message response systems

The z/OS operating system includes an automated message response feature. If you set up automated message responses for the V5 server and its messages with the ANR prefix, you might want to do the same for the newly installed z/OS media server and its messages with the ANZ prefix.

For a list of ANZ messages, see the messages section in the *IBM Tivoli Storage Manager for z/OS Media Installation and Configuration Guide*.

Performance considerations

Migration to the Tivoli Storage Manager V6.3 or later server running on AIX or Linux on System z can result in different network throughput requirements as compared to the V5 system on z/OS. After the migration, you might see an increase in the amount of data transferred over networks connected to the Tivoli Storage Manager server. To optimize server performance, review the guidelines in this section and plan the migration accordingly.

Before setting up a network connection between the Tivoli Storage Manager server and the z/OS media server, consider the following points:

- For client connections used to back up, archive, restore, and retrieve data, the V6.3 or later server generally requires the same network bandwidth as the V5 server running on a z/OS system. This is based on the assumption that the migrated V6.3 or later server protects the same clients as the V5 system.

- More network bandwidth is required for operations that store or retrieve data by using the z/OS media server than for operations that use a local disk or tape.
- To optimize performance, use dedicated networks for connections between the V6.3 or later server and the z/OS media server. Use technologies that optimize network performance and efficiency, such as jumbo frames and HiperSockets™. HiperSockets can be used for connections between Linux and z/OS logical partitions located on the same System z central processor complex.
- To increase the network bandwidth between the V6.3 or later server and the z/OS media server, consider setting up multiple interfaces specified on a single server definition. You can use a comma-delimited expression for the TCP/IP address, as in this example:

  ```
  define server ...
  hladdress=10.10.48.1,10.10.56.1
  lladdress=1500...
  ```

  If this method is used, data can be stored or retrieved by using any available network interface. You are not required to distribute storage requirements over several device classes. This method increases the available network bandwidth and supports network connection failover and load balancing.
- To optimize network performance when using the z/OS media server, ensure that both the z/OS and the Tivoli Storage Manager server systems can use a large TCP/IP window size. On z/OS, this means that the `TCPIP.PROFILE TCPCONFIG` statement includes the **TCPMAXRCVBUFRSIZE** parameter, which is set to the default value of 256 K or greater. On AIX, this means that the network tuning parameter **rfc1323** is set to 1, which is not the default value. On Linux, this means that the kernel parameter **net.ipv4.tcp_window_scaling** is set to the default value of 1.
- To reduce network bandwidth requirements, store backup and archive data to a V6.3 or later server local disk pool. Then use storage pool backup and storage pool migration to copy and move the data to z/OS media server tape storage. This method requires less network bandwidth than backing up or archiving the data directly to the z/OS media server FILE device class storage, and then moving the data to z/OS tape storage.
- If you store the data by using the z/OS media server, the single-session backup throughput might be 80% of the throughput expected when storing the data by using local storage devices. For example, assume that the throughput for backing up a large amount of data is 30 MB per second for a V5 server running on a z/OS system. Following the migration to the V6.3 or later server running on AIX or Linux on System z with a z/OS media server, the throughput might be reduced to 80%, or 24 MB per second.
- Consider using the Tivoli Storage Manager storage agent installed on the client system with the LAN-free communication method to back up or archive data to the z/OS media server directly. This method might reduce the network bandwidth requirements on the V6.3 or later server and increase backup throughput.

Chapter 19. Planning the migration

Planning for the migration to IBM Tivoli Storage Manager V6.3 or later is 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 V6.3 or later database uses a large percentage of processing capacity and requires a high amount of I/O activity.

In your planning, consider testing the migration process on nonproduction systems. Testing provides information about how long the migration 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 migrate.

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 migrating one server first, to get experience with how the migration process will work for your data. Use the results of the first migration process to plan for migrating the remaining servers.

Hardware and software requirements for the V5 and V6.3 or later servers

Before you start the migration process, ensure that the system meets hardware and software requirements for the V5 server and the V6.3 or later server.

During the migration process, you must upgrade the V5 server on z/OS to V5.5.6 or later. Follow the guidelines in "Determining the appropriate level for a V5 server before an upgrade" on page 37. Tivoli Storage Manager V5.5 servers on z/OS are supported at z/OS V1R7, z/OS V1R8, or later.

For information about hardware and software requirements for a V6.3 or later server that is running on AIX, see "Server requirements on AIX systems" on page 20.

For information about hardware and software requirements for a V6.3 or later server that is running on Linux on System z, see "Server requirements for Linux on System z systems" on page 30.

For the latest information about hardware and software requirements, see the Tivoli Storage Manager product support site at http://www.ibm.com/support/docview.wss?uid=swg21243309.

Compatibility with other components and versions

You can install other products that deploy and use DB2 products on the same system as the Tivoli Storage Manager Version 6.3 or later server running on AIX or Linux on System z.

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:

Table 74. Compatibility of the Tivoli Storage Manager server with other DB2 products on the system

Criterion	Instructions
Version level	The other products that use a DB2 product must use DB2 version 9 or later. DB2 products include product encapsulation and segregation support beginning with Version 9. Starting with this version, 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://pic.dhe.ibm.com/infocenter/db2luw/v9r7.
User IDs and directories	Ensure that the user IDs, fence user IDs, installation location, other directories, and related information are not shared across DB2 installations. Your specifications must be different from the IDs and locations that you used for the Tivoli Storage Manager server installation and configuration. If you used the **dsmicfgx** wizard or **dsmupgdx** wizard to configure Version 6.3 or later, or upgrade the server from Version 5.5, these are values that you entered when running the wizard. If you used the manual configuration for Version 6.3 or later or upgrade from Version 5.5 procedures, review the procedures that you used if necessary to recall the values that were used for the server.

Table 74. Compatibility of the Tivoli Storage Manager server with other DB2 products on the system (continued)

Criterion	Instructions
Resource allocation	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 have 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 workstation support. For example, run a DB2 application on its own virtualized system.

Estimating database and recovery log requirements

Plan the space requirements for the migration process, and the space requirements for the server databases and recovery log for the V6.3 or later server. The space requirements for a cross-platform migration from V5 to V6.3 or later are similar to the space requirements for an upgrade from V5 to V6.3 or later on the same platform.

To estimate the database and recovery log requirements, complete the following steps.

1. Estimate the space requirements for the V5 server system. For details, see “Space requirements for the V5 server system” on page 39.
2. Estimate the space requirements for the V6.3 or later server system. For details, see “Space requirements for the V6 server system” on page 39.
3. Estimate the total space for the migration process and the V6.3 or later server. For details, see “Estimating total space requirements for the upgrade process and upgraded server” on page 41. If you are planning to migrate the data by using the media method, review the information under Chapter 6, “Scenario 3: New system, media method,” on page 175. If you are planning to migrate the data by using the network method, review the information under Chapter 7, “Scenario 4: New system, network method,” on page 223.
4. Optional: Use a work sheet to plan the amount and location of space for the V6.3 or later server. For details, see “Worksheet for planning space for the V6.3 or later server” on page 44.

Planning data movement from FILE and DISK devices

The V6.3 or later server cannot access data that is stored by using DISK or FILE devices on the z/OS server. This restriction means that data that is stored on DISK or FILE devices must be backed up to tape before the migration begins.

Ensure that you have tape volumes available for backing up data that is stored by using DISK or FILE devices:

- At a minimum, tape volumes must be available for backing up the primary storage pool.
- To optimize the process, tape volumes should be available to create a second, onsite backup of the primary storage pool. By creating one backup storage pool offsite and another onsite, you fulfill disaster recovery requirements for offsite storage. At the same time, volumes from the second pool are available onsite to restore data immediately after migration.

As the first step in the preparation process, you will run the **ZMSPREPARE** command. The **ZMSPREPARE** command will be used to identify all DISK and FILE device type storage pools and the volumes and amount of data that must be backed up to tape.

Any backup sets on FILE storage must be deleted.

Related reference:

"ZMSPREPARE (Prepare a server on a z/OS system for migration)" on page 532

Estimating storage and device requirements

Estimate the amount of space that will be required for data storage in the new Tivoli Storage Manager V6.3 or later system. Plan the devices to be used for storage.

1. Estimate the storage requirements for the new Tivoli Storage Manager V6.3 or later system. For details, see the section that describes estimating space needs for sequential-access storage pools in the *Administrator's Guide*.
2. Plan the device requirements for the new Tivoli Storage Manager V6.3 or later system. For details, see the device configuration planning section in the *Administrator's Guide*.

Estimating the time required for migration

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

The following factors can affect the migration time:

- The size of the database being migrated.
- The number and speed of system processors.
- The configuration of storage devices. If new hardware is being introduced, time is required to define the new devices to the server, test the configuration, and adjust storage pools.
- 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 migration 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 long file names, can cause a relatively longer migration time.

Data is available on upgrades from Tivoli Storage Manager V5 to V6.3 or later on the same platform. This information might help you estimate the time required for a cross-platform migration.

In benchmark environments in IBM labs, migration 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 migration 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 database records stored in the endpoints, called the leaves of the tree. The extraction ignores the branches and extracts information only 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 requires.

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

Example: Estimating the migration time based on the database size

You can roughly estimate the time required for the migration based on the amount of data in the V5 database. To this estimate, add the time required for additional tasks, such as storage device configuration.

1. To obtain details about the V5 database, issue a command.
   - If the V5 server is running, issue the command:
     ```
     query db format=detailed
     ```
   - If the V5 server is not running, use the upgrade utility:
     ```
     dsmupgrd querydb
     ```

   Here is an example of the output obtained when the server is running, and the `query db format=detailed` command is issued:

```
                  Available Space (MB): 39,960
                Assigned Capacity (MB): 37,992
                Maximum Extension (MB): 1,968
                Maximum Reduction (MB): 8,360
                     Page Size (bytes): 4,096
                    Total Usable Pages: 9,725,952
                            Used Pages: 7,584,387
                              Pct Util: 78.0
                          Max. Pct Util: 78.0
                       Physical Volumes: 10
                      Buffer Pool Pages: 8,192
                  Total Buffer Requests: 180,003
                         Cache Hit Pct.: 99.81
                        Cache Wait Pct.: 0.00
                     Backup in Progress?: No
            Type of Backup In Progress:
          Incrementals Since Last Full: 0
        Changed Since Last Backup (MB): 67.63
                    Percentage Changed: 0.23
        Last Complete Backup Date/Time: 05/18/11 23:16:26
    Estimate of Recoverable Space (MB):
Last Estimate of Recoverable Space (MB):
```

Here is an example of the output obtained when the server is not running, and the **dsmupgrd querydb** utility is run:

```
                  Available Space (MB): 39,960
          Assigned Capacity (MB): 37,992
          Maximum Extension (MB): 1,968
          Maximum Reduction (MB): 8,360
               Page Size (bytes): 4,096
              Total Usable Pages: 9,725,952
                      Used Pages: 7,584,383
                        Pct Util: 78.0
                  Max. Pct Util: 78.0
                Physical Volumes: 10
               Buffer Pool Pages: 8,192
           Total Buffer Requests: 179,946
                  Cache Hit Pct.: 99.81
                 Cache Wait Pct.: 0.00
             Backup in Progress?: No
      Type of Backup In Progress:
    Incrementals Since Last Full: 0
  Changed Since Last Backup (MB): 67.63
              Percentage Changed: 0.23
  Last Complete Backup Date/Time: 05/19/11 06:16:26
 Estimate of Recoverable Space (MB):
Last Estimate of Recoverable Space (MB):
```

2. To calculate the amount of data in the database, use the results of the query command. 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:

   `7,584,383 used pages × 4096 bytes/page = 31,065,632,768 bytes, or 28.9 GB`

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

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

   ```
   28.9 GB ÷ 5 GB/hour = 5.8 hours
   28.9 GB ÷ 10 GB/hour = 2.9 hours
   ```

Related reference:

"DSMUPGRD QUERYDB (Display information about a V5 database)" on page 512

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 long as the time required for a full backup of the database.

Do not reorganize the Tivoli Storage Manager V5 database before the upgrade. The reason is that faster throughput can be obtained when the source database does not contain long sequences of pages allocated to a single database table. This tip applies to both the media method and the network method.

The following performance tips depend on the method that you choose for moving the data from the V5 database.

Media method

If you are using the media method, consider the following tips:

- If you are extracting the data to tape, use a high-speed tape device.
- 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 take more time. The slower speed of extraction might be acceptable, depending on the size of the database and your requirements for the upgrade.

Network method

If you are using the network method, consider the following tip:

- Use a high speed link. For upgrading a database greater than 2 - 3 GB, use at least a 1 Gb Ethernet network.

Related concepts:

"Comparison of database migration methods" on page 448

Performance tips for inserting data into the V6.3 or later database

The process for inserting the V5 extracted data into the V6.3 or later database is the longest-running part of a migration 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 use multiple processors or cores. The insertion process typically performs better on a system with a relatively small number of fast processors. If the system has many slow processors, you might experience reduced performance levels.

Disk storage

The insertion process is designed to use 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 redundant arrays of independent disks (RAIDs) 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.

Table 75. Example of LUN usage

LUN	Usage
1	Active log
2	Archive log
3, 4, 5	Database directories

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 V6.3 or later server. Plan to upgrade one server first in a test environment. Then stage the upgrade of additional servers and storage agents.

For information about storage-agent and library client compatibility with Tivoli Storage Manager V6.3 or later servers, see Technote 1302789 (http://www.ibm.com/support/docview.wss?uid=swg21302789).

Related tasks:

"Testing the upgrade process for a server" on page 49

Planning for changes to storage agents

To connect to a V6.3 or later server in a system that uses the z/OS media server, storage agents must be at version 6.3 or later.

If you have storage agents at earlier versions, upgrade them to V6.3 before upgrading the server to V6.3 or later. 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 following website: http://www.ibm.com/support/docview.wss?uid=swg21302789

Related concepts:

"Effects of migration on storage agents" on page 447

Preparing for operational changes

As you migrate your system from V5 to V6.3 or later, the method for backing up and monitoring the server database changes.

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

- Plan to back 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. For best results, consider scheduling more frequent backups for the V6.3 or later database than you did for the V5 database. To ensure that archive log space is pruned, consider scheduling more full database backups and fewer incremental backups.

  Review information about how database backups are performed automatically for the V6.3 or later server. For details, see the *Administrator's Guide*.
- Understand how database and recovery log space is used, and how monitoring will change.
- Verify scripts and administrative schedules. The V6.3 or later server adds new commands, changes some commands, and deletes some commands that are no longer needed. These changes will affect your automated operations. For information about new and changed commands, see "Command and option changes" on page 53.
- Verify the **SELECT** commands that you use regularly. Some parameters and syntax that were previously allowed are not accepted by the database manager program. For information about **SELECT** command updates, see "Changes to the **SELECT** command" on page 70. To resolve problems that are related to **SELECT** commands, see Technote 1380830 (http://www.ibm.com/support/docview.wss?uid=swg21380830).
- If you use products from independent software vendors to interface with the server, ensure that the products are compatible with the V6.3 or later server.

Reference information for planning

Information about updated commands and server options, and the migration of device classes and library attributes, can help you plan the migration process.

General reference information for Tivoli Storage Manager upgrades and migrations

General reference information is provided. You can review the changes in commands, options, and utilities that were implemented since V5 and learn about server naming practices. For more information, see "Reference information for planning" on page 53.

Utilities, scripts, and commands

For more information about the available utilities, scripts, and commands, see Appendix A, "Utilities, scripts, and commands for server upgrade and migration," on page 511.

Migration of device and library attributes

Review device class information to understand how z/OS device classes are mapped to an equivalent used by an AIX or Linux on System z system. Review the library and path information to understand how new libraries and paths are defined to ensure that existing device classes can use the z/OS media server. The **DSMSERV INSERTDB** utility maps the device classes and defines the libraries and paths.

Device class migration

The following tables describe how each z/OS device type is mapped to its equivalent on an AIX or Linux on System z system.

Table 76. 3590 device class attributes

Attribute	Used on z/OS	Used on AIX and Linux on System z	Notes
DEVTYPE	Yes	Yes	The value is always 3590.
LIBRARY	Yes (optional)	Yes (required)	The LIBRARY device class is replaced with a new library that provides access through the z/OS media server. If no library was specified on the V5 system, a new library is defined to provide access through the z/OS media server.
ESTCAPACITY	Yes	Yes	The value is preserved.
MAXCAPACITY	Yes	No	The value is discarded.
FORMAT	Yes	Yes	The value is preserved.
PREFIX	Yes	Yes	The value is preserved.
MOUNTRETENTION	Yes	Yes	The value is preserved.
MOUNTWAIT	Yes	Yes	The value is preserved.
MOUNTLIMIT	Yes	Yes	The value is preserved.
COMPRESSION	Yes	New	The value is preserved.
EXPIRATION	Yes	New	The value is preserved.
RETENTION	Yes	New	The value is preserved.
PROTECTION	Yes	New	The value is preserved.

Table 76. 3590 device class attributes (continued)

Attribute	Used on z/OS	Used on AIX and Linux on System z	Notes
UNIT	Yes	New	The value is preserved.

Table 77. 3592 device class attributes

Attribute	Used on z/OS	Used on AIX and Linux on System z	Notes
DEVTYPE	Yes	Yes	The value is always 3592.
LIBRARY	Yes (optional)	Yes (required)	The LIBRARY device class is replaced with a new library that provides access through the z/OS media server. If no library was specified on the V5 system, a new library is defined to provide access through the z/OS media server.
ESTCAPACITY	Yes	Yes	The value is preserved.
MAXCAPACITY	Yes	No	The value is discarded.
WORM	Yes	Yes	The value is preserved.
SCALEDCAPACITY	No	Yes	The default value of 100 is used.
DRIVEENCRYPTION	No	Yes	A value of ALLOW is used. The ALLOW value makes it possible for the remote z/OS system to control the use of drive encryption.
FORMAT	Yes	Yes	The value is preserved.
PREFIX	Yes	Yes	The value is preserved.
MOUNTRETENTION	Yes	Yes	The value is preserved.
MOUNTWAIT	Yes	Yes	The value is preserved.
MOUNTLIMIT	Yes	Yes	The value is preserved.
COMPRESSION	Yes	New	The value is preserved.
EXPIRATION	Yes	New	The value is preserved.

Table 77. 3592 device class attributes (continued)

Attribute	Used on z/OS	Used on AIX and Linux on System z	Notes
RETENTION	Yes	New	The value is preserved.
PROTECTION	Yes	New	The value is preserved.
UNIT	Yes	New	The value is preserved.

Table 78. CARTRIDGE device class attributes

Attribute	Used on z/OS	Used on AIX and Linux on System z	Notes
DEVTYPE	Yes	Yes	The value is always CARTRIDGE.
LIBRARY	No	Yes (required)	A new library is defined to provide access through the z/OS media server.
ESTCAPACITY	Yes	Yes	The value is preserved.
MAXCAPACITY	Yes	No	The value is discarded.
FORMAT	No	Yes	The default value of DRIVE is used.
PREFIX	Yes	Yes	The value is preserved.
MOUNTRETENTION	Yes	Yes	The value is preserved.
MOUNTWAIT	Yes	Yes	The value is preserved.
MOUNTLIMIT	Yes	Yes	The value is preserved.
COMPRESSION	Yes	New	The value is preserved.
EXPIRATION	Yes	New	The value is preserved.
RETENTION	Yes	New	The value is preserved.
PROTECTION	Yes	New	The value is preserved.
UNIT	Yes	New	The value is preserved.

Table 79. ECARTRIDGE device class attributes

Attribute	Used on z/OS	Used on AIX and Linux on System z	Notes
DEVTYPE	Yes	Yes	The value is always ECARTRIDGE.

Table 79. ECARTRIDGE device class attributes (continued)

Attribute	Used on z/OS	Used on AIX and Linux on System z	Notes
LIBRARY	Yes (optional)	Yes (required)	The library is replaced with a new library that provides access through the z/OS media server. If no library was specified on the V5 system, a new library is defined to provide access through the z/OS media server.
ESTCAPACITY	Yes	Yes	The value is preserved.
MAXCAPACITY	Yes	No	The value is discarded.
WORM	No	Yes	The default value of NO is used.
DRIVEENCRYPTION	No	Yes	A value of ALLOW is used. The ALLOW value makes it possible for the remote z/OS system to control the use of drive encryption.
FORMAT	Yes	Yes	The value is preserved.
PREFIX	Yes	Yes	The value is preserved.
MOUNTRETENTION	Yes	Yes	The value is preserved.
MOUNTWAIT	Yes	Yes	The value is preserved.
MOUNTLIMIT	Yes	Yes	The value is preserved.
COMPRESSION	Yes	New	The value is preserved.
EXPIRATION	Yes	New	The value is preserved.
RETENTION	Yes	New	The value is preserved.
PROTECTION	Yes	New	The value is preserved.
UNIT	Yes	New	The value is preserved.

Table 80. FILE device class attributes

Attribute	Used on z/OS	Used on AIX and Linux on System z	Notes
DEVTYPE	Yes	Yes	The value is always FILE.
LIBRARY	No	New	A new library is *not* defined to provide access to FILE device classes through the z/OS media server. The reason is that the media server does not support previous FILE device classes. LIBRARY is specified only on *new* FILE device classes, and is not added for device classes that existed on the V5 server.
MOUNTLIMIT	Yes	Yes	The value is preserved.
PREFIX	Yes	Yes	The value is preserved.
DIRECTORY	No	Yes	This attribute is not set.
SHARED	No	Yes	The default value of NO is used.
UNIT	Yes	No	The value is discarded.
VOLSER	Yes	No	The value is discarded.
PRIMARYALLOC	No	New	This attribute is not set for FILE device classes that are migrated from the V5 server. This attribute is used only for new FILE classes that are added.
SECONDARYALLOC	No	New	This attribute is not set for FILE device classes that are migrated from the V5 server. This attribute is used only for new FILE classes that are added.
MAXCAPACITY	Yes	Yes	The value is preserved.

Table 81. SERVER device class attributes.
Remember: Device classes with a device type of SERVER are the same across z/OS, AIX, and Linux on System z. All device classes with a device type of SERVER are preserved as-is.

Attribute	Used on z/OS	Used on AIX and Linux on System z	Notes
DEVTYPE	Yes	Yes	The value is always SERVER.
SERVERNAME	Yes	Yes	The value is preserved.
MOUNTLIMIT	Yes	Yes	The value is preserved.
MOUNTRETENTION	Yes	Yes	The value is preserved.
PREFIX	Yes	Yes	The value is preserved.
RETRYPERIOD	Yes	Yes	The value is preserved.
RETRYINTERVAL	Yes	Yes	The value is preserved.
MAXCAPACITY	Yes	Yes	The value is preserved.

Library and path migration

On the z/OS system, libraries and paths are used to enable LAN-free access of media by using storage agents that run on AIX or Linux on System z systems. Because LAN-free access is not supported for servers migrated from z/OS, all libraries and paths are deleted during migration. Then, new libraries and paths are created to allow access to media through the z/OS media server.

The **DSMSERV INSERTDB** utility defines new libraries and paths so that existing device classes can use the z/OS media server. For each device class, one new library is defined by using the same name as the device class:

```
DEFINE LIBRARY <devclass_name> LIBTYPE=ZOSMEDIA
```

One new path is defined:

```
DEFINE PATH <server_name><devclass_name>SRCTYPE=SERVER DESTTYPE=LIBRARY
ZOSMEDIASERVER=<media_server_name>ONLINE=YES
```

Migration of server options

During the upgrade process, the **ZMSPREPARE** command analyzes the Tivoli Storage Manager server options file and provides recommendations. The recommendations are designed to help you migrate server options to the server options file of the V6.3 or later system and to the server options file of the z/OS media server.

The **ZMSPREPARE** command makes recommendations based on the following table. Before you migrate server options, review the table.

Remember: The set of server options that is available on a V5 server is different from the set of options that is available on a V6.3 or later server. Similarly, the set

of server options that is available on a z/OS system is different from the set of server options that is available on an AIX or Linux on System z system.

Table 82. z/OS platform-specific server options

Option name	Used on AIX or Linux on System z	Used on z/OS media server	Notes
COMMMETHOD	Yes	No	This option specifies the communication method to be used by the server. z/OS systems support only the TCPIP and V6TCPIP communication methods. Both of these communication methods are also supported by AIX and Linux on System z systems.
DELETIONEXIT	No	No	This option specifies a user exit that receives control when a tape volume is deleted from the database. This server option is not compatible with AIX and Linux on System z systems. For this reason, any existing entry for this server option must be removed.
DYNALLOCOFFLN	No	Yes	This option makes it possible for Tivoli Storage Manager for z/OS Media to select an offline device if no other devices are available.
FILEEXIT	Yes	No	This option specifies a file to which enabled events are routed. The specified file name must be verified to ensure that it works on the V6.3 or later system.
FILETEXTEXIT	Yes	No	This option specifies a file to which enabled events are routed. The specified file name must be verified to ensure that it works on the V6.3 or later system.
HTTPTCPPORT	No	No	This option specifies the HTTP port number for the HTTP communication method for IBM TCP/IP. This option is not available in Tivoli Storage Manager V6.3 or later.
LFVOLUMEFORMATCOUNT	No	No	This option specifies the number of volumes that the Tivoli Storage Manager server formats automatically for LAN-free operations if the storage pool does not contain formatted volumes. This option is not available in Tivoli Storage Manager V6.3 or later.
LICENSES	No	No	This option specifies the terms of a licensing agreement. AIX and Linux on System z systems use a different licensing mechanism from the one specified by this option. For this reason, new licenses must be registered on the V6.3 or later server. Any existing entry for this server option must be removed.
MESSAGEFORMAT	Yes	Yes	This option specifies whether a message number is displayed in all lines of a multi-line message or only on the first line.
MSGHIGHLIGHT	No	No	This option specifies the message severity level for highlighting. Any existing entry must be removed when migrating the server options file to AIX or Linux on System z systems.
MSGSUPPRESS	No	Yes	This option specifies the level of messages to be suppressed. Any existing entry must be removed when migrating the server options file to AIX or Linux on System z systems. Any existing entry should be copied to the z/OS media server server options file.
OAMCALL	No	Yes	This option specifies whether Tivoli Storage Manager for z/OS Media allocation should access the OAM database to determine if a required tape is in the automated tape library.
ROUTECODE	No	Yes	This option specifies the routing code for Tivoli Storage Manager messages. Any existing entry must be removed when migrating the server options file to AIX or Linux on System z systems. Any existing entry should be copied to the z/OS media server server options file.

Table 82. z/OS platform-specific server options (continued)

Option name	Used on AIX or Linux on System z	Used on z/OS media server	Notes
TAPEDELEXIT	No	Yes	This option specifies the name of an exit program that is called when a tape volume is deleted from the Tivoli Storage Manager for z/OS Media pool of managed tape volumes.
TCPADDR	No	Yes	This option specifies the home IP address that Tivoli Storage Manager for z/OS Media will use to listen for incoming connections.
TCPADMINPORT	Yes	No	This option specifies the port number on which the server TCP/IP communication driver is to wait for requests for sessions other than client sessions. This option should be included in the AIX or Linux for System z server options file.
TCPBUFSIZE	Yes	No	This option specifies the size of the buffer used for TCP/IP send requests. The default value used by AIX and Linux on System z systems is 16, compared to 32, which is used by z/OS. Any existing value should be reconsidered in light of the fact that the V6.3 or later server will run on a different operating system.
TCPNAME	No	Yes	This option specifies the name of the started address space for TCP/IP. Any existing entry must be removed when migrating the server options file to AIX or Linux on System z. Any existing entry should be copied to the z/OS media server server options file.
TCPPORT	Yes	Yes	This option specifies the port number on which the TCP/IP communication driver of the server is to wait for requests for client sessions. This option should be migrated to the V6.3 or later server only after ensuring that the specified port will be available on the V6.3 or later server. Similarly, this option should be migrated to the z/OS media server only after ensuring that the specified port will be available on that server. It might not be useful for clients to contact the z/OS media server on the existing port. For this reason, the port specified for this server option might need to be different from the port of the Tivoli Storage Manager server that is being migrated from the z/OS system.
TCPWINDOWSIZE	Yes	No	This option specifies, in KB, the amount of receive data that can be buffered at one time on a TCP/IP connection. The option is used for tuning. Any existing value should be reconsidered in light of the fact that the V6.3 or later server will run on a different operating system.
TECBEGINEVENTLOGGING	Yes	No	This option specifies whether event logging for the Tivoli receiver should begin when the server starts.
TECHOSTNAME	Yes	No	This option specifies the host name or IP address for the Tivoli event server.
TECPORT	Yes	No	This option specifies the TCP/IP port address on which the Tivoli event server is listening.
UNIQUETDPTECEVENTS	Yes	No	This option generates a unique Tivoli Enterprise Console event class for each Tivoli Storage Manager message, including client, server, and Tivoli Data Protection agent messages.
UNIQUETECEVENTS	Yes	No	This option generates a unique Tivoli Enterprise Console event class for each Tivoli Storage Manager message.

Table 82. z/OS platform-specific server options (continued)

Option name	Used on AIX or Linux on System z	Used on z/OS media server	Notes
USEREXIT	Yes	No	This option specifies a user-defined exit that will be given control to manage an event. The syntax of this option differs on different operating systems. This option specifies a user exit that is loaded by the server. For this reason, any existing value should be reconsidered in light of the fact that a z/OS exit does not work on an AIX or Linux for System z operating system.

Related reference:

"Command and option changes" on page 53

Chapter 20. Preparing for the migration

To prepare for the migration from IBM Tivoli Storage Manager V5 on z/OS to V6.3 or later on AIX or Linux on System z, you must complete several steps. Ensure that you install and configure the V6.3 or later server and prepare the database of the V5 server for migration.

Preparing space for the migration process

Verify that you have sufficient space on the V6.3 or later system for the migration 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. If you plan to extract the original server database to media for later insertion into the new database, ensure that you have enough storage space. Storage space is required for 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 sequential, and the device class type must be tape. Define a new device class if necessary.
   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.

      When the data is later inserted into the V6.3 or later database, the instance user ID that you use for the upgraded server must have access permission for the manifest file.

      The manifest file might be less than 1 KB. However, for a complex configuration, it might exceed 1 KB.

Related tasks:

"Estimating database and recovery log requirements" on page 453

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.
2. Back up volume history information. 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 a copy of the server options file.
4. Optional: Make a copy of the accounting log file.
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.

Installing and configuring the V6.3 or later server

In preparation for migration of the V5 server from the z/OS system, install and complete an initial configuration of the V6.3 or later server.

Installing the V6.3 or later server on AIX or Linux systems

You can use an installation wizard to install the server, or install the server by using the console.

Starting with V6.3, the IBM Tivoli Storage Manager server installation wizard has a separate license agreement for the following products:

- Tivoli Storage Manager
- IBM Tivoli Storage Manager Extended Edition
- IBM System Storage Archive Manager
- IBM Tivoli Storage Manager for Storage Area Networks

To verify the system environment and install the server, complete the following steps:

1. Linux For some operating systems, you must check certain system settings before you begin the installation.

   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 installation wizard cannot run on your configuration.
It will now stop.
For more details about installation error logs,
enter the phrase "installation log files" in the
Search field at this site:

http://publib.boulder.ibm.com/infocenter/tsminfo/v6r3
```

2. Log in to the system by using the root user ID.
3. If you have the product DVD, complete the following steps.

   Insert the Tivoli Storage Manager DVD into a DVD drive. Ensure that the DVD is mounted on directory `/dvdrom` and change to that directory.
4. If you downloaded the program from Passport Advantage as an executable file, complete the following steps.
   a. Verify that you have enough space to store the installation files when they are extracted from the product package. See the download document for the space requirements:

      Tivoli Storage Manager: http://www.ibm.com/support/docview.wss?uid=swg24030521

      Tivoli Storage Manager Extended Edition: http://www.ibm.com/support/docview.wss?uid=swg24030527

      System Storage Archive Manager: http://www.ibm.com/support/docview.wss?uid=swg24030530
   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.
5. Ensure that the system environment meets installation requirements. You can verify the requirements manually or run the prerequisite checker. To run the prerequisite checker, complete the following steps:
   a. Run the `prereqcheck.bin` file.
   b. Select the language for the prerequisite checker user interface.
   c. In the welcome and disclaimer panels, review the statements and accept them.

   If the **Prerequisite Results** panel shows that your workstation successfully passed the checks, you are ready to start the installation. If an error message is shown in the **Prerequisite Results** panel, make the required corrections before continuing with the installation. For more information about the prerequisite checker, see “Running the prerequisite checker” on page 38.
6. 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.
   - Start the graphical wizard:

     ```
     ./install.bin
     ```

- Start the console wizard:

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

For information about translations that are available for the server, see the server language locales section. For information about the silent installation of the server, see the section on installing Tivoli Storage Manager in silent mode in the *Installation Guide*.

7. Select the language for your installation and follow the wizard, selecting **Next** to step through the wizard.

   a. You must accept the license agreement to proceed. Select the product that you are entitled to use and a license agreement is displayed. You can select only one product on the page. If you select Tivoli Storage Manager, Tivoli Storage Manager Extended Edition, or System Storage Archive Manager, you are asked if you will be using LAN-free or library sharing. If you select YES, you must accept the Tivoli Storage Manager for Storage Area Networks license. This is in addition to the license for the product that you chose on the previous page.
   b. Select the components that you want to install. Components include the server, languages, license, device driver, and storage agent. There is no default, so you must make a selection. If you previously installed a server, ensure that you select the same directory when you install a language package, license, or device driver. If you previously installed a storage agent, ensure that you select the same directory if you return to install a device driver. A server and a storage agent cannot be installed on the same workstation. For information about other components that you can choose to install, see the *Installation Guide*.

   The Tivoli Storage Manager client application programming interface (API), DB2, and Global Security Kit (GSKit) are automatically installed when you select the server component.

8. 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 you continue to the next step.

   The installation log is stored in the following location:

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

9. Download and apply any applicable fixes that have been released for the server. Go to the product support site at http://www.ibm.com/support/entry/portal/Downloads. Search for server updates.

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

10. Linux Modify kernel parameter values, if necessary.

    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://pic.dhe.ibm.com/infocenter/db2luw/v9r7. To find the information, enter a search string such as `modifying kernel parameters`, in the **Search** field at this site.

To run Tivoli Storage Manager with DB2, you might need to set kernel parameter values higher than the suggested minimum values and make other changes to the system. For more details, see the section on tuning kernel parameters for Linux systems in the *Installation Guide*.

Creating the directories and the user ID for the 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.
   a. Create the user ID and group.

      Restriction: In the user ID, only lowercase letters (a-z), numerals (0-9), and the underscore character (_) can be used. The user ID and group name must comply with the following rules:
      - The length must be 8 characters or less.
      - The user ID and group name cannot start with *ibm*, *sql*, *sys*, or a numeral.
      - The user ID and group name cannot be *user*, *admin*, *guest*, *public*, *local*, or any SQL reserved word.

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

      AIX

      ```
      # mkgroup id=1001 tsmsrvrs
      # mkuser id=1002 pgrp=tsmsrvrs home=/home/tsminst1 tsminst1
      # passwd tsminst1
      ```

      Linux

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

   b. Log off, then log in to your system, by using the new user ID and password. Use an interactive login program, such as telnet, so that you are prompted for the password and can change it if necessary.
   c. If a configuration profile does not exist for the user ID, create the file. For example, create a `.profile` file if you are using the Korn shell (ksh).
2. Create the directories that the server requires. Ensure that you are logged in under the new user ID that you created.

   You need a unique, empty directory for each item in the following table. Create the database directories, the active log directory, and the archive log directory on different physical volumes. For space requirements, see "Worksheet for planning space for the V6.3 or later server" on page 44.

Table 83. Worksheet for creating required directories

Item	Example commands for creating the directories	Your directories
The *instance directory* for the server, which will contain files for this server instance, including the server options file	`mkdir /home/user_ID/tsminst1`	

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

Active log directory	`mkdir /home/user_ID/tsmlog`	
Archive log directory	`mkdir /home/user_ID/tsmarchlog`	
Optional: Directory for the log mirror for the active log	`mkdir /home/user_ID/tsmlogmirror`	
Optional: Secondary archive log directory, which is the failover location for the archive log	`mkdir /home/user_ID/tsmarchlogfailover`	

When a server is initially created, with the **DSMSERV FORMAT** utility or with the configuration wizard, a server database and recovery log are created. In addition, files are created to hold database information that is used by the database manager.

3. Create additional logical volumes and mount the volumes on the directories that were created in the previous step.

Related tasks:

"Preparing space for the migration process" on page 469

Related reference:

"Server naming best practices" on page 72

Preparing the V5 server on z/OS for migration

To prepare the V5 server for migration, ensure that the server is upgraded to V5.5.6 or later. Then, on the V5.5.6 or later server, install the z/OS media server. Issue the **ZMSPREPARE** command to identify additional steps that must be completed before data migration. Then, back up data.

To protect your server and its data, follow the preparation steps carefully.

Important: It is possible, after the upgrade to V6.3 or later 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 completed all preparation steps.

Modifying the server before the migration

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

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 is completed and you might see error ANR2034E. This error can be ignored. For more information, see Technote 1408895 (http://www.ibm.com/support/docview.wss?uid=swg21408895). 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 you continue the upgrade process.
2. Review the steps for reverting to the earlier version of the server in the section, "Postupgrade phase: Reverting from V6.3 or later to the previous V5 server version" on page 345.

   If you must revert to the earlier version after the upgrade to V6.3 or later, 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 necessary.

      For example, if you want to be able to revert to the original server for up to 30 days after the upgrade to V6.3 or later, set the **REUSEDELAY** parameter to 31 days. Issue the following administrative command:

      ```
      update stgpool sequential_access_storage_pool reusedelay=31
      ```
   b. For each copy storage pool, set the **RECLAIM** parameter to 100 (meaning 100%). Issue the following administrative command:

      ```
      update stgpool copy_storage_pool reclaim=100
      ```
   c. If you typically use a **DELETE VOLHISTORY** command to delete database backups, ensure that the command does not delete database backups too frequently. The interval between backups should be at least the same number of days that you set for the **REUSEDELAY** period for sequential-access storage pools. For example, to delete database backups every 45 days, issue the following administrative command:

      ```
      delete volhist type=dbbackup todate=-45
      ```
   d. For important clients that use the server, verify that the value for the `schedlogretention` client option is set to retain the client schedule log for a sufficient 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.

For example, to prune the log every 45 days and save the log entries, add the following option:

```
schedlogretention 45 S
```

AIX HP-UX Linux Solaris Add the option to the `dsm.sys` file within a server stanza.

Windows Add the option to the client options file, `dsm.opt`.

Upgrading the V5 server to V5.5.6 or later

To prepare the Tivoli Storage Manager V5 server for the upgrade, ensure that Tivoli Storage Manager V5.5.6 or later is installed.

Upgrade the V5 server to V5.5.6 or later so that you can use the **ZMSPREPARE** command and other tools that are designed to aid in preparing for the migration.

The Tivoli Storage Manager server must not be running during installation of the fix pack.

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

Before you upgrade the Tivoli Storage Manager server, ensure that you retain the installation media from the base release of the installed server. If you installed Tivoli Storage Manager from a DVD, ensure that the DVD is available. If you installed Tivoli Storage Manager from a downloaded package, ensure that the downloaded files are available. If the upgrade fails, and the server license module is uninstalled, the installation media from the server base release are required to reinstall the license.

1. Obtain the package file for the V5.5.6 or later fix pack from the Tivoli Storage Manager FTP downloads site at ftp://public.dhe.ibm.com/storage/tivoli-storage-management/maintenance/server/v5r5/MVS/LATEST .
2. For installation information, review the `README.txt` file, which is available in the V5.5.6 or later package file.
3. Install the V5.5.6 or later fix pack.

For more information about the Tivoli Storage Manager server V5.5 release, see the Tivoli Storage Manager V5.5 information center at http://publib.boulder.ibm.com/infocenter/tivihelp/v1r1/index.jsp.

Installing Tivoli Storage Manager for z/OS Media

To install Tivoli Storage Manager for z/OS Media, use the appropriate installation commands. Then complete the configuration tasks.

Install Tivoli Storage Manager for z/OS Media by following the instructions in the *IBM Tivoli Storage Manager for z/OS Media Installation and Configuration Guide*.

Configure Tivoli Storage Manager for z/OS Media by following the instructions in the *IBM Tivoli Storage Manager for z/OS Media Installation and Configuration Guide*.

Related concepts:

"Tivoli Storage Manager for z/OS Media overview" on page 439

Defining a server that corresponds to the z/OS media server

On the V5 system, create a server definition that corresponds to the z/OS media server. The z/OS media server will be used during the **DSMSERV INSERTDB** step to access upgrade media on tape. After the migration is complete, the z/OS media server will be used to access client data that is stored on tape.

On the V5 server, issue the **DEFINE SERVER** command. Ensure that the following parameters are set:

- The **SERVER_NAME** parameter must specify the user ID that is used to run the Tivoli Storage Manager V5 server.
- The **SERVERPASSWORD** parameter must specify the password that is used to log on to the z/OS media server.
- The **HLADDRESS** parameter must specify the IP address of the z/OS media server.
- The **LLADDRESS** parameter must specify the port number of the z/OS media server.

Here is an example:

```
define server tsmserv serverpassword=yourlife hladdress=9.115.20.97 lladdress=1555
```

For details, see the DEFINE SERVER section in the *Administrator's Reference*.

Disabling sessions

In preparation for the migration, 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. 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.

4. Verify 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
   ```

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

   ```
   cancel session all
   ```

Analyzing the Tivoli Storage Manager server by using ZMSPREPARE

To analyze the Tivoli Storage Manager V5 server in preparation for the migration, use the **ZMSPREPARE** command. The **ZMSPREPARE** command provides information that is useful for completing the steps that you must take before data migration can begin.

The report that is generated by the **ZMSPREPARE** command includes information about the following items:

- Storage pool volumes that are located on FILE and DISK device classes and that must either be converted to tape or deleted
- Sequential volumes that are recorded in the volume history and that are located on FILE storage, but not including storage pool volumes
- Backup sets that are located on FILE storage
- Invalid device classes
- Server options that might require an update
- Date and time of the most recent backup of the Tivoli Storage Manager server database

Requirement: Run the **ZMSPREPARE** command to ensure that all prerequisites are met before data migration begins.

1. On the V5 server, run the **ZMSPREPARE** command from the administrative client command line. For more information about the **ZMSPREPARE** command, see "ZMSPREPARE (Prepare a server on a z/OS system for migration)" on page 532. The output from the **ZMSPREPARE** command shows the following types of information:

```
Disk-based storage pools.

Storage         Storage         Device          Estimated       Pct       Volumes
Pool Name       Pool Type       Class Name       Capacity      Util       are not
                                                                            marked
                                                                         destroyed
-----------     -----------     ----------     ----------     -----     ---------
ADPPOOL         Active-Data     FILE                551 G      19.6             0
DISKPOOL        Primary         DISK                731 G      38.5            10
FILEMIGPOOL     Primary         FILE                851 G      20.8            12
FROM-POMPE-     Primary         FROM-POMP-          561 G      22.1             0
 II2-VV                          EII2-VV
LONGFNPOOL      Primary         FILE                61 G       1.5             0


**************************************************
FILE device type backup sets.

Node Name           Backup Set Name     Data Type           Date/Time
---------------     ---------------     ---------------     --------------------
CLIENT115           TEST.99790852       File                08/19/11   13:20:25


Retention           Device              Description         Has Table
Period              Class Name                              of Conten-
                                                            ts (TOC)?
---------           ----------          ---------------     ----------
365                 FILE                No Description              No


**************************************************
Sequential volumes with a device type of FILE.

Date/Time                Volume Type        Device Class     Volume Name
--------------------     --------------     ------------     ---------------------
```

```
08/19/11   13:36:45      EXPORT             FILE             SVTSMS1.S3785800.EXP
08/19/11   13:36:45      EXPORT             FILE             SVTSMS1.S3785873.EXP
08/19/11   13:36:45      EXPORT             FILE             SVTSMS1.S3785947.EXP
08/19/11   13:36:45      EXPORT             FILE             SVTSMS1.S3786028.EXP
08/19/11   13:36:45      EXPORT             FILE             SVTSMS1.S3786094.EXP
08/19/11   13:36:45      EXPORT             FILE             SVTSMS1.S3786158.EXP


**************************************************
Convert server options file.
 ( Yes/No/Consult documentation/ Unknown option )

Line       Option             Include in V6 server         Include in media server
Number                        options file?                options file?
------     --------------     ------------------------     ------------------------
1          MSGWAITALL         No                           No
6          TCPPORT            Consult                      Consult
7          TCPNAME            No                           Consult
8          TCPADMINPORT       Yes                          No
9          HTTPTCPPORT        No                           No
14         VOLUMEHISTORY      Consult                      No
15         DEVCONFIG          Consult                      No
22         TCPBUFSIZE         Consult                      No
35         USELARGEBUFFE-     No                           No
            RS
48         LICENSE            No                           No
49         LICENSE            No                           No
54         LFVOLUMEFORMA-     No                           No
            TCOUNT
60         LFVOLUMEFORMA-     No                           No
            TCOUNT
73         LICENSE            No                           No
74         LICENSE            No                           No


**************************************************
No unsupported device classes are found.


**************************************************

     Last
 Complete
   Backup
Date/Time
---------
08/18/11
  13:52:-
       35


**************************************************
```

2. Make appropriate changes to your system environment by using the report generated by the **ZMSPREPARE** command. Based on the report, you might need to complete one or more of the following tasks:
   - Back up the disk-based primary storage pools that are identified by the **ZMSPREPARE** command to copy storage pools on tape. For details, see "Backing up data from disk-based primary storage pools" on page 480. Update the storage pool volumes so that `ACCESS=DESTROYED` and delete the volumes of disk-based backup storage pools. For details, see "Removing volumes of disk-based copy storage pools" on page 480. To view volume names in the storage pools that require handling, use the `ZMSPREPARE FORMAT=DETAILED` command.
   - Update identified server options. For details, see "Creating the Tivoli Storage Manager server options file" on page 481.
   - Remove or change invalid device classes.

- Remove sequential volumes with a device type of FILE such as database backups, exports, and backup sets. For details, see "Identifying and deleting FILE backup sets" on page 481.

Related reference:

"ZMSPREPARE (Prepare a server on a z/OS system for migration)" on page 532

Removing volumes of disk-based copy storage pools

Before you migrate the Tivoli Storage Manager V5.5 server on z/OS to V6.3 or later, delete all disk-based storage pool volumes or mark them as destroyed.

You can mark volumes of primary storage pools as destroyed, but destroyed is not a valid access mode for volumes of disk-based copy storage pools. For this reason, you must delete volumes of disk-based copy storage pools before you migrate your data.

1. By using the output of the **ZMSPREPARE** command, determine if the copy storage pool must be migrated from the V5.5 server to the V6.3 or later server or if it can be recreated on the V6.3 or later server after the migration.
2. If you must migrate the copy storage pool to V6.3 or later, recreate the copy storage pool on the V5.5 system from the primary storage pool by using the **BACKUP STGPOOL** command. The reason for taking this step is that copies of copy pools are not permitted in Tivoli Storage Manager.
3. If the primary storage pool is also disk-based, back up the primary storage pool to a tape-based copy storage pool as described in "Backing up data from disk-based primary storage pools."
4. Delete the volumes of the disk-based copy storage pools by using the **DELETE VOLUME** command.

   For details, see the DELETE VOLUME section in the *Administrator's Reference*.

Related reference:

"ZMSPREPARE (Prepare a server on a z/OS system for migration)" on page 532

Backing up data from disk-based primary storage pools

Disk-based primary storage pools will not be available after the migration. Therefore, you must create a tape copy storage pool for each disk-based primary storage pool that does not have one. Then, back up all data from disk-based primary storage pools to tape copy storage pools.

After the migration, restore the storage pools by using this backup.

1. Create a tape copy storage pool. Issue the **DEFINE STGPOOL** command. Specify the following parameters:
   - The **POOL_NAME** parameter specifies the name of the storage pool to be defined.
   - The **DEVICE_CLASS_NAME** parameter specifies the name of the sequential access device class to which this copy storage pool is assigned.
   - The **POOLTYPE=COPY** parameter specifies that you want to define a storage pool.

   Here is an example:

   ```
   define stgpool tapepool2 dc480 pooltype=copy
   ```

   For details, see the DEFINE STGPOOL section in the *Administrator's Reference*.
2. Back up a primary storage pool. Issue the **BACKUP STGPOOL** command. For example, to back up a primary storage pool named PRIMARY_POOL to a copy storage pool named COPYSTG, issue the following command:

```
backup stgpool primary_pool copystg
```

For details, see the BACKUP STGPOOL section in the *Administrator's Reference*.

3. Change the access mode of each volume of disk-based primary storage pools to destroyed so that no files can be written to or read from volumes in the storage pool. Use the **UPDATE VOLUME** command. For more information about changing the access mode of storage pools, see the *Administrator's Guide*. For more information about the **UPDATE VOLUME** command, see the *Administrator's Reference*.

Identifying and deleting FILE backup sets

Backup sets that use FILE device classes cannot be regenerated, moved, or accessed after you migrate your data. For this reason, delete any backup sets that use FILE device classes.

1. Determine which backup sets use FILE device classes. Review the report generated by the **ZMSPREPARE** command.
2. Delete any backup sets that use FILE device classes. For details, see the section on deleting backup sets in the *Administrator's Guide*.

Related tasks:

"Analyzing the Tivoli Storage Manager server by using ZMSPREPARE" on page 478

Creating the Tivoli Storage Manager server options file

To create a server options file, start by using the options file from the Tivoli Storage Manager V5 server and make appropriate changes for the V6.3 or later server.

1. Move the options file that is used by the Tivoli Storage Manager V5 server to the Tivoli Storage Manager V6.3 or later server instance directory. Ensure that the file is owned by the Tivoli Storage Manager server instance owner and that it has valid permissions for that owner ID.
2. Determine whether changes are required in the options file and make the required changes:
   a. Review the report generated by the **ZMSPREPARE** command. The `Convert server options file` section lists options that are in the V5 options file, but that might not transfer to the V6.3 or later file.
   b. Use the information in the `Convert server options file` section to determine whether to include a server option in the V6.3 or later file.

For general information about server options, see the *Administrator's Reference*. For information about new and changed server options since V5, see "Command and option changes" on page 53.

Related tasks:

"Analyzing the Tivoli Storage Manager server by using ZMSPREPARE" on page 478

Running the ZMSPREPARE command again to verify prerequisites

After you have run the **ZMSPREPARE** command once and have made any required changes in your environment, run the **ZMSPREPARE** command again to ensure that all migration prerequisites are met.

Important: It is mandatory to run the **ZMSPREPARE** command to ensure that all prerequisites are met before data migration begins.

1. On the V5 server, run the **ZMSPREPARE** command from the administrative client command line. For more information about the **ZMSPREPARE** command, see "ZMSPREPARE (Prepare a server on a z/OS system for migration)" on page 532.
2. Review the report generated by the **ZMSPREPARE** command to ensure that all migration prerequisites are met. If all migration prerequisites are met, the report is similar to the following one. Verify the following items:
   - The `Volumes are not marked destroyed` value is `0` for all storage pools.
   - For backup sets, this message is displayed: `No FILE device type backup sets are found.`
   - For sequential volumes, this message is displayed: `No sequential volumes with a device type of FILE were found.`
   - A value is displayed in the `Last Complete Backup Date/Time` column. Preferably, the time is recent.

```
tsm: EZU11>zmsprepare
Disk-based storage pools.

Storage        Storage        Device         Estimated      Pct      Volumes
Pool Name      Pool Type      Class Name      Capacity     Util      are not
                                                                       marked
                                                                    destroyed
-----------    -----------    ----------    ----------    -----    ---------
ARCHIVEPOOL    Primary        DISK               0.0 M      0.0            0
BACKUPPOOL     Primary        DISK              10.0 M      0.5            0
FILE           Primary        FILE                 4 G      0.0            0
SPACEMGPOOL    Primary        DISK               0.0 M      0.0            0


**************************************************
No FILE device type backup sets are found.


**************************************************
No sequential volumes with a device type of FILE were found.


**************************************************
Convert server options file.
 ( Yes/No/Consult documentation/ Unknown option )

Line      Option            Include in V6 server        Include in media server
Number                      options file?               options file?
------    --------------    ------------------------    ------------------------
1         COMMMETHOD        Yes                         No
2         TCPPORT           Consult                     Consult
8         DEVCONFIG         Consult                     No
9         LICENSE           No                          No
10        LICENSE           No                          No


**************************************************
No unsupported device classes are found.
```

```
**************************************************

     Last
 Complete
   Backup
Date/Time
---------
09/26/20-
 11 09:5-
     9:15


**************************************************
```

3. If any migration prerequisites are not met, make appropriate changes in your system environment and run the **ZMSPREPARE** command again. Repeat this step as required until all migration prerequisites are met.

Related reference:

"ZMSPREPARE (Prepare a server on a z/OS system for migration)" on page 532

Backing up the server database

Immediately before you migrate the server, perform a full database backup to a tape device class.

Back up the database by using the following command. Run either a full or snapshot backup.

```
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 by 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.

Tip: To protect the backup from media failures, make two copies of the backup. Ensure that at least one full database backup is available onsite. If you must restore the database after a failed upgrade, having an onsite backup database saves time.

Stopping the server before the migration

On the Tivoli Storage Manager V5 server running on z/OS, stop all server processes. Then demount any tapes that are mounted and stop the server.

To stop the server before you install the upgrade, use Tivoli Storage Manager administrative commands:

1. 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.

   For more information about querying and canceling processes, see the **QUERY PROCESS** and **CANCEL PROCESS** commands in the *Administrator's Reference*.

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

   ```
   query mount
   dismount volume volume_name
   ```

   For more information about unmounting tapes, see the **QUERY MOUNT** and **DISMOUNT VOLUME** commands in the *Administrator's Reference*.
3. Stop the server. Use the command:

   ```
   halt
   ```

Preparing the database of a V5 server for migration

Before you extract 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 as administrator to the V5 server system.
3. Prepare the database by using the **DSMUPGRD PREPAREDB** utility. To use the **DSMUPGRD PREPAREDB** utility on z/OS, you must submit a batch job by using JCL, as in the following example:

   ```
   //PREPARE JOB ,REGION=256M,TIME=1440,CLASS=A,MSGCLASS=H
   //* SETPROG APF,ADD,DSN=SVTSMS1.TSM556.LINKLIB,VOL=TS405B
   //*
   //TIVSMDB EXEC PGM=DSMUPGRD,
   //        PARM='POSIX(ON)/PREPAREDB MEDIASERVER=TUCMVSTT'
   //STEPLIB  DD DSN=SVTSMS1.TSM556.LINKLIB,DISP=SHR
   //OPT      DD DSN=SVTSMS1.TSM556.OPTIONS,DISP=SHR
   //DSMAMENG DD DSN=SVTSMS1.TSM556.MESSAGES(ANRMENU),DISP=SHR
   //HLPAMENG DD DSN=SVTSMS1.TSM556.HELP(ANRHENU),DISP=SHR
   //DSK      DD DSN=SVTSMS1.TSM556.DISKLOG,DISP=SHR
   //SYSPRINT DD SYSOUT=*
   //SYSTERM  DD SYSOUT=*
   ```
4. Monitor the job output for errors and warning messages. The job output can be found on the MVS™ console.

Before you migrate the V5 server database, ensure that the prepare operation is completed successfully. If the prepare operation fails, you might need to restart the V5 server to fix the problem and run the prepare operation again.

Related reference:

"DSMUPGRD PREPAREDB (Prepare a V5 database for upgrade)" on page 513

Chapter 21. Migrating the z/OS server database to the V6.3 or later server

Migrate the database of the IBM Tivoli Storage Manager V5 server that is running on z/OS to the V6.3 or later server.

Decide on a method for moving the database: the media method or the network method. For information about the advantages of each method, see "Comparison of database migration methods" on page 448.

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

To move the database by using the media method, follow the instructions in "Migrating a V5 z/OS server by using the media method."

To move the database by using the network method, follow the instructions in "Migrating a V5 z/OS server by using the network method" on page 487.

Migrating a V5 z/OS server by using the media method

To migrate a V5 z/OS server by using the media method, prepare the V5 database for migration and extract the data to media. Then create and format the new database and load the extracted data into the new database.

Creating and formatting the new database

Create the server instance and format files for an empty V6.3 or later database.

1. To define the database, run the DSMICFGX wizard, as you would when installing Tivoli Storage Manager.
2. Using the Tivoli Storage Manager instance owner ID, run the following command:

   ```
   dsmserv removedb tsmdb1
   ```

3. To format the database, use the **DSMSERV LOADFORMAT** utility with appropriate parameters.

If you complete these steps, there is no need to configure the system for database backup after the migration.

Extracting the data to media

Extract the data from the original V5 server database to sequential media.

1. Log in as administrator to the Tivoli Storage Manager V5 server system by using the administrative console.
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. To start the extraction, use the **DSMUPGRD EXTRACTDB** utility. To use the **DSMUPGRD EXTRACTDB** utility on z/OS, you must submit a batch job by using JCL, as in the following example:

```
//EXTRMED JOB ,REGION=256M,TIME=1440,CLASS=A,MSGCLASS=H
//* SETPROG APF,ADD,DSN=SVTSMS1.COLLIN.TSM556.LINKLIB,VOL=TS405B
//*
//TIVSMDB EXEC PGM=DSMUPGRD,
// PARM='POSIX(ON)/EXTRACTDB DEVCLASS=CARTRIDGE MAN=//SVTSMS1.MED.MFST'
//STEPLIB  DD DSN=SVTSMS1.TSM556.LINKLIB,DISP=SHR
//OPT      DD DSN=SVTSMS1.TSM556.OPTIONS,DISP=SHR
//DSMAMENG DD DSN=SVTSMS1.TSM556.MESSAGES(ANRMENU),DISP=SHR
//HLPAMENG DD DSN=SVTSMS1.TSM556.HELP(ANRHENU),DISP=SHR
//DSK      DD DSN=SVTSMS1.TSM556.DISKLOG,DISP=SHR
//SYSPRINT DD SYSOUT=*
```

For information about the **DSMUPGRD EXTRACTDB** command, see "DSMUPGRD EXTRACTDB (Extract data from a V5 server database)" on page 519.

4. Monitor the job output for errors and warning messages. The job output can be found on the MVS console. 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.`

   The length of time that the process runs depends on the size of the database. The time is approximately as long as the time required for a full backup of the database.

Moving tape to another tape library

If you are using tape devices that are directly attached to the V6.3 or later server, instead of tape devices that are managed by the z/OS media server, you might need to move the tapes.

This step is required only if you plan to run the **DSMSERV INSERTDB** command to transfer the V5 server data to tape devices that are directly attached to the V6.3 or later server. In this case, you might need to move the tapes to another tape library before the data can be inserted into the DB2 database. For more information, see the technical documentation for your tape library.

Loading the extracted data into the new database

Load the data that you extracted from the V5 server database into the V6.3 or later server database.

Ensure that the following requirements are met before you begin to load the data:

- A new, empty database must be prepared on the V6.3 or later server by using the **DSMSERV LOADFORMAT** command.
- 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 media that contains the extracted database must be available to the V6.3 or later server. The permissions must be set to grant access to the media for the user ID that owns the V6.3 or later server instance.
- The **MANIFEST** parameter must be specified to indicate that data will be read from external media.

1. On the V5 server, start the z/OS media server. The V6.3 or later server will access extracted data volumes through the z/OS media server.
2. Log on by using the Tivoli Storage Manager server instance user ID to the system where you installed the V6.3 or later server.

3. Copy the manifest file that was created by the extraction process on the V5 system to the V6.3 or later system. Ensure that the instance user ID has ownership or read/write permission for the manifest file.
4. Verify the contents of the manifest file and edit the file if necessary:
   a. Ensure that the device names are valid for the V6.3 or later system. In particular, ensure that the definitions for accessing the media server are correct. If you are not using a media server, ensure that device names for accessing devices on the V6.3 or later system are correct.
   b. Ensure that the manifest file contains a list of volumes to be used when the extracted data is loaded into the new database.
5. To load an extracted server database into the empty V6.3 or later database, issue the **DSMSERV INSERTDB** command. Direct the output of the process to a file for monitoring. For example, enter the following command on one line:

   AIX Linux

   ```
   nohup /opt/tivoli/tsm/server/bin/dsmserv insertdb \
   manifest=./manifest.txt >insert.out 2>&1 &
   ```
6. Monitor the process output for error messages, warning messages, and any items that you might need to address. The system displays interim statistics about the operation. However, there might be time periods when no messages are issued. During this time, DB2 operations are running in the background. The length of time that the process runs depends on the size of the database. For more information, see "Estimating the time required for migration" on page 454.

   Optional: Verify that the data-loading process is continuing; monitor the processor and I/O usage for the server process and the corresponding DB2 process. A message in the process output of the **DSMSERV INSERTDB** command indicates the status 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.`

   The success message must be displayed before you continue with the next step.
7. If you used the media method for upgrade *and* used a tape device, after the insertion operation is complete, protect the tape that holds the extracted data. For example, remove the tape or check it out from the library. Prevent the tape from being reused until you are sure that you do not need to run the insertion operation again.

Related information:

DSMUPGRD EXTRACTDB

Migrating a V5 z/OS server by using the network method

To migrate a V5 server running on z/OS to a V6.3 or later server running on AIX or Linux on System z, several steps are required. Prepare the database of the V5 server for migration, and create and format the new database. Then, move the V5 server database over the network to the V6.3 or later server database.

Creating and formatting the new database

Create the server instance and format files for an empty V6.3 or later database.

1. To define the database, run the DSMICFGX wizard, as you would when installing Tivoli Storage Manager.
2. Using the Tivoli Storage Manager instance owner ID, run the following command:

   ```
   dsmserv removedb tsmdb1
   ```

3. To format the database, use the **DSMSERV LOADFORMAT** utility with appropriate parameters.

If you complete these steps, there is no need to configure the system for database backup after the migration.

Moving the server database over a network

To move the server database over a network, first start the **DSMSERV INSERTDB** utility on the V6.3 or later server to ensure that the server can receive the database. Then, on the V5 server, extract the database and send it over the network to the V6.3 or later server by using the **DSMSERV EXTRACTDB** utility.

Before starting this procedure, ensure that the Tivoli Storage Manager V5 server and V6.3 or later server are not running.

1. Verify that there is a good network connection between the two systems.
2. Start the **DSMSERV INSERTDB** process on the V6.3 or later server to receive the database. The process must be started by the Tivoli Storage Manager instance owner user ID. 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 V6.3 or later server and directing the process output to `insert.out`, by using this command:

   ```
   nohup /opt/tivoli/tsm/server/bin/dsmserv insertdb \
   sesswait=60 >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. Some time might pass during which no messages are issued. During this time, DB2 operations are running in the background. Optional: To verify that operations are continuing as expected, monitor the CPU and I/O usage for the server process and the corresponding DB2 process. Before continuing to the next step, verify that the **DSMSERV INSERTDB** process has issued the following message:

   ```
   ANR1336I INSERTDB: Ready for connections from the source server
   ```

4. Start the **DSMSERV EXTRACTDB** process on the V5 server. Specify the TCP/IP address and port for the V6.3 or later server on the `PARM` card. Submit a batch job by using JCL, as in the following example:

   ```
   //EXTRACT JOB ,REGION=256M,TIME=1440,CLASS=A,MSGCLASS=H
   //*
   //TIVSMDB EXEC PGM=DSMUPGRD,
   //     PARM='POSIX(ON)/EXTRACTDB HLADDRESS=9.11.125.129 LLADDRESS=1500'
   //STEPLIB  DD DSN=SVTSMS1.TSM556.LINKLIB,DISP=SHR
   //OPT      DD DSN=SVTSMS1.TSM556.OPTIONS,DISP=SHR
   //DSMAMENG DD DSN=SVTSMS1.TSM556.MESSAGES(ANRMENU),DISP=SHR
   //HLPAMENG DD DSN=SVTSMS1.TSM556.HELP(ANRHENU),DISP=SHR
   //DSK      DD DSN=SVTSMS1.TSM556.DISKLOG,DISP=SHR
   ```

5. Monitor the processes for errors and warning messages, and for items that you might need to address. The job output can be found on the MVS console.

6. To find the messages that indicate the success or failure of the operations, examine the process outputs for the extraction and insertion processes.

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.`

Chapter 22. Configuring the z/OS media server devices on the new server

On the IBM Tivoli Storage Manager V6.3 or later server, configure devices that you plan to use with z/OS media server storage.

For details, see the section on configuring the Tivoli Storage Manager server to use z/OS media server storage in the *Administrator's Guide*.

Chapter 23. Taking the first steps after the migration

After you migrate the system, configure the server options, start the server, verify the migration results, and complete other tasks to ensure that the system operates as expected.

Complete the tasks that are described in the following topics:

1. "Configuring server options for the migrated server"
2. "Starting the server" on page 494
3. "Verifying the migration results" on page 499
4. "Recreating disk-based storage pools that were moved to tape" on page 499
5. "Registering licenses" on page 501
6. "Backing up the database" on page 501
7. "Updating automation" on page 502
8. "Updating configuration of storage agents" on page 502
9. "Beginning operations and monitoring the servers" on page 502
10. "Migrating data from z/OS media volumes to other devices" on page 504

After you migrate the system to V6.3.3 or later, you can authenticate passwords with the LDAP directory server, or authenticate passwords with the IBM Tivoli Storage Manager server. Passwords that are authenticated with the LDAP directory server can provide enhanced system security. For details, see the section about managing passwords and logon procedures in the *Administrator's Guide*.

Configuring server options for the migrated server

To help avoid problems with database growth and server performance, the server automatically monitors its database tables and reorganizes them when needed. Before starting the server for production use, set server options to control when reorganization runs. If you plan to use deduplication, ensure that the option to run index reorganization is enabled.

Verify the settings of several other server options.

Table and index reorganization requires significant processor resources, active log space, and archive log space. Because database backup takes precedence over reorganization, select the time and duration for reorganization to ensure that the processes do not overlap and reorganization can complete. For more information about scheduling reorganization, see *Administrator's Guide*.

If you update these server options while the server is running, you must stop and restart the server before the updated values take effect.

1. Modify the server options.

   Edit the server options file, `dsmserv.opt`, in the server instance directory. Follow these guidelines when editing the server options file:

   - To activate an option, remove the asterisk at the beginning of the line.
   - Begin entering an option on any line.
   - Enter only one option per line. The entire option with its value must be on one line.

- If you have multiple entries for an option in the file, the server uses the last entry.
- To view available server options, see the sample file, `dsmserv.opt.smp`, in the `/opt/tivoli/tsm/server/bin` directory.

2. If you plan to use deduplication, enable the **ALLOWREORGINDEX** server option. Add the following option and value to the server options file:

   ```
   allowreorgindex yes
   ```

3. Set two server options that control when reorganization starts and how long it runs. Select a time and duration so that reorganization runs when you expect that the server is least busy. These server options control both table and index reorganization processes.
   a. Set the time for reorganization to start by using the **REORGBEGINTIME** server option. Specify the time by using the 24-hour system. For example, to set the start time for reorganization as 8:30 p.m., specify the following option and value in the server options file:

      ```
      reorgbegintime 20:30
      ```

   b. Set the interval during which the server can start reorganization. For example, to specify that the server can start reorganization for four hours after the time set by the **REORGBEGINTIME** server option, specify the following option and value in the server options file:

      ```
      reorgduration 4
      ```

4. Verify the following server options.

Option name	Instructions
DEVCONFIG	Ensure that the file name that is specified by the **DEVCONFIG** option works on the V6.3 or later system. Ensure that the path exists and that the syntax is correct for the V6.3 or later platform.
LANGUAGE	Ensure that the language that is specified by the **LANGUAGE** option is appropriate. Specify en_US or another language that is available for the server. For more information about available languages, see the server language locales section in Appendix B.
VOLUMEHISTORY	Ensure that the file name that is specified by the **VOLUMEHISTORY** option works on the V6.3 or later system. Ensure that the path exists and that the syntax is correct for the V6.3 or later platform. **Important:** The V6.3 or later server uses a different format for volume history information than the V5 server. For this reason, back up the volume history when the migration completes. The **VOLUMEHISTORY** option was optional in V5, but is required for database backup and restore purposes in V6.3 or later.

5. If the server was running while you updated the server options file, stop and restart the server.

Starting the server

Verify that the server instance is correctly set up by starting the server instance. Before you start the server instance, ensure that permissions and ulimit values are set correctly.

The standard way to start the server is by using the instance user ID. By using the instance user ID, you simplify the setup process and avoid potential issues. However, in some cases, it might be necessary to use another user ID to start the server. For example, you might want to use the root user ID to ensure that the server can access specific devices. To allow a user other than the instance user ID

to start the server, the user ID must have sufficient authority to issue the start command for the server and database manager, and the user ID must belong to the SYSADM_GROUP group. The user ID must have authority to access the server database and to use all files, directories, and devices required by the server. Before starting the server, explicitly grant server database authority to the user ID and verify all other authorities for the user ID.

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.

Important: Linux When the Tivoli Storage Manager server is started, the dsmserv process is started as the instance owner. On Linux operating systems, the device special file names are owned by root. They normally have read/write permission for the root user, and read-only permission for group and world access. Because the Tivoli Storage Manager server is started as a non-root user, it might not have permission to access the device special files in read/write mode. To correct this situation, change permission settings on the device special files (for example, `/dev/rmtX`) to grant read/write access to the instance user. Changing permission settings can be done in several ways:

- If the system is dedicated to Tivoli Storage Manager and only the Tivoli Storage Manager administrator has access, make the device special file world writable.
- If the system has multiple users, you can restrict access by making the Tivoli Storage Manager instance user the owner of the special device files.
- If multiple user instances are running on the same system, change the group name, for example TAPEUSERS, and add each Tivoli Storage Manager instance user ID to that group. Then, change the ownership of the device special files to belong to the group TAPEUSERS, and make them group writable:

  ```
  chmod g+w /dev/rmtX
  ```

AIX Linux When you start the Tivoli Storage Manager server, the server attempts to change certain ulimit values to unlimited. In general, this server action helps to ensure optimal performance and facilitates debugging. If you are a non-root user when you start the server, attempts to change the ulimit values might fail. To ensure correct server operation if you are running the server as a non-root user, set the ulimit values as high as possible before you start the server.

As part of this task, ensure that you set DB2 user limits as high as possible. DB2 relies on private data memory for sort memory allocations during SQL processing. Insufficient shared heap memory can lead to Tivoli Storage Manager server failures during interaction with DB2. For more information about setting appropriate values, see Technote 1212174 (http://www.ibm.com/support/docview.wss?uid=swg21212174).

For guidance in setting ulimit values, see the following table:

Table 84. Ulimit values

Ulimit type	Standard value
Maximum size of core files created	Unlimited
Maximum size of a data segment for a process	Unlimited
Maximum file size	Unlimited

Table 84. Ulimit values (continued)

Ulimit type	Standard value
Maximum number of open files	• For servers on which replication, data deduplication, or both are enabled, specify a minimum value of 16384. • For all other servers, specify a minimum value of 8192.
Maximum amount of processor time in seconds	Unlimited

For instructions about setting ulimit values, see the documentation for your operating system.

Linux The default value for the user limit of maximum user processes (nproc) has changed on some distributions and versions of the Linux operating system. The new default value is 1024. This value can cause unexpected behavior in the Tivoli Storage Manager server. Increase the nproc limit to the minimum suggested value of 16384. If the value is not updated, the server might display unexpected behavior, including hangs or failures.

To verify the current user limit, issue the following command as the instance user:

```
ulimit -u
```

For example:

```
[user@Machine ~]$ ulimit -u
16384
```

To display the current values of all user limits, issue the following command:

```
ulimit -a
```

For example:

```
[user@Machine ~]$ ulimit -a
core file size          (blocks, -c) 0
data seg size           (kbytes, -d) unlimited
scheduling priority             (-e) 0
file size               (blocks, -f) unlimited
pending signals                 (-i) 128098
max locked memory       (kbytes, -l) 64
max memory size         (kbytes, -m) unlimited
open files                      (-n) 1024
pipe size            (512 bytes, -p) 8
POSIX message queues     (bytes, -q) 819200
real-time priority              (-r) 0
stack size              (kbytes, -s) 10240
cpu time               (seconds, -t) unlimited
max user processes              (-u) 16384
virtual memory          (kbytes, -v) unlimited
file locks                      (-x) unlimited
```

To update the user limit of maximum user processes, add a line to the /etc/security/limits.conf file.

Starting the server from the instance user ID

AIX Linux

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

1. Log in by using the instance user ID.

   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 instance user ID, if that profile exists.

   If you log in using the instance user ID and it had a configuration profile (`.profile` if you are using Korn shell or `.bash_profile` if you are using Bash 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 following command:

   ```
   . ~/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 `/tsminst1`. To start tsminst1, issue the following commands:

```
cd /tsminst1
/opt/tivoli/tsm/server/bin/dsmserv
```

To start the server in the background, issue the following commands:

```
cd /tsminst1
/opt/tivoli/tsm/server/bin/dsmserv -q &
```

Starting the server from the root user ID

AIX Linux

The standard way to start the server is by using the instance user ID. However, in some cases, it might be necessary to use another user ID to start the server. For example, you might want to use the root user ID to ensure that the server can access specific devices.

For information about starting the server by using the root user ID, see the *Administrator's Guide*.

Automatically starting servers

AIX Linux

You can configure servers to start automatically at system startup.

AIX If the server is installed on an AIX operating system, use the `rc.dsmserv` script, which is provided for this purpose. The `rc.dsmserv` script is in the `/opt/tivoli/tsm/server/bin` directory.

AIX

To configure a server to automatically start on system startup, complete the following steps:

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. Ensure that the run level in the `/etc/inittab` file matches the run level of the operating system. 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.

Example: Automatically starting a server instance

In this example, the instance owner is tsminst1; the server instance directory is `/home/tsminst1/tsminst1`; the run level is 2; and the process ID is tsm1. Add the following entry to `/etc/inittab` file, on one line:

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

Example: Automatically starting several server instances

If you have more than one server instance that you want to run, add an entry for each server instance. This example uses the following instance owner IDs:

- tsminst1
- tsminst2

This example uses these instance directories:

- `/home/tsminst1/tsminst1`
- `/home/tsminst2/tsminst2`

This example uses these process IDs:

- tsm1
- tsm2

The run level is 2. Add the following entries to the `/etc/inittab` file. Ensure that 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
```

Linux If the server is installed on a Linux operating system, use the `dsmserv.rc` script.

Linux For more information, see the section about automatically starting the server on a Linux system in the *Installation Guide*.

Verifying the migration results

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.

Recreating disk-based storage pools that were moved to tape

The process for recreating disk-based storage pools differs, depending on whether you deleted the original storage pools or marked them as destroyed.

Recreating deleted storage pools

If you backed up and then deleted storage pools in preparation for the migration, define new storage pools. These steps are necessary to ensure that data that you backed up can be restored and used by the Tivoli Storage Manager V6.3 or later system.

Use the **DEFINE STGPOOL** command to define storage pools on the Tivoli Storage Manager V6.3 or later server. Alternatively, define tape storage pools on the z/OS media server. Complete one of the following steps:

- To define storage pools on the Tivoli Storage Manager V6.3 or later system, run the **DEFINE STGPOOL** command.

  For details, see the **DEFINE STGPOOL** command in the *Administrator's Reference*.
- Define storage pools on the z/OS media server.

  For details, see the *IBM Tivoli Storage Manager for z/OS Media Installation and Configuration Guide*.

Recreating storage pool volumes marked as destroyed

If you backed up storage pool volumes and then marked them as destroyed, complete the following steps to ensure that data that you backed up can be restored and used by the V6.3 or later system.

1. Update the definitions of FILE device classes that write to disk by running the **UPDATE DEVCLASS** command. For device classes that were migrated from Tivoli Storage Manager V5.5 on z/OS to Tivoli Storage Manager V6.3 or later, update the **DIRECTORY** parameter to indicate where storage pool volumes are to be written. If required, update the **MAXCAPACITY** parameter. For more information about the **UPDATE DEVCLASS** command, see the *Administrator's Reference*.
2. For all disk-based storage pools and FILE storage pools that do not automatically allocate new volumes, define storage pool volumes. Use the **DEFINE VOLUME** command. For more information about the **DEFINE VOLUME** command, see the *Administrator's Reference*.

Restoring data from backed-up storage pools

Restore the backed-up storage pools to the primary DISK and FILE storage pools on the Tivoli Storage Manager V6.3 or later system.

To restore data from backed-up storage pools, on the Tivoli Storage Manager V6.3 or later system, run the **RESTORE STGPOOL** command. To specify the name of the new storage pool to which to restore the files, use the **NEWSTGPOOL** parameter.

For details, see the **RESTORE STGPOOL** command in the *Administrator's Reference*.

Tip: It might be necessary to temporarily increase the value of the **MAXSCR** parameter for some FILE storage pools to ensure that data is restored. The reason is that storage pool volumes with the `ACCESS=DESTROYED` attribute applied count against the **MAXSCR** parameter. Do not delete storage pool volumes that are marked as destroyed before you restore the data to the storage pool because the deletion also deletes corresponding data in the copy pool backup.

Cleaning up by deleting z/OS DISK and FILE volumes that were marked as destroyed

After you restore the primary storage pools from their backup on tape, you can delete DISK and FILE volumes that were marked as destroyed. These DISK and FILE storage pool volumes were used by the V5 system that was running on z/OS and are no longer required.

Do not delete storage pool volumes that are marked as destroyed before restoring the data to the storage pool because delete processing also deletes corresponding data in the copy pool backup.

To delete storage pool volumes, run the **DELETE VOLUME** command. If you are deleting several volumes, delete the volumes one at a time.

For details, see the **DELETE VOLUME** command in the *Administrator's Reference*.

Registering licenses

Immediately register any Tivoli Storage Manager licensed functions that you purchased so that you do not lose data after you begin to use the server. To ensure that both previous and new licenses are registered, complete the following steps:

1. In the server instance directory of your system, ensure that the `NODELOCK` file has been deleted or renamed. The `NODELOCK` file contains the previous licensing information for your installation.
2. Reregister previously registered licenses by using the **REGISTER LICENSE** command. For information about the **REGISTER LICENSE** command, see the REGISTER LICENSE section in the *Administrator's Reference*.
3. Register new licenses by using the **REGISTER LICENSE** command.

   Restriction: You cannot register licenses for IBM Tivoli Storage Manager for Mail, IBM Tivoli Storage Manager for Databases, IBM Tivoli Storage Manager for Enterprise Resource Planning, and IBM Tivoli Storage Manager for Space Management.

Backing up the database

After migrating data, perform a full backup of the database as soon as possible. Also back up the volume history.

1. Complete the following steps:
   a. If you did not use the instance configuration wizard to configure 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 V6.3 or later 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. From the Tivoli Storage Manager administrative command line, issue the following command:

   ```
   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
   ```

   You can specify the device class to 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.

4. Back up the volume history.

   ```
   backup volhistory filenames=file_name
   ```

Updating automation

After you migrate your data, you might need to modify administrative schedules that were defined in V5 because of changes in command syntax. Implement and verify changes to any automation or scripts that were identified as requiring modification in the planning process.

Important: Ensure that automation includes a backup of the database. Back up the database at least once per day.

Updating configuration of storage agents

After you migrate your data, verify that data can be transferred from storage agents to the z/OS media server. If necessary, reconfigure storage agents to ensure that data can be transferred.

Storage agents are used to ensure that client systems can write data directly to, and read data directly from, storage devices attached to the z/OS media server. A storage agent that is installed on a client system must be set up to communicate with the z/OS media server by using the LAN.

1. Verify that data can be transferred from the storage agent to the z/OS media server.

   For information about how to verify the data transfer, see the *Storage Agent User's Guide*.

2. If you detect an issue with data transfer, update the configuration of the storage agent.

   For information about how to configure a storage agent for z/OS media server access, see the *Storage Agent User's Guide*.

Beginning operations and monitoring the servers

When you start running the Tivoli Storage Manager V6.3 or later server, monitor the space used by the server to ensure that the amount of space is adequate. On the V5 server, where the z/OS media server is installed, you can continue to use z/OS tools to monitor activity on the system.

To monitor the V6.3 or later server and make any required adjustments, complete the following steps:

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 reaches its typical expected level, the space that is used by the active log is 80% - 90% of the space that is available to the active log directory. At that point, you might need to increase the amount of space. Whether you must increase the space depends on the types of transactions in the server workload. 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 are completed quickly. The transactions might use a large amount of space in the active log, but for a short 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. The transactions might use a small amount of space in the active log, but for a long time.
- Network connection types
  - Backup operations that occur over fast network connections cause transactions that are completed more quickly. The transactions use space in the active log for a shorter time.
  - Backup operations that occur over relatively slower connections cause transactions that take a longer time to be completed. The transactions use space in the active log for a longer time.

If the server is handling transactions with a wide variety of characteristics, the space that is used for the active log might increase and decrease significantly 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 long time.

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 stops. The goal is to make enough space available to the archive log so that it never uses all 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 that is 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, decreases, and then might grow again. Over time, as normal operations continue, the amount of space that is 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. You might need to move the archive log to a different file system.

For information about moving the archive log, see the *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 are 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 to use the archive failover log only under unusual conditions, not in normal operation.

After the migration, you can continue to use z/OS tools to monitor activity on the V5 system where the z/OS media server is running.

For information about monitoring activity on the V5 system, see the section on monitoring the server in a system running on z/OS. This information can be found in the Tivoli Storage Manager V5.5 information center at http://publib.boulder.ibm.com/infocenter/tivihelp/v1r1/index.jsp.

If you are using the Tivoli Storage Manager V5 TSO administrative client, you might want to change to a newer administrative client. You can adapt your z/OS tools to use the z/OS UNIX System Services (USS) 6.1.4 administrative client. The z/OS USS 6.1.4 administrative client is not available for download from the client FTP site, but can be obtained by ordering the following fix packs:
- UK62472 for the USS Backup-Archive client
- UK62473 for the USS API client

For more information about ordering fix packs, see the IBM Passport Advantage website at http://www.ibm.com/software/lotus/passportadvantage/.

Migrating data from z/OS media volumes to other devices

After migration, data can be moved from z/OS media volumes to other devices.

To move data from z/OS media volumes to other devices, use one or both of the following methods:
- Direct incoming new data to storage pools on the AIX or Linux on System z system. Then, allow existing data that is stored on the z/OS system to naturally expire.
- Actively move data from z/OS media volumes to storage pools on the AIX or Linux on System z system. To move the data, use the **MOVE DATA** or **MOVE NODEDATA** command.

For more information about the **MOVE DATA** and **MOVE NODEDATA** commands, see the *Administrator's Reference*.

Chapter 24. Troubleshooting the migration of a V5 server from a z/OS system to AIX or Linux on System z

Review this section for tips to troubleshoot common problems that might occur after the migration. A procedure that explains how to return to the previous version of the server is also included.

Reverting to the V5 server running on z/OS after a migration

If you must revert the IBM Tivoli Storage Manager server to a previous version after migration, you must have a full database backup from the V5 system. In addition, you must have the server installation media for your original version and key configuration files. If you carefully follow the preparation steps before you upgrade the server, it might be possible to revert to the previous version with minimal loss of data.

The V5 server running on z/OS can be put back into production at any point along the migration path. Depending on the amount of progress made, different actions are required to revert to the original server:

- To revert to the V5 server before data is moved to the V6.3 or later system, see "Reverting to the V5 server before data is moved to the V6.3 or later server."
- To revert to the V5 server before DISK or FILE volumes are deleted, see "Reverting to the V5 server before volumes are deleted."
- To revert to the V5 server after the original database is deleted, see "Reverting to the V5 server after the V5 database is deleted" on page 506.

Reverting to the V5 server before data is moved to the V6.3 or later server

If you completed the preparation steps for migration, but did not move data, you can revert to the V5 system. You must restart the z/OS server and update relevant volumes.

1. Restart the V5 server running on the z/OS system.
2. Change the access state of DISK and FILE volumes from destroyed to READWRITE.

Reverting to the V5 server before volumes are deleted

If you completed all preparation steps for migration, but did not delete DISK or FILE volumes, you can revert to the V5 server by completing the following steps.

1. Restart the V5 server running on the z/OS system.
2. Change the access state of DISK and FILE volumes from destroyed to READWRITE.

Reverting to the V5 server after the V5 database is deleted

To revert to the V5 server system after you have deleted the database, you must restore the V5 database from its backup copies. After the database is recovered, it might be necessary to restore the contents of DISK and FILE volumes.

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

Tip: The **REUSEDELAY** parameter can be used to extend the amount of time one can wait before reverting to the original V5 server running on a z/OS system. To extend the amount of time, specify the **REUSEDELAY** parameter for all sequential storage pools during the preparation phase. Specify the parameter before the final database backup is made and before the migration begins.

For more information about setting the **REUSEDELAY** parameter, see "Modifying the server before the migration" on page 475.

Restriction: Files backed up or archived to the server after the server is migrated to the V6.3 or later system will be lost if the server is reverted to V5. You cannot use EXPORT or IMPORT commands to recover these files because V6.3 or later export data cannot be imported by a V5 server.

Steps for reverting to the previous server version

To revert to the previous server version, complete the following steps:

1. Back up the V6.3 or later 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 must revert to the V6.3 or later server.
2. Remove the database from the database manager, and 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 must 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 V6.3 or later server. Uninstallation removes the server and the database manager software with their directories.

   For details, see the section describing how to uninstall Tivoli Storage Manager in the *Installation Guide*.
4. Reinstall the version of the server program that you were using before the upgrade to V6.3 or later. 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 5.5.6.0 before the upgrade, and you intend to use the database backup that was in use on this server, you must install the V5.5.0.0 server program and then the V5.5.6.0 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 V6.3 or later.
b. Reinstall any fix packs that were installed on the base server version before the upgrade to V6.3 or later.

5. Copy the following files to the directory for server information:
   - Device configuration file
   - Volume history file
   - Server options file
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 by 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 V6.3 or later server, you must complete 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 is less than the age of the database that you restored, 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 by using the **AUDIT VOLUME** command, specifying 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 by using the V6.3 or later 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 V6.3 or later, you must recreate them.

    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 storage pools, enabled data deduplication for any FILE-type storage pools, or did both while your server was running as a V6.3 or later server, you must complete additional steps to revert the server to the previous version.

Use this information if you did either or both of the following actions while your server was running as a V6.3 or later server:

- You enabled data deduplication for any storage pools that existed before the upgrade to V6.3 or later. Data deduplication applies only to storage pools that use a FILE device type.
- You created primary storage pools after the upgrade, *and* moved data that had been stored in other storage pools into the new storage pools.

Complete these steps after the server is restored to V5.

- For each storage pool for which you enabled data deduplication, 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 V6.3 or later.
- 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 was probably reused. Therefore, you must restore the original, V5 storage pools by using the storage pool backups that were created before the upgrade to V6.3 or later.

    If *no* data was moved from V5 DISK-type storage pools into a new storage pool, 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 exist and be usable in storage pool volumes on the restored V5 server. The data might 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 V6.3 or later server. If any volumes were reclaimed while the server was running as a V6.3 or later server, restore those volumes from storage pool backups that were created before the upgrade to V6.3 or later.

Part 4. Appendixes

Appendix A. Utilities, scripts, and commands for server upgrade and migration

Utilities and commands are available to upgrade or migrate a V5 server to V6.3 or later. 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 V6.3. 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 V6.3 or later.

Syntax

```
                                                  ┌─ -k──Server1──┐
►►──DSMUPGRD──┬──────────┬──┬──────────────────────┼───────────────┼──QUERYDB──────►◄
              └─ -quiet──┘  └─ -o──options_file──┘  └─ -k──key_name─┘
```

Parameters

AIX HP-UX Linux Solaris z/OS **-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 database for upgrade to V6.3 or later. You must run this utility before using the **DSMUPGRD EXTRACTDB** utility.

Syntax

```
                                                   ┌─ -k──Server1──┐
►►──DSMUPGRD──┬──────────┬──┬──────────────────────┼───────────────┼──PREPAREDB──►
              └─ -quiet──┘  └─ -o──options_file──┘  └─ -k──key_name─┘

►─MEDIASERVER-=-media_server_name──────────────────────────────────────────────►◄
```

Parameters

AIX HP-UX Linux Solaris z/OS **-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.

z/OS **MEDIASERVER**
Specifies the name of the server to be used as the z/OS media server. The server must have been defined by using the **DEFINE SERVER** command before using the **DSMUPGRD PREPAREDB** utility.

Example

```
dsmupgrd preparedb
```

DELETE VOLHISTORY (Delete sequential volume history information)

z/OS

The **DELETE VOLHISTORY** command is used to delete volume history file records that are no longer needed (for example, records for obsolete database backup volumes). In a migration from z/OS to AIX or Linux on System z, issue this command on the V5 server to specify the device class of volumes that must be deleted to prepare for the migration.

When you delete records for volumes that are not in storage pools (for example, database backup or export volumes), the volumes return to scratch status even if IBM Tivoli Storage Manager acquired them as private volumes. Scratch volumes of device type FILE are deleted. When you delete the records for storage pool volumes, the volumes remain in the Tivoli Storage Manager database. When you delete records for recovery plan file objects from a source server, the objects on the target server are marked for deletion.

Use the **DELETE BACKUPSET** command to delete specified backup set volume information in the volume history file. Do not use this **DELETE VOLHISTORY** command to delete backup set volume information in the volume history file.

For users of DRM, the database backup expiration should be controlled with the **SET DRMDBBACKUPEXPIREDAYS** command instead of this **DELETE VOLHISTORY** command. Using the **DELETE VOLHISTORY** command removes the Tivoli Storage Manager record of the volume. This can cause volumes to be lost that were managed by the **MOVE DRMEDIA** command. The standard way to manage the automatic expiration of DRM database backup volumes is by using the **SET DRMDBBACKUPEXPIREDAYS** command.

The **DELETE VOLHISTORY** command can be used to specify the device class of volumes that are to be deleted for migration purposes. The command can be used before migration of a Tivoli Storage Manager V5 server running on z/OS to a V6 server running on AIX or Linux on System Z. The device class must have a device type of FILE, and can be specified only if the **ZMSPREPARE** parameter is set to YES.

Notes:

1. Volumes for the most recent database backup series are not deleted.
2. Existing volume history files are not automatically updated with this command.
3. You can use the **DEFINE SCHEDULE** command to periodically delete volume history records.

Privilege class

To issue this command, you must have system privilege.

Syntax

```
                                        ┌─TOTime──=──23:59:59─┐
►►──DELete VOLHistory──TODate──=──date──┤                     ├──────────────────►
                                        └─TOTime──=──time─────┘
```

```
►─Type──=──┬─All──────────────────────────────────────────────────────►
           ├─DBBackup──┬──────────────────────────┬──────────────────────
           │           └─DEVclass──=──class_name──┘
           ├─DBSnapshot──┬──────────────────────────┬────────────────────
           │             └─DEVclass──=──class_name──┘
           ├─DBDump──────────────────────────────────────────────────────
           ├─DBRpf───────────────────────────────────────────────────────
           ├─EXPort──────────────────────────────────────────────────────
           ├─RPFile──┬─DELETELatest──=──No──────────┬────────────────────
           │         └─DELETELatest──=──┬─No─┬─────┘
           │                            └─Yes┘
           ├─RPFSnapshot──┬─DELETELatest──=──No──────────┬──────────────
           │              └─DELETELatest──=──┬─No─┬─────┘
           │                                 └─Yes┘
           ├─STGNew──────────────────────────────────────────────────────
           ├─STGReuse────────────────────────────────────────────────────
           └─STGDelete───────────────────────────────────────────────────

►──┬──────────────────────────────────────────────────────────────────┬──►◄
   │                      ┌─No─┐                                      │
   └─ZMSPREPARE──=──┬─────┬─Yes──┘──DEVClass──=──class_name──────────┘
```

Parameters

TODate (Required)

Specifies the date to use to select sequential volume history information to be deleted. Tivoli Storage Manager deletes only those records with a date on or before the date you specify. You can specify the date by using one of the following values:

Value	Description	Example
MM/DD/YYYY	A specific date	01/23/1999
TODAY	The current date	TODAY
TODAY-*days* **or** -*days*	The current date minus days specified. The maximum number of days that you can specify is 9999.	TODAY–30 **or** –30. To delete records that are 30 or more days old, specify TODAY-30 or -30.

TOTime

Specifies that you want to delete records created on or before this time on the specified date. This parameter is optional. The default is the end of the day (23:59:59). You can specify the time by using one of the following values:

Value	Description	Example
HH:MM:SS	A specific time on the specified date	12:30:22
NOW	The current time on the specified date	NOW

Value	Description	Example
NOW+*HH:MM* **or** +*HH:MM*	The current time plus hours and minutes on the specified date	NOW+03:00 **or** +03:00. If you issue the **DELETE VOLHISTORY** command at 9:00 with TOTIME=NOW+03:00 or TOTIME=+03:00, Tivoli Storage Manager deletes records with a time of 12:00 or earlier on the specified date.
NOW-*HH:MM* **or** -*HH:MM*	The current time minus hours and minutes on the specified date	NOW-03:30 **or** -03:30. If you issue the **DELETE VOLHISTORY** command at 9:00 with TOTIME=NOW-3:30 or TOTIME=-3:30, Tivoli Storage Manager deletes records with a time of 5:30 or earlier on the specified date.

Type (Required)
Specifies the type of records, which also meet the date and time criteria, to delete from the volume history file. Possible values are:

All
Specifies to delete all records.

Note: The **DELETE VOLHISTORY** command does not delete records of remote volumes.

DBBackup
Specifies to delete only records that contain information about volumes used for database full and incremental backups, that is, with volume types of BACKUPFULL and BACKUPINCR, and that meet the specified date and time criteria. The latest database full and incremental backup series will not be deleted.

DEVclass=*class_name*
Specifies the device class name that was used to create the database backups. This optional parameter can be used to delete database backups created by using a server-to-server virtual volume device class. The type of the device class must be SERVER. This parameter can be used only to delete volume history entries of type BACKUPFULL, BACKUPINCR, or DBSNAPSHOT.

A full, incremental, or snapshot database backup volume is eligible to be deleted if all of the following conditions are met:

- The device class that was used to create the database backup volume matches the specified device class.
- The volume was created on or before the specified date and time.
- The volume is not part of the latest full plus incremental database backup series if the specified volume type is DBBackup, or snapshot database backup series if the volume type is DBSnapshot.

DBSnapshot
Specifies to delete only records that contain information about volumes used for snapshot database backups, and that meet the specified date and time criteria. The latest snapshot database backup will not be deleted.

DEVclass=*classname*

Specifies the device class name that was used to create the database backups. This optional parameter can be used to delete database backups created by using a server-to-server virtual volume device class. The type of the device class must be SERVER. This parameter can be used only to delete volume history entries of type BACKUPFULL, BACKUPINCR, or DBSNAPSHOT.

A full, incremental, or snapshot database backup volume is eligible to be deleted if all of the following conditions are met:

- The device class that was used to create the database backup volume matches the specified device class.
- The volume was created on or before the specified date and time.
- The volume is not part of the latest full plus incremental database backup series if the specified volume type is DBBackup, or snapshot database backup series if the volume type is DBSnapshot.

DBRpf

Specifies to delete only records that contain information about full and incremental database backup volumes and recovery plan file volumes.

EXPort

Specifies to delete only records that contain information about export volumes.

RPFile

Specifies to delete only records that contain information about recovery plan file objects that are stored on a target server and that meet the specified date and time criteria.

DELETELatest

Specifies whether the latest recovery plan file is eligible for deletion. This optional parameter can be used to delete the latest recovery plan files created by using a server-to-server virtual volume device class.

This parameter can be used only to delete volume history entries of type RPFILE (for instance, those recovery plan files that were created by using the **DEVCLASS** parameter with the **PREPARE**command). If this parameter is not specified, the latest RPFILE entries are not deleted.

No Specifies that the latest RPFILE file is not deleted.

Yes Specifies that the latest RPFILE file is deleted if it meets the specified date and time criteria.

RPFSnapshot

Specifies to delete only records that contain information about recovery plan file objects that were created assuming snapshot database backups, that are stored on a target server, and that meet the specified date and time criteria. The latest RPFSNAPSHOT file will not be deleted unless it meets the specified date and time criteria, and the **DELETELATEST** parameter is set to Yes.

DELETELatest

Specifies whether the latest recovery plan file is eligible for deletion. This optional parameter can be used to delete the latest recovery plan files created by using a server-to-server virtual volume device class.

This parameter can be used only to delete volume history entries of type RPFSNAPSHOT (for instance, those recovery plan files that were

created by using the **DEVCLASS** parameter with the **PREPARE** command). If this parameter is not specified, the latest RPFSNAPSHOT entries are not deleted.

No Specifies that the latest `RPFSNAPSHOT` file is not deleted.

Yes Specifies that the latest `RPFSNAPSHOT` file is deleted if it meets the specified date and time criteria.

STGNew
Specifies to delete only records that contain information about new sequential access storage volumes.

STGReuse
Specifies to delete only records that contain information about reused sequential storage pool volumes.

STGDelete
Specifies to delete only records that contain information about deleted sequential storage pool volumes.

ZMSPREPARE
Specifies whether the **DELETE VOLHISTORY** command is being used to delete sequential volumes that are stored in a FILE device class. The deletion takes place before migrating a Tivoli Storage Manager V5 server that is running on z/OS to a V6 server that is running on AIX or Linux on System z.

No Specifies that the **DELETE VOLHISTORY** command is not being used to prepare for a migration. This is the default value.

Yes
Specifies that the **DELETE VOLHISTORY** command is being used to prepare for a migration.

DEVclass=*class_name*
Specifies the device class name that was used to create the volumes that are being deleted. The device class type must be FILE.

Example: Delete recovery plan file information

Delete all recovery plan file information created on or before 03/28/2005.

```
delete volhistory type=rpfile todate=03/28/2005
```

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 6.3 or later 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

```
►►─DSMUPGRD─┬──────────┬─┬──────────────────────┬─┬─────────────┬─EXTRACTDB──►
            └─ -quiet ─┘ └─ -o─options_file─────┘ │ ┌─ -k─Server1─┐ │
                                                 │ └─ -k─key_name─┘ │

►─┬─ A:  Extract to media ─┬──────────────────────────────────────────►
  └─ B:  Extract and transmit by using a network ─┘

  ┌─EVentbasedused─=─Yes──┐
►─┤                       ├──────────────────────────────────────────►◄
  └─EVentbasedused─=─Never─┘
```

A: Extract to media:

```
├─DEVclass─=─device_class_name─MANifest─=─file_name──────────────────►

  ┌─SCRatch─=─Yes──────┐
►─┤                    ├──┬──────────────────────────────────────────┤
  └─SCRatch─=─┬─Yes─┬──┘  │                  ┌─,──────────────┐
              └─No─┘      │ (1)              ▼                │
                          └─────VOLumenames─=─────volume_name─┘
```

B: Extract and transmit by 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 z/OS **-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.

Restriction: z/OS For a Tivoli Storage Manager server running on a z/OS system, you cannot use a device class with a device type of FILE.

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 supports 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 numeric IP address or the domain name of the V6.3 or later server. This parameter is required if you want to extract and simultaneously transmit the data to the V6.3 or later server by using the network.

If the V5 server and the V6.3 or later server are on the same system, you can specify `localhost`.

LLAddress
Specifies the low-level address of the V6.3 or later server. This address is the same as the value that is specified with the `TCPPORT` server option for the V6.3 or later server. This parameter is required if you want to extract and simultaneously transmit the data to the V6.3 or later server by using the network.

Examples

Extract and transmit the data to a server by 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 to media, the **DSMUPGRD** utility creates a manifest file. The manifest file contains information about the volumes and device classes 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 V6.3 or later server. You specify the name of the manifest file when you run the **DSMSERV INSERTDB** utility.

AIX HP-UX Linux Solaris Windows In the manifest file, the device configuration section contains information about the configuration settings of the source server device. You might need to edit settings, such as device names and drive element numbers, before you use the manifest file with the **DSMSERV INSERTDB** utility, especially if the utility is run on a different system.

A manifest file has content that is similar to the following example:

```
* Version 2 manifest file for EXTRACTDB
DEVCLASS=3584L2
STREAMS=1
VOLUMENAMES000=L12345
* Device Configuration Information
DEFINE DEVCLASS 3584L2 DEVTYPE=LTO FORMAT=DRIVE MOUNTLIMIT=DRIVES MOUNTWAIT=60
MOUNTRETENTION=60 PREFIX=ADSM LIBRARY=3584L2 WORM=NO DRIVEENCRYPTION=ALLOW
SET SERVERNAME MOKSHA
DEFINE LIBRARY 3584L2 LIBTYPE=SCSI SERIAL="00000002267304AB" SHARED=YES
AUTOLABEL=YES RESETDRIVE=YES
DEFINE DRIVE 3584L2 3584L2_DRV1 ELEMENT=265 ONLINE=Yes WWN="500507630F18BA09"
SERIAL="0007859130"
DEFINE PATH MOKSHA 3584L2 SRCTYPE=SERVER DESTTYPE=LIBRARY DEVICE=/dev/IBMchanger5 ONLINE=YES
DEFINE PATH MOKSHA 3584L2_DRV1 SRCTYPE=SERVER DESTTYPE=DRIVE LIBRARY=3584L2 DEVICE=/dev/IBMtape20 ONLINE=YES
```

z/OS The device configuration section contains device configuration information for the source server. Device configuration statements are based on definitions from the source server, but the statements are transformed into the

format required by a server running on AIX or Linux on System z. The device configuration section is set up to use a z/OS media server for media access.

A manifest file for an upgrade to an AIX system has content similar to the following example:

```
* Version 2 manifest file for EXTRACTDB
DEVCLASS=TAPE3592
STREAMS=1
VOLUMENAMES000=JJY010
/* Device Configuration */
DEFINE LIBRARY CARTRIDGE LIBTYPE=ZOSMEDIA
DEFINE DEVCLASS CARTRIDGE DEVTYPE=Cartridge ESTCAPACITY=184320K PREFIX=ADSM
MOUNTLIMIT=5 MOUNTRETENTION=60 MOUNTWAIT=60 UNIT=B81M5C36 COMPRESSION=Yes
PROTECTION=No LIBRARY=CARTRIDGE
DEFINE PATH TUCMVSTT-TSM CARTRIDGE SRCTYPE=SERVER DESTTYPE=LIBRARY
ZOSMEDIASERVER=TUCMVSTT ONLINE=YES
DEFINE DEVCLASS COPYFILEDEV DEVTYPE=File MAXCAPACITY=3144704K PREFIX=SVTSMS1
MOUNTLIMIT=20
DEFINE LIBRARY ECARTRIDGE LIBTYPE=ZOSMEDIA
DEFINE DEVCLASS ECARTRIDGE DEVTYPE=ECartridge ESTCAPACITY=9437184K
PREFIX=ADSM MOUNTLIMIT=2 MOUNTRETENTION=60 MOUNTWAIT=60 UNIT=3590
PROTECTION=No FORMAT=9840-C LIBRARY=ECARTRIDGE
DEFINE PATH TUCMVSTT-TSM ECARTRIDGE SRCTYPE=SERVER DESTTYPE=LIBRARY
ZOSMEDIASERVER=TUCMVSTT ONLINE=YES
DEFINE DEVCLASS FILE DEVTYPE=File MAXCAPACITY=2097152K PREFIX=SVTSMS1
MOUNTLIMIT=20
DEFINE DEVCLASS FROM-POMPEII2-VV DEVTYPE=File MAXCAPACITY=3144704K
PREFIX=SVTSMS1 MOUNTLIMIT=20
DEFINE DEVCLASS POMPEII2-VV DEVTYPE=Server SERVERNAME=POMPEII2
MAXCAPACITY=512000K PREFIX=ADSM MOUNTLIMIT=3 RETRYPERIOD=10 RETRYINTERVAL=30
DEFINE LIBRARY TAPE3592 LIBTYPE=ZOSMEDIA
DEFINE DEVCLASS TAPE3592 DEVTYPE=3592 ESTCAPACITY=314572800K
PREFIX=ADSM MOUNTLIMIT=2 MOUNTRETENTION=5 MOUNTWAIT=5 UNIT=C06M7N03
WORM=No PROTECTION=No RETENTION=30 FORMAT=Drive LIBRARY=TAPE3592
DEFINE PATH TUCMVSTT-TSM TAPE3592 SRCTYPE=SERVER DESTTYPE=LIBRARY
ZOSMEDIASERVER=TUCMVSTT ONLINE=YES
DEFINE LIBRARY 3590 LIBTYPE=ZOSMEDIA
DEFINE DEVCLASS 3590 DEVTYPE=3590 ESTCAPACITY=9437184K PREFIX=ADSM
MOUNTLIMIT=2 MOUNTRETENTION=60 MOUNTWAIT=60 UNIT=3590 COMPRESSION=Yes
PROTECTION=No LIBRARY=3590
DEFINE PATH TUCMVSTT-TSM 3590 SRCTYPE=SERVER DESTTYPE=LIBRARY
ZOSMEDIASERVER=TUCMVSTT ONLINE=YES
DEFINE SERVER POMPEII2 COMMMETHOD=TCPIP HLADDRESS=9.11.124.164
LLADDRESS=1500  NODENAME=TUCMVSTT-TSM PASSWORD=188b4fe70a44686c84d0dfd44b
SERVERPASSWORD=18589b55e788df53d5
DEFINE SERVER PURGE COMMMETHOD=TCPIP HLADDRESS=9.11.124.228 LLADDRESS=1500
SERVERPASSWORD=180fb66e028d
DEFINE SERVER STA_PURGE COMMMETHOD=TCPIP HLADDRESS=9.11.124.228 LLADDRESS=1502
SERVERPASSWORD=18909a64694f303df677
DEFINE SERVER TUCMVSTT COMMMETHOD=TCPIP HLADDRESS=9.11.92.49 LLADDRESS=1559
SERVERPASSWORD=187a747f70fff04180
SET SERVERNAME TUCMVSTT-TSM
SET SERVERPASSWORD 1891a1cefdcaf489d86c66af54
```

A manifest file for an upgrade to a Linux on System z system has content similar to the following example:

```
* Version 2 manifest file for EXTRACTDB
DEVCLASS=TAPE3490
STREAMS=1
VOLUMENAMES000=D71124,D71121,D71126
/* Device Configuration */
DEFINE LIBRARY CARTRIDGE LIBTYPE=ZOSMEDIA
DEFINE DEVCLASS CARTRIDGE DEVTYPE=Cartridge ESTCAPACITY=184320K PREFIX=ADSM
MOUNTLIMIT=2 MOUNTRETENTION=60 MOUNTWAIT=60 UNIT=3480 COMPRESSION=Yes
PROTECTION=No LIBRARY=CARTRIDGE
DEFINE PATH MVSTS CARTRIDGE SRCTYPE=SERVER DESTTYPE=LIBRARY
ZOSMEDIASERVER=TUCMVSTS ONLINE=YES
DEFINE LIBRARY ECARTRIDGE LIBTYPE=ZOSMEDIA
DEFINE DEVCLASS ECARTRIDGE DEVTYPE=ECartridge ESTCAPACITY=9437184K
PREFIX=ADSM MOUNTLIMIT=2 MOUNTRETENTION=60 MOUNTWAIT=60 UNIT=3590
PROTECTION=No FORMAT=9840-C LIBRARY=ECARTRIDGE
DEFINE PATH MVSTS ECARTRIDGE SRCTYPE=SERVER DESTTYPE=LIBRARY
ZOSMEDIASERVER=TUCMVSTS ONLINE=YES
DEFINE DEVCLASS FILE DEVTYPE=File MAXCAPACITY=2097152K PREFIX=SVTSMS2
MOUNTLIMIT=150
DEFINE DEVCLASS FROM-MVSTT DEVTYPE=File MAXCAPACITY=2097152K PREFIX=SVTSMS2
MOUNTLIMIT=100
DEFINE DEVCLASS LONGFN DEVTYPE=File MAXCAPACITY=204800K PREFIX=SVTSMS2
MOUNTLIMIT=20
DEFINE LIBRARY TAPE3490 LIBTYPE=ZOSMEDIA
DEFINE DEVCLASS TAPE3490 DEVTYPE=Cartridge ESTCAPACITY=184320K PREFIX=ADSM
MOUNTLIMIT=200 MOUNTRETENTION=60 MOUNTWAIT=60 UNIT=B81M4C36 COMPRESSION=Yes
PROTECTION=No RETENTION=60 LIBRARY=TAPE3490
DEFINE PATH MVSTS TAPE3490 SRCTYPE=SERVER DESTTYPE=LIBRARY
ZOSMEDIASERVER=TUCMVSTS ONLINE=YES
DEFINE LIBRARY TAPE3592 LIBTYPE=ZOSMEDIA
DEFINE DEVCLASS TAPE3592 DEVTYPE=3592 ESTCAPACITY=314572800K PREFIX=ADSM
MOUNTLIMIT=5 MOUNTRETENTION=2 MOUNTWAIT=60 UNIT=C06M7N03 WORM=No
PROTECTION=No FORMAT=Drive LIBRARY=TAPE3592
DEFINE PATH MVSTS TAPE3592 SRCTYPE=SERVER DESTTYPE=LIBRARY
ZOSMEDIASERVER=TUCMVSTS ONLINE=YES
DEFINE DEVCLASS TO-MVSTT DEVTYPE=Server SERVERNAME=TUCMVSTT
MAXCAPACITY=2097152K PREFIX=ADSM MOUNTLIMIT=50 RETRYPERIOD=10 RETRYINTERVAL=30
DEFINE LIBRARY 3590 LIBTYPE=ZOSMEDIA
DEFINE DEVCLASS 3590 DEVTYPE=3590 ESTCAPACITY=9437184K PREFIX=ADSM MOUNTLIMIT=2
MOUNTRETENTION=60 MOUNTWAIT=60 UNIT=3590 COMPRESSION=Yes PROTECTION=No LIBRARY=3590
DEFINE PATH MVSTS 3590 SRCTYPE=SERVER DESTTYPE=LIBRARY ZOSMEDIASERVER=TUCMVSTS
ONLINE=YES
```

```
DEFINE LIBRARY 3592 LIBTYPE=ZOSMEDIA
DEFINE DEVCLASS 3592 DEVTYPE=3592 ESTCAPACITY=314572800K PREFIX=ADSM
MOUNTLIMIT=2 MOUNTRETENTION=60 MOUNTWAIT=60 UNIT=C06M5N03 WORM=No
PROTECTION=No FORMAT=Drive LIBRARY=3592
DEFINE PATH MVSTS 3592 SRCTYPE=SERVER DESTTYPE=LIBRARY ZOSMEDIASERVER=TUCMVSTS
ONLINE=YES
DEFINE LIBRARY 3592LANFREE LIBTYPE=ZOSMEDIA
DEFINE DEVCLASS 3592LANFREE DEVTYPE=3592 ESTCAPACITY=314572800K PREFIX=ADSM
MOUNTLIMIT=1 MOUNTRETENTION=60 MOUNTWAIT=60 UNIT=C06M7N03 WORM=No
PROTECTION=No FORMAT=Drive LIBRARY=3592LANFREE
DEFINE PATH MVSTS 3592LANFREE SRCTYPE=SERVER DESTTYPE=LIBRARY
ZOSMEDIASERVER=TUCMVSTS ONLINE=YES
DEFINE SERVER PURGE COMMMETHOD=TCPIP HLADDRESS=purge.storage.tucson.ibm.com
LLADDRESS=1500  SERVERPASSWORD=180fb66e028d
DEFINE SERVER STA_PURGE COMMMETHOD=TCPIP HLADDRESS=purge.storage.tucson.ibm.com
LLADDRESS=1502  SERVERPASSWORD=18909a64694f303df677
DEFINE SERVER TUCMVSTS COMMMETHOD=TCPIP HLADDRESS=9.11.92.48 LLADDRESS=2556
SERVERPASSWORD=184feb8740bb139271
DEFINE SERVER TUCMVSTT COMMMETHOD=TCPIP HLADDRESS=tucmvstt.storage.tucson.ibm.com
LLADDRESS=2533  NODENAME=MVSTS PASSWORD=18bf4d36c185
SET SERVERNAME MVSTS
```

Related reference:

"DSMUPGRD EXTRACTDB (Extract data from a V5 server database)" on page 519

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 z/OS **-quiet**
Specifies that messages to the console are suppressed. This parameter is optional.

AIX HP-UX Linux Solaris Windows z/OS **-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 z/OS **-quiet**

Specifies that messages to the console are suppressed. This parameter is optional.

AIX HP-UX Linux Solaris Windows z/OS **-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 V6.3 or later 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 V6.3 or later.

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 to format an empty database on the V6.3 or later server in preparation for inserting data from an extracted V5 database.

Set the DB2CODEPAGE system environment variable to 819 for each server instance. Before you issue the **DSMSERV LOADFORMAT** command, log on to the system as the server instance owner and issue this command:

```
db2set -i instance_name DB2CODEPAGE=819
```

For example: AIX HP-UX Linux Solaris

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

Windows

```
db2set -i server1 DB2CODEPAGE=819
```

AIX HP-UX Linux Solaris Windows

Syntax

```
►►─DSMSERV─┬──────────────────┬─┬──────────────────┬─┬─────────────┬─┬─────────────┬─►
           └─ -u─user_name────┘ └─ -i─instance_dir─┘ │ ┌─ -k─Server1─┐ │
                                                      └─ -k─key_name─┘

►─┬──────────────────┬─┬──────────────┬─┬──────────┬─LOADFORMAT──────────────────►
  └─ -o─options_file─┘ └─ -noexpire───┘ └─ -quiet──┘

                  ┌─,──────────┐
►─┬─DBDir──=──────┴─directory──┬─┬─┬─ACTIVELOGSize──=──16384──────┬─┬──────────────►
  └─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 directory 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 by 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 131,072 MB (128 GB). If you specify an odd number, the value is rounded up to the next even number. The default is 16384 MB.

ACTIVELOGDirectory (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 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.

ARCHLogdirectory (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.

ARCHFailoverlogdirectory
Specifies the directory to be used as an alternative storage location if the ARCHLOGDIRECTORY directory is full. This parameter is optional. The maximum number of characters is 175.

MIRRorlogdirectory
Specifies the directory in which the server mirrors the active log (those files in the ACTIVELOGDIRECTORY 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 Linux

```
dsmserv format dbdir=/tsmdb001 activelogsize=8192
activelogdir=/activelog archlogdir=/archlog
archfailoverlogdir=/archfaillog mirrorlogdir=/mirrorlog
```

DSMSERV INSERTDB (Move a server database into an empty database)

Use the **DSMSERV INSERTDB** utility to move a server database into a new V6.3 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 two servers. The database can also be inserted from media that contains the extracted database.

Tip: AIX If the server is installed on an AIX Version 6.1 operating system, to improve system performance, consider selecting the time zone specification that is associated with the Portable Operating System Interface (POSIX). The alternative time zone specification, based on the Olson database, might affect system performance. For information about setting time zone specifications, see the documentation for the AIX operating system. If the server is installed on AIX Version 7.1, this issue does not occur.

Before you use the **DSMSERV INSERTDB** utility, complete the planning and preparation tasks, such as backing up the database and saving configuration information. Ensure that you meet all requirements before you move the server database. For planning and preparation information, see the upgrade or migration procedure for your operating system.

Requirements for insertion by 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.
- If the manifest file does not contain device configuration information, or if you are specifying the **CONFIGINFO=DEVCONFIG** parameter, both of the following statements must be true:
  - 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 V6.3 server. Also, the permissions must be set to grant access to the media for the user ID that owns the V6.3 server instance.

Syntax

```
>>-DSMSERV------------------------------------------------------------------------------------>
                                                                   .-k--Server1-.
            .-u--user_name-.  .-i--instance_dir-.  .-k--key_name-.

>-----------------------------------------------------------------------------INSERTDB-------->
   .-o--options_file-.  .-noexpire-.  .-quiet-.

                                                 .-PREview--=--No-------.
>-.-A:  Insert from media-.-.-------------------.-.-------------------.-.-------------------><
  '-B:  Insert over a network-'                 '-PREview--=--.-Yes-.-'
                                                              '-No--'
```

A: Insert from media:

```
                                        ┌─CONFiginfo──=──MANifest──────┐
├──┬──────────────────────────────────┬──┤                              ├──────────────►
   └─DEVclass──=──device_class_name──┘  └─CONFiginfo──=──┬─MANifest──┬─┘
                                                         └─DEVconfig─┘

►─MANifest──=──file_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 directory 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 either the manifest file or the device configuration file.

This parameter is optional and is used only when the database that you want to insert into the empty V6.3 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 V6.3 database was extracted to media.

CONFiginfo
Specifies the source of the device configuration information that is used by the **DSMSERV INSERTDB** operation. The default value for this parameter is **MANIFEST**. Possible values are as follows:

MANifest
Specifies that device configuration information is read from the manifest file. If the manifest file does not have device configuration information, the device configuration file is used instead.

DEVConfig
Specifies that device configuration information is read from the device configuration file.

SESSWait
Specifies the number of minutes that the V6.3 server waits to be contacted by the original server. The default value is 60 minutes.

Use this parameter only if the data that is inserted into the empty V6.3 database is transmitted from the source server with 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.

ZMSPREPARE (Prepare a server on a z/OS system for migration)

z/OS

Use the **ZMSPREPARE** command to view information about data that must be backed up from disk to tape to prepare to migrate the server to the z/OS media server.

The **ZMSPREPARE** command also reports on the following items:

- Copy and active-data storage pools that must be deleted or marked as destroyed
- Sequential volumes that are recorded in the volume history and that are located on FILE storage, but not including storage pool volumes
- Backup sets that are located on FILE storage
- Invalid device classes
- Server options that require an update
- Date and time of the most recent Tivoli Storage Manager server database backup

This command can be issued only on a z/OS server.

Privilege class

Any administrator can issue this command.

Syntax

```
                 ┌─STGpool──=──*──────────┐   ┌─Format──=──Standard──────┐
►►──ZMSPRepare───┤                        ├───┤                          ├──────────────────►◄
                 └─STGpool──=──pool_name──┘   └─Format──=──┬─Standard─┬─┘
                                                           └─Detailed─┘
```

Parameters

STGpool
Specifies the storage pools to be listed.

Format
Specifies the format of the output. The following values are possible:

Standard
Specifies that summary data is displayed.

Detailed
Specifies that detailed data is displayed.

Example: View data for all storage pools in standard format

View data for all storage pools in standard format. Issue the following command:

```
zmsprepare stgpool=* Format=Standard
```

```
Disk-based Storage Pools...
Storage        Storage        Device         Estimated      Pct      Volumes
Pool Name      Pool Type      Class Name      Capacity     Util    not mark-
                                                                    ed destr-
                                                                         oyed
-----------    -----------    ----------    ----------    -----    ---------
ARCHIVEPOOL    Primary        DISK              0.0 M      0.0            0
BACKUPPOOL     Primary        DISK             12.0 M      0.0            1
HFSPOOL        Primary        HFSCLASS          0.0 M      0.0            2
SPACEMGPOOL    Primary        DISK              0.0 M      0.0            0


**************************************************
No FILE device type Backup Sets found.
**************************************************
Sequential volumes with a device type of FILE...
Date/Time            Volume Type    Device Class Volume Name
-------------------- -------------- ------------ ------------------------------
04/22/2011 13:20:09  BACKUPFULL     FILE         USER3.S3503609.DBB
04/22/2011 13:20:30  EXPORT         FILE         USER3.S3503630.EXP
**************************************************
Server options file conversion guidance.
 ( Yes/No/Consult documentation )
Line     Option           Include in V6 server       Include in media server
Number                    options file?              options file?
------   --------------   ------------------------   ------------------------
19       COMMOPENTIMEO-   No                     No
          UT
24       COMMMETHOD       Yes                        No
104      TCPNAME          No                         Yes
109      DELETIONEXIT     No                         No
137      VOLUMEHISTORY    Consult                    No
163      DEVCONFIG        Consult                    No
167      TCPPORT          Consult                    Consult
**************************************************

     Last
 Complete
   Backup
Date/Time
03/15/11 15:51:21
```

Example: View data for all storage pools in detailed format

View data for all storage pools in detailed format. Issue the following command:

```
zmsprepare stgpool=* Format=Detailed
```

The output is similar to that of the previous example, except for the storage pool section, which includes a list of any volumes not marked DELETED:

```
Disk-based Storage Pools...
           Storage Pool Name: ARCHIVEPOOL
           Storage Pool Type: Primary
           Device Class Name: DISK
          Estimated Capacity: 0.0 M
                    Pct Util: 0.0
Volumes not marked destroyed: 0
          Copy Storage Pools:
                 Volume Name:

           Storage Pool Name: BACKUPPOOL
           Storage Pool Type: Primary
           Device Class Name: DISK
          Estimated Capacity: 12.0 M
                    Pct Util: 0.0
Volumes not marked destroyed: 1
          Copy Storage Pools:
                 Volume Name: STGVOL1 Read/Write

           Storage Pool Name: HFSPOOL
           Storage Pool Type: Primary
           Device Class Name: HFSCLASS
          Estimated Capacity: 0.0 M
                    Pct Util: 0.0
Volumes not marked destroyed: 2
          Copy Storage Pools:
                 Volume Name: /u/tsm/tsm1/hfsvol1 Read/Write
                               /u/tsm/tsm2/hfsvol2 Read/Write

           Storage Pool Name: SPACEMGPOOL
           Storage Pool Type: Primary
           Device Class Name: DISK
          Estimated Capacity: 0.0 M
                    Pct Util: 0.0
Volumes not marked destroyed: 0
          Copy Storage Pools:
                 Volume Name:
```

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 B. Installing server language packages

AIX HP-UX Linux Solaris Windows

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

Server language locales

Use either the default language package option or select another language package to display server messages and help.

AIX HP-UX Linux Solaris This language package is automatically installed for the following default language option for Tivoli Storage Manager server messages and help:

- AIX LANGUAGE en_US
- HP-UX LANGUAGE AMENG

  The following system locale must be installed on the system when you use LANGUAGE AMENG:

  HP-UX en_US.iso88591
- Linux LANGUAGE en_US
- LANGUAGE AMENG

  Solaris The following system locale must be installed on the system when you use LANGUAGE AMENG:

  Solaris en_US

Windows This language package is automatically installed for the following default language option for Tivoli Storage Manager server messages and help: LANGUAGE AMENG.

For languages or locales other than the default, install the language package that your installation requires.

You can use the languages shown: AIX

Table 85. 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

Table 85. Server languages for AIX (continued)

Language	LANGUAGE option value
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
Notes: • The system must have en_US environment support installed. • For more information about setting the LANGUAGE option, see the *Administrator's Reference*.	

HP-UX

Table 86. 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	AMENG (default)
	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

Table 86. Server languages for HP-UX (continued)

Language	LANGUAGE option value
Korean	ko_KR.eucKR
	ko_KR.utf8
Portuguese, Brazilian	pt_PT.iso88591
	pt_PT.utf8
Russian	ru_RU.iso88595
	ru_RU.utf8
Spanish	es_ES.iso88591
	es_ES.utf8
Notes: For more information about setting the LANGUAGE option, see the *Administrator's Reference*.	

Linux

Table 87. 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
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
Notes: For more information about setting the LANGUAGE option, see the *Administrator's Reference*.	

Solaris

Table 88. 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	AMENG (default)
	en_US.UTF-8
French	fr_FR.ISO8859-1
	fr_FR.UTF-8
German	de_DE.ISO8859-1
	de_DE.UTF-8
Italian	it_IT.ISO8859-1
	it_IT.UTF-8
Japanese	ja
	ja_JP.UTF-8
Korean	ko
	ko_KR.UTF-8
Portuguese, Brazilian	pt_BR.ISO8859-1
	pt_BR.UTF-8
Russian	ru_RU.ISO8859-5
	ru_RU.UTF-8
Spanish	es_ES.ISO8859-1
	es_ES.UTF-8
Notes: • LANGUAGE AMENG requires system locale en_US. • For more information about setting the LANGUAGE option, see the *Administrator's Reference*.	

Windows

Table 89. Server languages for Windows

Language	LANGUAGE option value
Chinese, Simplified	chs
Chinese, Traditional	cht
English	ameng
French	fra
German	deu
Italian	ita
Japanese (Shift-JIS)	jpn
Korean	kor

Table 89. Server languages for Windows (continued)

Language	LANGUAGE option value
Portuguese, Brazilian	ptb
Russian	rus
Spanish	esp
Notes: For more information about setting the LANGUAGE option, see the *Administrator's Reference*.	

Restriction: AIX Linux Solaris Windows For Administration Center users, some characters might not be displayed 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.

Configuring a language package

After you configure a language package, messages and help are shown on the Tivoli Storage Manager in languages other than US English. Installation packages are provided with Tivoli Storage Manager.

AIX HP-UX Linux Solaris To set support for a certain 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 "Server language locales" on page 537.

  HP-UX To use the `it_IT.iso88591` locale, set the `LANGUAGE` option to `it_IT.iso88591`. See "Server language locales" on page 537.

  Solaris To use the `it_IT.ISO8859-1` locale, set the `LANGUAGE` option to `it_IT.ISO8859-1`. See "Server language locales" on page 537.

- 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 value:

  ```
  export LC_MESSAGES=it_IT
  ```

Windows Set the LANGUAGE option in the server options file to the name of the locale that you want to use. For example: to use the `ita` locale, set the LANGUAGE option to `ita`. See "Server language locales" on page 537.

If the locale is successfully initialized, it formats the date, time, and number for the server. If the locale is not successfully initialized, the server uses the US English message files and the date, time, and number format.

Appendix C. HP-UX system resource requirements

HP-UX

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

HP-UX

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 544 for details.

Estimating required process resources

HP-UX

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

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

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

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

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

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

Estimating required number of threads per process

HP-UX

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

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

See “Viewing and modifying the kernel configuration” for details.

Viewing and modifying the kernel configuration

HP-UX

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

Start either SAM or SMH, then select:

1. Kernel Configuration
2. Configurable Parameters

A list of parameters, whose values you can change, is displayed. The list includes:

- **semmns** The maximum number of semaphores
- **shmmax** The maximum amount of available shared memory
- **nproc** The maximum number of processes
- **max_thread_proc** The maximum number of threads allowed in each process

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

Appendix D. Using 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. Then, 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.

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

For more information, 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 does 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 the `/usr` directory. In order to install Tivoli Storage Manager Version 6.3 or later to a local zone on the Solaris platform, the zone must be configured with write access to the `/usr` directory.

To create a basic local zone with write access to the `/usr` directory, complete the following procedure.

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 6.3 or later, 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 by using the same process to install and run them in global zones.

Appendix E. 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.

Servers upgraded from V6.1.0 or V6.1.1: On a system that is running the Tivoli Storage Manager V6.1.0 or V6.1.1 server program, an additional service named `DB2 - DB2TSM1 - DB2TSM-0` is displayed in the list of services. When the V6.1.0 or V6.1.1 server program is upgraded to a later version, that service is renamed to `DB2 - DB2TSM1 - DB2TSM`. This service does not affect the operation of the Tivoli Storage Manager server instances that you configure. `DB2TSM` is a nonfunctional DB2 instance.

Appendix F. Accessibility features for the Tivoli Storage Manager product family

Accessibility features help users who have a disability, such as restricted mobility or limited vision, to use information technology products successfully.

Accessibility features

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

- 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

If you install the IBM Tivoli Storage Manager Operations Center in console mode, the installation is fully accessible.

The accessibility features of the Operations Center are fully supported only in the Mozilla Firefox browser that is running on a Windows system.

The Tivoli Storage Manager Information Center, and its related publications, are accessibility-enabled. For information about the accessibility features of the information center, see the following topic: http://pic.dhe.ibm.com/infocenter/tsminfo/v6r3/topic/com.ibm.help.ic.doc/iehs36_accessibility.html.

Keyboard navigation

On Windows, the Tivoli Storage Manager product family follows Microsoft conventions for all keyboard navigation and access. Drag and Drop support is managed by using the Microsoft Windows Accessibility option known as *MouseKeys*. For more information about MouseKeys and other Windows accessibility options, see the Windows online help, citing the keyword "MouseKeys".

On other operating systems, these products follow the operating-system conventions for keyboard navigation and access.

Vendor software

The Tivoli Storage Manager product family 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.

IBM and accessibility

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

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Glossary

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

You can view the glossary in the Tivoli Storage Manager information center at http://pic.dhe.ibm.com/infocenter/tsminfo/v6r3.

To view glossaries for other IBM products, see http://www.ibm.com/software/globalization/terminology/.

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