Note

Before using this information and the product it supports, read the general information under Appendix S, "Notices," on page 229.

This edition applies to version 6, release 3, of IBM Tivoli Directory Server and to all subsequent releases and modifications until otherwise indicated in new editions.

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About this book

IBM® Tivoli® Directory Server (also referred to as Tivoli Directory Server) is the IBM implementation of Lightweight Directory Access Protocol for supported Windows®, AIX®, Linux® (System x®, System z®, System p®, and System i®), Solaris, and Hewlett-Packard UNIX® (HP-UX) (Itanium) operating systems.

*IBM Tivoli Directory Server version 6.3 Installation and Configuration Guide* describes how to install, configure, and uninstall Tivoli Directory Server version 6.3, and how to upgrade to the 6.3 version from previous releases of the product. For detailed information about supported operating system versions, as well as other required software and hardware, see *IBM Tivoli Directory Server version 6.3 System Requirements*.

Intended audience for this book

This book is for administrators who will install and configure Tivoli Directory Server version 6.3.

Readers need to know how to use the operating system on which Tivoli Directory Server will be installed.

Publications

This section lists publications in the IBM Tivoli Directory Server version 6.3 library and related documents. The section also describes how to access Tivoli publications online and how to order Tivoli publications.

**IBM Tivoli Directory Server version 6.3 library**

The following documents are available in the IBM Tivoli Directory Server version 6.3 library:

- *IBM Tivoli Directory Server Version 6.3 What is New for This Release*, GC27-2746-00
  Provides information about the new features in the IBM Tivoli Directory Server Version 6.3 release.

- *IBM Tivoli Directory Server Version 6.3 Quick Start Guide*, GI11-9351-00
  Provides help for getting started with IBM Tivoli Directory Server 6.3. Includes a short product description and architecture diagram, as well as a pointer to the product Information Center and installation instructions.

  Contains the minimum hardware and software requirements for installing and using IBM Tivoli Directory Server 6.3 and its related software. Also lists the supported versions of corequisite products such as DB2® and GSKit.

  Contains complete information for installing, configuring, and uninstalling IBM Tivoli Directory Server. Includes information about upgrading from a previous version of IBM Tivoli Directory Server.

  Contains instructions for performing administrator tasks through the Web Administration Tool and the command line.
Related publications

The following documents also provide useful information:

  IBM Tivoli Directory Server Version 6.3 uses the Java Naming and Directory Interface (JNDI) client from Sun Microsystems. See this document for information about the JNDI client.

Accessing terminology online

The IBM Terminology Web site consolidates the terminology from IBM product libraries in one convenient location. You can access the Terminology Web site at the following Web address:


Accessing publications online

IBM posts publications for this and all other Tivoli products, as they become available and whenever they are updated, to the Tivoli Information Center Web site at [http://publib.boulder.ibm.com/tividd/td/link/tdprodlist.html](http://publib.boulder.ibm.com/tividd/td/link/tdprodlist.html)

In the Tivoli Information Center window, click Tivoli product manuals. Click the letter that matches the first letter of your product name to access your product library. For example, click M to access the IBM Tivoli Monitoring library or click O to access the IBM Tivoli OMEGAMON® library.
IBM posts publications for this and all other Tivoli products, as they become available and whenever they are updated, to the Tivoli Documentation Central Web site at http://www.ibm.com/tivoli/documentation.

Note: If you print PDF documents on other than letter-sized paper, set the option in the File → Print window that allows Adobe® Reader to print letter-sized pages on your local paper.

Ordering publications


You can also order by telephone by calling one of these numbers:
• In the United States: 800-879-2755
• In Canada: 800-426-4968

In other countries, contact your software account representative to order Tivoli publications. To locate the telephone number of your local representative, perform the following steps:
2. Select your country from the list and click Go.
3. Click About this site in the main panel to see an information page that includes the telephone number of your local representative.

Accessibility

Accessibility features help users with a physical disability, such as restricted mobility or limited vision, to use software products successfully. With this product, you can use assistive technologies to hear and navigate the interface. You can also use the keyboard instead of the mouse to operate all features of the graphical user interface.

Visit the IBM Accessibility Center at http://www.ibm.com/alphaworks/topics/accessibility/ for more information about IBM’s commitment to accessibility.

For additional information, see Appendix R, “Accessibility features for Tivoli Directory Server,” on page 227.

Tivoli technical training

For Tivoli technical training information, refer to the following IBM Tivoli Education Web site at http://www.ibm.com/software/tivoli/education.

Tivoli user groups

Tivoli user groups are independent, user-run membership organizations that provide Tivoli users with information to assist them in the implementation of Tivoli Software solutions. Through these groups, members can share information and learn from the knowledge and experience of other Tivoli users. Tivoli user groups include the following members and groups:
• 23,000+ members
• 144+ groups
Support information

If you have a problem with your IBM software, you want to resolve it quickly. IBM provides the following ways for you to obtain the support you need:

Online


IBM Support Assistant

The IBM Support Assistant is a free local software serviceability workbench that helps you resolve questions and problems with IBM software products. The Support Assistant provides quick access to support-related information and serviceability tools for problem determination. To install the Support Assistant software, go to http://www.ibm.com/software/support/isa.

Troubleshooting Guide

For more information about resolving problems, see the IBM Tivoli Directory Server Version 6.3 Problem Determination Guide.

Conventions used in this book

This book uses several conventions for special terms and actions, operating system-dependent commands and paths, and margin graphics.

Typeface conventions

This book uses the following typeface conventions:

Bold

• Lowercase commands and mixed case commands that are otherwise difficult to distinguish from surrounding text
• Interface controls (check boxes, push buttons, radio buttons, spin buttons, fields, folders, icons, list boxes, items inside list boxes, multicolumn lists, containers, menu choices, menu names, tabs, property sheets), labels (such as Tip, and Operating system considerations)
• Keywords and parameters in text

Italic

• Citations (examples: titles of books, diskettes, and CDs)
• Words defined in text (example: a nonswitched line is called a point-to-point line)
• Emphasis of words and letters (words as words example: "Use the word that to introduce a restrictive clause."; letters as letters example: "The LUN address must start with the letter L")
• New terms in text (except in a definition list): a view is a frame in a workspace that contains data.
• Variables and values you must provide: ... where myname represents....

Monospace

• Examples and code examples
• File names, programming keywords, and other elements that are difficult to distinguish from surrounding text
• Message text and prompts addressed to the user
• Text that the user must type
• Values for arguments or command options

Operating system-dependent variables and paths

This book uses the UNIX convention for specifying environment variables and for directory notation.

When using the Windows command line, replace $variable with %variable% for environment variables and replace each forward slash (/) with a backslash (\) in directory paths. The names of environment variables are not always the same in the Windows and UNIX environments. For example, %TEMP% in Windows environments is equivalent to $TMPDIR in UNIX environments.

Note: If you are using the bash shell on a Windows system, you can use the UNIX conventions.
Chapter 1. Installation roadmap for a server

Use the checklist in this chapter to install a server. For the simplest path, if a step contains Simple and Advanced instructions, use the Simple instruction.

The simplest path uses the InstallShield GUI Typical installation path and uses default selections wherever possible. It creates a default directory server instance and installs all Tivoli Directory Server 6.3 components that are not already installed.

If you want more control over your installation, use the Advanced instructions, which guide you through the InstallShield GUI Custom installation path.

If you are upgrading from a previous release, do not use this checklist. Instead, see Chapter 4, “Upgrading from previous releases,” on page 17 for instructions.

To install the server:

__ 1. Read a brief overview to understand the components of Tivoli Directory Server that you will install:

- **Simple:** To understand the types of servers you can install, see Chapter 3, “Installation, instance creation, configuration, and upgrade overview,” on page 9. The Typical installation path installs both the full directory server, which includes DB2 database for storing directory server information, and the proxy server, which distributes LDAP requests to the full directory servers and has no database associated with it.

- **Advanced:** Decide what kind of server or servers you want to install on a computer. See Chapter 3, “Installation, instance creation, configuration, and upgrade overview,” on page 9 for information about the types of servers.

__ 2. Be sure that you have the minimum required hardware and software.

See IBM Tivoli Directory Server version 6.3 System Requirements for information.

__ 3. If you want to use a language other than English for server messages and tools such as the Instance Administration Tool, install the language pack for your language. See Chapter 5, “Installing language packs using the InstallShield GUI,” on page 31 for instructions. Return to this checklist after you install the language pack.

**Note:** You can install a language pack after installing Tivoli Directory Server, but the Instance Administration Tool and Configuration Tool panels, as well as server messages, will display in English until you install a language pack.

__ 4. Install Tivoli Directory Server using the InstallShield GUI. Use the appropriate instruction for your installation:

- **Simple:** During installation, you will select the Typical installation path. See Chapter 2, “Quick installation path for a server,” on page 3. (These instructions assume that you accept defaults wherever possible.)

**Note:** If you want to use the Typical installation path but you want more information as you are installing, use the following information:
- For Windows systems, see “Before you install” on page 39 and "Installing with the Typical installation path on Windows systems” on page 41.

- For AIX, Linux, and Solaris systems, see “Before you install” on page 39 and “Installing with the Typical installation path on AIX, Linux, and Solaris systems” on page 50.

- **Advanced**: During installation, you will select the **Custom** installation path.

  For Windows systems, see “Before you install” on page 39 and “Installing with the Custom installation path on Windows systems” on page 45.

  For AIX, Linux, and Solaris systems, see “Before you install” on page 39 and “Installing with the Custom installation path on AIX, Linux, and Solaris systems” on page 52.

_5_. On Windows systems, if the system restarts, log on as the user you were logged on as during installation.

_6_. Use the Instance Administration Tool to manage directory server instances:

  - **Simple**: You have created the default directory server instance. When the Instance Administration Tool starts, you have the option to create additional directory server instances. In addition, you can use the **Manage** button in the Instance Administration Tool to start the Configuration Tool and view the configuration status of the default instance or change the password for the primary administrator DN. See Chapter 13, “Creating and administering instances,” on page 95 for information about using the Instance Administration Tool.

  - **Advanced**: When the Instance Administration Tool starts, create a directory server instance. See Chapter 13, “Creating and administering instances,” on page 95 for information about using the Instance Administration Tool.

_7_. Optionally, verify the installation and configuration by loading the sample LDIF file into the database.

  See Appendix N, “Loading the sample LDIF file into the database,” on page 215 for information.

_8_. Start the directory server instance and, if you installed the Web Administration Tool, start it.


_9_. See the IBM Tivoli Directory Server Version 6.3 Administration Guide for information about setting up and using the server and the Web Administration Tool.

If you installed a full directory server and you want to plan the organization of your database, see Appendix C, “Configuration planning,” on page 185 for information.
Chapter 2. Quick installation path for a server

Before starting, be sure that you have the minimum required hardware and software. See IBM Tivoli Directory Server Version 6.3 System Requirements for more information.

To follow the simplest path through installation of a server, use the steps in this chapter along with the installation roadmap in Chapter 1, “Installation roadmap for a server,” on page 1. If you want more control over the features, use the Custom installation path when you install and create the directory server instance, which is described in Chapter 7, “Installing Tivoli Directory Server using the InstallShield GUI,” on page 39.

If you are upgrading from a previous release, do not use the installation instructions in this chapter. To upgrade, see Chapter 4, “Upgrading from previous releases,” on page 17 for instructions.

Installing Tivoli Directory Server on a Windows system using the Typical installation path

Use the following information to install Tivoli Directory Server on a Windows system using the InstallShield GUI and the Typical installation path if you are willing to accept the defaults.

To install Tivoli Directory Server:
1. On the computer where you are installing Tivoli Directory Server, stop any programs that are running and close all windows.
2. Log on to the system using an Administrator ID if you are not already logged on as an administrator.
3. Use the following steps to start the installation program:
   a. If you are installing from a DVD, insert the DVD in your DVD drive.
   b. Find the directory where the installation program is located in one of the following ways:
      • If you are installing locally from a DVD or remotely from the network, select the drive for your DVD or for the appropriate network path, and then go to the tds folder.
      • If you downloaded the zip files, save all the zip files in the same directory. Unzip all the .zip files to the tdsV6.3 folder, and then go to the tdsV6.3\tds folder.
4. Double-click the tdsV6.3\tds\install_tds.exe icon. After the installation program is initialized, the language window is displayed.
5. Select the language you want to use during Tivoli Directory Server installation. Click OK.

   Note: This is the language used only in the installation program. It is not the language used for messages, tools such as the Configuration Tool, or for storing data in Tivoli Directory Server.
6. On the Welcome window, click Next.
7. After reading the Software license agreement, select I accept the terms in the license agreement if you are willing to accept the agreement. Click Next.
8. Any supported versions of previously installed components and their corresponding version levels are displayed. Click Next.

9. To install in the default directory (C:\Program Files\IBM\LDAP\V6.3), click Next.

**Note:** If you have already installed a Language Pack, this window is not displayed.

10. Select Typical, and then click Next.

11. If a supported version of DB2 is not installed, DB2 will be installed. A window is displayed for specifying a user ID and password for the DB2 system ID.
   a. In the User ID field, type a Windows user ID (for example, db2admin) and password to use for the DB2 system ID. If the user ID does not already exist, the installation program will create it. (This is the preferred method.)
      If you provide an existing user ID, it must be a member of the Administrators group.
   b. In the Password field, type the password for the user ID. Be sure that the password meets the password requirements for your operating system. (If this is an existing user ID, be sure to type the correct password. Otherwise, DB2 does not install correctly.)
   c. Type the password again for confirmation.
   d. Click Next.

**Note:** If multiple supported versions of DB2 are already installed on the system, a window is displayed with the installed versions of DB2.
      Choose the level of DB2 you want to use, and then click Next. (You will not be asked for a user ID and password.)

12. A window summarizing the components to be installed and configured is displayed.

**Note:** Any corequisite products needed by Tivoli Directory Server, such as DB2 and GSKit, are automatically installed. These products are listed in the summary. You cannot select which components to install using the Typical installation path.

To begin installation, click Install.

Progress panels are displayed as Tivoli Directory Server and its corequisite products are installed.

13. To create the default directory server instance, which is named dsrdbm01, a window is displayed requesting passwords and an encryption seed. Set the passwords and encryption seed by doing the following:
   a. In the User password field, type a user password for the operating system user. Be sure that the password meets the password requirements for your operating system. (The Typical installation creates an operating system user named dsrdbm01 who owns the directory server instance; you are specifying the password for this user.)
   b. In the Confirm password field, type the password again for confirmation.
   c. In the Encryption seed field, type the encryption seed. The encryption seed must contain only printable ISO-8859-1 ASCII characters with values in the range of 33 to 126 inclusive, and must be a minimum of 12 and a maximum of 1016 characters in length. For information about characters that can be used, see Appendix K, “ASCII characters from 33 to 126,” on page 209.

**Note:** Save the encryption seed for future references.
This encryption seed is used to generate a set of Advanced Encryption Standard (AES) secret key values. These values are used to encrypt and decrypt directory stored password and secret key attributes.

d. In the Confirm seed field, type the encryption seed again for confirmation.

e. In the Administrator DN password field, type the administrator password for the directory server instance. This is the password associated with the cn=root primary administrator.

f. In the Confirm DN password field, type the password again for confirmation.

Click Next.

14. The Installation complete window is displayed. The installation is complete, and the default directory server instance has been created.

The Instance Administration Tool is launched. You can use this tool to view information about and manage directory server instances.

To test the installation by loading a sample database and then starting the server, see “Loading a sample database and starting the server” on page 7.

If you want to start the Web Administration tool, see “Starting the Web Administration Tool” on page 8.

---

**Installing Tivoli Directory Server on an AIX, Linux, or Solaris system using the Typical installation path**

Use the following information to install Tivoli Directory Server on an AIX, Linux, or Solaris system using the InstallShield GUI and the Typical installation path if you are willing to accept the defaults.

**Notes:**

1. When installing Tivoli Directory Server on AIX, Linux, or Solaris system using the InstallShield GUI, ensure that the install_tds.bin command is run from a command-line program that supports GUI.

2. For best results on Solaris X64 system, use the Custom installation path. If you use the Typical installation path, default instance creation might fail without displaying an error message. However, you can tell that the error occurred in the following ways:

   - When the Instance Administration Tool is launched at the end of installation, the default instance, dsrdbm01, will not be listed as an existing instance.
   - When the error occurs during installation, the /opt/IBM/ldap/V6.3/var/ldapinst.log logs the following error:

```
```

To work around this problem, do one of the following:

- Use the Typical installation path to install Tivoli Directory Server. After installation, use the Instance Administration Tool to create the default instance or any other instance. See “Creating an instance with the Instance Administration Tool” on page 96 for information about creating an instance.
To install Tivoli Directory Server, do the following:

1. Log on to the system as root if you are not already logged on.
2. Use the following steps to start the installation program:
   a. If you are installing from a DVD, insert the DVD in your DVD drive.
   b. Find the directory where the installation program is located in one of the following ways:
      • If you are installing locally from a DVD or remotely from the network, select the drive for your DVD or for the appropriate network path, and then go to the **tds** folder.
      • If you downloaded the tar files, **save all the tar files in the same directory**. Untar all the .tar files, and then go to the **tds6.3/tds** folder.
3. Run **tds6.3/tds/install_tds.bin**. After the installation program is initialized, the language window is displayed.
4. Select the language you want to use during Tivoli Directory Server installation. Click **OK**.

   **Note:** This is the language used only in the installation program. It is not the language used for messages, tools such as the Configuration Tool, or for storing data in Tivoli Directory Server.

5. In the Welcome window, click **Next**.
6. After reading the Software license agreement, select **I accept the terms in the license agreement** if you are willing to accept the agreement. Click **Next**.
7. Any previously installed components and their corresponding version levels are displayed. Click **Next**.
8. Select **Typical**, and then click **Next**.
9. If multiple supported versions of DB2 are already installed on the system, choose the DB2 you want to use, and then click **Next**.
10. A window summarizing the components to be installed and configured is displayed.

   **Note:** Any corequisite products needed by Tivoli Directory Server, such as DB2 and GSKit, are automatically installed. These products are listed in the summary. You cannot select which components to install using the Typical installation path.

   To begin installation, click **Install**.

   Progress panels are displayed as Tivoli Directory Server and its corequisite products are installed.

11. To create the default directory server instance, which is named **dsrdbm01**, a window is displayed requesting passwords and an encryption seed. Set the passwords and encryption seed by doing the following:
   a. In the **User password** field, type a user password for the operating system user. Be sure that the password meets the password requirements for your operating system. (The Typical installation creates an operating system user
named dsrdbm01 who owns the directory server instance; you are specifying the password for this user.)

b. In the Confirm password field, type the password again for confirmation.

c. In the Encryption seed field, type the encryption seed. The encryption seed must contain only printable ISO-8859-1 ASCII characters with values in the range of 33 to 126 inclusive, and must be a minimum of 12 and a maximum of 1016 characters in length. For information about characters that can be used, see Appendix K, “ASCII characters from 33 to 126,” on page 209.

Note: Save the encryption seed for future references.

This encryption seed is used to generate a set of Advanced Encryption Standard (AES) secret key values. These values are used to encrypt and decrypt directory stored password and secret key attributes.

d. In the Confirm seed field, type the encryption seed again for confirmation.

e. In the Administrator DN password field, type the administrator password for the directory server instance. This is the password associated with the cn=root primary administrator.

f. In the Confirm DN password field, type the password again for confirmation.

Click Next.

12. The Installation complete window is displayed. The installation is complete, and the default directory server instance has been created.

The Instance Administration Tool is launched. You can use this tool to view information about and manage directory server instances.

To test the installation by loading a sample database and starting the server, see “Loading a sample database and starting the server.”

To start the Web Administration tool, see “Starting the Web Administration Tool” on page 8.

---

**Loading a sample database and starting the server**

The following information describes how to load a sample database and start the server.

To load a sample database, do the following:

1. To start the Configuration Tool for configuring a directory server instance, select the directory server instance, for example: dsrdbm01, from the Instance Administration Tool, and then click Manage.

2. In the task list on the left of the Configuration Tool, expand LDIF Tasks, and then click Import LDIF data.

3. In the Import LDIF data window on the right, to complete the Path and LDIF file name field, do one of the following:

   - Click Browse to locate the sample LDIF file. The file is named sample.ldif, and it is in the examples subdirectory of the directory where you installed Tivoli Directory Server.
   - Type one of the following paths:
– For a Windows system, type:
<installpath>\examples\sample.ldif

where, <installpath> is the full path to the directory where you installed Tivoli Directory Server. By default, this directory is
C:\Program Files\IBM\LDAP\V6.3
– For an AIX or Solaris system, type:
/opt/IBM/ldap/V6.3/examples/sample.ldif
– For a Linux system, type:
/opt/ibm/ldap/V6.3/examples/sample.ldif

4. Click Standard import.
5. Click Import. (You might have to scroll down to see this button.)
6. You can start the server through the Configuration Tool:
   a. In the Configuration Tool, click Manage server state in the task list on the left.
   b. Click Start server.

Starting the Web Administration Tool

Use the following instructions to start the Web Administration Tool.
1. Start the application server:
   • On a Windows system, the application is started automatically.
   • On an AIX or Solaris system, at a command prompt, type:
     /opt/IBM/ldap/V6.3/idstools/startWebadminApp
   • On a Linux system, at a command prompt, type:
     /opt/ibm/ldap/V6.3/idstools/startWebadminApp

2. Go to the Tivoli Directory Server Web Administration Tool Console
   Administration login page:
   • On a Windows system, click Start -> Programs -> IBM Tivoli Directory Server 6.3 -> Web Administration Tool.
   • On an AIX, Linux, or Solaris system, in a Web browser, type the following address: http://localhost:12100/IDSWebApp/

3. Log in to the console as the console administrator, using the following instructions:
   a. In the User ID field, type superadmin.
   b. In the Password field, type secret.

   The IBM Tivoli Directory Server Web Administration Tool console is displayed.

For information about using the Web Administration Tool, see the IBM Tivoli Directory Server version 6.3 Administration Guide.
Chapter 3. Installation, instance creation, configuration, and upgrade overview

This chapter briefly describes installation, upgrading from an earlier version of Tivoli Directory Server, instance creation, and configuration for Tivoli Directory Server version 6.3.

Before you begin: .zip, .tar, and .iso files

The Tivoli Directory Server product is available in three types of files: .zip, .tar, and .iso. (There are .iso files that can be burned onto DVDs, and there are multiple .zip and .tar files that correspond to each .iso file.)

If you downloaded .zip files, uncompress the files after you download them to your computer. Uncompress all .zip files in the same directory.

If you downloaded .tar (or Tape ARchive) files, uncompress the files after you download them. Uncompress all .tar files in the same directory.

The .iso file versions of the product are used to burn installation DVDs that can then be used in the installation process. The .iso files are images that must be processed through a DVD burner program to create DVDs. When you create the DVDs, be sure that you do not make data DVDs of the .iso files. Select the option that extracts the data from the .iso files and burns the files on the DVD.

For information about the directory structure after you uncompress the file on different operating systems, see Appendix A, “Directory structure of downloaded files,” on page 167.

After you process the downloaded files, you can install Tivoli Directory Server using the installation instructions in the appropriate installation chapter.

Upgrading from a previous release

If you have a previous version of Tivoli Directory Server, upgrading is necessary if you want to use Tivoli Directory Server 6.3 with your existing schema definitions and directory server configuration. Tivoli Directory Server 6.3 do not support migration from Tivoli Directory Server versions earlier than 6.0, and if detected will not provide with the Server or Proxy Server option for installation, but will allow installation of other components such as Embedded WebSphere® Application Server, C Client, Java Client, or Web Administration Tool, if selected. If your existing version is Tivoli Directory Server 6.0, 6.1, or 6.2, you can keep your existing version and also install Tivoli Directory Server 6.3. You can then upgrade any existing 6.0, 6.1, or 6.2 directory server instance to 6.3 version after installation of Tivoli Directory Server 6.3. You can also create new 6.3 directory server instances on the same system. You can continue to run your existing 6.0, 6.1, or 6.2 directory server instances and also run 6.3 directory server instances.

If you have a server from a supported version of Tivoli Directory Server that is earlier than 6.0, you must first upgrade to version 6.0, 6.1, or 6.2 before you can upgrade to the 6.3 version. Clients from earlier supported versions can coexist with Tivoli Directory Server version 6.3 clients and directory server instances.
In addition, it might be necessary to upgrade your operating system and your DB2 version. See *IBM Tivoli Directory Server Version 6.3 System Requirements** for information about supported operating system and DB2 versions.

If you want to upgrade from an earlier version of Tivoli Directory Server, see Chapter 4, “Upgrading from previous releases,” on page 17 for instructions.

**Installation**

When you install Tivoli Directory Server on a computer, you can install one or more features that allow the computer to function as a client, a proxy server, a full directory server, or a console for managing servers. In addition, if you want a server to display messages in a language other than English, you must also install a language pack.

There are several ways to install Tivoli Directory Server 6.3. You can install using an InstallShield graphical user interface (GUI) or you can use installation tools for your operating system. Instructions for using the InstallShield GUI are found in Chapter 7, “Installing Tivoli Directory Server using the InstallShield GUI,” on page 39.

For information about operating-system-specific installation methods, see the installation chapter for the operating system on which you are installing. For example, see Chapter 8, “Installing Tivoli Directory Server using AIX utilities,” on page 57.

Before you install, see *IBM Tivoli Directory Server Version 6.3 System Requirements** for hardware and software requirements.

To help you decide what you want to install, the following sections describe the choices on the InstallShield GUI main panel.

**Client**

The client Software Development Kit (SDK) provides the tools required to develop C-language LDAP applications. The following are provided:

- Client libraries that provide a set of C-language APIs
- C header files for building and compiling LDAP applications
- Sample programs in source form
- Executable versions of the sample programs

The client can be installed alone, and it must be installed when you install a server. Tivoli Directory Server 6.3 clients can coexist on the same computer with another client that is of version 6.0, 6.1, or 6.2.

**Java client**

The Java client includes the Java SDK, Java 1.6 SR 7, IBM Tivoli Directory Server JNDI Toolkit, and Java client utilities. The Java client is required if you are installing a server.

**Server**

You can install two types of servers: the full directory server and the proxy server. You can install both types of directory servers on one computer and create one or more instances of the types of directory servers you have installed. These are
called directory server instances. Each directory server instance can function either as a proxy server or full directory server, but not both.

A Tivoli Directory Server 6.3 server requires that the version 6.3 C client and the Java client also be installed. In addition, the server can coexist on the same computer with another client of version 6.0, 6.1, or 6.2 or with a version 6.0, 6.1, or 6.2 server.

**Proxy server**
The *proxy* server is an LDAP server that acts as a front end to the directory. It authenticates the client with respect to the entire directory and routes requests to full directory servers. This improves performance and provides a unified view of the directory to the client. The proxy server can also be used at the front end of a server cluster or a distributed directory for providing failover and load balancing.

The proxy server is configured with information that allows it to connect to each of the full directory servers for which it is the proxy server. It routes each request to one or more target servers. The proxy server can load balance among target servers that are equally capable of handling an operation; it performs transparent failover to alternate servers if a target server is busy or down.

If the directory data is large and the environment is write-intensive, consider using a proxy server. Large directory environments that are read-heavy might be able to achieve adequate scaling by introducing replication. Before you decide to use a proxy server, refer to the list of supported features within the proxy server in the *IBM Tivoli Directory Server Version 6.3 Administration Guide*. The proxy server supports fewer features than the full directory server.

To install a proxy server, you do not need to have DB2 installed on the computer.

This book contains information about installing a proxy server and creating and configuring a proxy server instance. For additional information about proxy server, including information about setting up a proxy server instance as a proxy for full directory server instances, see the *IBM Tivoli Directory Server Version 6.3 Administration Guide*.

**Note:** If you downloaded Tivoli Directory Server 6.3 from Passport Advantage®, you are entitled to use the proxy server. If you obtained Tivoli Directory Server 6.3 from another Web site, you are entitled to use the proxy server for evaluation purposes only. To be entitled to full use of the proxy server, download Tivoli Directory Server 6.3 from the Passport Advantage Web site.

**Full directory server**
The *full directory server* is an LDAP server; it is configured with a database instance, and it processes client requests that require accessing entries stored in the database. DB2 is required for a full directory server.

**Web Administration Tool**
You can use the Web Administration Tool as a console to administer LDAP servers, which can be of the following types:
- Tivoli Directory Server 6.3
- Tivoli Directory Server 6.2
- Tivoli Directory Server 6.1
- Tivoli Directory Server 6.0
Embedded WebSphere Application Server

A Web application server is required to run the Web Administration Tool. Embedded WebSphere Application Server 7.0.0.7 is provided with Tivoli Directory Server 6.3. For information about other Web application servers that are supported, see IBM Tivoli Directory Server Version 6.3 System Requirements.

DB2

IBM DB2 is required for the full directory server because directory data is stored in a DB2 database (DB2 is not required for the proxy server). IBM DB2 Enterprise Server Edition (ESE) 9.7 or IBM DB2 Workgroup Server Edition (WSE) 9.7 is included with Tivoli Directory Server depending on the operating system and platform. However, other versions of DB2 are supported, which include IBM DB2 Enterprise Server Edition (ESE) 9.5 FixPack 3. See IBM Tivoli Directory Server Version 6.3 System Requirements to find out which versions of DB2 are supported for your operating system.

When DB2 is installed using the InstallShield GUI, the DB2 install path will the following:

- On Windows system, the path will be: "\Program Files\IBM\tdsV6.3db2". The default drive is "C", unless the user installs Tivoli Directory Server on another drive. The copy name on Windows will be “TDSV63DB2”.
- On Linux systems, the path will be: "/opt/ibm/tdsV6.3db2".
- On AIX and Solaris systems, the path will be: "/opt/IBM/tdsV6.3db2".

Note: Remote databases are not supported.

Global Security Kit (GSKit)

Tivoli Global Security Kit (GSKit) is an optional software package that is required only if Secure Sockets Layer (SSL) Security or Transport Layer Security (TLS) is required.

Tivoli Directory Server alone does not provide the capability for SSL connections from Tivoli Directory Server clients. You can enable the SSL feature by installing the IBM GSKit package. The GSKit package includes SSL support and associated RSA Security, Inc. technology.

OpenSSL is included in GSKit and may be used for cryptographic operations (as per the OpenSSL license requirements).

Tivoli Directory Server can work without the GSKit installed. In this case, the server accepts only non-secure connections from directory clients. Similarly, the
Tivoli Directory Server client can work without the GSKit installed. Install GSKit on both the server and client if you want to use secure connections.

Version 8 of GSKit is provided with Tivoli Directory Server 6.3.

**Client package installation**
The client package of Tivoli Directory Server includes the following:
- Client
- Java client
- Global Security Kit (GSKit)

On Windows systems, user need to install the client packages using the InstallShield GUI. On AIX, Linux, Solaris, and HP-UX (Itanium®) systems, user need to use operating system utilities to install the client package.

**Tivoli Directory Server solutions based on IBM Tivoli Directory Integrator**
You must install IBM Tivoli Directory Integrator if you want to do any of the following:
- Use the log management tool (idslogmgmt).
  You can find information about the log management tool in the *IBM Tivoli Directory Server Version 6.3 Administration Guide*.
- Use Simple Network Management Protocol (SNMP).
- Use the Active Directory synchronization feature.
  You can find information about SNMP and Active Directory synchronization in the *IBM Tivoli Directory Server Version 6.3 Administration Guide*.


**Instance creation and database configuration**
During or after server installation, you must perform the following configuration tasks before you can use the server:
- Create user IDs for the directory server instance owner and, for some installations, the database instance owner and the database owner. This can be done through the Instance Administration Tool, which runs during installation if you use the Typical installation path of the InstallShield GUI or after installation if you use the Custom installation path.
- Create a directory server instance. This can be done during or after installation. When you install Tivoli Directory Server using the Typical path of the InstallShield GUI, you create the default directory server instance, for which most of the settings are predefined. When you install Tivoli Directory Server using some other method (such as the Custom installation path of the InstallShield GUI or operating system utility installation), you can create a directory server instance with settings that you define.
• Set the Tivoli Directory Server primary administrator distinguished name (DN) and password for the directory server instance. This operation can be compared to defining the root user ID and password on a UNIX system.

• If the directory server instance is not a proxy server, configure the database. You do not need a database for a proxy server instance.

You can have multiple directory server instances on one computer, and they can be a mixture of proxy server and full directory server instances. The files for each directory server instance are stored in a path that includes the directory server instance name.

During or after successful installation of a server, if you used the InstallShield GUI to install, the Instance Administration Tool runs so that you can create a directory server instance. If you did not use the InstallShield GUI to install, you must start the Instance Administration Tool manually or use the idsicrt command-line utility.

When you create a full directory server instance, a database instance is also created if the full directory server is installed on the computer. By default, the directory server instance and the database instance have the same name. The name must match the name of an existing user on the system that meets certain qualifications, described in Appendix D, “Setting up users and groups: directory server instance owner, database instance owner, and database owner,” on page 187.

You can also use the Instance Administration Tool for the following tasks:
- Starting and stopping the server and the administration server
- Making a copy of a Tivoli Directory Server 6.3 directory server instance that is on the same computer or on another computer
- Migrating server schema and configuration files from a previous release to a Tivoli Directory Server 6.3 instance
- Editing the TCP/IP settings for an instance
- Viewing all instances on the computer
- Viewing details about a particular instance
- Deleting an instance

If you prefer to use the command line, all the tasks in the list can be done with the following command-line utilities:
- idsslapd starts or stops the server
- idsdiradm starts or stops the administration server
- idsideploy creates a directory server instance from an existing directory server instance.
- idsimigr migrates the schema and configuration files from a previous release to Tivoli Directory Server 6.3 versions of these files.
- idssethost sets the IP addresses the directory server instance binds to.
- idssetport sets the ports the directory server instance binds to.
- idsilist lists the directory server instance(s) on the computer and can list detailed information about each instance.
- idsidrop removes a directory server instance.
Database configuration and server setup

If you do not set the administrator DN and password or configure the database through the Instance Administration Tool, you can use the Configuration Tool (idsxcfg) for these and other tasks. (You must create a directory server instance before you can use the Configuration Tool.)

The Configuration Tool has a GUI, and it can be used for the following tasks:
- Starting or stopping the server and the administration server
- Setting or changing the Tivoli Directory Server administrator DN and password
- Configuring and unconfiguring the database
- Backing up, restoring, and optimizing the database for a full directory server instance
- Backing up and restoring instance information for a proxy server instance
- Enabling and disabling the changelog
- Performing DB2 index reorganization or DB2 row compression
- Adding or removing suffixes
- Adding schema files to or removing schema files from the list of schema files to be loaded at startup
- Importing and exporting LDAP Data Interchange Format (LDIF) data
- Configuring Active Directory Synchronization
- Setting up and running the Performance Tuning Tool

If you prefer to use the command line, all the tasks in the list can be done with the following command-line utilities.
- idsslapd starts or stops the server.
- idsdiradm starts or stops the administration server.
- idsdnpwd sets the administrator DN and password for a directory server instance.
- idscfgdb configures the database for a directory server instance. (The database is created when you create the directory server instance.)
- idsucfgdb unconfigures the database for a directory server instance.
- idsdbmaint performs DB2 index reorganization and row compression.
- idscfgchglg configures the change log for a directory server instance.
- idsucfgchglg unconfigures the change log for a directory server instance.
- idscfgsuf configures a suffix for a directory server instance.
- idsucfgsuf unconfigures a suffix for a directory server instance.
- idscfgsch configures a schema file for a directory server instance.
- idsucfgsch unconfigures a schema file for a directory server instance.
- idsldif2db or idsbulkload imports LDIF data.
- idsdb2ldif exports LDIF data.
- idsdbback backs up the database.
- idsdbrestore restores the database.
- idsrunstats optimizes the database.
- idsadscfg configures Active Directory Synchronization.
- idsperf tune tunes directory server performance.

Note: For proxy server instances, only the following tasks are available:
- Starting or stopping the server or the administration server in the Configuration Tool (idsslapd and idsdiradm command-line utilities)
- Managing the administrator DN and password in the Configuration Tool (idsdnpw command-line utility)
- Managing schema files in the Configuration Tool (idscfgsch and idsucfgsch command-line utilities)
- Managing suffixes in the Configuration Tool (idscfgsuf and idsucfgsuf command-line utilities)
- Backing up and restoring directory server instance files
Chapter 4. Upgrading from previous releases

Upgrading refers to the process of installing Tivoli Directory Server version 6.3 so that you can preserve the data, changes that were made to the schema definitions, and directory server configuration of a directory server instance from an earlier version. Use the procedures in this chapter when you are upgrading an existing directory server instance from an earlier version of Tivoli Directory Server.

If your existing version is Tivoli Directory Server 6.0, 6.1, or 6.2, you can keep your existing Tivoli Directory Server version and also install Tivoli Directory Server 6.3. You can then upgrade any existing 6.0, 6.1, or 6.2 directory server instances to 6.3 version using the idsimigr utility or by using the Instance Administration Tool (idsxinst GUI utility), and you can create new 6.3 directory server instances. Before performing migration of any existing 6.0, 6.1, or 6.2 directory server instances to 6.3 version, you must backup the existing schema and configuration files and database to overcome any migration failures. You can continue to run your existing 6.0, 6.1, or 6.2 directory server instances, and also run 6.3 directory server instances.

If you have a server from a version of Tivoli Directory Server that is earlier than 6.0, you must first upgrade it to Tivoli Directory Server version 6.0, 6.1, or 6.2 before you can upgrade to the 6.3 version.

If you have only a client installed, see "About the client"

About the client

If you have only a client installed, upgrading is not necessary. Clients from IBM Tivoli Directory Server versions 6.0, 6.1, and 6.2 can coexist with Tivoli Directory Server 6.3 client and server.

Before you upgrade

Before you upgrade to Tivoli Directory Server 6.3 from a previous version, do the following steps:

1. Be sure that the server you plan to migrate to Tivoli Directory Server 6.3 can be successfully started. (If the server is not a proxy server, be sure that the database is configured.) If the server cannot be started successfully, whether it is a proxy server or a full directory server, the upgrade is not supported.

   Note: You must not remove the directory server instance that you want to upgrade. For a full directory server instance, you must not unconfigure the database. If you do either of these, upgrade is not supported.

2. Back up the databases and DB2 settings. See the Administration Guide for your release of Tivoli Directory Server for information about backing up databases using DB2 commands, the dbbackup or idsdbbackup command, or the Configuration Tool. Take an offline database backup for each local database on the server. (You can do this step now or after step 3.)

3. Back up the configuration files and schema files by using the migbkup utility.

   Notes:
   a. You can find this utility in one of the following locations:
For Windows systems:
  If you created a DVD: the \tools subdirectory on the DVD
  If you downloaded a .zip file, the tdsV6.3\tools subdirectory of the
directory where you unzipped the file

For AIX, Linux, and Solaris systems:
  If you created a DVD: the /tools subdirectory on the DVD
  If you downloaded a .tar file: the tdsV6.3/tools subdirectory of the
directory where you untarred the file

b. If you manually edited the V3.modifiedschema file for the version of Tivoli
Directory Server that you are upgrading, be sure that you do not have
duplicate object identifiers (OIDs) for objectclasses or attributetypes in the
file. If duplicate OIDs exist, they are not all preserved during the upgrade,
and only the first OID is migrated. After upgrade is complete, the
administration server and the idsslapd server might fail to start. If this
occurs, you must manually add the missing attributes or objectclasses to the
V3.modifiedschema file before starting the servers.

Type the following at a command prompt:
• For Windows systems:
  migbkup.bat instance_home backup_directory
• For AIX, Linux, and Solaris systems:
  migbkup instance_home backup_directory

This utility backs up the server configuration file (ibmslapd.conf) and all
standard schema files that are supplied with Tivoli Directory Server from the
instance_home\etc directory to a temporary directory, specified by
backup_directory.

The parameter instance_home is the location of the directory server instance (for
e.g., example, C:\idsslapd-instance_name on a Windows system, or
owner_home_directory/idsslapd-instance_name on an AIX, Linux, or Solaris
system).

For example:
• On a Windows system, to back up files from Tivoli Directory Server 6.2 for
directory server instance myinst to a directory named d:\tds62\savefiles,
type the following:
  migbkup.bat c:\idsslapd-myinst d:\tds62\savefiles

The command backs up the following files:
• ibmslapd.conf
• V3.ibm.at
• V3.ibm.oc
• V3.system.at
• V3.system.oc
• V3.user.at
• V3.user.oc
• V3.modifiedschema
• V3.config.at
• V3.config.oc
• V3.ldapsyntaxes
• V3.matchingrules
• ibmslapdcfg.ksf
The command also creates the db2info file. This file contains the path to the copy of DB2 that is used by the backed-up directory server. (This information is required by the migration tool to perform DB2 instance and database migration while performing Tivoli Directory Server instance migration.)

4. If you have additional schema files that you used in your previous release, copy them manually to the backup_directory. When you migrate the configuration and schema files during instance creation, these files will not be migrated, but they will be copied to the new directory server instance location for use by the directory server instance.

5. Be sure that the operating system on which you will install Tivoli Directory Server 6.3 is supported. See IBM Tivoli Directory Server Version 6.3 System Requirements for information about supported levels. If the operating system is not supported, install a supported version.

6. Use one of the following procedures to upgrade a directory server instance from versions 6.0, 6.1, or 6.2 to Tivoli Directory Server 6.3:
   - If you want to upgrade using the Instance Administration Tool (idsxinst GUI), see “Before you install” on page 39 and then use the information in “Migrating an instance” on page 106 to migrate to Tivoli Directory Server 6.3.
   - If you want to upgrade Tivoli Directory Server on an AIX, Linux, or Solaris system using operating system utilities and commands, use the information in “Upgrading using the command line and operating system utilities.”

Upgrading using the command line and operating system utilities

To upgrade a directory server instance from version 6.0, 6.1, or 6.2 to Tivoli Directory Server 6.3 using operating system utilities on AIX, Linux, or Solaris system:

1. Be sure that you have followed the instructions in “Before you upgrade” on page 17.

2. Read and understand Chapter 6, “Considerations before you install on AIX, Linux, and Solaris systems,” on page 35.

3. Stop the Tivoli Directory Server instance and the administration server of the previous version.

4. If the version is 6.0, 6.1, or 6.2 do not uninstall Tivoli Directory Server or the upgrade will fail. If you want to uninstall Tivoli Directory Server 6.0, 6.1, or 6.2, you can do it after step 6.

5. Install Tivoli Directory Server 6.3 using operating system utilities for your operating system. See one of the following chapters for information:
   - Chapter 8, “Installing Tivoli Directory Server using AIX utilities,” on page 57
   - Chapter 9, “Installing Tivoli Directory Server using Linux utilities,” on page 69
   - Chapter 10, “Installing Tivoli Directory Server using Solaris utilities,” on page 75

6. Use the idsimigr command to migrate the schema and configuration files from the earlier releases to Tivoli Directory Server 6.3 version of these files and to create a Tivoli Directory Server 6.3 directory server instance with the upgraded information. This directory server instance is the upgraded version of your previous server. In the process, the idsdbmigr command is called and DB2 can
be upgraded, or the database might be converted from a 32-bit to a 64-bit
database if needed. (Database internal data migration occurs when the Tivoli
Directory Server 6.3 directory server instance is started for the first time.)

For example, you want to migrate a Tivoli Directory Server 6.0 instance,
myinst, to Tivoli Directory Server 6.3, issue the following:

```
idsimigr -I myinst
```

For more detailed information about the idsimigr command, see the *IBM Tivoli
Directory Server Version 6.3 Command Reference*.

After you start the server for the first time, be sure to run a backup. (Database
internal data migration occurs when the Tivoli Directory Server 6.3 directory
server instance is started for the first time.) For information about backing up
the directory server instance, see the "Back up the directory server instance" on
page 135.

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Migrating from IBM DB2 ESE to IBM DB2 WSE

On Linux 32-bit operating system running on Intel® platforms, IBM DB2 Enterprise
Server Edition (ESE) version 9.7 is not supported. On these platforms, Tivoli
Directory Server version 6.3 supports IBM DB2 Workgroup Server Edition (WSE)
version 9.7. For users who want to migrate from previous versions of supported
Tivoli Directory Server with DB2 8 ESE or 9.1 ESE to Tivoli Directory Server
version 6.3 with DB2 WSE v9.7, do the following:

1. Install Tivoli Directory Server version 6.3 with DB2 WSE v9.7 on the system
   from which you want to migrate the previous Tivoli Directory Server
   instances.
2. Stop the directory server instance that you want to migrate.
3. Run the Tivoli Directory Serve v6.3's migbkup utility and take backup of the
   instance to be migrated. For example, run the migbkup utility with the
   following format:

   ```
   migbkup <instance_directory>/idsslapd-<instance_name>/<instance backup directory>
   ```

   To know more about migbkup, see *IBM Tivoli Directory Server Version 6.3
   Command Reference*.

4. Backup the database of the directory server instance that is to be migrated
   using the DB2 commands. For example, if the directory instance to be
   migrated is inst1 and the database instance is inst1, then do the following:
   a. su - inst1
   b. sqlib/db2profile
   c. db2 backup database inst1 to <database backup directory>
   d. exit

   **Note:** If the change log database is configured for the directory server
   instance, the change log database also must be backed up.
   ```
   db2 backup db ldapclog to <changelog backup directory>
   ```

5. Drop the directory server instance, DB2 instance, and the database of inst1.
6. Run the Tivoli Directory Server v6.3's idsimigr command, and perform the
   migration using the instance backup directory. For example, run the idsimigr
   command of the following format:

   ```
   idsimigr -I inst1 -u <instance backup directory> -l <instance home directory> -n
   ```

   **Note:** Since the migration is being performed using the instance backup
directory, it will take the remote migration path.
7. Configure the migrated instance. For example, run the `idscfgdb` command of the following format:
   ```
   idscfgdb -I inst1 -a inst1 -w inst1 -t inst1 -l <instance home directory> -n
   ```
   **Note:** If the change log database is configured previously for the migrated instance, you need to configure the change log database for the directory server instance:
   ```
   idscfgchglg -I inst1 -n
   ```

8. Restore the database that was backed up using the DB2 commands. Run the following commands:
   a. `su - inst1`
   b. `db2 restore database inst1 from <database backup directory> replace existing`
   c. `exit`
   **Note:** If the change log database was backed up, restore the change log database for the instance using the DB2 commands.
   ```
   db2 restore db ldapclog from <changelog backup directory>
   ```

9. Catalog the restored database using the DB2 commands. Run the following commands:
   a. `su - inst1`
   b. `db2 uncatalog database inst1`
   c. `db2 catalog database inst1 as inst1 authentication server`
   d. `exit`
   **Note:** Catalog the restored change log database using the DB2 commands.
   ```
   a. `su - inst1`
   b. `db2 uncatalog database ldapclog`
   c. `db2 catalog database ldapclog as ldapclog authentication server`
   d. `exit`

10. Start the directory server instance.
    ```
    ibmslapd -I inst1 -n -t
    ```

### Upgrading remotely

You can upgrade from Tivoli Directory Server 6.0, 6.1, or 6.2 remotely; that is, remote migration of an instance from one computer to another. You might want to do this in one of the following cases:

- The computer where the earlier version of Tivoli Directory Server is installed is running an operating system that is not supported for Tivoli Directory Server 6.3, and you do not want to upgrade the operating system on that computer.
- You want to install Tivoli Directory Server 6.3 on a computer with a different operating system but migrate the server from the earlier version of Tivoli Directory Server to the new computer. (For example, you have Tivoli Directory Server 6.1 on an AIX system, but you want the 6.3 server to be on a Solaris SPARC system.) In this case, the two operating systems must have the same *endianness*; for example, if the first computer is little endian, the second system must also be little endian. (Endianness is concerned with the ordering of bits used to represent data in memory.) If the operating systems do not have the same endianness, the migration does not work.
The procedure for remote upgrade is similar to the procedure for upgrading on the same computer, except that you must copy the backup files from the computer where you have backed up the files to a computer where you want to run Tivoli Directory Server 6.3. In this example procedure, the computer with the earlier version of Tivoli Directory Server is called Computer A, and the computer where you want to run Tivoli Directory Server 6.3 is called Computer B.

**Note:** If you are performing a remote system migration from a system that participates in replication, be sure to enable replication where the current system is the supplier and the new system will be the consumer. This will ensure that updates are queued and can be replayed when the new system is brought online. Do this before taking the backup on the system you are migrating from.

To upgrade remotely:

1. On Computer A, back up the database for the directory server instance you want to migrate from, using the idsdb2ldif (or db2ldif) utility from the previous release. See the documentation for the previous version of Tivoli Directory Server for information about this utility.
2. Install Tivoli Directory Server 6.3 on Computer B.
3. Use the migbkup utility from Tivoli Directory Server 6.3 on Computer A to back up the schema and configuration files. For additional information about this utility, see step 3 in “Before you upgrade” on page 17.
4. Copy the backup from the migbkup utility to Computer B.
5. Copy the LDIF file created in step 1 from Computer A to Computer B.
6. Run the migration utility (the idsimigr command) on Computer B, using the -u argument to provide the location on Computer B where the backed-up files from Computer A are located. The migration tool creates a new Tivoli Directory Server 6.3 instance with the schema and configuration information from the backed-up files. For more information about the idsimigr command, see step 6 in “Upgrading using the command line and operating system utilities” on page 19.
7. Run the idscfgdb command or the Configuration Tool to configure the database.
8. On Computer B, import the data using the idsldif2db command. See the IBM Tivoli Directory Server Version 6.3 Command Reference for information about the idsldif2db command.

After you start the server for the first time, be sure to run a backup. (Database internal data migration occurs when the Tivoli Directory Server 6.3 directory server instance is started for the first time.) For information about backing up the directory server instance, see “Backing up the directory server instance” on page 135.

The supported types of operating systems for remote migration across operating systems are shown in the following table. (Source operating systems are listed down the left side; target operating systems are listed across the top.)
Table 1. Supported cross-operating-system migration scenarios

<table>
<thead>
<tr>
<th>Operating system: source system (Tivoli Directory Server before 6.3)</th>
<th>Intel 32-bit Windows</th>
<th>AMD/EM64T Windows</th>
<th>System x Linux (32-bit)</th>
<th>AMD64/EM64T Linux</th>
<th>System i and System p Linux</th>
<th>System z Linux</th>
<th>AIX</th>
<th>Solaris SPARC</th>
<th>Solaris X64</th>
</tr>
</thead>
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<td>AMD64/EM64T Linux</td>
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<tr>
<td>Solaris X64</td>
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**Upgrading Embedded WebSphere Application Server and migrating the Web Administration Tool**

If you have Web Administration Tool from an earlier version of Tivoli Directory Server deployed into Embedded WebSphere Application Server, the InstallShield GUI can upgrade Embedded WebSphere Application Server to the version provided with Tivoli Directory Server 6.3 and deploy the Web Administration Tool into it, migrating your previous Web Administration Tool configuration.

If you have the Web Administration Tool or White Pages, or both, from an earlier version of Tivoli Directory Server deployed into Embedded WebSphere Application Server, the InstallShield GUI migrates your previous Web Administration Tool and White Pages configurations and deploys these applications into Embedded WebSphere Application Server. The InstallShield GUI supports migration of Embedded WebSphere Application Server from the following versions to Embedded WebSphere Application Server V7.0.0.7 is provided with Tivoli Directory Server V6.3:

- Tivoli Directory Server V6.0 - Embedded WebSphere Application Server V5.x
- Tivoli Directory Server V6.1 - Embedded WebSphere Application Server V6.1.0.7
Upgrading Embedded WebSphere Application Server and deploying the Web Administration Tool

You can use the `idswmigr` command-line utility to upgrade an earlier version of Embedded WebSphere Application Server to the version provided with Tivoli Directory Server 6.3, and deploy the 6.3 version of the Web Administration Tool into it.

The `idswmigr` tool does the following:

- Saves the configuration files for the previous version of the Web Administration Tool
- Undeploys the earlier version of the Web Administration Tool from the earlier version of Embedded WebSphere Application Server
- Backs up the configuration of the earlier version of Embedded WebSphere Application Server to a temporary location that you specify
- Restores the configuration for the earlier version of Embedded WebSphere Application Server to the new location
- Installs the 6.3 version of the Web Administration Tool into the version of Embedded WebSphere Application Server provided with Tivoli Directory Server 6.3
- Migrates the previous Web Administration Tool configuration files and restores these files into the new Embedded WebSphere Application Server

Before you use the `idswmigr` command, do the following:

1. Uninstall the version of the Web Administration Tool that you have installed. (This is the IDSWebApp.war file in the idstools directory.) However, leave Embedded WebSphere Application Server installed, and leave the Web Administration Tool deployed into it.
2. Install the new version of the Web Administration Tool.
3. Install the new version of Embedded WebSphere Application Server. (Do not deploy the Web Administration Tool into Embedded WebSphere Application Server. The `idswmigr` command will do this.)

To use the `idswmigr` command-line utility to upgrade Embedded WebSphere Application Server and the Web Administration Tool and deploy the Web Administration Tool into Embedded WebSphere Application Server, type the following at a command prompt:

```
 idswmigr [-l temp_path] [-s source_path -t target_path -i prev_dir -r profile_name -a app_name -v -o ports_path ]
```

where:

- `-l temp_path`
  Specifies a location for the temporary files.

- `-s source_path`
  Specifies the source location for the previous version of Embedded WebSphere Application Server.
-t target_path
  Specifies the target location where the new Embedded WebSphere
  Application Server is installed.

-i prev_dir
  Specifies the home directory where the current version of IBM Tivoli
  Directory Server is installed.

-r profile_name
  Specifies the profile name associated with the application. Defaults to
  TDSWebAdminProfile if not specified.

-a app_name
  -a is the application name. Defaults to IDSWebApp.war if not specified.

-v Displays the version.

-o ports_path
  Specifies the fully qualified path of the ports definition file. If not specified,
  defaults to the following path:
  • <TDS_INSTALL_Directory>/V6.3\idstools\TDSWEBPortDef.props on
    Windows systems
  • /opt/IBM/ldap/V6.3/idstools/TDSWEBPortDef.props on AIX and
    Solaris systems
  • /opt/ibm/ldap/V6.3/idstools/TDSWEBPortDef.props on Linux systems

### Upgrading the Embedded WebSphere Application Server v7.0
#### to latest fix pack level

At times, it becomes important to upgrade software that are bundled with a
product to their latest fix pack level for maintenance purposes. IBM Tivoli
Directory Server v6.3 provide embedded WebSphere Application Server 7.0.0.7 to
deploy and use IBM Tivoli Directory Server Web Administration Tool. To upgrade
Embedded WebSphere Application Server to latest fix pack level, do the following:

1. Identify the install location of Embedded WebSphere Application Server. If
   Embedded WebSphere Application Server was installed using the InstallShield
   GUI, then the default location are as follows:
   • On AIX and Solaris platforms: /opt/IBM/ldap/V6.3/appsrv
   • On Linux platforms: /opt/ibm/ldap/V6.3/appsrv
   • On Windows platforms: <TDS_V6.3_install_location>\appsrv

2. Find the version of the Embedded WebSphere Application Server that is
   installed on the system. This helps you determine the fix pack level required
   for upgrade. For this run the following commands:

   On AIX, Solaris, and Linux:
   ```
   cd <EWAS_InstallLocation>
   ./versionInfo.sh
   ```

   On Windows:
   ```
   cd <EWAS_InstallLocation>
   versionInfo.bat
   ```

   Latest recommended Tivoli Directory Server fixes can be downloaded from
   [http://www-01.ibm.com/support/docview.wss?rs=767&uid=swg27009778](http://www-01.ibm.com/support/docview.wss?rs=767&uid=swg27009778) and
3. To install Embedded WebSphere fix packs, you must use WebSphere Update Installer. If WebSphere Update Installer is not installed on the system, install it using the following steps:
   a. Stop all WebSphere Application Server and related processes. The product to be updated must not be running while you apply maintenance.
   b. Depending on your platform, download the most recent WebSphere Update Installer package.
   c. Extract the downloaded WebSphere Update Installer package (zip or tar) to a temporary directory and change to the UpdateInstaller subdirectory.
   d. To install the Update Installer, run the install or install.exe program.
      On Windows systems, run the install.exe command.
      On UNIX-based systems, run the ./install command.

   To know how to install the Update Installer, see Installing the Update Installer for WebSphere Software.

4. Install Embedded WebSphere Application Server and its associated SDK fix packs using the following steps:
   a. Run the backupConfig command to back up configuration files.
   b. Verify required disk space, as described in the readme file for the maintenance package.
   c. Stop all WebSphere Application Server processes, and Java processes, if necessary. The product might not continue to operate successfully if you attempt to install fix pack while Embedded WebSphere Application Server-related Java processes are running.
   d. Download the Embedded WebSphere and SDK maintenance packages into the update installer maintenance directory, <updi_install_root>/maintenance, where <updi_install_root> is the install location of the Update installer.
   e. Refer to instructions in the Update Installer installation documentation directory, <updi_install_root>/docs/readme_updateinstaller.html, to install maintenance packages.

5. Verify the Embedded WebSphere Application Server version that you upgraded.
   On AIX, Solaris, and Linux:
   cd <EWAS_InstallLocation>
   ./versionInfo.sh

   On Windows:
   cd <EWAS_InstallLocation>
   versionInfo.bat

6. Start the Embedded WebSphere Application Server.

---

**Migrating Tivoli Directory Server solutions based on IBM Tivoli Directory Integrator**

The default installation path of Tivoli Directory Integrator v7.1:

**For AIX, Linux, and Solaris systems**  
```
/opt/IBM/TDI/V7.1
```

**For Windows systems**  
```
C:\Program Files\IBM\TDI\V7.1
```

If you have not installed Tivoli Directory Integrator in the default path, the environment variable `IDS_LDAP_TDI_HOME` must be set and must point to Tivoli Directory Integrator install location.

This section describes migration of the following solutions:
- Log management tool.
- Simple Network Management Protocol (SNMP).
- Active Directory synchronization.

For more information about the log management tool, SNMP, and Active Directory synchronization, see the *IBM Tivoli Directory Server version 6.3 Administration Guide*.

**Migrating Tivoli Directory Server solutions from an earlier version to IBM Tivoli Directory Server version 6.3**

**Migrating log management solution**

To migrate log management solution configured on a Tivoli Directory Server version earlier than 6.3 to Tivoli Directory Server version 6.3, do the following:

1. Take a backup of the solution.properties file located in the `<TDSinstance-home>/idsslapd-<instance>/etc/logmgmt` for your existing version of Tivoli Directory Server.
3. Delete all the files and subdirectories from the directory `<TDSinstance-home>/idsslapd-<instance>/etc/logmgmt` for the migrated instance.
5. Logon to the system using the credentials of Tivoli Directory Server instance owner.
6. Copy the following:
   - Copy the contents from `<TDI 7.1 install location>/etc` to `<TDSinstance-home>/idsslapd-<instance>/etc/logmgmt`
   - Copy the contents from `<TDI 7.1 install location>/serverapi` to `<TDSinstance-home>/idsslapd-<instance>/etc/logmgmt`
   - Copy `<TDI 7.1 install location>/idisrv.sth` to `<TDSinstance-home>/idsslapd-<instance>/etc/logmgmt`
   - Copy `<TDI 7.1 install location>/testserver.jks` to `<TDSinstance-home>/idsslapd-<instance>/etc/logmgmt`
7. Create a directory named "logs" in `<TDSinstance-home>/idsslapd-<instance>/etc/logmgmt`.
8. Add the following entry at the end of the `<TDSinstance-home>/idsslapd-<instance>/etc/logmgmt/solutions.properties` file:
   ```
   systemqueue.on=false
   ```
9. If the install path of Tivoli Directory Integrator is different from the default path, then set the environment variable IDS_LDAP_TDI_HOME to point to Tivoli Directory Integrator install location.

10. Run the log management solution.

**Migrating SNMP solution**

To migrate SNMP solution configured on a Tivoli Directory Server version earlier than 6.3 to Tivoli Directory Server version 6.3, do the following:

1. Take a backup of the snmp directory for your existing version of Tivoli Directory Server, for example Tivoli Directory Server version 6.2.


3. Replace the `<TDS v6.3 install path>/idstools/snmp/idssnmp.conf` file by the `<TDS v6.2 install path>/idstools/snmp/idssnmp.conf` file.

4. Replace the `<TDS v6.3 install path>/idstools/snmp/idssnmp.properties` file by the `<TDS v6.2 install path>/idstools/snmp/idssnmp.properties` file.

5. Replace the `<TDS v6.3 install path>/idstools/snmp/IBM-DIRECTORYSERVER-MIB` file by the `<TDS v6.2 install path>/idstools/snmp/IBM-DIRECTORYSERVER-MIB` file.


8. If the install path of Tivoli Directory Integrator is different from the default path, then set the environment variable IDS_LDAP_TDI_HOME to point to Tivoli Directory Integrator install location.

9. Run the SNMP solution.

**Using Active Directory synchronization solution**

To use the Active Directory synchronization solution, do the following:

**If IBM Tivoli Directory Server version 6.3 instance newly configured**

1. Install IBM Tivoli Directory Integrator version 7.1.

2. Configure the Active Directory synchronization solution using the idsadscfg command. To know more about the idsadscfg command, see *IBM Tivoli Directory Server version 6.3 Command Reference*, and to know more about Active Directory synchronization, see *IBM Tivoli Directory Server version 6.3 Administration Guide*.

**If migrating a supported version of Tivoli Directory Server instance to Tivoli Directory Server version 6.3**

1. Install IBM Tivoli Directory Integrator version 7.1.

2. After migrating the Tivoli Directory Server instance to Tivoli Directory Server version 6.3, configure the Active Directory synchronization solution using the idsadscfg command. To know more about the idsadscfg command, see *IBM Tivoli Directory Server version 6.3 Command Reference*, and to know more about Active Directory synchronization, see *IBM Tivoli Directory Server version 6.3 Administration Guide*.  

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3. Restore the changes that you had made before migration to the
<TDInstance-home>/idsslapd-<instance>/etc/tdisoldir/
solution.properties file, if any.

**Note:** Replacing the new solution.properties file with the old
file may not work because the format of the
solution.properties file that gets created when running
idsadscfg command of 6.3 is different from the old
solution.properties file.

4. Run the Active Directory synchronization solution.
Chapter 5. Installing language packs using the InstallShield GUI

If you want to use the server in languages other than English, you must install language packs for the languages you want to use.

**Note:** You do not need to install language packs for the client, unless you want to use the `idslink` and `idsrmlink` commands and you want messages from the commands displayed in a language other than English. For information about the `idslink` and `idsrmlink` commands, see the IBM Tivoli Directory Server version 6.3 Command Reference.

You can install language packs with the InstallShield GUI or with operating system utilities on AIX, Linux, and Solaris systems. To install language packs using the InstallShield GUI, use the information in this chapter. To install using operating system utilities, see the appropriate chapter; choose from one of the following:

- For AIX systems, see Chapter 8, “Installing Tivoli Directory Server using AIX utilities,” on page 57.
- For Linux systems, see Chapter 9, “Installing Tivoli Directory Server using Linux utilities,” on page 69.
- For Solaris systems, see Chapter 10, “Installing Tivoli Directory Server using Solaris utilities,” on page 73.

To install language packs using the InstallShield GUI:

1. Do one of the following:

   - **On Windows systems:**
     
     a. Be sure that you are logged on as a member of the Administrators group.
     
     b. Use the following steps to start the installation program:
        
        1) If you are installing from a DVD, insert the DVD in your DVD drive.
        
        2) Find the directory where the installation program is located in one of the following ways:
           
           - If you are installing locally from a DVD or remotely from the network, select the drive for your DVD or for the appropriate network path, and then go to the \tdsLangpack folder.
           
           - If you downloaded the zip file, go to the directory where you unzipped the files, and then go to the \tdsV6.3\tdsLangpack folder.
        
        c. If you are using Intel 32-bit Windows, double-click the `idslp_setup_win32` icon, or type `idslp_setup_win32.exe` at a command prompt.
           
           If you are using AMD/EM64T Windows, double-click the `idslp_setup_win64` icon, or type `idslp_setup_win64.exe` at a command prompt.

   - **On AIX, Linux, and Solaris systems:**
     
     a. Log in as root.
     
     b. Use the following steps to start the installation program:
1) If you are installing from a DVD, insert the DVD in your DVD drive.

2) Find the directory where the installation program is located in one of the following ways:
   - If you are installing locally from a DVD or remotely from the network, select the drive for your DVD or for the appropriate network path, and then go to the /tdsLangpack folder.
   - If you downloaded a tar file, go to the directory where you untarred the files, and then go to the /tdsV6.3/tdsLangpack folder.

c. Type one of the following:
   - On AIX systems: idslp_setup_aix.bin
   - On System x Linux systems: idslp_setup_linux86.bin
   - On AMD64/EM64T Linux systems: idslp_setup_lin.bin
   - On System z Linux systems: idslp_setup_linux390.bin
   - On System i and System p Linux systems: idslp_setup_linuxppc.bin
   - On Solaris SPARC systems: idslp_setup_solaris.bin.
   - On Solaris X64 systems: idslp_setup_solarisx86.bin

2. The Welcome window is displayed. Click Next.

3. On Windows systems only, if you have not yet installed Tivoli Directory Server, a window is displayed asking where you want to install the language packs. This path will also be the path where Tivoli Directory Server is installed. Click Next to install in the default directory. You can specify a different directory by clicking Browse or typing the path you want. The directory will be created if it does not exist.

   Note: Be sure that the installation location is not the same as the path where another version of the client is installed.

4. A window showing the languages is displayed. The languages you can choose are:
   - German
   - French
   - Italian
   - Spanish
   - Japanese
   - Korean
   - Portuguese
   - Simplified Chinese
   - Traditional Chinese

   On AIX systems, the following additional languages are available:
   - Czechoslovakian
   - Hungarian
   - Polish
   - Russian
   - Slovakian

   Select the languages you want to install, and then click Next.
5. A summary window displays the languages you want installed, the path where these language packs will be installed, and the amount of disk space required. Click Back to change any of your selections. Click Next to begin installation.

6. After installation is complete, click Finish on the confirmation window.

Language packs are installed in the LangPack subdirectory of the directory where Tivoli Directory Server is installed.
Chapter 6. Considerations before you install on AIX, Linux, and Solaris systems

For AIX, Linux, and Solaris systems, there are some environments that might require special setup.

Installing Tivoli Directory Server: use InstallShield GUI or operating system utilities, but not both

On AIX, Linux, and Solaris systems, the InstallShield GUI installation program installs the same packages that are installed by the operating system utilities, but sometimes it groups multiple packages under a single feature listed in the InstallShield GUI installation panels. For example, the C Client 6.3 feature includes the base client package and the bit-client package (32-bit client for a 32-bit client operating system and 64-bit client for a 64-bit client operating system).

Note: When installing Tivoli Directory Server on AIX, Linux, or Solaris systems using the InstallShield GUI, ensure that the install_tds.bin command is run from a command-line program that supports GUI.

If you mix the two types of installation, you might not install all of the correct packages for a feature. Therefore, install using either the InstallShield GUI installation program or operating system utilities, but not both. (For example, if you install Tivoli Directory Server initially using the InstallShield GUI installation program and you later want to add a feature that you did not install, be sure to use the InstallShield GUI again, rather than operating system utilities.)

Mounting and unmounting the DVD during installation

On AIX, Linux, and Solaris systems, if you are installing from DVDs created from the downloaded .iso files, you must mount the DVD before you begin installing.

Mounting the DVD and starting the installation program on Linux systems

On some versions of the Linux operating system, you might receive the following error message when you start the InstallShield GUI installation program using the install_tds.exe command:

Bad interpreter: /bin/sh: Permission denied

This occurs when the default automount settings have -noexec permission; the permissions must be changed before you can run the installation program. To work around this condition:

1. Unmount the DVD with the following command:
   umount /media/DirectoryV6.3
2. Remount the DVD with the following command:
   mount -o loop,ro /dev/hda /mnt/cdrom/
The idsldap user and group

During installation of a server, the idsldap user and group are created if they do not already exist.

Note: On AIX, Linux, and Solaris systems, operating system utility installation creates the idsldap user if it does not already exist. However, if the /home/idsldap directory (on Linux and AIX systems) or /export/home/idsldap directory (on Solaris systems) already exists, it might not be possible to create the idsldap user. Therefore, if the idsldap user does not exist, be sure that this directory is also not present.

During InstallShield GUI installation, if this directory is detected on Linux, AIX, or Solaris system, but the idsldap user ID is not present on the system, the Server and Proxy Server are not listed as features that you can install.

If your environment requires that you have more control over this user and group, you can create them before you install. Requirements are:
- The idsldap user must be a member of the idsldap group.
- The root user must be a member of the idsldap group.
- The idsldap user must have a home directory.
- The default shell for the idsldap user must be the Korn shell.
- The idsldap user can have a password, but is not required to.
- The idsldap user can be the owner of the director server instance.

You can use the Instance Administration Tool to create users and groups as you are creating a directory server instance, or you can use the following commands to create the idsldap user and group and set them up correctly:

On AIX systems:
Use the following commands.
To create the idsldap group:
```
mgrou p idsldap
```
To create user ID idsldap, which is a member of group idsldap, and set the korn shell as the default shell:
```
mkuser pgrp=idsldap home=/home/idsldap shell=/bin/ksh idsldap
```
To set the password for user idsldap:
```
passwd idsldap
```
To modify the root user ID so that root is a member of the group idsldap:
```
/usr/bin/chgrp -m + root idsldap
```

On Linux systems:
Use the following commands.
To create the idsldap group:
```
groupadd idsldap
```
To create user ID idsldap, which is a member of group idsldap, and set the korn shell as the default shell:
```
useradd -g idsldap -d /home/idsldap -m -s /bin/ksh idsldap
```

To set the password for user idsldap:
```bash
passwd idsldap
```
To modify the root user ID so that root is a member of the group idsldap:
```bash
usermod -G idsldap,rootgroups root
```
where `rootgroups` can be obtained by using the command:
```bash
groups root
```

**On Solaris systems:**
Use the following commands.

To create the idsldap group:
```bash
groupadd idsldap
```
To create user ID idsldap, which is a member of group idsldap, and set the korn shell as the default shell:
```bash
useradd -g idsldap -d /export/home/idsldap -m -s /bin/ksh idsldap
```

To set the password for user idsldap:
```bash
passwd idsldap
```
To modify the root user ID so that root is a member of the group idsldap, use an appropriate tool.

Be sure that all these requirements are met before you install. The proxy server does not install correctly if the idsldap user exists but does not meet the requirements.

**Note:** For information about requirements for other user IDs you must create, see Appendix D, “Setting up users and groups: directory server instance owner, database instance owner, and database owner,” on page 187.

---

**Installation directory on AIX, Linux, and Solaris platforms**

Tivoli Directory Server is installed in the following path:

**On AIX and Solaris systems:**
```
/opt/IBM/ldap/V6.3
```

**On Linux systems:**
```
/opt/ibm/ldap/V6.3
```

---

**Using commands to set and remove links**

Links for client and server utilities are not set automatically during installation. However, if you are upgrading from Tivoli Directory Server 6.0, 6.1, or 6.2 and you have links set to the utilities, these links will remain unless you change them.

You can use the `idslink` utility to set the links to Tivoli Directory Server 6.3 command-line utilities such as `idsldapmodify` and `idsldapadd` and libraries such as `libibmldap.so`. These links point to the location where the Tivoli Directory Server 6.3 utilities and libraries reside: `installpath/bin`, `installpath/sbin`, and `installpath/lib`. (`installpath` is the directory where Tivoli Directory Server 6.3 is installed.) To remove the links set by the `idslink` utility, you can use the `idsrmlink` utility.
For more information about these commands, see the *IBM Tivoli Directory Server version 6.3 Command Reference*. 
Chapter 7. Installing Tivoli Directory Server using the InstallShield GUI

You can use the InstallShield GUI to install Tivoli Directory Server. If you do not want to use the InstallShield GUI to install, this book contains a manual installation procedure for each non-Windows operating system in separate chapters. (For example, see Chapter 8, “Installing Tivoli Directory Server using AIX utilities,” on page 57.) To install Tivoli Directory Server silently on Windows systems, see Chapter 12, “Installing and uninstalling silently on Windows systems,” on page 83.

If you install Tivoli Directory Server using the InstallShield GUI, you must also uninstall using the InstallShield GUI. This is also true for installation of corequisite products such as DB2, Embedded WebSphere Application Server, and GSKit. See “Uninstalling Tivoli Directory Server using the InstallShield GUI” on page 161 for instructions for removing Tivoli Directory Server using the InstallShield GUI.

Before you install

Be sure that the requirements for your operating system are met before you begin installation. See IBM Tivoli Directory Server version 6.3 System Requirements for information.

Before installing, be sure that the following conditions are met. If these conditions are not met, the installation program will exit.

• If you are upgrading from a previous release (Tivoli Directory Server 6.0, 6.1, or 6.2):

Use the instructions in Chapter 4, “Upgrading from previous releases,” on page 17 to install Tivoli Directory Server 6.3 and migrate your data. With Tivoli Directory Server 6.3, pre 6.0 versions of servers are not supported and there would be no forceful migration of directory server instances from previous releases (Tivoli Directory Server 6.0, 6.1, or 6.2) since directory server instances of 6.x versions can coexist.

• If you are not upgrading from a previous release of Tivoli Directory Server, and you have an unsupported version of DB2 installed on your computer, and you are installing the full directory server:

If the DB2 version is earlier than 8, you must remove it. Tivoli Directory Server does not install if these versions of DB2 are present. If you have DB2 version 8 installed, you can leave it on the system; this DB2 version can coexist with the version of DB2 that Tivoli Directory Server installs. If you do not have a version of DB2 on your system, the InstallShield GUI installs it if you choose to install the full directory server.

• The server and the client from Tivoli Directory Server 6.3 can coexist with the following clients and servers:
  – A client from Tivoli Directory Server 6.0, 6.1, or 6.2
  – A server from Tivoli Directory Server 6.0, 6.1, or 6.2

If any of these are installed, you can leave them installed. However, links on AIX, Linux, and Solaris systems for Tivoli Directory Server 6.3 libraries and commands are not set. If you want to set links to Tivoli Directory
Server libraries and commands, use the `idslink` command. See the *IBM Tivoli Directory Server Version 6.3 Command Reference* for information about the command.

On Windows systems, the path is not set to include the directories where the Tivoli Directory Server 6.3 libraries and commands reside. This means that when using the command line, you must type the full path to the command or change to the subdirectory where the command resides before typing the command. Otherwise, a message indicating the failure to find command will be displayed.

As an alternative, you can update your PATH environment variable to include the following Tivoli Directory Server 6.3 subdirectories:

- `installpath\sbin`
- `installpath\bin`
- `installpath\lib`

(For a default installation, `installpath` on Windows systems is: `C:\Program Files\IBM\LDAP\V6.3`)

If you have more than one version of Tivoli Directory Server installed and you set the path to find commands for one version of Tivoli Directory Server, you must type the full path or go to the subdirectory where the command resides if you want to issue a command for another version of Tivoli Directory Server.

- If you have the Web Administration Tool from Tivoli Directory Server 6.0, 6.1, or 6.2 installed and you want to migrate it, leave the Embedded WebSphere Application Server installed with the Web Administration Tool deployed into it. For systems with Tivoli Directory Server 6.0, 6.1, or 6.2 installed, the previous version of the Web Administration Tool will be undeployed, the new version of Embedded WebSphere Application Server will be installed, the new version of the Web Administration Tool will be deployed into Embedded WebSphere Application Server, and the Web Administration Tool configuration files will be migrated. You can uninstall the old version of Embedded WebSphere Application Server later.

- Similarly, if you have White Pages from Tivoli Directory Server 6.1 or 6.2 and you want to migrate it, leave Embedded WebSphere Application Server installed with White Pages deployed into it, and White Pages configuration files will be migrated.

- On Windows systems, if you are installing the proxy server or the full directory server, the Administrators group provided with the Windows operating system must exist.

- On Windows systems, be sure that you have at least 255 MB of free space in the directory specified by the TEMP environment variable or the directory you want to use as a temporary directory. If you use a temporary directory and you are installing any of the corequisite products (Embedded WebSphere Application Server or DB2) be sure that you also have an additional 150 MB in the directory specified by the TEMP environment variable.

- On AIX and Linux systems, be sure that you have at least 300 MB of free space in the `/tmp` directory or the directory you want to use as a temporary directory. If you use a temporary directory and you are installing any of the corequisite products (Embedded WebSphere Application Server or DB2) be sure that you also have an additional 150 MB in the `/tmp` directory.

- On Solaris system, be sure that you have at least 400 MB of free space in the `/tmp` directory or the directory you want to use as a temporary directory. If you use a temporary directory and you are installing any of the corequisite products (Embedded WebSphere Application Server or DB2) be sure that you also have an additional 150 MB in the `/tmp` directory.
Installing Tivoli Directory Server on a Windows system

There are two installation paths in the InstallShield GUI: Typical and Custom.

- Use the Typical installation path if you want to accept default settings, install all the Tivoli Directory Server components that are not already installed, and create a default directory server instance.
- Use the Custom installation path if you want to select components for installation and create a directory server instance using the Instance Administration Tool. When you use this tool you can customize the directory server instance.

Installing with the Typical installation path on Windows systems

To install Tivoli Directory Server 6.3 using the Typical installation path:

1. Be sure that you are logged on as a member of the Administrators group.
2. On the computer where you are installing Tivoli Directory Server, stop any programs that are running and close all windows. If you have windows open, the initial Tivoli Directory Server installation window might be hidden behind other windows.
3. If you are installing from a DVD:
   a. Insert the DVD in your DVD drive.
   b. Go to the DVD drive, and then go to the tds folder.
   If you are installing from downloaded .zip files, go to the folder where you downloaded all the zip files. Uncompress all the .zip files to the tdsV6.3 folder, and then go to the tdsV6.3\tds folder.
4. Double-click the tdsV6.3\tds\install_tds.exe icon.
   If you prefer, you can use the command line to begin installation and specify a temporary directory other than the one specified by the TEMP environment variable. To use this option, go to the appropriate directory (from step 3) and type the following at a command prompt:
   \texttt{install\_tds -is:tempdir directory}
   where \texttt{directory} is the directory you want to use for temporary space. Be sure that you have at least 255 MB of free space in this directory. If you are installing any of the corequisite products (Embedded WebSphere Application Server or DB2) be sure that you also have an additional 150 MB in the directory specified by the TEMP environment variable.
   For example:
   \texttt{install\_tds -is:tempdir "c:\My Documents\temp"}
   The language window is displayed.

\textbf{Note}: If the installation program exits without displaying the language window, it might be because there is not enough space in the directory specified by the TEMP environment variable or the directory you specified for temporary space. Be sure that you have at least 255 MB of free space in this directory.
5. Select the language you want to use during Tivoli Directory Server installation. Click \textbf{OK}.

\textbf{Note}: This is the language used in the installation program, not in Tivoli Directory Server messages, tools such as the Configuration Tool, or for...
storing data in Tivoli Directory Server. The language used in Tivoli Directory Server is determined by the language pack you install.

6. On the Welcome window, click Next.

7. After reading the Software license agreement, select I accept the terms in the license agreement if you are willing to accept the agreement. Click Next.

8. If you have any components already installed, they are displayed with their corresponding version levels. Click Next.

9. To install in the default directory, click Next. You can specify a different directory by clicking Browse or typing the directory path you want. The directory will be created if it does not exist. (The default installation directory is C:\Program Files\IBM\LDAP\V6.3.)

Notes:

a. If you have already installed one or more language packs, the installation location is set to the path where you installed the language packs, and you are not asked where you want to install.

b. Be sure that the installation location is not the same as the path where another version of the client or the server is installed.

c. Do not use special characters, such as hyphen (-) and period (.) in the name of the installation directory. For example, use ldapdir rather than ldap-dir or ldap.dir.

d. Do not use national language characters in the name of the installation directory.

10. Click Typical and then click Next.

11. If DB2 is being installed, a window is displayed prompting you to enter a Windows user ID and password for the DB2 system ID. On the window:

   a. Type the user ID. This user ID must not be the user ID you intend to use as the owner of the directory server instance.

   If you are not using an existing user ID, DB2 creates the user ID you specify with the password you type. This is the preferred method.

   Note: If you are creating a new user ID and your system has "Password must meet complexity requirements" enabled, be sure that the password you supply meets the complexity requirements. If it does not, installation will fail. See the Windows documentation for information about complexity requirements.

   If you are using an existing Windows user ID, it must be a member of the Administrators group.

   b. Type the password, and then type the password again for verification. (If you are using an existing Windows user ID, be sure that your password is correct. Otherwise, DB2 does not install correctly.)

   c. Click Next.

   Note: If multiple supported copies of DB2 are already installed on the system, a window is displayed with the installed versions of DB2. Choose the level of DB2 you want to use, and then click Next. (You will not be asked for a user ID and password.)

12. The installation program now has enough information to begin installing. A summary window displays the components that will be installed, the installation locations, and the amount of disk space required. The Typical installation path installs all features that are not already installed. If you want to install different features, you must click Back until you reach the window...
where you selected **Typical** installation, and select **Custom** installation instead. Then use the instructions in “Installing with the Custom installation path on Windows systems” on page 45. Typical installation does not allow you to select features for installation.

Click **Install** to begin installation.

Progress windows are displayed as features are installed.

**Notes:**

a. The \bin, \sbin, and \lib directories are not added to the PATH environment variable. This allows Tivoli Directory Server 6.3 to coexist with Tivoli Directory Server 6.0, 6.1 and 6.2.

b. If the Web Administration Tool is installed, Directory Services Markup Language (DSML) files are also copied to your computer. See Appendix M, “Installing and configuring DSML,” on page 213 for information about installing and configuring DSML.

c. If the Web Administration Tool is installed, a Web application server is required to run the tool, and Embedded WebSphere Application Server is installed and configured for you. If Tivoli Directory Server 6.0 is installed with version 5.1.1 of Embedded WebSphere Application Server, Tivoli Directory Server 6.1 is installed with version 6.1 of Embedded WebSphere Application Server, or Tivoli Directory Server 6.2 is installed with version 6.1 of Embedded WebSphere Application Server, the InstallShield GUI installation program automatically migrates your configuration to the version provided with Tivoli Directory Server 6.3. If you want to use another WebSphere application server, you must use Custom installation to select a Web application server.

When Embedded WebSphere Application Server is installed and an application (such as the Web Administration tool) is deployed into Embedded WebSphere Application Server, the Embedded WebSphere Application Server for that application is also installed as a service, and the service is automatically started.

**Note:** After installation has begun, do not try to cancel the installation. If you inadvertently cancel the installation, see the information about recovering from a failed installation in the IBM Tivoli Directory Server version 6.3 Problem Determination Guide before you attempt to reinstall.

13. The Typical installation path creates the default directory server instance with the following information, which you cannot change:

   **Name:** dsrdbm01
   **Instance location:** c:\idsslapd-dsrdbm01
   **Group name:** Administrators
   **Administrator DN:** cn=root
   **Database name:** dsrdbm01

In addition, the o=sample suffix is created for the default directory server instance. You can add other suffixes later by using the Configuration Tool or the \idscfgsuf command. See “Managing suffixes” on page 144 for information.

Type the following additional information about the default directory server instance in the appropriate fields:

**User password**

Type the system password for user dsrdbm01. If this user does not exist on the system, the user ID will be created with the password you specify. If the user ID already exists, be sure to type the correct password for the user.
Confirm password
Type the password again for confirmation.

Encryption seed
Type an encryption seed string (used as a seed for generating encrypted stash files). The encryption seed must only contain printable ISO-8859-1 ASCII characters with values in the range of 33 to 126 inclusive, and must be a minimum of 12 and a maximum of 1016 characters in length. For information about characters that can be used, see Appendix K, “ASCII characters from 33 to 126,” on page 209.

Note: Save the encryption seed for future references.

This encryption seed is used to generate a set of Advanced Encryption Standard (AES) secret key values. These values are used to encrypt and decrypt directory stored password and secret key attributes.

Confirm seed
Type the encryption seed string again for confirmation.

Administrator DN password
Type a password for the administrator DN for the directory server instance. (The Administrator DN for the default directory instance is cn=root.)

Confirm DN password
Type the administrator DN password again for confirmation.

Click Next when you have completed all the fields.

14. The Installation complete window is displayed. The installation is complete, and the default directory server instance has been created.

Click Finish.

Note: If you are asked if you want to restart your computer now or later, select the option you want and click Finish. (You might need to restart your system to complete Tivoli Directory Server installation. You cannot use Tivoli Directory Server until this is completed.)

If your computer is restarted, log in using the same user ID that you used to install Tivoli Directory Server.

If you installed DB2, the DB2 First Steps GUI might be started. You can go through the DB2 First Steps or close this GUI.

Note: A license subdirectory is created in the directory where Tivoli Directory Server is installed. This subdirectory contains Tivoli Directory Server license files in all provided languages.

The Instance Administration Tool gets launched, and you can use the Instance Administration Tool to add more directory server instances or edit existing directory server instances. See Chapter 13, “Creating and administering instances,” on page 95 for instructions.

To make changes to your configuration at a later time, see Chapter 14, “Configuration,” on page 121 for more information about using the Configuration Tool.
If any errors occurred during installation, instance creation, or configuration, see the information in the IBM Tivoli Directory Server version 6.3 Problem Determination Guide for information about recovering from these errors.

**Installing with the Custom installation path on Windows systems**

To install Tivoli Directory Server 6.3 on a Windows system using the Custom installation path:

1. Be sure that you are logged on as a member of the Administrators group.
2. On the computer where you are installing Tivoli Directory Server, stop any programs that are running and close all windows. If you have open windows, the initial Tivoli Directory Server installation window might be hidden behind other windows.
3. If you are installing from a DVD:
   a. Insert the DVD in your DVD drive.
   b. Go to the DVD drive, and then go to the `tds` folder.
   If you are installing from downloaded .zip files, go to the folder where you downloaded all the zip files. Uncompress all the .zip files to the `tdsV6.3` folder, and then go to the `tdsV6.3\tds` folder.
4. Double-click the `tdsV6.3\tds\install_tds.exe` icon.
   If you prefer, you can use the command line to begin installation and specify a temporary directory other than the one specified by the TEMP environment variable. To use this option, go to the appropriate directory (from step 3) and type the following at a command prompt:
   ```
   install_tds -is:tempdir directory
   ```
   where `directory` is the directory you want to use for temporary space. Be sure that you have at least 255 MB of free space in this directory. If you are installing any of the corequisite products (Embedded WebSphere Application Server or DB2) be sure that you also have an additional 150 MB in the directory specified by the TEMP environment variable.
   For example:
   ```
   install_tds -is:tempdir "c:\My Documents\temp"
   ```
   The language window is displayed.

   **Note:** If the installation program exits without displaying the language window, it might be because there is not enough space in the directory specified by the TEMP environment variable or the directory you specified for temporary space. Be sure that you have at least 255 MB of free space in this directory.
5. Select the language you want to use during Tivoli Directory Server installation. Click **OK**.

   **Note:** This is the language used in the installation program, not in Tivoli Directory Server. The language used in Tivoli Directory Server is determined by the language pack you install.
6. On the Welcome window, click **Next**.
7. After reading the Software license agreement, select I accept the terms in the license agreement if you are willing to accept the agreement. Click **Next**.
8. If you have any components already installed, they are displayed with their corresponding version levels. Click **Next**.
9. To install in the default directory, click **Next**. You can specify a different directory by clicking **Browse** or typing the directory path you want. The directory will be created if it does not exist. (The default installation directory is C:\Program Files\IBM\LDAP\V6.3.)

**Notes:**

a. If you have already installed one or more language packs, the installation location is set to the path where you installed the language packs, and you are not asked where you want to install.

b. Be sure that the installation location is not the same as the path where another version of the client is installed.

c. Do not use special characters, such as hyphen (−) and period (.) in the name of the installation directory. For example, use **ldapdir** rather than **ldap-dir** or **ldap.dir**.

d. Do not use national language characters in the name of the installation directory.

10. Click **Custom** and then click **Next**.

If the window in the following step is very slow to be displayed, you might have a slow network drive attached. You can detach the network drive and see if the window is displayed more quickly.

11. A window showing the following components for installation is displayed:

- Tivoli Global Security Kit
- DB2
- Embedded WebSphere Application Server
- C Client 6.3
- Java Client 6.3
- Web Administration Tool 6.3
- Proxy Server 6.3
- Server 6.3

You can choose to reinstall the server, the client, or the Web Administration Tool if they were previously installed.

**Notes:**

a. If a corequisite product (such as DB2) is not displayed and it is not already installed on the system, be sure that you downloaded the .zip file for that product and extracted it in the same directory where you extracted the other Tivoli Directory Server .zip files. (If you do not want to install that corequisite product, you need not download the .zip file, but be aware that it will not be displayed on the window that shows the installable components.)

b. The **installpath\bin**, **installpath\sbin**, and **installpath\lib** directories are not added to the PATH environment variable. This allows Tivoli Directory Server 6.3 to coexist with Tivoli Directory Server 6.0, 6.1, and 6.2.

c. If the Web Administration Tool is installed, Directory Services Markup Language (DSML) files are also copied to your computer. See [Appendix M, “Installing and configuring DSML,” on page 213](#) for information about installing and configuring DSML.

d. If the Web Administration Tool is installed, a Web application server is required to run the tool, and Embedded WebSphere Application Server is installed and configured for you. If Tivoli Directory Server 6.0 is installed with version 5.1.1 of Embedded WebSphere Application Server, Tivoli Directory Server 6.1 is installed with version 6.1 of Embedded WebSphere.
Application Server, or Tivoli Directory Server 6.2 is installed with version 6.1 of Embedded WebSphere Application Server, the InstallShield GUI installation program automatically migrates your configuration to the version provided with Tivoli Directory Server 6.3. If you want to use another WebSphere application server, you must select a Web application server.

When Embedded WebSphere Application Server is installed and an application (such as the Web Administration tool) is installed into Embedded WebSphere Application Server, the Embedded WebSphere Application Server for that application is also installed as a service, and the service is automatically started.

This window also indicates the amount of disk space required and available on the selected drive.

Be sure that the components you want to install are selected, and click Next.

12. If you selected Server 6.3 but not DB2 and there are multiple supported copies of DB2 on the system, you are asked to select the version of DB2 you want to use with Tivoli Directory Server 6.3.

13. If you selected DB2, a window is displayed prompting you to enter a Windows user ID and password for the DB2 system ID. On the window:
   
a. Type the user ID. This user ID must not be the user ID you intend to use as the owner of the directory server instance.
   
   If you are not using an existing user ID, DB2 creates the user ID you specify with the password you type. This is the preferred method.
   
   Note: If you are creating a new user ID and your system has "Password must meet complexity requirements" enabled, be sure that the password you supply meets the complexity requirements. If it does not, installation will fail. See the Windows documentation for information about complexity requirements.
   
   If you are using an existing Windows user ID, it must be a member of the Administrators group.
   
b. Type the password, and then type the password again for verification. (If you are using an existing Windows user ID, be sure that your password is correct. Otherwise, DB2 does not install correctly.)
   
c. Click Next.

14. The Web Administration Tool 6.3 application require a Web application server. If you selected Web Administration Tool 6.3 but you did not select Embedded WebSphere Application Server, a window is displayed for the application you selected asking you to specify a Web application server into which to deploy the application. You can do one of the following:

   • Click Detected WebSphere Application Servers and then select a WebSphere Application Server that is installed on the system and detected by the InstallShield GUI installation program. The application will be deployed into this version of WebSphere Application Server.

   • Click Custom location of WebSphere Application Server to specify a path to a version of WebSphere Application Server in a different location. The application will be deployed into this version of WebSphere Application Server.

   • Click Do not specify. I will manually deploy at a later time. You must deploy the application into a WebSphere Application Server before you can use the application.
User can use the deploy_IDSWebApp command to deploy Web Administration Tool (IDSWebApp.war) into a Web application server. To know more about the deploy_IDSWebApp command, see Deploying the Web Administration Tool into Embedded WebSphere Application Server.

15. The installation program now has enough information to begin installing. A summary window displays the components you selected and the locations where the selected components will be installed. Click Back to change any of your selections. Click Install to begin installation.

Note: After installation has begun, do not try to cancel the installation. If you inadvertently cancel the installation, see the information about recovering from a failed installation in the IBM Tivoli Directory Server version 6.3 Problem Determination Guide before you attempt to reinstall.

16. Click Finish.

Notes:

a. If you are asked if you want to restart your computer now or later, select the option you want and click Finish. (You might need to restart your system to complete Tivoli Directory Server installation. You cannot use Tivoli Directory Server until this is completed.)

   If your computer is restarted, log in using the same user ID that you used to install Tivoli Directory Server.

b. If you installed DB2, the DB2 First Steps GUI might be started. You can go through the DB2 First Steps or close this GUI.

c. A license subdirectory is created in the directory where Tivoli Directory Server is installed. This subdirectory contains Tivoli Directory Server license files in all provided languages.

If you installed a server, the Instance Administration Tool automatically starts so that you can create a directory server instance and complete configuration. Before you can use the server, you must:

- Create a directory server instance.
- Set the administrator DN and password for the instance.
- If you installed and plan to use the full directory server, configure the database that will store the directory data. (The proxy server does not require a database.)

To create a directory server instance, use the instructions in "Creating a directory server instance" on page 96. You can set the administrator DN and password and configure the database during the instance creation process.

To make changes to your configuration at a later time, see Chapter 14, "Configuration," on page 121 for more information about using the Configuration Tool.

If any errors occurred during installation, instance creation, or configuration, see the information IBM Tivoli Directory Server version 6.3 Problem Determination Guide for information about recovering from these errors.
Installing Tivoli Directory Server on an AIX, Linux, or Solaris system

Tivoli Directory Server is installed in the following directory:

- On AIX and Solaris systems: /opt/IBM/ldap/V6.3
- On Linux systems: /opt/ibm/ldap/V6.3

There are two installation paths in the InstallShield GUI: Typical and Custom.

**Note:** When installing Tivoli Directory Server on AIX, Linux, or Solaris systems using the InstallShield GUI, ensure that the install_tds.bin command is run from a command-line program that supports GUI.

- Use the Typical installation path if you want to accept default settings, install all the Tivoli Directory Server components that are not already installed, and create a default directory server instance.

  **Note:** For best results on Solaris X64 systems, use the Custom installation path. If you use the Typical installation path, default instance creation might fail without displaying an error message. However, you can tell that the error occurred in the following ways:
  - When the Instance Administration Tool is launched at the end of installation, the default instance, dsrdbm01, will not be listed as an existing instance.
  - When the error occurs during installation, the /opt/IBM/ldap/V6.3/var/ldapinst.log logs the following error:

    ```
    ```

    To work around this problem, do one of the following:
    - Use the Typical installation path to install Tivoli Directory Server. After installation, use the Instance Administration Tool to create the default instance or any other instance. See “Creating an instance with the Instance Administration Tool” on page 96 for information about creating an instance.
    - Use the Custom installation path to install Tivoli Directory Server. See “Before you install” on page 39 and “Installing with the Custom installation path on AIX, Linux, and Solaris systems” on page 52 for information about using the Custom installation path. After installation, use the Instance Administration Tool to create the default instance or any other instance. See “Creating an instance with the Instance Administration Tool” on page 96 for information about creating an instance.

- Use the Custom installation path if you want to select components for installation and create a directory server instance using the Instance Administration Tool. When you use this tool you can customize the directory server instance.

**Note:** The InstallShield GUI installation program is supported only for the Global Zone on Solaris 10. Before you begin to install, set the following variables:

- SUNW_PKG_THISZONE=true (The default for this variable is false.)
- SUNW_PKG_ALLZONES=false (The default for this variable is false.)
To install in the Whole Root Zone or Sparse Root Zone, you must use operating system utility installation. For information about the Tivoli Directory Server components that are supported in various zones, see IBM Tivoli Directory Server Version 6.3 System Requirements.

Installing with the Typical installation path on AIX, Linux, and Solaris systems

To install Tivoli Directory Server on an AIX, Linux, or Solaris system using the Typical installation path:
1. Log in as root.
2. If you are installing from a DVD, insert and mount the DVD in your DVD drive, and then change directories to the tds directory on the DVD.
   If you are installing from downloaded .tar files, go to the folder where you downloaded all the tar files. Untar all the .tar files, and then go to the tdsV6.3/tds subdirectory.
3. Type ./install_tds.bin
   If you prefer, you can specify a temporary directory other than the system temporary directory. To use this option, change directories to the appropriate directory (from step 2) and type the following at a command prompt:
   ./install_tds.bin -is:tempdir directory
   where directory is the directory you want to use for temporary space. Be sure that you have at least 300 MB of free space in this directory on AIX and Linux systems, and 400 MB on Solaris systems. If you are installing any of the corequisite products (Embedded WebSphere Application Server or DB2) be sure that you also have an additional 150 MB in the /tmp directory.
   For example:
   ./install_tds.bin -is:tmpdir /opt/tmp
   A language window is displayed.
4. Select the language you want to use during Tivoli Directory Server installation. Click OK.
   Note: This is the language used in the installation program, not in Tivoli Directory Server messages, tools such as the Configuration Tool, or for storing data in Tivoli Directory Server. The language used in Tivoli Directory Server is determined by the language pack you install.
5. On the Welcome window, click Next.
6. After reading the Software license agreement, select I accept the terms in the license agreement if you are willing to accept the agreement. Click Next.
7. If you have any components already installed, they are displayed with their corresponding version levels. Click Next.
8. Click Typical, and then click Next.
9. If multiple supported versions of DB2 are already installed on the system, choose the DB2 you want to use, and then click Next.
10. The installation program now has enough information to begin installing. A summary window displays the components that will be installed, the installation locations, and the amount of disk space required. The Typical installation path installs all features that are not already installed. If you want to install different features, you must click Back until you reach the window where you selected Typical installation, and select Custom installation instead. Then use the instructions in "Installing with the Custom installation path on..."
AIX, Linux, and Solaris systems” on page 52. Typical installation does not allow you to select features for installation.

Click **Install** to begin installation.

Progress windows are displayed as features are installed.

**Notes:**

a. If the Web Administration Tool is installed, Directory Services Markup Language (DSML) files are also copied to your computer. See Appendix M, “Installing and configuring DSML,” on page 213 for information about installing and configuring DSML.

b. If the Web Administration Tool is installed, a Web application server is required to run the tool, and Embedded WebSphere Application Server is installed and configured for you. If Tivoli Directory Server 6.0 is installed with version 5.1.1 of Embedded WebSphere Application Server, Tivoli Directory Server 6.1 is installed with version 6.1 of Embedded WebSphere Application Server, or Tivoli Directory Server 6.2 is installed with version 6.1 of Embedded WebSphere Application Server, the InstallShield GUI installation program automatically migrates your configuration to the version provided with Tivoli Directory Server 6.3. If you want to use another WebSphere application server, you must use Custom installation to select a Web application server.

c. Because different versions of Tivoli Directory Server clients and server instances can coexist on the same system, no links are set for client and server utilities. If you want to set links, use the **idslink** command after installation. See the IBM Tivoli Directory Server version 6.3 Command Reference for information about the **idslink** command and the **idsrmlink** command, which you can use to remove previously set links.

**Note:** After installation has begun, do not try to cancel the installation. If you inadvertently cancel the installation, see the information about recovering from a failed installation in the IBM Tivoli Directory Server version 6.3 Problem Determination Guide before you attempt to reinstall.

11. The Typical installation path creates the default directory server instance with the following information, which you cannot change:

- **Name**: dsrdbm01
- **Instance location**: /home/dsrdbm01 (On Solaris systems, this directory is /export/home/dsrdbm01.)
- **Group name**: grrdbm01
- **Administrator DN**: cn=root
- **Database name**: dsrdbm01

In addition, the o=sample suffix is created for the default directory server instance. You can add other suffixes later with the Configuration Tool or the **idscfgsuf** command. See “Managing suffixes” on page 144 for information.

Type the following additional information about the default directory server instance in the appropriate fields:

- **User password**
  
  Type the system password for user dsrdbm01. If this user does not exist on the system, the user ID will be created with the password you specify. If the user ID already exists, be sure to type the correct password for the user.

- **Confirm password**
  
  Type the password again for confirmation.
Encryption seed
Type an encryption seed string (used as a seed for generating encrypted stash files). The encryption seed must only contain printable ISO-8859-1 ASCII characters with values in the range of 33 to 126 inclusive, and must be a minimum of 12 and a maximum of 1016 characters in length. For information about characters that can be used, see Appendix K, “ASCII characters from 33 to 126,” on page 209.

Note: Save the encryption seed for future references.

This encryption seed is used to generate a set of Advanced Encryption Standard (AES) secret key values. These values are used to encrypt and decrypt directory stored password and secret key attributes.

Confirm seed
Type the encryption seed string again for confirmation.

Administrator DN password
Type a password for the administrator DN for the directory server instance. (The Administrator DN for the default directory instance is cn=root.)

Confirm DN password
Type the administrator DN password again for confirmation.

Click Next when you have completed all the fields.

12. Click Finish.

Note: A license subdirectory is created in the directory where Tivoli Directory Server is installed. This subdirectory contains Tivoli Directory Server license files in all provided languages.

The Instance Administration Tool starts. You can use the Instance Administration Tool to add more directory server instances or edit existing directory server instances. See Chapter 13, “Creating and administering instances,” on page 95 for instructions.

To make changes to your configuration at a later time, see Chapter 14, “Configuration,” on page 121 for more information about using the Configuration Tool.

If any errors occurred during installation, instance creation, or configuration, see the information in the IBM Tivoli Directory Server version 6.3 Problem Determination Guide for information about recovering from these errors.

Installing with the Custom installation path on AIX, Linux, and Solaris systems
To install Tivoli Directory Server 6.3 on AIX, Linux, and Solaris systems using the Custom installation path:

1. Log in as root.
2. If you are installing from a DVD, insert the DVD in your DVD drive, and then change directories to the tds directory on the DVD.
   If you are installing from downloaded .tar files, go to the folder where you downloaded all the tar files. Untar all the .tar files, and then go to the tdsV6.3/tds subdirectory.
3. Type 
   ./install_tds.bin
   
   If you prefer, you can specify a temporary directory other than the system temporary directory. To use this option, change directories to the appropriate directory (from step 2 on page 52) and type the following at a command prompt:
   
   ./install_tds.bin -is:tempdir directory
   
   where directory is the directory you want to use for temporary space. Be sure that you have at least 300 MB of free space in this directory on AIX and Linux systems, and 400 MB on Solaris systems. If you are installing any of the corequisite products (Embedded WebSphere Application Server or DB2) be sure that you also have an additional 150 MB in the /tmp directory.
   
   For example:
   
   ./install_tds.bin -is:tempdir /opt/tmp
   
   A language window is displayed.

4. Select the language you want to use during Tivoli Directory Server installation. Click OK.

   **Note:** This is the language used in the installation program, not in Tivoli Directory Server. The language used in Tivoli Directory Server is determined by the language pack you install.

5. On the Welcome window, click Next.

6. After reading the Software license agreement, select I accept the terms in the license agreement if you are willing to accept the agreement. Click Next.

7. If you have any components already installed, they are displayed with their corresponding version levels. Click Next.

8. Click Custom and then click Next.
   
   If the window in the following step is very slow to be displayed, you might have a slow network drive attached. You can detach the network drive and see if the window is displayed more quickly.

9. A window showing the following components for installation is displayed:
   - Tivoli Global Security Kit
   - DB2
   - Embedded WebSphere Application Server
   - C Client 6.3
   - Java Client 6.3
   - Web Administration Tool 6.3
   - Proxy Server 6.3
   - Server 6.3

   Components that are already installed are not displayed.

   **Notes:**
   
   a. If a corequisite product (such as Tivoli Global Security Kit) is not displayed and it is not already installed on the system, be sure that you downloaded the .tar file for that product and extracted it in the same directory where you extracted the other Tivoli Directory Server .tar files. (If you do not want to install that corequisite product, you need not download the .tar file, but be aware that it will not be displayed on the window that shows the installable components.)
b. If you require SSL, be sure that you select **Tivoli Global Security Kit** unless you already have a valid version of GSKit installed. If you do not select this option, encryption cannot be used. On AIX systems, the idsldap.clt_max_crypt32bit63, idsldap.clt_max_crypt64bit63, and idsldap.srv_max_cryptobase64bit63 packages (for encryption) are installed only if you install GSKit.

c. If the Web Administration Tool is installed, Directory Services **Markup Language** (DSML) files are also copied to your computer. See Appendix M, “Installing and configuring DSML,” on page 213 for information about installing and configuring DSML.

d. If the Web Administration Tool is installed, a Web application server is required to run the tool, and Embedded WebSphere Application Server is installed and configured for you. If Tivoli Directory Server 6.0 is installed with version 5.1.1 of Embedded WebSphere Application Server, Tivoli Directory Server 6.1 is installed with version 6.1 of Embedded WebSphere Application Server, or Tivoli Directory Server 6.2 is installed with version 6.1 of Embedded WebSphere Application Server, the InstallShield GUI installation program automatically migrates your configuration to the version provided with Tivoli Directory Server 6.3.

e. Because different versions of Tivoli Directory Server clients and server instances can coexist on the same system, no links are set for client and server utilities. If you want to set links, use the **idslink** command after installation. See the **IBM Tivoli Directory Server version 6.3 Command Reference** for information about the command.

This window also indicates the amount of disk space required and available on the selected drive.

Be sure the components you want to install are selected, and click **Next**.

10. If you selected **Server 6.3** but not **DB2** and there are multiple supported versions of DB2 on the system, you are asked to select the version of DB2 you want to use with Tivoli Directory Server 6.3.

11. The Web Administration Tool 6.3 application require a Web application server. If you selected **Web Administration Tool 6.3** but you did not select **Embedded WebSphere Application Server**, a window is displayed for the application you selected asking you to specify a Web application server into which to deploy the application. You can do one of the following:

- Click **Detected WebSphere Application Servers** and then select a WebSphere Application Server that is installed on the system and detected by the InstallShield GUI installation program. The application will be deployed into this version of WebSphere Application Server.

- Click **Custom location of WebSphere Application Server** to specify a path to a version of WebSphere Application Server in a different location. The application will be deployed into this version of WebSphere Application Server.

- Click **Do not specify. I will manually deploy at a later time**. You must deploy the application into a WebSphere Application Server before you can use the application.

User can use the deploy_IDSWebApp command to deploy Web Administration Tool (IDSWebApp.war) into a Web application server. To know more about the deploy_IDSWebApp command, see Deploying the Web Administration Tool into Embedded WebSphere Application Server.

12. The installation program now has enough information to begin installing. A summary window displays the components you selected and the locations...
where the selected components will be installed. Click **Back** to change any of your selections. Click **Install** to begin installation.

**Note:** After installation has begun, do not try to cancel the installation. If you inadvertently cancel the installation, see the information about recovering from a failed installation in the *IBM Tivoli Directory Server version 6.3 Problem Determination Guide* before you attempt to reinstall.

13. Click **Finish**.

**Note:** A license subdirectory is created in the directory where Tivoli Directory Server is installed. This subdirectory contains Tivoli Directory Server license files in all provided languages.

If you installed a server, the Instance Administration Tool automatically starts so that you can create a directory server instance and complete configuration. Before you can use the server, you must:

- Create a directory server instance.
- Set the administrator DN and password for the instance.
- If you installed and plan to use the full directory server, configure the database that will store the directory data. (The proxy server does not require a database.)

To create a directory server instance, use the instructions in “Creating a directory server instance” on page 96. You can set the administrator DN and password and configure the database during the instance creation process.

To make changes to your configuration at a later time, see Chapter 14, “Configuration,” on page 121 for more information about using the Configuration Tool.

If any errors occurred during installation, instance creation, or configuration, see the *IBM Tivoli Directory Server version 6.3 Problem Determination Guide* for information about recovering from these errors.

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**After you install using the InstallShield GUI**

After you install using the InstallShield GUI, there are directories that you can remove:

- The ismptemp.tds directory is left on the system and can be removed. On Windows systems, the ismptemp.tds directory is located wherever the TEMP environment variable is pointing. On AIX, Linux, and Solaris systems, the ismptemp.tds directory is in the `/tmp` directory.

  If you installed using the `-istempdir` option, the ismptemp.tds dir is at the location specified with that option.

- There might also be some ismpxx directories (where `xxx` is a number such as 001 or 002) in the temporary directory location described in the previous item. You can remove these directories after the installation program exits.
Chapter 8. Installing Tivoli Directory Server using AIX utilities

You can use either of the following utilities to install Tivoli Directory Server on AIX:
- **SMIT** (This is the preferred installation method.) See “SMIT installation” on page 62 for information.
- **installp**. See “Command line installation using installp” on page 65 for information.

**Attention:** If you are upgrading from Tivoli Directory Server 6.0, 6.1, or 6.2, use the instructions in Chapter 4, “Upgrading from previous releases,” on page 17.

Before you install Tivoli Directory Server, be sure you have a supported version of DB2 installed. (See IBM Tivoli Directory Server version 6.3 System Requirements for supported versions of DB2.)

If you want to use the version of DB2 provided with Tivoli Directory Server, use the **db2_install** utility to install it. The **db2_install** utility is in the /db2 directory of the Tivoli Directory Server DVD if you have one, or in the tdsV6.3/db2/directory of the directory where you untarred the DB2 tar file for AIX.

**Notes:**
1. After you start the **db2_install** utility, you are prompted for a keyword. In response to this prompt, type ESE.
2. After you install DB2, you can check the /tmp/db2_install_log.99999 file to verify that the installation was successful. (99999 is a random number associated with the installation.)
3. The **db2_install** command might fail with the following message:
   A minor error occurred while installing "DB2 Enterprise Server Edition" on this computer. Some features may not function correctly.
   For more information see the DB2 installation log at "/tmp/db2_install.log.*".
   If this occurs, check the log shown in the message for the following error:
   DB11130E The SA MP Base Component could not be installed or updated because system prerequisites were not met. See the log file /tmp/prereqSAM.log.* for details.
   This error does not affect the functioning of DB2 with the server and can be ignored.

If you are installing the Web Administration Tool, you must also install a Web application server such as Embedded WebSphere Application Server. See Appendix H, “Installing, configuring, and uninstalling Embedded WebSphere Application Server,” on page 199 for information.

The server and the client from Tivoli Directory Server 6.3 can coexist with the following clients and servers:
- A client from Tivoli Directory Server 6.0, 6.1, or 6.2
- A server from Tivoli Directory Server 6.0, 6.1, or 6.2

If any of these are installed, you can leave them installed.
Notes:
1. For a server with no X11 support, do not install the Java client, which is in package idsldap.cltjava63, when you install the server. However, you will not be able to use the Instance Administration Tool or the Configuration Tool, which require Java, and you must use the command line to create directory server instances and configure the database.

2. You do not need to install security functions if you are not going to use them. You can provide SSL by installing a Global Security Kit (GSKit), which is included with Tivoli Directory Server 6.3, and then the SSL package on the client, server, or both. See “Installing GSKit” on page 67 for more information.

3. If you are installing Tivoli Directory Server on a node within an RS/6000® SP environment, see “Before installing on a node within an RS/6000 SP environment” before beginning installation.

For more detailed information about installation procedures and commands for the AIX operating system, see the AIX Installation Guide provided with the operating system.

Before installing on a node within an RS/6000 SP environment

Attention: Use this section only if you are installing on a node within an RS/6000 SP environment.

If you are installing Tivoli Directory Server on a node within an RS/6000 SP environment you must first add the necessary users and groups to the Control Workstation (CWS) and propagate them to the nodes using the /var/sysamn/supper update command, as follows:
1. Add the idsldap user and group on the CWS, and add the idsldap and root users to the idsldap group. For example:
   mkgroup idsldap
   mkuser idsldap
   chgrpmem -m + root,idsldap idsldap
2. Update the RS/6000 SP nodes with the new users and groups.
   /var/sysamn/supper update

You are now ready to install and configure Tivoli Directory Server on the RS/6000 SP node.

Note: You might want to turn off the timer function on the CWS to each affected RS/6000 SP node to allow installation, instance creation, and configuration to complete before the CWS updates the timer to the RS/6000 SP node. After installation, instance creation, and configuration are complete and verified, turn the timer function on again.

Packages, filesets, and prerequisites

Tivoli Directory Server is installed in /opt/IBM/ldap/V6.3.

The following information shows the packages you must install for each feature. You can install all the features at the same time, but if you install them separately, you must install them in the order shown.

32-bit client (no SSL)
   Install (in this order):
   1. Package: idsldap.cltbase63
Contains the following filesets:
- idsldap.cltbased63.rte – Base client runtime
- idsldap.cltbased63.adt – Base client SDK

2. **Package**: idsldap.clts32bit63
   Contains fileset idsldap.clts32bit63.rte – 32-bit client (no SSL)

**32-bit client (SSL)**
Install (in this order):
1. GSKit 8.0 if not already installed. See “Installing GSKit” on page 67 for information. GSKit version 8.0 is provided with this product. (A supported version of GSKit must be installed before you install the idsldap.clt_max_crypto32bit63 package.)
2. **Package**: idsldap.cltbased63
   Contains the following filesets:
   - idsldap.cltbased63.rte – Base client runtime
   - idsldap.cltbased63.adt – Base client SDK
3. **Package**: idsldap.clts32bit63
   Contains fileset idsldap.clts32bit63.rte – 32-bit client (no SSL)
4. **Package**: idsldap.clt_max_crypto32bit63
   Contains fileset idsldap.clt_max_crypto32bit63.rte – 32-bit client (SSL)

**64-bit client (no SSL)**
Install (in this order):
1. **Package**: idsldap.cltbased63
   Contains the following filesets:
   - idsldap.cltbased63.rte – Base client runtime
   - idsldap.cltbased63.adt – Base client SDK
2. **Package**: idsldap.clts64bit63
   Contains fileset idsldap.clts64bit63.rte – 64-bit client (no SSL)

**64-bit client (SSL)**
Install (in this order):
1. GSKit 8.0 if not already installed. See “Installing GSKit” on page 67 for information. GSKit version 8.0 is provided with this product. (A supported version of GSKit must be installed before you install the idsldap.clt_max_crypto64bit63 package.)
2. **Package**: idsldap.cltbased63
   Contains the following filesets:
   - idsldap.cltbased63.rte – Base client runtime
   - idsldap.cltbased63.adt – Base client SDK
3. **Package**: idsldap.clts64bit63
   Contains fileset idsldap.clts64bit63.rte – 64-bit client (no SSL)
4. **Package**: idsldap.clt_max_crypto64bit63
   Contains fileset idsldap.clt_max_crypto64bit63.rte – 64-bit client (SSL)

**Java client**
Install the following:

**Package**: idsldap.cltjava63
Contains fileset idsldap.cltjava63.rte – Java client
Proxy server (64-bit). (This includes the client packages.)
Install (in this order):
1. **Package**: idsldap.cltbase63
   Contains the following filesets:
   - idsldap.cltbase63.rte – Base client runtime
   - idsldap.cltbase63.adt – Base client SDK
2. **Package**: idsldap.clt64bit63
   Contains fileset idsldap.clt64bit63.rte – 64-bit client (no SSL)
3. **Package**: idsldap.cltjava63
   Contains fileset idsldap.cltjava63.rte – Java client

   **Note**: If you do not require X11 support, do not install the Java client.
4. **Package**: idsldap.srvbase64bit63
   Contains fileset idsldap.srvbase64bit63.rte – Base Server
5. **Package**: idsldap.srvproxy64bit63
   Contains fileset idsldap.srvproxy64bit63.rte – Proxy server
6. **Package**: idsldap.msg63.en_US
   Contains the English messages
7. **Package**: idsldap.ent63
   Contains fileset idsldap.ent63.rte - IBM Directory Server Entitlement
   (supplied only on Passport Advantage)

Proxy server (SSL) (64-bit). (This includes the client packages.)
Install (in this order):
1. GSKit 8.0 if not already installed. See “Installing GSKit” on page 67
   for information. GSKit version 8.0 is provided with this product. (A
   supported version of GSKit must be installed before you install the
   idsldap.cl_max_crypto64bit63 and idsldapsrv_max_cryptobase64bit63
   packages.)
2. **Package**: idsldap.cltbase63
   Contains the following filesets:
   - idsldap.cltbase63.rte – Base client runtime
   - idsldap.cltbase63.adt – Base client SDK
3. **Package**: idsldap.clt64bit63
   Contains fileset idsldap.clt64bit63.rte – 64-bit client (no SSL)
4. **Package**: idsldap.cl_max_crypto64bit63
   Contains fileset idsldap.cl_max_crypto64bit63.rte – 64-bit client (SSL)
5. **Package**: idsldap.cltjava63
   Contains fileset idsldap.cltjava63.rte – Java client
6. **Package**: idsldap.srvbase64bit63
   Contains fileset idsldap.srvbase64bit63.rte – Base Server
7. **Package**: idsldap.srv_max_cryptobase64bit63
   Contains fileset idsldap.srv_max_cryptobase64bit63.rte – Base Server
   (SSL)
8. **Package**: idsldap.srvproxy64bit63
   Contains fileset idsldap.srvproxy64bit63.rte – Proxy server (64-bit)
9. **Package**: idsldap.msg63.en_US
   Contains the English messages
10. **Package:** idsldap.ent63
    Contains fileset idsldap.ent63.rte - IBM Directory Server Entitlement (supplied only on Passport Advantage)

**Full directory server (no SSL) (64-bit). (This includes the client packages.)**
Install (in this order):
1. **Package:** idsldap.cltbase63
    Contains the following filesets:
    - idsldap.cltbase63.rte – Base client runtime
    - idsldap.cltbase63.adt – Base client SDK
2. **Package:** idsldap.clt64bit63
    Contains fileset idsldap.clt64bit63.rte – 64-bit client (no SSL)
3. **Package:** idsldap.cltjava63
    Contains fileset idsldap.cltjava63.rte – Java client

**Note:** If you do not require X11 support, do not install the Java client.

4. **Package:** idsldap.srvbase64bit63
    Contains fileset idsldap.srvbase64bit63.rte – Base Server (no SSL) (64-bit)
5. **Package:** idsldap.srv64bit63
    Contains fileset idsldap.srv64bit63.rte – Directory server (64-bit)
6. **Package:** idsldap.msg63.en_US
    Contains the English messages
7. **Package:** idsldap.ent63
    Contains fileset idsldap.ent63.rte - IBM Directory Server Entitlement (supplied only on Passport Advantage)

**Full directory server (SSL) (64-bit). (This includes the client packages.)**
Install (in this order):
1. GSKit 8.0 if not already installed. See "Installing GSKit" on page 67 for information. GSKit version 8.0 is provided with this product. (A supported version of GSKit must be installed before you install the idsldap.clt_max_crypto64bit63 and idsldap.srv_max_cryptobase64bit63 packages.)
2. **Package:** idsldap.cltbase63. Contains the following filesets:
    - idsldap.cltbase63.rte – Base client runtime
    - idsldap.cltbase63.adt – Base client SDK
3. **Package:** idsldap.clt64bit63
    Contains fileset idsldap.clt64bit63.rte – 64-bit client (no SSL)
4. **Package:** idsldap.clt_max_crypto64bit63
    Contains fileset idsldap.clt_max_crypto64bit63.rte – 64-bit client (SSL)
5. **Package:** idsldap.cltjava63
    Contains fileset idsldap.cltjava63.rte – Java client

**Note:** If you do not require X11 support, do not install the Java client.

6. **Package:** idsldap.srvbase64bit63
    Contains fileset idsldap.srvbase64bit63.rte – Base Server (no SSL) (64-bit)
7. **Package:** idsldap.srv_max_cryptobase64bit63
Contains fileset idsladp.srv_max_cryptobase64bit63.rte – Base Server (SSL) (64-bit)

8. **Package:** idsladp.srv64bit63
   Contains fileset idsladp.srv64bit63.rte – Directory server (64-bit)

9. **Package:** idsladp.msg63.en_US
   Contains the English messages

10. **Package:** idsladp.ent63
    Contains fileset idsladp.ent63.rte - IBM Directory Server Entitlement (supplied only on Passport Advantage)

**Web Administration Tool (no SSL)**

Install the following:

**Package:** idsladp.webadmin63
Contains fileset idsladp.webadmin63.rte – Web Administration Tool (no SSL)

**Web Administration Tool (SSL)**

Install (in this order):

1. GSKit 8.0 if not already installed. See "Installing GSKit" on page 67 for information.

2. **Package:** idsladp.webadmin_max_crypto63
   Contains fileset idsladp.webadmin_max_crypto63.rte – Web Administration Tool (SSL)

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**SMIT installation**

To install Tivoli Directory Server using **SMIT**:

1. Log in as root.

2. If you want to include security functions, install GSKit. (A supported version of GSKit must be installed before you install any of the "max_crypto" packages.) See "Installing GSKit" on page 67 for information.

3. **If you are installing from a DVD:**
   a. Insert the DVD into the DVD drive.
   b. If you are installing the client, server, or Web Administration Tool, go to the /tdsfiles subdirectory.
      If you are installing a language pack for a language other than English, go to the tdsLangpack/native subdirectory. (You must install a language pack for the language in which you want server messages displayed. You can install the language pack before or after you install the server.)

4. If you are installing from the .tar files:
   a. Go to the directory where you untailed the files.
   b. If you are installing the client, server, or Web Administration Tool, go to the tdsV6.3/tdsfiles subdirectory.
      If you are installing a language pack for a language other than English, go to the tdsV6.3/tdsLangpack/native subdirectory. (You must install a language pack for the language in which you want server messages displayed. You can install the language pack before or after you install the server.)

4. At a command prompt, type the following:
   ```sh
   smit install
   ```
5. Click Install and Update Software. The Install and Update Software window is displayed.

6. Click Install and Update from ALL Available Software.

7. Do one of the following:
   - If you are installing from the DVD, click List next to the INPUT device/directory for software field, and select the appropriate drive or the directory containing the Tivoli Directory Server images.
   - If you are installing from the unzipped file, type . in the INPUT device/directory for software field.

   Click OK.

8. Move your cursor to Software to install. Do one of the following:
   - Type idsldap to install all the idsldap filesets.
   - Click List to list all the filesets on the DVD, and then select the filesets that you want to install.

   If you are installing the product and you select the list option, you see, for example:

   idsldap.clt32bit63
   6.3.0.0 Directory Server - 32 bit Client
   idsldap.clt64bit63
   6.3.0.0 Directory Server - 64 bit Client
   idsldap.clt_max_crypto32bit63
   6.3.0.0 Directory Server - 32 bit Client (SSL)
   idsldap.clt_max_crypto64bit63
   6.3.0.0 Directory Server - 64 bit Client (SSL)
   idsldap.cltbase63
   6.3.0.0 Directory Server - Base Client
   idsldap.cltjava63
   6.3.0.0 Directory Server - Java Client
   idsldap.ent63
   6.3.0.0 Directory Server - Entitlement
   idsldap.msg63.en_US
   6.3.0.0 Directory Server - Messages - U.S. English (en)
   idsldap.srv64bit63
   6.3.0.0 Directory Server - 64 bit Server
   idsldap.srv_max_cryptobase64bit63
   6.3.0.0 Directory Server - Base Server (SSL)
   idsldap.srvbase64bit63
   6.3.0.0 Directory Server - Base Server
   idsldap.srproxy64bit63
   6.3.0.0 Directory Server - 64 bit Proxy Server
   idsldap.webadmin63
   6.3.0.0 Directory Server - Web Administration
   idsldap.webadmin_max_crypto63
   6.3.0.0 Directory Server - Web Administration (SSL)

   If you are installing a language pack, for example:

   > idsldap.msg63.pt_BR Messages - Brazilian Portuguese (pt_BR)
   > idsldap.msg63.cs_CZ Messages - Czech (cs)
   > idsldap.msg63.fr_FR Messages - French (fr)
   > idsldap.msg63.de_DE Messages - German (de)
   > idsldap.msg63.hu_HU Messages - Hungarian (hu)
   > idsldap.msg63.it_IT Messages - Italian (it)
   > idsldap.msg63.jp_JP Messages - Japanese (ja)
   > idsldap.msg63.ko_KR Messages - Korean (ko)
   > idsldap.msg63.pl_PL Messages - Polish (pl)
   > idsldap.msg63.ru_RU Messages - Russian (ru)
   > idsldap.msg63.zh_CN Messages - Simplified Chinese (zh_CN)
Select the filesets you want to install and click **OK**.

**Note:** You might see the following items listed: appsrv, db2, tds, and whitepages. Be sure that these items are not selected.

9. Click **OK**. The message *Are You Sure?* is displayed.

10. Click **OK** to start the installation.

11. Check the installation summary at the end of the output to verify successful installation of the filesets.

12. Click **Done**.

13. To exit SMIT, press F12, or click **Cancel** until you are back to a command prompt. To verify that Tivoli Directory Server was installed successfully, type the following at a command prompt:

   ```bash
   lspp -al idsldap.*
   ```

   The output displayed lists all the filesets starting with `idsldap`. For example:

   ```console
   idsldap.clt32bit63.rte 6.3.0.0 C F Directory Server - 32 bit Client
   idsldap.clt64bit63.rte 6.3.0.0 C F Directory Server - 64 bit Client
   idsldap.clt_max_crypto32bit63.rte 6.3.0.0 C F Directory Server - 32 bit Client (SSL)
   idsldap.clt_max_crypto64bit63.rte 6.3.0.0 C F Directory Server - 64 bit Client (SSL)
   idsldap.cltbase63.adt 6.3.0.0 C F Directory Server - Base Client
   idsldap.cltbase63.rte 6.3.0.0 C F Directory Server - Base Client
   idsldap.cltjava63.rte 6.3.0.0 C F Directory Server - Java Client
   idsldap.msg63.en_US 6.3.0.0 C F Directory Server - Messages - U.S. English (en)
   idsldap.srv64bit63.rte 6.3.0.0 C F Directory Server - 64 bit Server
   idsldap.srvproxy64bit63.rte 6.3.0.0 C F Directory Server - Proxy Server
   idsldap.srvbase64bit63.rte 6.3.0.0 C F Directory Server - Base Server
   idsldap.srv_max_cryptobase64bit63.rte 6.3.0.0 C F Directory Server - Base Server (SSL)
   idsldap.webadmin63.rte 6.3.0.0 C F Directory Server - Web Administration
   idsldap.webadmin_max_crypto63.rte 6.3.0.0 C F Directory Server - Web Administration (SSL)
   idsldap.ent63.rte 6.3.0.0 C F Directory Server - Entitlement
   ```

**Notes:**

1. If you install the Web Administration Tool, DSML files are also copied to your computer. See Appendix M, “Installing and configuring DSML,” on page 213 for information about installing and configuring DSML.

2. If you install the Web Administration Tool, a Web application server such as Embedded WebSphere Application Server is required to run the tool. See
Appendix H, “Installing, configuring, and uninstalling Embedded WebSphere Application Server,” on page 199 for information about installing and configuring a Web application server.

**Command line installation using installp**

**Note:** If you want to upgrade from Tivoli Directory Server 6.0, 6.1, or 6.2, use the instructions in Chapter 4, “Upgrading from previous releases,” on page 17.

To install Tivoli Directory Server from a command prompt:

1. Log in as **root**.
2. If you want to include security functions, install GSKit. See “Installing GSKit” on page 67. (A supported version of GSKit must be installed before you install any of the "max_crypto" packages.)
3. **If you are installing from a DVD:**
   a. Insert the DVD into the DVD drive and mount the DVD.
   b. If you are installing the client, server, or Web Administration Tool, go to the /tdsfiles subdirectory on the DVD.
      If you are installing a language pack for a language other than English, go to the /tdsLangpack/native directory on the DVD. (You must install a language pack for the language in which you want server messages displayed. You can install the language pack before or after you install the server.)

**If you are installing from the .tar files:**

a. Go to the directory where you untarred the files.
   b. If you are installing the client, server, or Web Administration Tool, go to the /tdsV6.3/tdsfiles subdirectory.
      If you are installing a language pack for a language other than English, go to the /tdsV6.3/tdsLangpack/native directory. (You must install a language pack for the language in which you want server messages displayed. You can install the language pack before or after you install the server.)

4. Determine which Tivoli Directory Server packages and which language packs you need. See “Packages, filesets, and prerequisites” on page 58 for information. To see the packages that are available for installation, type the following command:
   
   ```shell
   installp -ld . | grep idsldap
   ```
   
   A list of all the installable Tivoli Directory Server packages or language packs is displayed. (This depends on which subdirectory you started the `installp` command from.)

5. At a command prompt, install the required packages by typing the following command:

   ```shell
   installp -acgXd . packages
   ```

   where:
   - `-a` stands for `apply`.
   - `-c` stands for `commit`.
   - `-g` installs prerequisites if necessary.
   - `-X` increases the file system space if needed.
   - `-d` stands for `device`.
• *packages* is the package name or list of package names you want to install.

**Examples:**
To install all of the Tivoli Directory Server filesets, type:
```
installp -acgXd idsldap
```

6. Upon completion of installation, the system generates an installation summary. Verify that the Result column shows *success* for all loaded files. You can also verify that Tivoli Directory Server was installed successfully by typing the following at a command prompt:
```
lspp -a | grep -i idsldap
```
The output displayed lists all the filesets starting with *idsldap*. This list includes the server, client, Web Administration Tool, HTML, and message filesets. For example:
```
idsldap.clt32bit63.rte 6.3.0.0 C F Directory Server - 32 bit Client
idsldap.clt64bit63.rte 6.3.0.0 C F Directory Server - 64 bit Client
idsldap.clt_max_crypto32bit63.rte 6.3.0.0 C F Directory Server - 32 bit Client (SSL)
idsldap.clt_max_crypto64bit63.rte 6.3.0.0 C F Directory Server - 64 bit Client (SSL)
idsldap.cltbase63.adt 6.3.0.0 C F Directory Server - Base Client
idsldap.cltbase63.rte 6.3.0.0 C F Directory Server - Base Client
idsldap.cljava63.rte 6.3.0.0 C F Directory Server - Java Client
idsldap.msg63.en_US 6.3.0.0 C F Directory Server - Messages - U.S. English (en)
idsldap.srv64bit63.rte 6.3.0.0 C F Directory Server - 64 bit Server
idsldap.srvproxy64bit63.rte 6.3.0.0 C F Directory Server - Proxy Server
idsldap.srvbase64bit63.rte 6.3.0.0 C F Directory Server - Base Server
idsldap.srv_max_cryptobase64bit63.rte 6.3.0.0 C F Directory Server - Base Server (SSL)
idsldap.webadmin63.rte 6.3.0.0 C F Directory Server - Web Administration
idsldap.webadmin_max_crypto63.rte 6.3.0.0 C F Directory Server - Web Administration (SSL)
idsldap.ent63.rte 6.3.0.0 C F Directory Server - Entitlement
```

**Notes:**
1. If you install the Web Administration Tool, DSML files are also copied to your computer. See Appendix M, “Installing and configuring DSML,” on page 213 for information about installing and configuring DSML.
2. If you install the Web Administration Tool, a Web application server such as Embedded WebSphere Application Server is required to run the tool. See Appendix H, “Installing, configuring, and uninstalling Embedded WebSphere Application Server,” on page 199 for information about installing and configuring a Web application server.
Installing GSKit

Before you install Tivoli Directory Server, if you want an SSL-enabled version of Tivoli Directory Server, you must install GSKit to take advantage of the security features. You can use either SMIT or `installp` to install.

To install using SMIT:
1. Invoke SMIT by typing `smit` at a command prompt.
2. Select Software Installation & Maintenance.
3. Select Install and Update Software.
4. Select Install and Update from ALL Available Software.
5. On the device/directory window specify the tdsV6.3/gskit directory, which contains the GSKit installable software.
6. Select the filesets of the software packages to install.
7. Select the options appropriate to your installation requirements from the Options window.

   **Note:** Set the **Install all prereqs** option to yes.

8. Confirm that you want to complete the installation.

The `installp` command installs available software products in a compatible installation package. To install GSKit using `installp`, enter the following at a command prompt:

**Installing GSKit (64-bit)**
```
installp -acgXd . GSKit8.gskcrypt64.ppc.rte
installp -acgXd . GSKit8.gskssl64.ppc.rte
```

**Installing GSKit (32-bit)**
```
installp -acgXd . GSKit8.gskcrypt32.ppc.rte
installp -acgXd . GSKit8.gskssl32.ppc.rte
```

where
- `-a` stands for **apply**
- `-c` stands for **commit**
- `-g` automatically installs or commits any requisite software product.
- `-X` expands the filesystem if necessary.
- `-d` stands for **device**. This specifies where the installation media can be found.

See [Appendix Q, “Setting up GSKit to support CMS key databases,” on page 223](#) for more information about setting up GSKit after installation.

Setting system variables for GSKit

You must set the following variable so that `ikeyman` can run:

`JAVA_HOME=location`, where `location` is the location where JDK 1.6 is installed. (The copy of the JDK 1.6 is installed Tivoli Directory Server is in `ldaphome/java`.)

**Note:** If you are prompted to set `JAVA_HOME`, you can set it to the location of the Java that is installed with Tivoli Directory Server. On Linux system, you must also set the `LIBPATH` environment variable as follows:

```
export LIBPATH=ldaphome/java/jre/bin:ldaphome/java/jre/bin/classic:$LIBPATH
```
On AIX systems use the LIBPATH environment variable to specify the library path, on Solaris systems use the LD_LIBRARY_PATH environment variable, and on Windows system use the LIB environment variable to specify the library path.

Removing GSKit

To remove GSKit using SMIT:
1. Invoke SMIT by typing `smit` at a command prompt.
2. Select **Software Installation and Maintenance** on the menu.
3. Select **Software Maintenance and Utilities**.
4. On the Maintenance window, select **Remove Installed Software** to open the Remove Software Product window.
5. Enter the name of the software package.
6. Set the flag for **REMOVE dependent software?** to **YES** to instruct the system to automatically remove software products and updates that are dependent upon the product you are removing.
7. Confirm the procedure to complete the removal of the software package.

To remove GSKit using `installp`, type the following at a command prompt:

**Removing GSKit (64-bit)**

```
installp -u -g -V2 GSKit8.gskssl64.ppc.rte
installp -u -g -V2 GSKit8.gskcrypt64.ppc.rte
```

**Removing GSKit (32-bit)**

```
installp -u -g -V2 GSKit8.gskssl32.ppc.rte
installp -u -g -V2 GSKit8.gskcrypt32.ppc.rte
```

where

- `-u` removes the specified software and any of its installed updates from the system.
- `-g` removes or rejects dependents of the specified software.

**Note:** If you use the `-g` option while the Tivoli Directory Server “max_crypto” packages are still installed, the packages will be removed.

- `-V2` prints an alphabetically ordered list of FAILURES and WARNINGS.
Chapter 9. Installing Tivoli Directory Server using Linux utilities

Attention: If you are upgrading from Tivoli Directory Server 6.0, 6.1, or 6.2, use the instructions in Chapter 4, “Upgrading from previous releases,” on page 17.

Installing Tivoli Directory Server

Before you install Tivoli Directory Server, be sure that you have a supported version of DB2 installed. (See IBM Tivoli Directory Server version 6.3 System Requirements for supported versions of DB2.) If you want to use the version of DB2 provided with Tivoli Directory Server, you must use the `db2_install` utility to install it. (If you do not use this utility, the DB2 license file is not added correctly.) The `db2_install` utility is in the `/db2` directory of the Tivoli Directory Server DVD if you have one, or in the tdsV6.3/db2/ subdirectory of the directory where you untarred the DB2 tar file for Linux.

Notes:
1. After you start the `db2_install` utility, you are prompted for a keyword. In response to this prompt, on System x Linux (32-bit) operating system, type WSE (since DB2 V9.7 WSE is provided), and on all other platforms of Linux operating system, type ESE (since DB2 V9.7 ESE is provided).
2. After you install DB2, you can check the `/tmp/db2_install_log.99999` file to verify that the installation was successful. (99999 is a random number associated with the installation.)

If you are installing the Web Administration Tool, you must install a Web application server such as the Embedded WebSphere Application Server. See Appendix H, “Installing, configuring, and uninstalling Embedded WebSphere Application Server,” on page 199 for information.

Packages

Tivoli Directory Server is installed in `/opt/ibm/ldap/V6.3`.

The Tivoli Directory Server for the Linux operating system is provided in the following packages.

System x Linux packages:
- `idsldap-cltbase63-6.3.0-0.i386.rpm` – IBM Directory Server - Base Client
- `idsldap-clt32bit63-6.3.0-0.i386.rpm` – IBM Directory Server - 32 bit Client
- `idsldap-cltjava63-6.3.0-0.i386.rpm` – IBM Directory Server - Java Client
- `idsldap-srvbase32bit63-6.3.0-0.i386.rpm` – IBM Directory Server – Base Server
- `idsldap-srvproxy32bit63-6.3.0-0.i386.rpm` – IBM Directory Server - Proxy Server
- `idsldap-srv32bit63-6.3.0-0.i386.rpm` – IBM Directory Server - 32 bit Server
• idsldap-webadmin63-6.3.0-0.i386.rpm – IBM Directory Server - Web Administration
• idsldap-msg63-en-6.3.0-0.i386.rpm – IBM Directory Server - Messages U.S. English (en)
• idsldap-ent63-6.3.0-0.i386.rpm - IBM Directory Server Entitlement (supplied only on Passport Advantage)

**System z Linux packages:**
• idsldap-cltbase63-6.3.0-0.s390.rpm – IBM Directory Server - Base Client
• idsldap-clt32bit63-6.3.0-0.s390.rpm – IBM Directory Server - 32 bit Client
  Requires idsldap-cltbase63-6.3.0-0.s390.rpm
• idsldap-clt64bit63-6.3.0-0.s390x.rpm – IBM Directory Server - 64 bit Client
  Requires idsldap-cltbase63-6.3.0-0.s390.rpm
• idsldap-cltjava63-6.3.0-0.s390.rpm – IBM Directory Server - Java Client
• idsldap-srvbase64bit63-6.3.0-0.s390x.rpm - IBM Directory Server – Base Server
  Requires idsldap-clt64bit63-6.3.0-0.s390x.rpm and its prerequisites
• idsldap-srvproxy64bit63-6.3.0-0.s390x.rpm – IBM Directory Server - Proxy Server
  Requires idsldap-srvbase64bit63-6.3.0-0.s390x.rpm and its prerequisites
• idsldap-srv64bit63-6.3.0-0.s390x.rpm – IBM Directory Server - 64 bit Server
  Requires idsldap-srvbase64bit63-6.3.0-0.s390x.rpm and its prerequisites
• idsldap-webadmin63-6.3.0-0.s390.rpm – IBM Directory Server - Web Administration
• idsldap-msg63-en-6.3.0-0.s390.rpm – IBM Directory Server - Messages U.S. English (en)
• idsldap-ent63-6.3.0-0.s390.rpm - IBM Directory Server Entitlement (supplied only on Passport Advantage)

**System i and System p Linux packages:**
• idsldap-cltbase63-6.3.0-0.ppc.rpm – IBM Directory Server - Base Client
• idsldap-clt32bit63-6.3.0-0.ppc.rpm – IBM Directory Server - 32 bit Client
  Requires idsldap-cltbase63-6.3.0-0.ppc.rpm
• idsldap-clt64bit63-6.3.0-0.ppc64.rpm – IBM Directory Server - 64 bit Client
  Requires idsldap-cltbase63-6.3.0-0.ppc.rpm
• idsldap-cltjava63-6.3.0-0.ppc.rpm – IBM Directory Server - Java Client
• idsldap-srvbase64bit63-6.3.0-0.ppc64.rpm - IBM Directory Server – Base Server
  Requires idsldap-clt64bit63-6.3.0-0.ppc64.rpm and its prerequisites
• idsldap-srvproxy64bit63-6.3.0-0.ppc64.rpm – IBM Directory Server - Proxy Server
  Requires idsldap-srvbase64bit63-6.3.0-0.ppc64.rpm and its prerequisites
• idsldap-srv64bit63-6.3.0-0.ppc64.rpm – IBM Directory Server - 64 bit Server
  Requires idsldap-srvbase64bit63-6.3.0-0.ppc64.rpm and its prerequisites
Installing features

To install the proxy server or the full directory server:

1. Log in as root.
2. If you are installing from a DVD, after you mount the DVD go to:
   • The /tdsfiles subdirectory of the DVD to install Tivoli Directory Server packages
   • The /tdsLangpack/native directory of the DVD to install language packs for languages other than English
   If you are installing from downloaded tar files, go to:
   • The tdsV6.3/tdsfiles subdirectory of the directory where you untarred the tar files to install Tivoli Directory Server packages
   • The tdsV6.3/tdsLangpack/native directory of the directory where you untarred the tar files to install language packs for languages other than English
3. Install the 32-bit client by typing the following at a command prompt:
rpm -ihv idsldap-cltbase63-6.3.0-0.i386.rpm
rpm -ihv idsldap-clt32bit63-6.3.0-0.i386.rpm

Note: On System i and System p Linux, System z Linux, and
AMD64/Opteron/EM64T Linux systems, install the 64-bit client instead
of the 32-bit client because the server is 64-bit. For example:
rpm -ihv idsldap-cltbase63-6.3.0-0.ppc.rpm
rpm -ihv idsldap-clt64bit63-6.3.0-0.ppc64.rpm

4. Depending on which type of server you want, do one of the following:
   • Install the proxy server by typing the following at a command prompt:
rpm -ihv idsldap-cltjava63-6.3.0-0.i386.rpm
rpm -ihv idsldap-srvbase32bit63-6.3.0-0.i386.rpm
rpm -ihv idsldap-srvproxy32bit63-6.3.0-0.i386.rpm
rpm -ihv idsldap-ent63-6.3.0-0.i386.rpm
   • Install the full directory server by typing the following at a command
     prompt:
rpm -ihv idsldap-cltjava63-6.3.0-0.i386.rpm
rpm -ihv idsldap-srvbase32bit63-6.3.0-0.i386.rpm
rpm -ihv idsldap-srv32bit63-6.3.0-0.i386.rpm

5. Verify that the packages have been installed correctly by typing the following at
   a command prompt:
rpm -qa | grep idsldap

If the product has been successfully installed, the following output is displayed:
   • For the proxy server:
     idsldap-cltbase63-6.3.0-0
     idsldap-clt32bit63-6.3.0-0
     idsldap-cltjava63-6.3.0-0
     idsldap-srvbase32bit63-6.3.0-0
     idsldap-srvproxy32bit63-6.3.0-0
     idsldap-ent63-6.3.0-0
   • For the full directory server:
     idsldap-cltbase63-6.3.0-0
     idsldap-clt32bit63-6.3.0-0
     idsldap-cltjava63-6.3.0-0
     idsldap-srvbase32bit63-6.3.0-0
     idsldap-srv32bit63-6.3.0-0

Note: The 64-bit client is displayed for System i and System p Linux, System z
Linux, and AMD64/Opteron/EM64T Linux systems.

6. Install the English messages:
rpm -ihv idsldap-msg63-en-6.3.0-0.i386.rpm
You can install messages in other languages by using the package names for
those languages. These names are:
   • German: idsldap-msg63-de-6.3.0-0.i386.rpm
   • Spanish: idsldap-msg63-es-6.3.0-0.i386.rpm
   • French: idsldap-msg63-fr-6.3.0-0.i386.rpm
   • Italian: idsldap-msg63-it-6.3.0-0.i386.rpm
   • Japanese: idsldap-msg63-ja-6.3.0-0.i386.rpm
   • Korean: idsldap-msg63-ko-6.3.0-0.i386.rpm
   • Brazilian Portuguese: idsldap-msg63-pt_BR-6.3.0-0.i386.rpm
   • Simplified Chinese: idsldap-msg63-zh_CN-6.3.0-0.i386.rpm
   • Traditional Chinese: idsldap-msg63-zh_TW-6.3.0-0.i386.rpm
7. If you want to include security functions, install GSKit. See “Installing GSKit.”

**To install the client only packages:**

To install the 32-bit client, type the following at a command prompt:

```
rpm -ihv idsldap-cltbase63-6.3.0-0.i386.rpm
rpm -ihv idsldap-clt32bit63-6.3.0-0.i386.rpm
rpm -ihv idsldap-cltjava63-6.3.0-0.i386.rpm
```

If you want to include security functions, install GSKit. See “Installing GSKit.”

**To install the Web Administration Tool**, type the following at a command prompt:

```
rpm -ihv idsldap-webadmin63-6.3.0-0.i386.rpm
```

**Notes:**

1. If you install the Web Administration Tool, DSML files are also copied to your computer. See Appendix M, “Installing and configuring DSML,” on page 213 for information about installing and configuring DSML.

2. If you install the Web Administration Tool, a Web application server such as Embedded WebSphere Application Server is required to run the tool. See Appendix H, “Installing, configuring, and uninstalling Embedded WebSphere Application Server,” on page 199 for information about installing and configuring a Web application server.

---

**Installing GSKit**

Use the following information to install GSKit 8.0 through the command line.

The package names for GSKit 8.0 on the Linux platforms are as follows:

**System x Linux:**

- gskcrypt32-8.0.13.1.linux.x86.rpm
- gskssl32-8.0.13.1.linux.x86.rpm

**System z Linux (32-bit):**

- gskcrypt31-8.0.13.1.linux.s390.rpm
- gskssl31-8.0.13.1.linux.s390.rpm

**System z Linux (64-bit):**

- gskcrypt64-8.0.13.1.linux.s390x.rpm
- gskssl64-8.0.13.1.linux.s390x.rpm

**System i and System p Linux (32-bit):**

- gskcrypt32-8.0.13.1.linux.ppc.rpm
- gskssl32-8.0.13.1.linux.ppc.rpm

**System i and System p Linux (64-bit):**

- gskcrypt64-8.0.13.1.linux.ppc.rpm
- gskssl64-8.0.13.1.linux.ppc.rpm

**Linux IA64 (Itanium) and AMD64/EM64T Linux (32-bit):**

- gskcrypt32-8.0.13.1.linux.x86.rpm
- gskssl32-8.0.13.1.linux.x86.rpm
Linux IA64 (Itanium) and AMD64/EM64T Linux (64-bit):

gskcrypt64-8.0.13.1.linux.x86_64.rpm
gskssl64-8.0.13.1.linux.x86_64.rpm

To install GSKit using **rpm**, log in as **root**, go to the directory where the GSKit file is, and type the following at a command prompt: (This example uses the System x Linux package name.)

```
rpm -ihv gskcrypt32-8.0.13.1.linux.x86.rpm
rpm -ihv gsksssl32-8.0.13.1.linux.x86.rpm
```

See [Appendix Q, “Setting up GSKit to support CMS key databases,” on page 223](#) for more information about setting up GSKit after installation.

**Removing GSKit**

To remove GSKit, type the following at a command prompt:

- On a 32-bit system (System x Linux):
  ```
rpm -evv gsksssl32-8.0.13.1.linux.x86.rpm
rpm -evv gskcrypt32-8.0.13.1.linux.x86.rpm
  ```

- On a 64-bit system (Linux IA64 and AMD64/EM64T Linux):
  ```
rpm -evv gsksssl64-8.0.13.1.linux.x86_64.rpm
rpm -evv gskcrypt64-8.0.13.1.linux.x86_64.rpm
  ```

where

- **-evv** specifies to erase the package and display debugging information. If no trace or debug information is desired, use only **-e**.
Chapter 10. Installing Tivoli Directory Server using Solaris utilities

Attention: If you are upgrading from Tivoli Directory Server 6.0, 6.1, or 6.2, use the instructions in Chapter 4, “Upgrading from previous releases,” on page 17.

Before you install

Before you install Tivoli Directory Server, be sure that you have a supported version of DB2 installed. (See IBM Tivoli Directory Server version 6.3 System Requirements for supported versions of DB2.) If you want to use the version of DB2 provided with Tivoli Directory Server, you must use the db2_install utility to install it. (If you do not use this utility, the DB2 license file is not added correctly.) The db2_install utility is in the /db2 directory of the Tivoli Directory Server DVD if you created one, or in the tdsV6.3/db2/ directory of the directory where you unzipped the DB2 tar file for Solaris.

Notes:
1. After you start the db2_install utility, you are prompted for a keyword. In response to this prompt, type ESE. When you are asked if you want to install to a directory other than the /opt directory, be sure to accept the default of /opt. Tivoli Directory Server assumes that DB2 is installed in this directory.
2. You might see the message test: argument expected at the end of installation. You can ignore this message. After you install DB2, you can check the /tmp/db2_install_log.99999 file to verify that the installation was successful. (99999 is a random number associated with the installation.)

If you have a client from IBM Tivoli Directory Server 6.0, 6.1, or 6.2, or a server from Tivoli Directory Server 6.0, 6.1, or 6.2, you can leave it installed. The server and the client from Tivoli Directory Server 6.3 can coexist with a client or server from one of these versions.

If you are installing the Web Administration Tool, you must install a Web application server such as Embedded WebSphere Application Server. See Appendix H, “Installing, configuring, and uninstalling Embedded WebSphere Application Server,” on page 199 for information.

Installing Tivoli Directory Server

Tivoli Directory Server is installed in /opt/IBM/ldap/V6.3.

Use the pkgadd from a command prompt to install Tivoli Directory Server.

Note: You do not need to install security functions if you are not going to use them. You can provide SSL by installing Global Security Kit (GSKit). See “Installing GSKit” on page 79 for information about installing GSKit.

The following instructions assume that you are installing from a DVD drive.

Package dependencies

The following Tivoli Directory Server packages are available for installation:
Note: There are packages available for Sun SPARC Solaris and AMD64/Opteron/EM64T Solaris operating systems. The package names are the same for both operating systems.

- IDSlbc63: Base client
- IDSl32c63: 32-bit client
- IDSl64c63: 64-bit client
- IDSljc63: Java client
- IDSlbs63: Base server
- IDSl64p63: Proxy server
- IDSl64s63: 64-bit server
- IDSlweb63: Web Administration Tool
- IDSlen63: English messages
- IDSlent63: Entitlement

Because of package dependencies, the order of installation is significant. Install the packages in the following order:

**For the 32-bit client only:**
Install in the following order:
1. Base client
2. 32-bit client

**For the 64-bit client only:**
Install in the following order:
1. Base client
2. 64-bit client

**For the proxy server:**
Install in the following order:
1. Base client
2. 64-bit client
3. Java client
4. Base server
5. Proxy server
6. English messages (can be in any order)
7. Entitlement (can be in any order)

**For the full directory server:**
Install in the following order:
1. Base client
2. 64-bit client
3. Java client
4. Base server
5. full directory server
6. English messages (can be in any order)
7. Entitlement (can be in any order)

If you do not install in the order shown, the installation might fail.
Note: Because the Web Administration Tool package has no dependencies on any of the other packages, and none of the other packages are dependent on it, you can install it in any order.

Command line installation using pkgadd

To install Tivoli Directory Server from a command prompt:

1. Log in as root.
2. If you are installing from a DVD, after you mount the DVD go to:
   - The /tdsfiles subdirectory of the DVD to install Tivoli Directory Server packages
   - The /tdsLangpack/native directory of the DVD to install language packs for languages other than English

   If you are installing from downloaded tar files, go to:
   - The tdsV6.3/tdsfiles subdirectory of the directory where you untarred the tar file to install Tivoli Directory Server packages
   - The tdsV6.3/tdsLangpack/native directory of the directory where you untarred the tar file to install language packs for languages other than English

3. At a command prompt, install the packages you want by typing the following command for each package:

   pkgadd -d pkgfilename

   where pkgfilename is the file name of the package you want to install. Do not use the system default of ALL. The system does not sequence the packages correctly and the installation fails.

   The packages shown in the following tables are available. Be sure to install in the order shown in "Package dependencies" on page 75.

   Note: There are packages available for Sun SPARC Solaris and AMD64/Opteron/EM64T Solaris operating systems. The package names and the file names are the same for both operating systems.

   Table 2. Tivoli Directory Server packages for Solaris operating systems

<table>
<thead>
<tr>
<th>Package</th>
<th>Package name</th>
<th>File name</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Directory Server - Base Client</td>
<td>IDSIdbc63</td>
<td>idsldap.cltbase63.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - 32 bit Client</td>
<td>IDSId32c63</td>
<td>idsldap.clt32bit63.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - 64 bit Client</td>
<td>IDSId64c63</td>
<td>idsldap.clt64bit63.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - Java Client</td>
<td>IDSIdjc63</td>
<td>idsldap.cltjava63.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - Base Server</td>
<td>IDSIdbs63</td>
<td>idsldap.srvbase64bit63.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - Proxy Server</td>
<td>IDSId64p63</td>
<td>idsldap.srvproxy64bit63.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - 64 bit Server</td>
<td>IDSId64s63</td>
<td>idsldap.srv64bit63.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - Web Administration</td>
<td>IDSIdweb63</td>
<td>idsldap.webadmin63.pkg</td>
</tr>
</tbody>
</table>
Table 2. Tivoli Directory Server packages for Solaris operating systems (continued)

<table>
<thead>
<tr>
<th>Package</th>
<th>Package name</th>
<th>File name</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Directory Server - Messages U.S. English (en)</td>
<td>IDSlen63</td>
<td>idsladp.msg63.en.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - Entitlement</td>
<td>IDSsent63</td>
<td>idsladp.ent63.pkg</td>
</tr>
</tbody>
</table>

Table 3. Tivoli Directory Server language packages for Solaris operating systems

<table>
<thead>
<tr>
<th>Package</th>
<th>Package name</th>
<th>File name</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Directory Server - Messages German (de)</td>
<td>IDSlede63</td>
<td>idsladp.msg63.de.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - Messages Spanish (es)</td>
<td>IDSles63</td>
<td>idsladp.msg63.es.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - Messages French (fr)</td>
<td>IDSlf63</td>
<td>idsladp.msg63.fr.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - Messages Italian (it)</td>
<td>IDSlit63</td>
<td>idsladp.msg63.it.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - Messages Japanese (ja)</td>
<td>IDSja63</td>
<td>idsladp.msg63.ja.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - Messages Korean (ko)</td>
<td>IDSlko63</td>
<td>idsladp.msg63.ko.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - Messages Brazilian (br)</td>
<td>IDSlbr63</td>
<td>idsladp.msg63.pt_BR.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - Messages Simplified Chinese (cn)</td>
<td>IDSlcn63</td>
<td>idsladp.msg63.zh_CN.pkg</td>
</tr>
<tr>
<td>IBM Directory Server - Messages Traditional Chinese (tw)</td>
<td>IDSltw63</td>
<td>idsladp.msg63.zh_TW.pkg</td>
</tr>
</tbody>
</table>

The following instructions show you how to install different features:

- To install the 32-bit client, type:
  ```
  pkgadd -d idsldap.cltbase63.pkg
  pkgadd -d idsldap.clt32bit63.pkg
  ```

- To install the 64-bit client, type:
  ```
  pkgadd -d idsldap.cltbase63.pkg
  pkgadd -d idsldap.clt64bit63.pkg
  ```

- To install the proxy server (with English messages), type:
  ```
  pkgadd -d idsldap.cltbase63.pkg
  pkgadd -d idsldap.clt64bit63.pkg
  pkgadd -d idsldap.cltjava63.pkg
  pkgadd -d idsldap.srvbase64bit63.pkg
  pkgadd -d idsldap.srvproxy64bit63.pkg
  pkgadd -d idsldap.msg63.en.pkg
  pkgadd -d idsldap.ent63.pkg
  ```

- To install the full directory server (with English messages), type:
  ```
  pkgadd -d idsldap.cltbase63.pkg
  pkgadd -d idsldap.clt64bit63.pkg
  pkgadd -d idsldap.cltjava63.pkg
  pkgadd -d idsldap.srvbase64bit63.pkg
  pkgadd -d idsldap.srv64bit63.pkg
  pkgadd -d idsldap.msg63.en.pkg
  pkgadd -d idsldap.ent63.pkg
  ```
Notes:

a. When you install client or server packages, the system might prompt you with the following query: This package contains scripts which will be executed with super-user permission during the process of installing the package. Continue with installation?

Type y to continue. These scripts create the Tivoli Directory Server user ID.

b. If you are installing a server package, you might also see the following prompt: Do you want to install these as setuid and/or setgid files?

Type y to continue. The programs must be able to start daemons, run DB2 commands, and create the Tivoli Directory Server DB2 instance user ID and group, so they must occasionally run as root.

• To install messages in another language, type the following:

```
pkgadd -d idsldap.msg63.language_ID.pkg
```

where language_ID is one of the following:

- de for German
- es for Spanish
- fr for French
- it for Italian
- ja for Japanese
- ko for Korean
- pt_BR for Brazilian Portuguese
- zh_CN for simplified Chinese
- zh_TW for traditional Chinese

• To install the Web Administration Tool package, type:

```
pkgadd -d idsldap.webadmin63.pkg
```

Notes:

a. If you install the Web Administration Tool, DSML files are also copied to your computer. See Appendix M, “Installing and configuring DSML,” on page 215 for information about installing and configuring DSML.

b. If you install the Web Administration Tool, a Web application server such as Embedded WebSphere Application Server is required to run the tool. See Appendix H, “Installing, configuring, and uninstalling Embedded WebSphere Application Server,” on page 199 for information about installing and configuring a Web application server.

4. If you want to include security functions, install GSKit. See “Installing GSKit.”

5. After you install, you might need to set kernel parameters before you use the directory. See “Setting kernel parameters on Solaris systems” on page 160 for information.

## Installing GSKit

You can install GSKit using the command line.

To install GSKit using the command line:

1. Insert the DVD, or download the GSKit .tar file.
2. Log in as root.
3. At a command prompt, change the working directory to the gskit directory and install the required file sets with the following commands:
To install the 64-bit GSKit:
pkgadd -d gsk8cry64.pkg
pkgadd -d gsk8ssl64.pkg

To install the 32-bit GSKit:
pkgadd -d gsk8cry32.pkg
pkgadd -d gsk8ssl32.pkg

See Appendix Q, “Setting up GSKit to support CMS key databases,” on page 223 for more information about setting up GSKit after installation.

Removing GSKit
To remove GSKit, type the following at a command prompt:

- To remove the 64-bit GSKit:
  pkgrm gsk8ssl64
  pkgrm gsk8cry64

- To remove the 32-bit GSKit:
  pkgrm gsk8ssl32
  pkgrm gsk8cry32
Chapter 11. Installing Tivoli Directory Server clients using HP-UX utilities

Before you install

IBM Tivoli Directory Server version 6.3 client only packages are available for
HP-UX on Itanium systems (Intel IA64 processor-based servers) that have the
HP-UX 11i v2 or HP-UX 11i v3 operating system installed.

If you have a client from Tivoli Directory Server 6.0, 6.1, or 6.2, or a server from
Tivoli Directory Server 6.0, 6.1, or 6.2, you can leave it installed. The client from
Tivoli Directory Server 6.3 can coexist with a client or server of supported versions.

Installing Tivoli Directory Server client only packages

Use the following sections to install Tivoli Directory Server client only packages.

Package dependencies

The following Tivoli Directory Server v6.3 packages are available for installation:
- idsldap.cltnbase63.depot: Base client
- idsldap.clts2bit63.depot: 32-bit client
- idsldap.clts64bit64.depot: 64-bit client
- idsldap.cljav63.depot: Java client

Because of package dependencies, the order of installation is significant. Install the
packages in the following order:

For the 32-bit client only:
   Install in the following order:
   1. Base client
   2. 32-bit client

For the 64-bit client only:
   Install in the following order:
   1. Base client
   2. 64-bit client

Installing using swinstall

The instructions in this section assume that you are logged in as root and have
downloaded and then extracted Tivoli Directory Server Version 6.3 client-only
packages for the supported version of platform and operating system in the
tdsV6.3 directory.

To verify if any Tivoli Directory Server packages are installed on the system, run
the following command:

swlist | grep idsldap

To install Tivoli Directory Server v6.3 client packages, run the following command
at command prompt:
swinstall -s <extracted_path>/tdsV6.3/tdsfiles/idsldap.cltbase63.depot *
swinstall -s <extracted_path>/tdsV6.3/tdsfiles/idsldap.clt32bit63.depot *
swinstall -s <extracted_path>/tdsV6.3/tdsfiles/idsldap.clt64bit63.depot *
swinstall -s <extracted_path>/tdsV6.3/tdsfiles/idsldap.cltjava63.depot *

where, -s specifies the full path of the software source.

Note: To enable SSL, you must also install GSKit. See “Installing GSKit.”

---

### Installing GSKit

You can install the GSKit package through the `swinstall` command.

To install GSKit, run the following command at a command prompt:

- For 64-bit GSKit:
  ```
  swinstall -s <extracted_path>/tdsV6.3/gskit/gskcrypt64 gskcrypt64
  swinstall -s <extracted_path>/tdsV6.3/gskit/gskssl64 gskssl64
  ```

  where, -s specifies the full_path of the software source.

- For 32-bit GSKit:
  ```
  swinstall -s <extracted_path>/tdsV6.3/gskit/gskcrypt32 gskcrypt32
  swinstall -s <extracted_path>/tdsV6.3/gskit/gskssl32 gskssl32
  ```

  where, -s specifies the full_path of the software source.

See Appendix Q, “Setting up GSKit to support CMS key databases,” on page 223 for more information about setting up GSKit after installation.

---

### Removing GSKit

To remove GSKit, run the following command at a command prompt:

- For 64-bit GSKit:
  ```
  swremove gskssl64
  swremove gskcrypt64
  ```

- For 32-bit GSKit:
  ```
  swremove gskssl32
  swremove gskcrypt32
  ```
Chapter 12. Installing and uninstalling silently on Windows systems

This chapter provides instructions for the following on a Windows computer:
- Installing and uninstalling Tivoli Directory Server 6.3 and the language packs using silent installation
- Installing and uninstalling GSKit from a command prompt

To silently install and uninstall on AIX, Linux, Solaris, and HP-UX (Itanium) systems, use the operating system utilities for those operating systems.

Silent installation

You can use silent installation to install Tivoli Directory Server or the language packs with no user input required.

The following options and conditions apply to silent installation:
- You do not need to install all features. You can choose to install:
  - The client only
  - The Java client
  - The Web Administration Tool only
  - The proxy server (includes the client and the Java client)
  - The full directory server (includes the client and the Java client)
- You can also use Tivoli Directory Server silent installation to install DB2, GSKit, and Embedded WebSphere Application Server.
- If a supported version of DB2 (for example, DB2 9.5) is already installed on the computer, the silent installation program will not install DB2 9.7 even if it is selected for installation in the options file.
- If you install DB2, a Windows system user ID is created for the DB2 system ID. By default, this user ID is `db2admin` and the password is `db2admin`. If you want to use a different user ID or password, or both, you must modify them in the Server installation options file. Change the occurrences of `db2admin` in the file to the user ID or password (or both) that you want to use.

Notes:
1. This user ID must not be the user ID that will be used as the owner of the directory server instance.
2. If you are not using an existing user ID, DB2 creates the user ID specified with the password specified. This is the preferred method.
3. If you are creating a new user ID, be sure that the password meets the password requirements for your operating system. If your system has "Password must meet complexity requirements" enabled, be sure that the password you supply meets the complexity requirements. If it does not, installation will fail. See the Windows documentation for information about complexity requirements.
4. If you are using an existing Windows user ID, it must be a member of the Administrators group. In this case, be sure that the password you specify is correct. Otherwise, DB2 does not install correctly.
You must have at least 255 MB of free space in the directory specified by the TEMP environment variable or the directory you want to use as a temporary directory.

If you are installing the proxy server or the full directory server, the Administrators group provided with the Windows operating system must exist.

The installation must be run by a user ID with Administrator privileges.

If the client is already installed, you can add the proxy server or full directory server in a later installation.

If a server is selected for installation in the options file, the client and the Java client will automatically be installed if they are not present on the system, regardless of whether they were selected for installation in the options file.

The Web Administration Tool can be installed whether or not a server or the client is installed.

The installation location cannot be the same as the path where another version of the product is installed.

The server and the client from Tivoli Directory Server 6.3 can coexist with the following clients and servers:
- A client from Tivoli Directory Server 6.0, 6.1, or 6.2
- A server from Tivoli Directory Server 6.0, 6.1, or 6.2

If any of these are installed, you can leave them installed.

Before you begin silent installation, be sure that the options file for the server, client, or language packs is updated with the correct information about the features you want to install and the installation path. To edit an options file, copy the file from the optionsFile directory to a writable location. The files are:

- Server options file: InstallServer.txt
- Client only options file: InstallClient.txt. (This file is provided in the client-only package.)
- Language pack options file: InstallLP.txt

For information about changing the installation options files, see “Options files for silent installation of servers and language packs” on page 89.

**Installing the server or client silently**

To begin installing Tivoli Directory Server 6.3 using silent installation:

1. If you are installing from a DVD:
   a. Insert the DVD in your DVD drive.
   b. Go to the DVD drive.
   c. At a command prompt, type the following:
      
      ```
      cd \tds
      ```

   If you are installing from downloaded .zip files:
   a. Go to the directory where you unzipped the downloaded .zip files.
   b. At a command prompt, type the following:
      
      ```
      cd tds\v6.3\tds
      ```

2. Type the following command:

   ```
   install_tdsSilent -issilent -options full_path\optionsFiles\InstallServer.txt
   ```

   where `full_path` is the full path to the optionsFiles directory.

   (If you want to install only the client from the client-only package, substitute `InstallClient.txt` for `InstallServer.txt`.)
Notes:

a. If you want to specify a temporary directory other than the one specified by
the TEMP environment variable, use the -is:tempdir option, as follows:

```
install_tdsSilent -is:silent -options optionsFiles\InstallServer.txt
-is:tempdir temp_directory
```

where temp_directory is the directory you want to use for temporary space.
Be sure that you have at least 255 MB of free space in this directory.

b. If you want to specify an additional log file, use the -log option, as follows:

```
install_tdsSilent -is:silent -options full_path\optionsFiles\InstallServer.txt
-log !c:\mydirectory\ldapinst.log @ALL
```

where full_path is the full path to the optionsFiles directory.

c:\mydirectory\ldapinst.log can be changed to point to where you want to
place the log file. The log file will still be created in the target installation
directory. The default location is:
C:\Program Files\IBM\LDAP\V6.3\var\ldapinst.log

c. You must use install_tdsSilent because only install_tdsSilent returns a
return code.

3. Tivoli Directory Server is installed with no further input.

If the installation exits for any reason, you can find information about the exit
by viewing the return code or checking the installpath\var\ldapinst.log file.
(installpath is the path where you installed Tivoli Directory Server.)

Check the return code by checking the value of %ERRORLEVEL% from a .bat
file. A return code of 0 indicates that the installation was successful. A non-zero
return code indicates that the installation failed. See "Checking the return code"
on page 87 for a list of return codes.

Installation is complete when control returns to the command line or to the
invoking program.

If installation is unsuccessful, check to be sure that your options file settings
and command-line parameters are valid.

4. After installation, restart the system. If you are also installing other products,
you can restart at an appropriate time. If the server was installed, you must do
the following before the server is usable:

a. Create a directory server instance using the idsicrt command. See "Creating
an instance with the command line" on page 113.

b. Set the administrator DN and password using the idsdnpw command. See
"Managing the primary administrator DN with the command line" on page
125.

c. If the directory server instance is a full directory server, configure the
database using the idscfgdb command line utility to configure silently. See
"Configuring the database with the command line" on page 130.

Installing language packs silently

To begin installing Tivoli Directory Server 6.3 language packs using silent
installation:

1. If you are installing from a DVD:

   a. Insert the DVD in your DVD drive.

   b. Go to the DVD drive.

   c. At a command prompt, type the following:

```
   cd tdsLangpack
```
If you are installing from downloaded .zip files:

a. Go to the directory where you unzipped the downloaded .zip files.

b. At a command prompt, type the following:
   cd tdsV6.3\tdsLangpack

2. At a command prompt, type the following:

   • For Intel 32-bit Windows systems:
     idslp_setup_win32Silent.exe -is:silent
     -options full_path_to_options_file\InstallLP.txt
   • For AMD/EM64T Windows systems:
     idslp_setup_win64Silent.exe -is:silent
     -options full_path_to_options_file\InstallLP.txt

   where full_path_to_options_file is the full path to the InstallLP.txt file you are using. The InstallLP.txt file is in the tdsLangpack\optionsFiles subdirectory of the DVD or the unzipped .zip file, but if you moved it, you must specify the current location of the file.

Notes:

a. If you want to specify an additional log file, type the following:

   • For Intel 32-bit Windows systems:
     idslp_setup_win32Silent.exe -is:silent
     -options d:\tdsLangpack\optionsFiles\InstallLP.txt
     -log c:\mydirectory\ldaplp_inst.log @ALL
   • For AMD/EM64T Windows systems:
     idslp_setup_win64Silent.exe -is:silent
     -options d:\tdsLangpack\optionsFiles\InstallLP.txt
     -log c:\mydirectory\ldaplp_inst.log @ALL

c:\mydirectory\ldaplp_inst.log can be changed to point to where you want to place the log file. The log file will still be created in the target installation directory.

   The default location is for the log is install_dir\var\ldaplp_inst.log. (If you installed in the default location, the log is:
   C:\Program Files\IBM\LDAP\V6.3\var\ldaplp_inst.log.)

b. You might receive the following Java exception when installing the language packs silently. If you receive this error, you can ignore it; use the information in "Verifying the silent installation" to determine whether installation was successful.

   An error occurred during wizard bean change notification:
   java.lang.NullPointerException
   at java.util.Hashtable.put(Hashtable.java:632)
   at java.util.Properties.setProperty(Properties.java:163)
   at java.lang.System.setProperty(System.java:387)
   at com.ibm.ldap.nls.beans.setUnixPath.execute(setUnixPath.java:38)
   at com.installshield.wizard.StandardWizardListener.execute(Unknown Source)
   at com.installshield.wizard.StandardWizardListener.currentBeanChanged(Unknown Source)
   at com.installshield.wizard.StandardWizardListener.runThread.run(Wizard.java:1822)

Verifying the silent installation

To verify that the silent installation was successful, you can check the return code, log file, and the Windows registry.

Common reasons for the silent installation failing are:
• A previous or current version of Tivoli Directory Server is already installed. Only the following are supported:
  – A client from Tivoli Directory Server 6.0, 6.1, or 6.2
  – A server from Tivoli Directory Server 6.0, 6.1, or 6.2
• The prerequisites are not present. The server requires a valid version of DB2, or DB2 must already be installed.
• There is not enough disk space to install.
• The options file is incorrect. Be very careful when editing the options file. There cannot be blank lines or control characters in the file. If the installation exits with no log file, this is usually because the options file is not valid (with blank lines, for example), or because the path to the options file was specified incorrectly.

**Checking the return code**
The `%ERRORLEVEL%` variable contains the return code. The following return codes can be received:

- **2002 Java exception** (A possible cause is that you are attempting to install to a location where another version is installed. If you receive this return code, entries might have been created for Tivoli Directory Server 6.3 in the registry. Check the registry and, if there are any such entries, remove them before you try to install again.)
- **3001 Prerequisites missing**
- **3002 Java exception**
- **3003 No feature selected for silent install**
- **3009 Cannot install a feature.** (Refer to the log for the reason.)

Other return codes might be returned from the InstallShield program.

**Checking the log file**
To verify that silent installation was successful using the log file:

1. Check the log file to see if it exists in the target directory. If the log is not there, the installation failed, and you can refer to the log file that was specified on the silent installation command with the `-log` option to see why the installation failed.

2. Check the log file for the string `Exiting LdapExit`.

**Checking the Windows registry**
Verify that the installation was completed using the Windows registry. The following text should be in the registry, depending on which components were installed:

In `HKEY_LOCAL_MACHINE\SOFTWARE\IBM\IDSLDAP\6.3`

```plaintext
ClientMajorVersion 6.3
JavaClientMajorVersion 6.3
BaseServerMajorVersion 6.3
ServerMajorVersion 6.3
ProxyServerMajorVersion 6.3
WebadminMajorVersion 6.3
WebSphereAppSrvMajorVersion 7.0
LDAPHome install_location
BitMode set to 32 or 64
```

In `HKEY_LOCAL_MACHINE\SOFTWARE\IBM\IDSLDAP\6.3\Client`

```plaintext
ClientMinorVersion 0.0
```
In HKEY_LOCAL_MACHINE\SOFTWARE\IBM\IDSLDAP\6.3\JavaClient
  JavaClientMinorVersion 0.0

In HKEY_LOCAL_MACHINE\SOFTWARE\IBM\IDSLDAP\6.3\Webadmin
  WebadminMinorVersion 0.0

In HKEY_LOCAL_MACHINE\SOFTWARE\IBM\IDSLDAP\6.3\BaseServer
  BaseServerMinorVersion 0.0

In HKEY_LOCAL_MACHINE\SOFTWARE\IBM\IDSLDAP\6.3\Server
  ServerMinorVersion 0.0

In HKEY_LOCAL_MACHINE\SOFTWARE\IBM\IDSLDAP\6.3\ProxyServer
  ProxyServerMinorVersion 0.0

In HKEY_LOCAL_MACHINE\SOFTWARE\IBM\IDSLDAP\6.3\WebSphereAppSrv
  WebSphereAppSrvMinorVersion 0.7

In HKEY_LOCAL_MACHINE\SOFTWARE\IBM\IDSLDAP\6.3\LanguagePack
  LangPackVersion 6.3
  LPHome install_location

By default, LPHome is set to ldaphome\LangPack.

In addition, if you are installing on AMD/EM64T Windows, the following text is also in the registry.

In HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432NODE\IBM\IDSLDAP\6.3
  ClientMajorVersion 6.3
  JavaClientMajorVersion 6.3
  BaseServerMajorVersion 6.3
  ServerMajorVersion 6.3
  ProxyServerMajorVersion 6.3
  WebadminMajorVersion 6.3
  WebSphereAppSrvMajorVersion 7.0
  LDAPHome install_location
  BitMode 64

In HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432NODE\IBM\IDSLDAP\6.3\Client
  ClientMinorVersion 0.0

In HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432NODE\IBM\IDSLDAP\6.3\JavaClient
  JavaClientMinorVersion 0.0

In HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432NODE\IBM\IDSLDAP\6.3\Webadmin
  WebadminMinorVersion 0.0

HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432NODE\IBM\IDSLDAP\6.3\BaseServer
  BaseServerMinorVersion 0.0
Options files for silent installation of servers and language packs

See the following sections for information about the silent installation options file for the servers, client only (from the client-only package), and language packs.

Server installation options file

The following text is in the server installation options file, InstallServer.txt, provided with Tivoli Directory Server:

```plaintext
# Sample response file for the Server/Client package
# (Lines beginning with # are comments)
# Be sure there are no blank lines in this file!
# All lines that are not comments must be present; they cannot be commented out.
# Where indicated, values can be changed.
#
# The following 3 lines MUST be present, and NOT modified
-silent
-G createDirectoryResponse="yes"
-G replaceExistingResponse="yesToAll"
#
# install destination - this can be modified to install location
-P product.installLocation="C:\Program Files\IBM\ldap\V6.3"
#
# Select the features to install. Note: if the server is selected, the
# Client, JavaClient, and BaseServer will automatically be installed. If the
# ProxyServer is selected, the JavaClient, Client and BaseServer will
# automatically be installed.
# The coreqs will also be installed. For the server to be installed make
# sure that DB2 is already installed or that the active property is set
# to true here in the file.
# To deselect a feature, set the field to false.
-P DB2Feature.active=true
-P BaseServerFeature.active=true
-P ServerFeature.active=true
-P ProxyServerFeature.active=true
-P JavaClientFeature.active=true
-P ClientFeature.active=true
-P WebadminFeature.active=true
-P GSKITFeature.active=true
-P AppSrvFeature.active=true
# Replace the following with a valid Userid for the Db2 administrator.
# Used only if DB2 is being installed.
-W LdapInit.silentDB2Admin="db2admin"
# Replace the following with a valid password for the Db2 administrator.
# Used only if DB2 is being installed.
-W LdapInit.silentDB2AdminPW="db2admin"
# This must be last line. Be sure no blank lines or carriage controls follow!

You can edit the following line to point to the desired target installation directory:
-P product.installLocation="C:\Program Files\IBM\ldap\V6.3"
```

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Be sure that the installation location is not the same as the path where another version of the client is installed.

You can edit the features lines to disable a feature from being installed. For example, to indicate that you do not want to install the IBM Tivoli Directory Server Web Administration Tool, change

-P WebadminFeature.active=true

to

-P WebadminFeature.active=false

If you install DB2, a Windows system user ID is created for the DB2 system ID. By default, this user ID is **db2admin** and the password is **db2admin**. If you want to use a different user ID or password, or both, you must modify them in the `-W LdapInit.silentDB2Admin="db2admin"` and `-W LdapInit.silentDB2AdminPW="db2admin"` lines.

**Notes:**
1. This user ID must **not** be the user ID that will be used as the owner of the directory server instance.
2. If you are not using an existing user ID, DB2 creates the user ID specified with the password specified. This is the preferred method.
3. If you are creating a new user ID, be sure that the password meets the password requirements for your operating system. If your system has “Password must meet complexity requirements” enabled, be sure that the password you supply meets the complexity requirements. If it does not, installation will fail. See the Windows documentation for information about complexity requirements.
4. If you are using an existing Windows user ID, it must be a member of the Administrators group. In this case, be sure that the password you specify is correct. Otherwise, DB2 does not install correctly.

**Note:** If you have any feature except the client, GSKit, or DB2 from the 6.0, 6.1 or 6.2 version, or the server from the 6.0, 6.1, or 6.2 version installed, you can install only the client. If this is the case, be sure to disable all other features by setting them to false.

**Client installation options file**
The following text is in the client installation options file, InstallClient.txt, provided with the client-only package:

```
# options file for silent install
# Use this file with the Client-only package
#(Lines beginning with # are comments)
# Be sure there are no blank lines in this file!
# All lines that are not comments must be present; they cannot be commented out.
# Where indicated, values can be changed.
#
# The following 3 lines MUST be present, and NOT modified
-silent
-G createDirectoryResponse="yes"
-G replaceExistingResponse="yesToAll"
#
# install destination - this can be modified to install location
-P product.installLocation="C:\Program Files\IBM\ldap\V6.3"
# To deselect a feature, set the field to false
-P ClientFeature.active=true
-P GSKITFeature.active=true
# This must be last line. Be sure no blank lines or carriage controls follow!
```
You can change only the installation location in this file.

To change the installation location, change the following line to point to the desired target installation directory:

```
-P product.installLocation="C:\Program Files\IBM\ldap\V6.3"
```

Be sure that the installation location is not the same as the path where another version of the client is installed.

**Language packs installation options file**

The following text is in the language packs installation options file, InstallLP.txt, provided with Tivoli Directory Server:

```
# Sample of a response file for the Language pack Uninstall
# (Lines beginning with # are comments)
# Be sure there are no blank lines in this file!

# The following 3 lines MUST be present
-silent
-G createDirectoryResponse="yes"
-G replaceExistingResponse="yesToAll"

# Language Pack support file install destination - this can be modified to install location
-P product.installLocation="C:\Program Files\IBM\LDAP\V6.3"

# Set the following entries to true to install a language feature
# or keep it false to NOT install

-P GermanXlations.active=false
-P FrenchXlations.active=false
-P ItalianXlations.active=false
-P SpanishXlations.active=false
-P JapaneseXlations.active=false
-P KoreanXlations.active=false
-P BrazilianXlations.active=false
-P SChineseXlations.active=false
-P TChineseXlations.active=false

# This must be last line. Be sure no blank lines or carriage controls follow!
```

By default, no language packs are installed. To install the language pack for a language, edit the line for that language and change false to true. For example, to install the Japanese language pack, change

```
-P JapaneseXlations.active=false
```

to

```
-P JapaneseXlations.active=true
```

**Silent uninstallation**

You can use silent uninstallation to uninstall Tivoli Directory Server, the language packs, DB2, GSKit, or Embedded WebSphere Application Server with no user input required.

The following options and conditions apply to silent uninstallation:

- You must have at least 100 MB of memory free before invoking silent uninstallation.
- You must have at least 255 MB of free space in the directory specified by the TEMP environment variable.
Before you begin silent uninstallation, be sure that the options file for the server or language packs is updated with the correct information about the features you want to uninstall. To edit an options file, copy the file from the optionsFile directory to a writable location. The files are:

- Server options file: UnInstallServer.txt
- Client only options file: UnInstallClient.txt (You cannot change this file.)
- Language pack options file: UnInstallLP.txt

For information about changing the uninstallation options files, see “Options files for silent uninstallation of servers and language packs.”

**Note:** Be sure to drop all instances of DB2 before running the DB2 uninstallation from the silent uninstaller. If there are DB2 instances on the system, the silent uninstaller will prompt you for information and the uninstallation will not be silent.

To begin uninstalling Tivoli Directory Server 6.3 using silent uninstallation, type the following at a command prompt:

```
"C:\Program Files\IBM\LDAP\V6.3\uninst\uninstall.exe" -is:silent
-options C:UnInstallServer.txt -log !C:\ldapuninst.log @ALL
```

(If you are uninstalling a client-only installation, substitute UnInstallClient.txt for UnInstallServer.txt.) This example assumes that Tivoli Directory Server is installed in the C:\Program Files\IBM\LDAP\V6.3 directory and that the UnInstallServer.txt file has been copied to the C:\ directory.

**Note:** The silent uninstallation process runs asynchronously, returning to a command prompt immediately. Allow some time for processing before you assume that the silent uninstallation is finished.

To begin uninstalling Tivoli Directory Server 6.3 language packs using silent uninstallation, type the following at a command prompt:

```
"C:\Program Files\IBM\LDAP\V6.3\LangPack\uninstall\uninstall.exe"
-is:silent -options C:\UnInstallLP.txt -log !C:\lpuninst.log @ALL
```

This example assumes that Tivoli Directory Server is installed in the C:\Program Files\IBM\LDAP\V6.3 directory and that the UninstallLP.txt file has been copied to the C:\ directory.

### Options files for silent uninstallation of servers and language packs

See the following sections for information about the silent uninstallation options file for the servers and the language packs. (You cannot change the client uninstallation options file.)

#### Server uninstallation options file

The following text is in the server uninstallation options file, UnInstallServer.txt, provided with Tivoli Directory Server:

```
#Sample response file for uninstall
#(Lines beginning with # are comments)
# Be sure there are no blank lines in this file!
#
# The following 4 lines MUST be present
-silent
-G createDirectoryResponse="yes"
-G replaceExistingResponse="yesToAll"
```

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You can edit the features lines to disable a feature from being uninstalled. For example, to indicate that you do not want to uninstall the IBM Tivoli Directory Server Web Administration Tool, change

-P WebadminFeature.activeForUninstall=true

to

-P WebadminFeature.activeForUninstall=false

Language packs options file

The following text is in the language packs uninstallation options file, UnInstallLP.txt, provided with Tivoli Directory Server:

# Select the features to be uninstalled. If a feature was never installed the # Sample of a response file for the Language pack Uninstall # (Lines beginning with # are comments) # Be sure there are no blank lines in this file! # # The following 4 lines MUST be present -silent -G createDirectoryResponse="yes" -G replaceExistingResponse="yesToAll" -G removeModifiedResponse="yesToAll" # # # # # The "activeForUninstall" property specifies whether you want a feature to be # uninstalled. # Unless otherwise specified, the "activeForUninstall" property for a all # installed feature by default is set to true; a property value must be set # to false if you want to leave its feature installed. # The default action, if no property values are specified, is to uninstall all # features that are currently installed. # The following list of features should only include languages installed on # your system. # If a language feature was already installed and you do not wish to uninstall # it then uncomment its property entry. This will set the activeForUninstall # property value to false and keep the corresponding language feature installed. #P GermanXlations.activeForUninstall=false #P FrenchXlations.activeForUninstall=false #P ItalianXlations.activeForUninstall=true #P SpanishXlations.activeForUninstall=false #P JapaneseXlations.activeForUninstall=false #P KoreanXlations.activeForUninstall=false #P BrazilianXlations.activeForUninstall=false
By default, no language packs are uninstalled. To uninstall the language pack for a
language, edit the line for that language. Remove the # character from the line, and
change false to true. For example, to uninstall the French language pack, change

#-P FrenchXlations.activeForUninstall=false
to
-P FrenchXlations.activeForUninstall=true
Chapter 13. Creating and administering instances

During or after installation of a server, you must create a directory server instance and then set the administrator DN and password for the instance. For a full directory server, you must also configure the database that is associated with the server instance. (For a proxy server, no database is configuration is required.)

Note: A file named ldapdb.properties is created for each non-proxy directory server instance you create. This file resides in the etc directory of the instance directory (idsslapd-instance_name/etc on Windows systems or idsslapd-instance_name/etc on AIX, Linux, or Solaris systems). It contains the version of DB2 that the instance is using, as well as the path where that version of DB2 is installed. For more information, see Appendix J, “Updating the ldapdb.properties file,” on page 207.

The Instance Administration Tool (idsxinst) is a graphical user interface (GUI) that you can use to create and manage directory server instances. When you use the Instance Administration Tool, the tool guides you through the steps you need.

You can use the Instance Administration Tool to create, view, copy, change information about, and delete instances. You can also use this tool to create or edit the users who own directory server instances and to migrate instances from some previous versions of Tivoli Directory Server. You can use the Instance Administration Tool to start or stop the server or the administration server for your instances. In addition, you can launch the Configuration Tool from the Instance Administration Tool.

You can also use command-line utilities for these tasks.

Starting the Instance Administration Tool

To use the Instance Administration Tool on AIX, Linux, and Solaris systems, you must be logged in as root. On Windows systems, you must be logged on as a member of the Administrators group.

The Instance Administration Tool can be started in different ways:

• When you install a server using the InstallShield GUI, the Instance Administration Tool starts:
  – After installation to view the default instance you created if you use the typical installation path.
  – After installation to create an instance for which you specify all options if you use the Custom installation path.

• If you want to create a new instance or edit an existing one, you can start the Instance Administration Tool from the command line:

  1. Go to the sbin subdirectory of the directory where Tivoli Directory Server 6.3 is installed. This directory is:
     – On Windows systems, by default:
       C:\Program Files\IBM\LDAP\V6.3\sbin
     – On AIX and Solaris systems: /opt/IBM/ldap/V6.3/sbin
     – On Linux systems: /opt/ibm/ldap/V6.3/sbin
2. Type `idsxinst`.

- On Windows systems, you can also click Start -> All Programs -> IBM Tivoli Directory Server 6.3-> Instance Administration Tool.

---

### Creating a directory server instance

**Attention:** When you create a new directory server instance that is **not** a copy of an existing directory server instance, be aware of the information that follows. (If you create a directory server instance as a copy of an existing directory server instance, the two directory server instances are cryptographically synchronized and you do not need to synchronize them.)

1. If you want to use replication, use a distributed directory, or import and export LDIF data between server instances, you must cryptographically synchronize the server instances to obtain the best performance.

If you are creating a directory server instance that must be cryptographically synchronized with an existing directory server instance, you must synchronize the server instances **before** you do any of the following:

- Start the second server instance
- Run the `idsbulkload` command from the second server instance
- Run the `idsldif2db` command from the second server instance

See Appendix E, “Synchronizing two-way cryptography between server instances,” on page 191 for information about synchronizing directory server instances.

2. After you create a directory server instance and configure the database, use the `idsdbback` utility to create a backup of the directory server instance. The configuration and directory key stash files are archived along with the associated configuration and directory data. You can then use the `idsdbrestore` utility to restore the key stash files if necessary. (You can also use the `idsdbback` utility after you load data into the database. See “Backing up the directory server instance” on page 135 for information about backing up the database.)

---

### Creating an instance with the Instance Administration Tool

You can use the Instance Administration Tool to create an instance in several different ways:

- Create a default instance with a default name and other settings. (See “Creating the default instance.”)
- Create a new instance for which you specify all the settings. (See “Creating a new instance for which you specify all settings” on page 98.)
- Migrate an instance from a previous version of Tivoli Directory Server. (See “Migrating an instance” on page 106.)
- Create a new instance that is a copy of an instance on the computer or on another computer. (See “Creating an instance that is a copy of another instance” on page 109.)

### Creating the default instance

You can create the default instance if you are not migrating a directory server instance from a previous version and you want to create a new directory server instance with default settings. (This option is not available if you have already created a default directory server instance; you can create only one default instance.) The default directory server instance has the following settings, which you cannot change:
On Windows systems

- **Name**: dsrdbm01
- **Instance location**: c:\idsslapd-dsrdbm01
- **Group name**: Administrators
- **Administrator DN**: cn=root
- **Database name**: dsrdbm01

On AIX, Linux, and Solaris systems:

- **Name**: dsrdbm01
- **Instance location**: /home/dsrdbm01. (On Solaris systems, this directory is /export/home/dsrdbm01.)
- **Group name**: grrdbm01
- **Administrator DN**: cn=root
- **Database name**: dsrdbm01

The DB2 tablespace for the default instance are Database Managed Storage (DMS).

In addition, the o=sample suffix is created for the default directory server instance. You can add other suffixes later with the Configuration Tool or the `idscfgsuf` command. See “Managing suffixes” on page 144 for information.

If these settings are too restrictive, choose another option.

To create the default instance:

1. If the Instance Administration Tool is not started, start it. See “Starting the Instance Administration Tool” on page 95 for instructions.
2. Click **Create an instance**.
3. On the Create new directory server instance window:
   a. Click **Create default instance**.
   b. Click **Next**.
4. On the Default instance details window, complete the following fields:
   - **User password**: Type the password for the system user, dsrdbm01, that will own the directory server instance.
   - **Confirm password**: Type the password again for confirmation.
   - **Encryption seed**: Type a string of characters that will be used as an encryption seed.

   The encryption seed must contain only printable ISO-8859-1 ASCII characters with values in the range of 33 to 126, and must be a minimum of 12 and a maximum of 1016 characters in length. For information about what characters can be used, see Appendix K, “ASCII characters from 33 to 126,” on page 209.

   This encryption seed is used to generate a set of Advanced Encryption Standard (AES) secret key values. These values are stored in the directory server instance's directory key stash file and used to encrypt and decrypt directory stored password and secretkey attributes.

   Record the encryption seed in a secure location; you might need it if you export data to an LDIF file (the `idsdb2ldif` command) or regenerate the key stash file (the `idsgendirksf` command.)
Confirm encryption seed
Type the encryption seed again for confirmation.

Administrator DN password
The administrator DN for the default instance is **cn=root**. Type the password for the administrator DN. You must define a password. Passwords are case-sensitive. Double byte character set (DBCS) characters in the password are not valid.

**Note:** Record the password in a secure location for future reference.

Confirm password
Type the password again for confirmation.

Click **Next**.

5. In the Verify settings window, information is displayed about the options you specified. To return to an earlier window and change information, click **Back**. To begin creating the directory server instance, click **Finish**.

6. The Results window is displayed, and messages are displayed while the directory server instance is being created. A completion message is displayed when instance creation is complete. Click **OK** to remove the message.

7. Click **Close** to close the window and return to the main window of the Instance Administration Tool.

8. If you have finished using the Instance Administration Tool, click **Close** to exit the tool.

**Note:** After you create the default instance, see Chapter 15, “After you install and configure,” on page 155 for information about:
- Starting the server
- Starting the Embedded WebSphere Application Server service if you have installed and configured the Web Administration Tool.

You can find information about using the Web Administration Tool in the IBM Tivoli Directory Server Version 6.3 Administration Guide.

Creating a new instance for which you specify all settings
To create a new instance for which you specify all the settings with the Instance Administration Tool:

1. If the Instance Administration Tool is not started, start it. See “Starting the Instance Administration Tool” on page 95 for instructions.

2. Click **Create an instance**.

3. On the Create a new directory server instance window, click **Create a new directory server instance**.

4. If you want the new directory server instance to be a proxy server instance, select the **Set up as proxy** check box. A proxy server does not have an associated database instance.

5. Click **Next**.

6. On the Instance details window, complete the following fields:

   User name
   Do one of the following:
   - If the user you want to own the directory server instance is an existing user on the system, select the system user ID of the user from the list. This name will also be the name of the directory server instance.
If you want to change properties for the user, click **Edit user**. On the window that displays:

a. If you want to change the user’s password, type the new password in the **Password** field.

b. Type the password again for confirmation in the **Confirm password** field.

c. If you are on an AIX, Linux, or Solaris system and you want to change the home directory for the user, type the new home directory in the **Home directory** field. You can click **Browse** to locate the home directory.

d. If you are on an AIX, Linux, or Solaris system and you want to change the user’s primary group, type the new primary group in the **Primary group** field.

e. Click **Edit** to save your changes.

- If you want to create a new system user ID for the owner of the directory server instance, click **Create user**. On the window that displays:

  a. Type a name for the user in the **User Name** field. This name becomes the directory server instance name.

  The name of the new directory server instance must be unique; if there is already a directory server instance on the computer with the same name, you will receive an error message. See Appendix D, “Setting up users and groups: directory server instance owner, database instance owner, and database owner,” on page 187 for detailed information about requirements for the user ID.

  b. Type the password for the user in the **Password** field.

  c. Type the password again for confirmation in the **Confirm password** field.

  d. If you are on an AIX, Linux, or Solaris system:

     1) Type the home directory for the user in the **Home directory** field. You can click **Browse** to locate the home directory.

     2) Type the name of the user’s primary group in the **Primary group** field.

  e. Click **Create** to create the user.

**Instance location**

Type the location where the directory server instance files will be stored. Be sure that you have at least 30 MB of free disk space in this location.

On Windows systems, this location is a drive, such as C:. The directory instance files will be stored on the drive you specify in the \idsslapd-instance_name directory. (instance_name is the name of the directory server instance.)

On AIX, Linux, and Solaris systems, the default location for the instance files is in the directory instance owner’s home directory, but you can specify a different path. Click **Browse** if you want to select a location.

**Encryption seed string**

Type a string of characters that will be used as an encryption seed.
The encryption seed must contain only printable ISO-8859-1 ASCII characters with values in the range of 33 to 126 inclusive, and must be a minimum of 12 and a maximum of 1016 characters in length. For information about what characters can be used, see Appendix K, "ASCII characters from 33 to 126," on page 209.

This encryption seed is used to generate a set of Advanced Encryption Standard (AES) secret key values. These values are stored in the directory server instance's directory key stash file and used to encrypt and decrypt directory stored password and secretkey attributes.

Record the encryption seed in a secure location; you might need it if you export data to an LDIF file (the `idsdb2ldif` command) or regenerate the key stash file (the `idsgendirksf` command.)

Confirm encryption seed
Type the encryption seed string again for confirmation.

Use encryption salt value
Select this check box if you want to provide an encryption salt value.

- If you are migrating and you want the directory server instance to be cryptographically synchronized with the same directory server instances as the instance you are migrating, check this box and then complete the Encryption salt string and Confirm encryption salt string fields.
- If you are creating a new directory server instance and you want the new directory server instance to be cryptographically synchronized with other directory server instances, check this box and then specify the same encryption salt string that the other directory server instances have.

If you clear the check box, the Instance Administration Tool generates an encryption salt string value randomly.

Encryption salt string
If you want to provide an encryption salt string, type the value.

The encryption salt is used, along with the encryption seed, to generate two-way Advanced Encryption Standard (AES) encryption keys that are stored in key stash files. These values are used to encrypt and decrypt directory stored password and secretkey attributes.

If you want to use replication, use a distributed directory, or import and export LDIF data between server instances, you can obtain better performance if the directory server instances have the same encryption salt value. Therefore, if the directory server instance you are creating or migrating will be used in one of these ways, set the encryption salt value to the encryption salt value of the directory server instances with which it will be involved in these activities.

You can obtain a server's salt value by searching (using the ldapsearch utility) the server's `cn=crypto,cn=localhost` entry. The attribute type is `ibm-slapdCryptoSalt`. For example:

```
ldapsearch -D adminDN -w adminPw -b "cn=crypto,cn=localhost" 
objectclass=* ibm-slapdCryptoSalt
```

A value similar to the following is returned:

```
ibm-slapdCryptoSalt=:SxaQ+.qdKor
```
The part of the string after the equal to sign (=) is the encryption salt. In this example, the encryption salt is :SxaQ+.qdKor.

The encryption salt must contain only printable ISO-8859-1 ASCII characters with values in the range of 33 to 126, and must be exactly 12 characters in length. For information about characters that can be used, see Appendix K, “ASCII characters from 33 to 126,” on page 209.

Confirm encryption salt
Type the encryption salt string again for confirmation.

Instance description
Optionally, type a description of the directory server instance. This description is displayed in other windows to help identify the instance.

Click Next.
7. If the DB2 instance details window is displayed, either accept the name that is displayed in the DB2 instance name field, or type or select a different name for the DB2 instance, and then click Next.
By default, the DB2 instance name is the same as the name of the directory server instance, but you can specify a different name for the DB2 instance. If you specify a different name, there must be a system user ID by the same name. This name cannot be already associated with another directory server instance.

Note: Be sure that the DB2 instance used by Tivoli Directory Server is a dedicated instance and that no other programs or products are configured to use this instance.

8. In the TCP/IP settings for multihomed hosts window, do one of the following:
• If you want the directory server instance to listen on all IP addresses, select the Listen on all configured IP addresses check box.
• If you want the directory server instance to listen on a particular set of IP addresses that are configured on the computer, clear the Listen on all configured IP addresses check box. Then select the IP address or addresses in the list that you want the directory server instance to listen on.

Click Next.
9. In the TCP/IP port settings window, complete the following fields:

Server port
Type the number of the port you want the server to use as its contact port. The number must be between 1 and 65535.

Server secure port
Type the number of the port you want the server to use as its secure port. The number must be between 1 and 65535.

Administration server port
Type the number of the port you want the administration server to use as its port. The number must be between 1 and 65535.

Administration server secure port
Type the number of the port you want the administration server to use as its secure port. The number must be between 1 and 65535.
Notes:

a. If you have two or more directory server instances listening on the same IP address (or set of IP addresses), be sure that those directory server instances do not use any of the same port numbers.

b. ON AIX, Linux, and Solaris systems, port numbers below 1000 can be used only by root.

Click Next.

10. If the Optional steps window is displayed:

a. Select **Configure administrator DN and password** if you want to configure the administrator DN and password for the directory server instance now. (The administrator DN and password are required for both proxy servers and full directory servers.)

b. Select **Configure database** if you want to configure the database for the directory server instance now. (A proxy server instance does not require a database.)

   When you configure the database, the Instance Administration Tool adds information about the database that will be used to store directory data to the configuration file (ibmslapd.conf) for the directory server instance. In addition, if the database does not already exist, the Instance Administration Tool creates the database.

   In some cases (for example, if you are migrating from a previous release), these options might not be available.

   Click Next.

   **Note:** You can use the Configuration Tool or the command line later if you do not want to set the administrator DN or configure the database now, but you cannot use the directory server instance until you have done these steps.

11. If the Configure administrator DN and password window is displayed:

a. In the **Administrator DN** field, type a valid DN (or accept the default DN, cn=root).

   The administrator DN is the DN used by the administrator of the directory server instance. This administrator is the one user who has full access to all data in the directory.

   The default DN is **cn=root**. DNs are not case sensitive. If you are unfamiliar with LDAP DN format, or if for any other reason you do not want to define a new DN, accept the default DN.

b. Type the password for the administrator DN in the **Administrator Password** field. You must define a password. Passwords are case-sensitive. Double byte character set (DBCS) characters in the password are not valid.

   Record the password in a secure location for future reference.

c. Retype the password in the **Confirm password** field.

d. Click Next.

12. If the Configure database window is displayed:

a. Type a valid DB2 administrator ID in the **Database user name** field. This ID must already exist and must have the proper authority before you can configure the database.
Note: Before server startup, this user must have the locale set to the correct locale for the language in which you want server messages to be displayed. If necessary, log in as the user and change the locale to the correct one.

b. Type the password for the user in the **Password** field. Passwords are case-sensitive.

Note: If you change the system password for the DB2 administrator, you cannot update it through the Instance Administration Tool. You must use the Configuration Tool or the `idscfgdb` command with the `-w` option. See “Changing the password for the database owner” on page 132 or “Configuring the database with the command line” on page 130 for information.

c. Type the name you want to give the DB2 database in the **Database name** field. The name can be from 1 to 8 characters long.

d. Select the **Show advanced tablespace options** check box if either of the following is true:

- You want this database to use System Managed Storage (SMS) data storage for the DB2 tablespaces.
- You want this database to use Database Managed Storage (DMS) data storage for the DB2 tablespaces and you want to configure the sizes and locations for the USERSPACE1 and LDAPSPACE tablespaces for the database.

If you clear the check box, the USERSPACE1 and LDAPSPACE tablespaces will be created using DMS with default sizes and locations.

DB2 can use one of two types of data storage when it creates table spaces. These are System Managed Storage (SMS) and Database Managed Storage (DMS).

When SMS is used, the operating system’s file system manager allocates and manages the space where DB2 tables are stored (the tablespace).

When DMS is used, the tablespaces are managed by the database manager. The database administrator decides which devices and files to use, and DB2 manages the space on those devices and files.

The default for Tivoli Directory Server 6.3 is DMS. Versions of Tivoli Directory Server earlier than 6.2 use SMS for all databases.

Note: The default minimum disk space requirement for a DMS database is 1 GB. If you have limited disk space and do not plan to have a large directory, configure an SMS database. An SMS database requires a minimum of 150 MB of disk space. These requirements are for an empty database. When you store data in the database, more disk space is required.

e. Click **Next**.

13. If the Database options window is displayed:

a. Type the location for the database in the **Database install location** field. For Windows platforms, this must be a drive letter. For non-Windows platforms, the location must be a directory name, such as `/home/ldapdb`. (You can click **Browse** to locate a directory.)

Be sure that you have at least 1 GB (for a DMS database) or 150 MB (for an SMS database) of free hard disk space in the location you specify and that additional disk space is available to accommodate growth as new entries are added to the directory.
b. If you want to configure the database for online backup:

1) Select the **Configure for online backup** check box.
2) In the **Database backup location** field, type the location where you want the backed-up information to be stored. Click **Browse** to search for the location.

If you configure the database for online backup, when database configuration is complete: the initial, offline backup of the database will be performed, and then the Administration Server will be restarted.

**Notes:**
1) Do not exit the Instance Administration Tool while the backup operation is running.
2) You can also configure online backup for a directory server instance using the command line. However, if you do this, you cannot unconfigure online backup through the command line (using the `idscfgdb` command with the `-c` flag).

If you configure online backup for a directory server instance using either the Instance Administration Tool or the Configuration Tool, you can unconfigure it through the Configuration Tool or the command line.

For the most reliable results, use the Instance Administration Tool or the Configuration Tool to administer online backup.

c. In the **Character-set option** box:

1) Click the type of database you want to create. Click one of the following:
   - **Create a universal DB2 database (UTF-8/UCS-2)** to create a UCS Transformation Format (UTF-8) database, in which LDAP clients can store UTF-8 character data.
   - **Create a local codepage DB2 database** to create a database in the local code page.

Create a universal database if you plan to store data in multiple languages in the directory. A universal database is also most efficient because less data translation is needed. If you want to use language tags, the database must be a UTF-8 database. For more information about UTF-8, see [Appendix O, “UTF-8 support,” on page 217](#).

d. Click **Next**.

14. If you selected the **Show advanced tablespace options** check box in the Configure database window, the Select database tablespace type window is displayed. In the window:

a. Under **Select database tablespace type**, **DMS** is selected. DMS tablespace support is used only for the USERSPACE1 and LDAPSPACE tablespaces. All other tablespaces, such as catalog and temporary tablespaces, are of type **SMS**.

   If you select **SMS** instead, all other fields are disabled.

b. In the **USERSPACE1 tablespace details** section of the window:

1) In the **Tablespace container** field, click **File** if you want the USERSPACE1 tablespace to be located in a file system or **Raw device** if you want the USERSPACE1 tablespace created in a raw device. (A raw device is a device where no file system is installed, such as a hard disk that has no file system.)

   If the database tablespace container location is in a file system, a DMS **cooked** tablespace will be created. In this case, you can specify the initial
size for the tablespace and an extendable unit size, and the tablespace will be automatically expanded if needed.

If the database tablespace container location is in a raw device, a DMS raw tablespace will be created. In this case, the size of the database tablespace container is fixed and cannot be expanded. If you do this, specify the size along with the container location instead of accepting the default values.

2) Do one of the following:
   - If you selected File in the Tablespace container field:
     a) In the Directory path field, specify the path where you want the USERSPACE1 tablespace created. You can click Browse to select the path.
     b) In the File field, type the file name where you want the tablespace created or accept the default file name, USPACE. (By default, the path and file name is: database_location/instance name/NODE0000/SQL00001/USPACE on AIX, Linux, and Solaris systems, or database_location\instance name\NODE0000\SQL00001\USPACE on Windows systems.)
   - If you selected Raw device in the Tablespace container field, type the location of the raw device in the Device path field. On Windows systems, this path must start with \\. (for example, \\.device_name); on AIX, Linux, and Solaris systems, this must be a valid path.

Note: in the Tablespace container field:
   - If you select File, the USERSPACE1 tablespace container will be the auto-incremental type, where you can provide the initial size (in the Initial size (Pages) field) and an extendable unit size (in the Extendable size (Pages) field). If you do not change these fields, the initial size defaults to 16K pages, and the extendable unit size defaults to 8K pages. (The page size for the USERSPACE1 tablespace container is 4 KB per page.)
   - If you select Raw Device, the size of the USERSPACE1 tablespace container is fixed. The default size is 16K pages, but for best results, specify the size you want.

3) In the Initial size (Pages) field, type the initial size for the USERSPACE1 tablespace or accept the default.

c. In the LDAPSPACE tablespace details section of the window:
   1) In the Tablespace container field, click File if you want the LDAPSPACE tablespace to be located in a file system or Raw device if you want the LDAPSPACE tablespace created in a raw device. (A raw device is a device where no file system is installed, such as a hard disk having no file system.)
   2) Do one of the following:
      - If you selected File in the Tablespace container field:
        a) In the Directory path field, specify the path where you want the LDAPSPACE tablespace created. You can click Browse to select the path.
        b) In the File field, type the file name where you want the tablespace created or accept the default file name, which is database location/ldap32kcont_instance name/ldapspace.
If you selected **Raw device** in the **Tablespace container** field, type the location of the raw device in the **Device path** field. On Windows systems, this path must start with `\\` (for example, `\\device_name`); on AIX, Linux, and Solaris systems, this must be a valid path.

**Note:** in the **Tablespace container** field:

- If you select **File**, the LDAPSPACE tablespace container will be the auto-incremental type, where you can provide the initial size (in the **Initial size (Pages)** field) and an extendable unit size (in the **Extendable size (Pages)** field). If you do not change these fields, the initial size defaults to 16K pages, and the extendable unit size defaults to 8K pages. (The page size for the LDAPSPACE tablespace is 32 KB per page.)
- If you select **Raw Device**, the size of the LDAPSPACE tablespace container is fixed. The default size is 16K pages, but for best results, specify the size you want.

3) In the **Initial size (Pages)** field, type the initial size for the LDAPSPACE tablespace or accept the default.

d. In the **Other properties** section of the window, if you selected **File** in one or both of the **Tablespace container** fields, use the **Extendable size (Pages)** field to specify the number of pages by which the tablespace containers that are of type **File** will be expanded if needed.

e. Click **Next**.

15. In the Verify settings window, information is displayed about the options you specified. To return to an earlier window and change information, click **Back**.

To begin creating the directory server instance, click **Finish**.

16. The Results window is displayed, and messages are displayed while the instance is being created. A completion message is displayed when instance creation is complete. Click **OK** to remove the message.

17. Click **Close** to close the window and return to the main window of the Instance Administration Tool.

18. If you have finished using the Instance Administration Tool, click **Close** to exit the tool.

**Note:** After you set the administrator DN and password and, for a full directory server, configure the database, see Chapter 15, “After you install and configure,” on page 155 for information about:

- Starting the server
- Starting the Embedded WebSphere Application Server service if you have installed and configured the Web Administration Tool.

You can find information about using the Web Administration Tool in the *IBM Tivoli Directory Server Version 6.3 Administration Guide*.

**Migrating an instance**

You can migrate a directory server instance from a previous version of Tivoli Directory Server to a 6.3 directory server instance.

If you are performing remote migration of a Tivoli Directory Server version 6.0, 6.1, or 6.2, you must have already backed up the configuration and schema files. See “Before you upgrade” on page 17.

- To migrate a Tivoli Directory Server version 6.0, 6.1, or 6.2 directory server instance:
1. If the Instance Administration Tool is not started, start the tool. See “Starting the Instance Administration Tool” on page 95 for instructions.

2. Select the 6.0, 6.1, or 6.2 directory server instance you want to migrate in the list, and click Migrate.

3. In the Migrate directory server instance window, click Migrate.
   Messages are displayed while the directory server instance is being migrated. A completion message is displayed when migration is complete. Click OK to remove the message.
   Click Close to close the window and return to the main window of the Instance Administration Tool.
   If you have finished using the Instance Administration Tool, click Close to exit the tool.

• For remote migration of a directory server instance:
  1. If the Instance Administration Tool is not started, start it. See “Starting the Instance Administration Tool” on page 95 for instructions.
  2. Click Create an instance.
  3. Click Migrate from a previous version of directory server. Then type the path where you backed up the configuration and schema files from the previous version. (Click Browse to select the path.)
     Click Next.
  4. In the Instance details window, complete the following fields:
     **User name**
     Do one of the following:
     - If the user you want to own the directory server instance is an existing user on the system, select the system user ID of the user from the list. This name will also be the name of the directory server instance. (You cannot edit user information for an existing user when you are migrating an instance.)
     - If you want to create a new system user ID for the owner of the directory server instance, click Create user. On the window that displays:
       a. Type a name for the user in the User Name field. This name becomes the directory server instance name.
          The name of the new directory server instance must be unique; if there is already a directory server instance on the computer with the same name, you will receive an error message. See Appendix D, “Setting up users and groups: directory server instance owner, database instance owner, and database owner,” on page 187 for detailed information about requirements for the user ID.
       b. Type the password for the user in the Password field.
       c. Type the password again for confirmation in the Confirm password field.
       d. If you are on an AIX, Linux, or Solaris system:
          1) Type the home directory for the user in the Home directory field. You can click Browse to locate the home directory.
          2) Type the name of the user’s primary group in the Primary group field.
       e. Click Create to create the user.
**Instance location**
Type the location where the directory server instance files will be stored. Be sure that you have at least 30 MB of free disk space in this location.

On Windows systems, this location is a drive, such as C: The directory instance files will be stored on the drive you specify in the \idsslapd-instance_name directory. (instance_name is the name of the directory server instance.)

On AIX, Linux, and Solaris systems, the default location for the instance files is in the directory instance owner's home directory, but you can specify a different path. Click **Browse** if you want to select a location.

**Instance description**
Optionally, type a description of the directory server instance. This description is displayed in other windows to help identify the instance.

Click **Next**.

**Note:** When performing remote migration from a previous release to Tivoli Directory Server 6.3, the following will be disabled: Encryption seed string, Confirm encryption seed, Use encryption salt value, Encryption salt string, and Confirm encryption salt. Tivoli Directory Server 6.3 determines the values for these fields from the appropriate backed up configuration files.

5. In the DB2 instance details window, verify that the DB2 instance name is correct, and then click **Next**.

6. In the TCP/IP port settings window, complete the following fields:

**Server port**
Type the number of the port you want the server to use as its contact port. The number must be between 1 and 65535.

**Server secure port**
Type the number of the port you want the server to use as its secure port. The number must be between 1 and 65535.

**Administration server port**
Type the number of the port you want the administration server to use as its port. The number must be between 1 and 65535.

**Administration server secure port**
Type the number of the port you want the administration server to use as its secure port. The number must be between 1 and 65535.

**Notes:**

a. If you have two or more directory server instances listening on the same IP address (or set of IP addresses), be sure that those directory server instances do not use any of the same port numbers.

b. ON AIX, Linux, and Solaris systems, port numbers below 1000 can be used only by root.

Click **Next**.

7. In the Verify settings window, information is displayed about the options you specified. To return to an earlier window and change information, click **Back**. To begin creating the directory server instance, click **Finish**.
8. The Results window is displayed, and messages are displayed while the instance is being migrated. A completion message is displayed when migration is complete. Click OK to remove the message.

9. Click Close to close the window and return to the main window of the Instance Administration Tool.

   If you have finished using the Instance Administration Tool, click Close to exit the tool.

**Note:** After you migrate the instance, see Chapter 15, “After you install and configure,” on page 155 for information about:

- Starting the server.

  After you start the server for the first time, be sure to run a backup. (Database internal data migration occurs when the Tivoli Directory Server 6.3 directory server instance is started for the first time.) For information about backing up the directory server instance, see “Backing up the directory server instance” on page 135.

- Starting the Embedded WebSphere Application Server service if you have installed and configured the Web Administration Tool.

You can find information about using the Web Administration Tool in the IBM Tivoli Directory Server Version 6.3 Administration Guide.

**Creating an instance that is a copy of another instance**

You can use the Instance Administration Tool to create a directory server instance that uses an existing directory server instance (on the local computer or on another computer) as a template. When you do this, the configuration settings and schema files from the source directory server instance are duplicated and the directory key stash files are also synchronized. The new directory server instance can be configured as a replica or a peer to the source directory server instance if it is in an existing replication deployment, as a full directory server instance that is not participating in replication, or as an additional proxy server. Requirements are:

- The source directory server instance must be running Tivoli Directory Server version 6.3; it cannot be running an earlier version of Tivoli Directory Server, and it cannot be running another version of LDAP.

- The source directory server instance must be running, and it cannot be running in configuration only mode.

- The source directory server instance must be accessible from the computer where you are running the Instance Administration Tool.

- If the directory server instance you are creating will be a peer or replica, there must be a replication context defined on the source directory server instance. (You cannot use the Instance Administration Tool to set up the first replica or peer in a replication topology.) The source directory server instance must already have at least one replication context, replication group, and replication subentry defined. If a replica is being configured, the source directory server instance must already have the initial replication topology defined, including an agreement to at least one other server. If a peer is being configured, the source server must be defined as a master for one or more of the subentries in the replication configuration.

- If the directory server instance you are creating will be a peer or replica, a new replication subentry will be created under ibm-replicaGroup=default,replContextDN. If this DN is not present, the instance cannot be copied.
The new directory server instance will be created on the computer where the Instance Administration Tool is running. If the source directory server is on a different computer, the operating systems of the two computers need not be the same. For example, on a Windows system, you can make a copy of a directory server instance that is running on a Linux system.

The Instance Administration Tool will also copy the key database files if the source directory server is running under SSL mode and the Instance Administration Tool is connected to the source directory server using SSL communication.

If the directory server instance you are copying is a proxy server, the new directory server instance will also be a proxy. If the directory server instance you are copying is a full directory server, the new directory server instance will also be a full directory server, and you can choose whether or not you want to copy the data from the existing directory server instance.

Note: If you want to copy the data from the existing directory server instance while creating the new directory server instance, the following requirements must be met:

- The version of DB2 need not be the same for both directory server instances. A database backup from one operating system family can be restored on any system within the same operating system family. For example, on Windows operating systems, you can restore a database created on DB2 UDB V8 to a DB2 Version 9 database system. For AIX, Linux, and Solaris operating systems, as long as the endianness (big endian or little endian) of the backup and restore operating systems is the same, you can restore backups that were produced on DB2 UDB V8 to DB2 Version 9.
- The source directory server instance must be configured to allow for online backups. You can configure for online backup during initial database configuration (through the Instance Administration Tool or the Configuration Tool), or using the Backup database task in the Configuration Tool.
- An initial offline backup must have been taken on the source directory server instance at some time before you use the Instance Administration Tool to copy the directory server instance. The path you specify must contain only one backup image.
- The path where the backup images are stored must be accessible to both the source directory server instance and the new directory server instance.

To create an instance that is a copy of another instance:

1. If the Instance Administration Tool is not started, start it. See "Starting the Instance Administration Tool" on page 95 for instructions.
2. On the Tivoli Directory Server Instance Administration Tool window, do one of the following:
   - If you want to make a copy of a directory server instance that is on the computer, select the directory server instance in the list and then click Copy local instance.
   - If you want to make a copy of a directory server instance that is on another computer, click Copy remote instance.

   The Source information window is displayed.
3. Complete the following fields, and then click Next:
   - Host If the directory server instance you want to copy is not on the local
computer, type the host name or IP address. If the directory server instance is on the local computer, this field is completed automatically and you cannot edit it.

**Port**
If the port displayed for the directory server instance you want to copy is not correct, type the number of the port on which the directory server instance is running.

**Administrator DN**
If the directory server instance you want to copy is not on the local computer, type the administrator DN for the directory server instance you want to copy. If the directory server instance is on the local computer, this field is completed automatically and you cannot edit it.

**Password**
Type the administrator DN password for the directory server instance you want to copy.

**Encryption seed**
Type the encryption seed for the directory server instance you want to copy. You must provide the correct encryption seed or the directory server instance will not be copied.

**Use SSL connection**
If the source directory server instance is using Secure Sockets Layer (SSL) security and you want the new directory server instance to use the same SSL configuration settings, select this check box, and then complete the following fields:

**Key file**
Type the path and file name of the SSL key database file on the source directory server instance. You can use the Browse button to locate this file.

**Key name**
Type the private key name to use in the key file on the source directory server instance.

**Key password**
Type the key database password on the source directory server instance.

If you do not want the new directory server instance to use SSL, clear the **Use SSL connection** check box.

Click **Next**.

4. In the Instance setup - step 1 window:
   a. Verify that the information provided about the source directory server instance in the **Source URL** and **Source instance type** fields is correct.
   The **Source instance type** can be **Directory server** (a server that has an associated database) or **Proxy server** (an LDAP server that is not associated with a database, but acts as a front-end to the directory and routes requests to certain other directory servers). If these fields are not correct, click **Back** to return to a panel where you can specify information about the source directory server instance again.

   b. If you want the new directory server instance to participate in replication as a peer or replica server, select the **Configure as Peer or Replica server** check box, and then click either **Replica** or **Peer** to specify the replication role of the directory server instance.
The **Configure as Peer or Replica server** check box is enabled only if the following requirements are met:

- The **Source instance type** is **Directory server**.
- There is a replication context defined on the source directory server instance. (You cannot use the Instance Administration Tool to set up the first replica or peer in a replication topology. The source directory server instance must already have at least one replication context, replication group, and replication subentry defined. If a replica is being configured, the source directory server instance must already have the initial replication topology defined, including an agreement to at least one other server. If a peer is being configured, the source server must be defined as a master for one or more of the subentries in the replication configuration.

For more information about replication, see the *IBM Tivoli Directory Server Version 6.3 Administration Guide*.

c. In the **User name** field, specify the system user ID that will own the new directory server instance. This will also be the name of the directory server instance, the DB2 administrator ID, the database instance name, and the database name. The user ID must exist on the system and must not be the name of any other directory server instance on the computer. The name cannot be longer than 8 characters. See Appendix D, “Setting up users and groups: directory server instance owner, database instance owner, and database owner,” on page 187 for detailed information about the user ID.

d. In the **Password** field, specify the system password for the user ID.

e. In the **Install location** field, specify the location where the directory server instance files will be stored. This will also be the location of the database. Be sure that you have at least 30 MB of free disk space in this location.

On Windows systems, this location is a drive, such as C:. The directory instance files will be stored on the drive you specify in the \idsslapd-instance_name directory. (instance_name is the name of the directory server instance.)

On AIX, Linux, and Solaris systems, the default location for the instance files is in the directory instance owner’s home directory, but you can specify a different path. Click **Browse** if you want to select a location.

Click **Next**.

5. In the **Instance setup - step 2** window, complete the following fields and then click **Next**.

   **Administrator DN**
   
   Type the administrator DN for the new directory server instance.

   **Password**
   
   Type the administrator DN password for the new directory server instance.

   **Confirm password**
   
   Type the administrator DN password again for confirmation.

   **Copy data from source instance to new instance**
   
   If you want to copy the data from the database of the source directory server instance during the copy directory server instance operation, select this check box and then type the path where the backup images are stored in the **Path for backup images** field. (You can use the
Browse button to help you locate the path.) This check box is selected by default and cannot be cleared if you are creating a replica or peer server.

If you want to copy the data while creating the new directory server instance, the following requirements must be met:

- The source directory server instance must be configured to allow for online backups. You can configure for online backup during initial database configuration (through the Instance Administration Tool or the Configuration Tool), or using the Backup database task in the Configuration Tool.
- An initial offline backup must have been taken on the source directory server instance at some time before you use the Instance Administration Tool to copy the directory server instance. The path you specify must contain only one backup image.
- The path where the backup images are stored must be accessible to both the source directory server instance and the new directory server instance.

If the source directory server instance is a remote instance, be sure that the backup path is a shared path that is accessible from both the systems (for example, a read-write NFS file system).

See the IBM Tivoli Directory Server Administration Guide for information about the backup procedures.

6. In the Verify settings window, information is displayed about the options you specified. To return to an earlier window and change information, click Back. To begin creating the directory server instance, click Finish.

7. The Results window is displayed, and messages are displayed while the instance is being created. A completion message is displayed when instance creation is complete. Click Close to close the window.

Note: After you create the instance, set the administrator DN and password and, for a full directory server, configure the database, see Chapter 15, “After you install and configure,” on page 155 for information about:

- Starting the server
- Starting the Embedded WebSphere Application Server service if you have installed and configured the Web Administration Tool.

You can find information about using the Web Administration Tool in the IBM Tivoli Directory Server Version 6.3 Administration Guide.

Creating an instance with the command line

You can use the idsicrt command to create an instance or the idsideploy command to copy an instance.

For example, using the idsicrt command:

- To create a new directory server instance called myinst that has a port of 389, a secure port of 636, an encryption seed of mysecretkey!, an encryption salt of mysecretsalt, and a DB2 instance with the name myinst, issue the command:
  
  idsicrt -I myinst -p 389 -s 636 -e mysecretkey! -g mysecretsalt

If the directory server instance already existed, this command would fail. If you did not specify the encryption salt, the command would randomly generate an encryption salt. If you did not specify the encryption seed, you would be prompted for the seed. In the following example, you are prompted to enter an
encryption seed. The encryption seed is not displayed on the command line when you enter it. After you type the encryption seed and press Enter, the command attempts to create the directory server instance.

```
idsicrt -I myinst -p 389 -s 636
```

The response is:

```
Enter encryption seed:
```

- To create the same instance so that it binds to a particular IP address, issue the command:

```
idsicrt -I myinst -p 389 -s 636 -e mysecretkey! -g mysecretsalt -i 1.9.86.566
```

- To create a new directory server instance called `myinst` that has a port of 389, a secure port of 636, an encryption seed of `mysecretkey!`, and a DB2 instance with the name `mydbin`, use the following command:

```
idsicrt -I myinst -p 389 -s 636 -e mysecretkey! -t mydbin
```

In this case, the command will randomly generate an encryption salt value.

- To create an instance named `myinst` on a Windows system where the operating system user `myinst` does not exist, issue the following command. (The operating system user will also be created with password `mypassword`.)

```
idsicrt -I myinst -e mysecretkey! -l C: -w mypassword
```

- To create an instance named `myinst` on an AIX, Linux, or Solaris system where the operating system user `myinst` does not exist, issue the following command. (The operating system user will also be created with password `mypassword` and primary group `primary`.)

```
idsicrt -I myinst -e mysecretkey! -G primary -w mypassword
```

- To create a new proxy directory server instance called `proxinst`, use the following command:

```
idsicrt -x -I proxinst -p 389 -s 636 -e mysecretkey!
```

**Note:** After you create the directory server instance with the `idsicrt` command, use the `idsdnpw` command to set the administrator DN and password. See “Managing the primary administrator DN with the command line” on page 125. If the directory server instance is a full directory server, configure the database using the `idscfgdb` command line utility. See “Configuring the database with the command line” on page 130.

For example, to create a directory server instance that is a copy of an existing instance using the `idsideploy` command:

- To create a new directory server instance (`newinst`) that is a copy of directory server `myinst`:

```
idsideploy -a owmerpw -I newinst -e mysecretkey! -D cn=root -sU ldap://localhost:389
-sD cn=root1 -sw srcpw -w newdnpw -l C: -b C:\output -q -L C:\backup
```

- To create a new proxy directory server instance (`prxinst`) that is a copy of proxy server instance `proxinst`:

```
idsiddepoly -x -I prxinst -D cn=root -e abcdefghijkl -sD cn=root -sw root
-sU ldap://localhost:7389
```

- To create an instance named `newinst` that is a copy of a directory server instance at URL `ldap://localhost:7389` on a Windows system when the corresponding operating system user does not exist:

```
idsideploy -I newinst -a newusrpw -D newadminDN -w newdnpw -e encryptionseed
-l C: -sU ldap://localhost:7389 -sD srcAdminDN -sw newdnpw
```

- To create an instance named `newinst` that is a copy of a directory server instance at URL `ldap://localhost:7389` on an AIX, Linux, or Solaris system when the corresponding operating system user does not exist:
idsiddeploy -I newinst -a newusrpw -D newadminDN -w newdnpw -e encryptionseed
   -G primary -sU ldap://localhost:7389 -sD srcAdminDN -sw srcadmpw

Note: When created, a database instance normally requires 10 to 20 MB of space.
This space is not used, however, if the directory server instance is
configured as a proxy server.

See the IBM Tivoli Directory Server 6.3 Command Reference for more information
about using the idsicrt and idsideploy commands.

Starting or stopping the directory server or the administration server

You can use the Instance Administration Tool or the command line to start or stop
a directory server instance or directory administration server.

Starting or stopping the directory server or the administration server with the Instance Administration Tool

A directory server instance can be in one of the following states: Started, Stopped,
or Started (Config only).

To start or stop a directory server instance with the Instance Administration Tool:
1. In the Instance Administration Tool, select the directory server instance you
   want to start or stop, and then click Start/Stop. (You can start a directory server
   instance only if it is stopped; you can stop it only if it is started.)
2. Do one of the following:
   • To start the directory server instance, click Start server.
   • To stop the directory server instance, click Stop server.

Note: The directory server instance can be started only in normal mode with the
Instance Administration Tool. To start the directory server in configuration
only mode, use the command line. For information about configuration only
mode, see the IBM Tivoli Directory Server Version 6.3 Administration Guide.

A directory administration server can be in one of the following states: Started or
Stopped.

To start or stop a directory administration server:
1. In the Instance Administration Tool, select the directory server instance for
   which you want to start or stop the administration server, and then click
   Start/Stop.
2. Do one of the following:
   • To start the directory administration server, click Start administration server.
   • To stop the directory administration server, click Stop administration server.

Starting or stopping the directory server or the administration server with the command line

You can use the idsslapd command to start or stop a directory server instance.

A directory server instance can be in one of the following states: Started, Stopped,
or Started (Config only).
• To start a directory server instance named instancename, type the following
  command:
idsslapd -I instancename

- To stop a directory server instance named instancename, type the following command:
  idsslapd -I instancename -k

You can use the idsdiradm command to start or stop the directory administration server for an instance.

A directory administration server can be in one of the following states: Started or Stopped.
- To start the directory administration server for a directory server instance named instancename, type the following command:
  idsdiradm -I instancename
- To stop the directory administration server for a directory server instance named instancename, type the following command:
  idsdiradm -I instancename -k

### Launching the Configuration Tool from the Instance Administration Tool

You can launch the Configuration Tool from the Instance Administration Tool. This is useful if you want to:
- Check the configuration status of a directory server instance.
- Set or change the administration DN or password, or both, for a directory server instance.

To launch the Configuration Tool from the Instance Administration Tool, on the IBM Tivoli Directory Server Instance Administration Tool window, select the directory server instance you want to change, and then click **Configure**.

**Note:** On Solaris systems, this button might not work. See “[Starting and using the IBM Tivoli Directory Server Configuration Tool (idsxcfg)](page 121)” for information about launching the Configuration Tool.

For information about using the Configuration Tool, see Chapter 14, “Configuration,” on page 121.

### Changing the TCP/IP settings for an instance

You can use either the Instance Administration Tool or the command line to change the TCP/IP settings for an existing directory server instance.

### Changing the TCP/IP settings with the Instance Administration Tool

To change the TCP/IP settings for an existing directory server instance:
1. If the Instance Administration Tool is not started, start it. See “Starting the Instance Administration Tool” on page 95 for instructions.
2. On the IBM Tivoli Directory Server Instance Administration Tool window, select the directory server instance you want to change, and then click **Edit TCP/IP settings**.
3. On the first Edit TCP/IP settings window that is displayed, do one of the following:
• If you want the directory server instance to listen on all IP addresses, select the **Listen on all configured IP addresses** check box.

• If you want the directory server instance to listen on a particular set of IP addresses that are configured on the computer, clear the **Listen on all configured IP addresses** check box. Then select the IP address or addresses in the list that you want the directory server instance to listen on. (To select multiple addresses, press Shift or Ctrl and click the IP addresses you want.)

Click **Next**.

4. On the second Edit TCP/IP settings window that is displayed, complete the following fields:

   **Server port number**
   Type the number of the port you want the server to use as its contact port. The number must be between 1 and 65535.

   **Server secure port number**
   Type the number of the port you want the server to use as its secure port. The number must be between 1 and 65535.

   **Administration server port number**
   Type the number of the port you want the administration server to use as its port. The number must be between 1 and 65535.

   **Administration server secure port number**
   Type the number of the port you want the administration server to use as its secure port. The number must be between 1 and 65535.

**Notes:**

a. The port numbers you specify must not cause conflicts with ports being used by any other directory server instance that is bound to a particular hostname or IP address.

b. ON AIX, Linux, and Solaris systems, port numbers below 1000 can be used only by root.

Click **Finish**.

5. A Results window is displayed. A completion message is displayed when instance creation is complete. Click **OK** to remove the message.

6. Click **Close** to close the window and return to the main window of the Instance Administration Tool.

---

**Changing the TCP/IP settings with the command line**

You can use the `idssethost` command to set the IP addresses a directory server instance will bind to. For example:

To update the IP addresses of the directory server instance `myinst` to bind only to 1.3.45.668, run the following command:

```
idssethost -I myinst -i 1.3.45.668
```

To update the IP addresses of the directory server instance `myinst` to bind to all available IP addresses, use the following command:

```
idssethost -I myinst -i all
```

You can use the `idsetport` command to set the ports a directory server instance will use. For example, to update the port of the directory server instance `myinst` to 555, use the following command:

```
idsetport -I myinst -p 555
```
See the IBM Tivoli Directory Server Version 6.3 Command Reference for more information about the `idssethost` and `idssetport` commands.

**Viewing information about an instance**

You can use the Instance Administration Tool or the command line to view information about a directory server instance.

**Viewing information about an instance using the Instance Administration Tool**

To use the Instance Administration Tool to view information about an existing directory server instance:

1. If the Instance Administration Tool is not started, start it. See “Starting the Instance Administration Tool” on page 95 for instructions.
2. On the IBM Tivoli Directory Server Instance Administration Tool window, select the directory server instance for which you want to see information, and then click View.
   The View instance details window is displayed.
3. Click OK when you have finished viewing the information.

**Viewing information about an instance using the command line**

You can use the `idsilist` command to list the directory server instance(s) on the computer.

For example, to get a list of directory server instances residing on the computer, use the following command:

```
idsilist
```

To obtain detailed information about the instances, issue the same command with the -a or -r option. The -a option provides formatted information about all the directory server instances on the computer, and the -r option provides the same information in a raw format. To obtain information about a specific directory server instance, issue the `idsilist` command with the `-I <instance_name>` option. This option can be used in conjunction with the -a or -r option, or can be used alone.

See the IBM Tivoli Directory Server Version 6.3 Command Reference for information about the `idsilist` command.

**Deleting a directory server instance**

You can use the Instance Administration Tool or the command line to delete a directory server instance.

**Deleting an instance using the Instance Administration Tool**

To use the Instance Administration Tool to delete a directory server instance:

1. If the Instance Administration Tool is not started, start it. See “Starting the Instance Administration Tool” on page 95 for instructions.
2. On the IBM Tivoli Directory Server Instance Administration Tool window, select the directory server instance you want to delete, and then click Delete.
   The Delete directory server instance window is displayed.
3. In the Options box, click one of the following options:
   • Click **Delete directory server instance only** if you want to remove the
directory server instance but leave the database instance intact.
   • Click **Delete directory server instance and destroy associated database
instance** if you want to remove the database instance as well as removing
the directory server instance.
4. Click **Delete**.
5. Messages are displayed in the window as the directory server instance is
removed. A completion message is displayed when instance removal is
complete. Click **OK** to remove the message.
6. When removal is complete, click **Close** to close the window and return to the
main window of the Instance Administration Tool.

**Deleting an instance using the command line**

You can use the `idsidrop` command to delete a directory server instance.

For example, to remove a directory server instance and retain the associated
database instance, run the following command:

```
idsidrop -I instancename
```

To remove a directory server instance and destroy the associated database instance,
run the following command:

```
idsidrop -I instancename -r
```

To unconfigure the associated database instance without removing a directory
server instance, run the following command:

```
idsidrop -I instancename -R
```

See the *IBM Tivoli Directory Server Version 6.3 Command Reference* for information
about the `idsidrop` command.
Chapter 14. Configuration

If you did not use the Instance Administration Tool to set the administrator DN and password or configure the database for the directory server instance, you can use either the Configuration Tool (idsxcfg) or command-line utilities for these tasks. You must set the administrator DN and password and, for a full directory server, configure the database, before you can use the directory instance. Also, if you want to change the administrator DN or password after you have set it for the first time, you must use either the Configuration Tool or the command line.

Note: After you configure, see Chapter 15, “After you install and configure,” on page 155 for information about:

- Starting the server
- Starting the Embedded WebSphere Application Server service if you want to use the Web Administration Tool

You can find more information in the IBM Tivoli Directory Server Version 6.3 Administration Guide.

You can use the Configuration Tool for the following tasks:

- Starting or stopping the server
- Managing the primary administrator DN and password.
- Configuring and unconfiguring the database
- Optimizing the database
- Maintaining the database by performing DB2 index reorganization or DB2 row compression
- Backing up and restoring the database
- Tuning the performance of the directory server instance
- Enabling and disabling the change log
- Adding and removing suffixes
- Adding and removing schema files
- Importing and exporting LDIF data
- Configuring Active Directory synchronization

Starting and using the IBM Tivoli Directory Server Configuration Tool (idsxcfg)

To start and use the Configuration Tool:

1. On AIX, Linux, or Solaris systems, log in as root, as the directory server instance owner, or with a user ID that is in the primary group of the directory server instance owner. On Windows systems, log on as any user in the default Administrators group.

2. Go to the sbin subdirectory of the directory where Tivoli Directory Server 6.3 is installed. This directory is:

- On Windows systems, by default:
  C:\Program Files\IBM\LDAP\V6.3\sbin
- On AIX and Solaris systems: /opt/IBM/ldap/V6.3/sbin
- On Linux systems: /opt/ibm/ldap/V6.3/sbin
3. Type `idsxcfg` at a command prompt.
   If you have more than one directory server instance on the computer, you must type `idsxcfg -I instancename` where `instancename` is the name of the directory server instance you want to configure.

   **Note:** You can also launch the Configuration Tool from the Instance Administration Tool. In the Configuration Tool, select the directory server instance you want to configure, and click **Manage**.

4. The Configuration Tool window is displayed. This window displays information about the current configuration status of the directory server instance.

   In the task list on the left, click the task you want to perform. For information about performing a task, see the section shown in the following list:

   **Manage server state**
   See “Starting or stopping the directory server or the administration server” on page 123.

   **Manage administrator DN**
   See “Managing the primary administrator DN for a directory server instance” on page 124.

   **Manage administrator password**
   See “Managing the primary administrator password for a directory server instance” on page 125.

   **Database tasks**
   Expand this task to do any of the following:

   **Configure database**
   See “Configuring the database for a directory server instance” on page 126. This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.

   **Unconfigure database**
   See “Unconfiguring the database for a directory server instance” on page 133. This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.

   **Optimize database**
   See “Optimizing the database” on page 134. (This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.)

   **Maintenance**
   See “Maintaining the database” on page 134.

   **Backup/Restore**
   Expand this task to do one of the following:

   **Backup database**
   See “Backing up the directory server instance” on page 135. (This option is called **Backup instance** if you are configuring a proxy server.)

   **Restore database**
   See “Restoring the database” on page 137. (This option is called **Restore instance** if you are configuring a proxy server.)
**Performance tuning**
See “Tuning the performance of the directory server” on page 137.

**Manage changelog**
See “Enabling or disabling the change log for a directory server instance” on page 142. This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.

**Manage suffixes**
See “Managing suffixes” on page 144. This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.

**Manage schema files**
See “Managing schema files” on page 146.

**LDIF tasks**
Expand this task to do one of the following:

**Import LDIF data**
See “Importing LDIF data with the Configuration Tool” on page 149. (This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.)

**Export LDIF data**
See “Exporting LDIF data with the Configuration Tool” on page 150. (This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.)

**Active directory synchronization**
See “Configuring Active Directory synchronization” on page 151.

5. Close the Configuration Tool when you have completed all configuration tasks.

---

**Starting or stopping the directory server or the administration server**

You can use the Configuration Tool or the command line to start or stop a directory server instance or directory administration server.

**Starting or stopping the directory server or the administration server with the Configuration Tool**

A directory server instance can be in one of the following states: Started, Stopped, or Started (Config only).

To start or stop a directory server instance with the Configuration Tool:

1. In the IBM Tivoli Directory Server Configuration Tool window, click **Manage server state** in the task list on the left.

2. Do one of the following:
   - To start the directory server instance, click **Start server**.
   - To stop the directory server instance, click **Stop server**.

**Note:** The directory server instance can be started only in normal mode with the Configuration Tool. To start the directory server in configuration only mode,
A directory administration server can be in one of the following states: Started or Stopped.

To start or stop a directory administration server:
1. In the IBM Tivoli Directory Server Configuration Tool window, click **Manage server state** in the task list on the left.
2. Do one of the following:
   - To start the directory administration server, click **Start administration server**.
   - To stop the directory administration server, click **Stop administration server**.

### Starting or stopping the directory server or the administration server with the command line

You can use the `idsslapd` command to start or stop a directory server instance.

A directory server instance can be in one of the following states: Started, Stopped, or Started (Config only).

- To start a directory server instance named `instancename`, type the following command:
  
  `idsslapd -I instancename`

- To stop a directory server instance named `instancename`, type the following command:
  
  `idsslapd -I instancename -k`

You can use the `idsdiradm` command to start or stop the directory administration server for an instance.

A directory administration server can be in one of the following states: Started or Stopped.

- To start the directory administration server for a directory server instance named `instancename`, type the following command:
  
  `idsdiradm -I instancename`

- To stop the directory administration server for a directory server instance named `instancename`, type the following command:
  
  `idsdiradm -I instancename -k`

### Managing the primary administrator DN for a directory server instance

The administrator DN is the DN used by the primary administrator of the directory server instance. A DN is made up of attribute:value pairs, separated by commas; for example, `cn=Ben Gray,ou=editing,o=sample`. The default DN is `cn=root`. DNs are not case sensitive.

You can use either the Configuration Tool or the command line to set or change the primary administrator DN.

### Managing the primary administrator DN with the Configuration Tool

To set or change the primary administrator DN with the Configuration Tool:
1. In the IBM Tivoli Directory Server Configuration Tool window, click Manage administrator DN in the task list on the left.

2. In the Manage administrator DN window on the right, type a valid DN (or accept the default DN, cn=root) in the Administrator DN field.
   The Tivoli Directory Server administrator DN is the DN used by the primary administrator of the directory. This administrator is the one user who has full access to all data in the directory.
   The default DN is cn=root. DNs are not case sensitive. If you are unfamiliar with LDAP DN format, or if for any other reason you do not want to define a new DN, accept the default DN.

3. Click OK.

4. A completion message is displayed. Click OK.

Managing the primary administrator DN with the command line

You can use the idsdnpw command to change the administrator DN and password for a directory server instance. The command can be run only when the directory server instance is not running. The primary administrator specifies an administrator password and, optionally, an administrator DN, which the utility writes to the ibmslapd.conf file for the directory server instance. The administrator DN is set to cn=root by default.

For example:

To set the administrator DN to cn=myname and the password to secret on a computer with only one directory server instance, issue the command:

idsdnpw -u cn=myname -p secret

If the password is not specified, you are prompted for the password. The password is not displayed on the command line when you type it.

Note: If the administration password policy has been enabled, the administrator's password must conform to the administration password policy requirements. See the IBM Tivoli Directory Server Version 6.3 Administration Guide for information about the password policy.

See the IBM Tivoli Directory Server Version 6.3 Command Reference for detailed information about the idsdnpw command.

Managing the primary administrator password for a directory server instance

You can use either the Configuration Tool or the command line to set or change the primary administrator password.

Managing the primary administrator password with the Configuration Tool

To set or change the primary administrator password with the Configuration Tool:

1. Stop the server if it is running.
2. In the IBM Tivoli Directory Server Configuration Tool window, click Manage administrator password in the task list on the left.
3. In the Manage administrator password window on the right, type a password in the Administrator password field. Passwords are case-sensitive. Double byte character set (DBCS) characters in the password are not supported. Record the password in a secure place for future reference.

   **Note:** If the administration password policy has been enabled, the primary administrator's password must conform to the administration password policy requirements. See the IBM Tivoli Directory Server Version 6.3 Administration Guide for information about the password policy.

4. Retype the password in the Confirm password field.
5. Click OK.
6. A completion message is displayed. Click OK.

**Managing the primary administrator password with the command line**

You can use the `idsdnpw` command to change the primary administrator password for a directory server instance. The command can be run only when the directory server instance is not running.

For example:

To change the primary administrator password to newsecret on a computer with only one directory server instance, issue the command:

`idsdnpw -p newsecret`

You are prompted to continue or exit.

   **Note:** If the administration password policy has been enabled, the primary administrator's password must conform to the administration password policy requirements. See the IBM Tivoli Directory Server Version 6.3 Administration Guide for information about the password policy.

See the IBM Tivoli Directory Server Version 6.3 Command Reference for detailed information about the `idsdnpw` command.

**Configuring the database for a directory server instance**

When you configure a database, the Configuration Tool adds information about the database that will be used to store directory data to the configuration file for the directory server instance. In addition, if the database does not already exist, the Configuration Tool creates the database.

**Notes:**

1. The server must be stopped before you configure or unconfigure the database.
2. This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.
3. If you created the default instance, the database for that instance has already been created and configured.

You can use either the Configuration Tool or the command line to configure the database.
Configuring the database with the Configuration Tool

To configure a database for the directory server instance:

1. Stop the server if it is running.

2. In the task list on the left navigational pane of the Configuration Tool, click **Configure database**.

3. Do one of the following:

   - If you are configuring the database for a new directory instance:
     a. Type a user ID in the **Database user name** field. This user ID owns the database that is used by the directory instance, and the directory server instance uses this user ID to connect to the database. The user ID must already exist before you can configure the database. (See Appendix D, “Setting up users and groups: directory server instance owner, database instance owner, and database owner,” on page 187 for more information about requirements for the user ID.)
     b. Type a password for the user in the **Password** field. Passwords are case-sensitive.
     c. In the **Database name** field, type the name you want to give the DB2 database that is used by the directory server instance to store directory data. The name can be from 1 to 8 characters long.
     d. Select the **Show advanced tablespace options** check box if either of the following is true:
        - You want this database to use System Managed Storage (SMS) data storage for the DB2 tablespaces.
        - You want this database to use Database Managed Storage (DMS) data storage for the DB2 tablespaces and you want to configure sizes and locations for the USERSPACE1 and LDAPSPACE tablespaces for the database.

     If you clear the check box, the USERSPACE1 and LDAPSPACE tablespaces will be created using DMS with default sizes and locations.

     If you are configuring a directory server instance with an existing database, this check box is disabled when you type the name of the existing database in the **Database name** field.

     DB2 can use one of two types of data storage when it creates table spaces. These are System Managed Storage (SMS) and Database Managed Storage (DMS).

     When SMS is used, the operating system's file system manager allocates and manages the space where DB2 tables are stored (the tablespace).

     When DMS is used, the tablespaces are managed by the database manager. The database administrator decides which devices and files to use, and DB2 manages the space on those devices and files.

     The default for Tivoli Directory Server 6.3 is DMS. Versions of Tivoli Directory Server earlier than 6.2 use SMS for all databases.

   - Note: The default minimum disk space requirement for a DMS database is 1 GB. If you have limited disk space and do not plan to have a large directory, configure an SMS database. An SMS database requires a minimum of 150 MB of disk space. These requirements are for an empty database. When you store data in the database, more disk space is required.

   - If you are reconfiguring the database options for an existing directory server instance:
a. To change the database password, select the **Reset password** check box, and then do the following:

1) In the **Password** field, type the new database password.

2) In the **Confirm password** field, type the database password again for confirmation.

b. To disable online backup support for the database, select the **Disable support for online backup** check box. (If you select this check box, the administration server will be restarted after the database is successfully reconfigured).

Click **Next**.

4. If the database installation location is requested:

a. Type the location for the database in the **Database install location** field. For Windows systems, this location must be a drive letter. For AIX, Linux, and Solaris systems, the location must be a directory name, such as /home/ldapdb, and you can click **Browse** to locate the directory.

   Be sure that you have at least 1 GB (for a DMS database) or 150 MB (for an SMS database) of free hard disk space in the location you specify and that additional disk space is available to accommodate growth as new entries are added to the directory.

b. If you plan to perform online backups of the database:

1) Select the **Configure for online backup** check box.

2) In the **Database backup location** field, type the location where you want the backed-up information to be stored. Click **Browse** to search for the location.

   **Note:** If you do not specify a database backup location, the database will not be configured for online backup.

Clear the **Configure for online backup** check box if you do not want to perform online backups of the database.

If you configure the database for online backup and you specify a backup location, the initial, offline backup of the database will be performed, and then the Administration Server will be restarted after the database is successfully configured.

**Notes:**

1) Do not exit the Configuration Tool while the backup operation is running.

2) You can also configure online backup for a directory server instance using the command line. However, if you do this, you cannot unconfigure online backup through the command line (using the **idscfgdb** command with the **-c** flag).

   If you configure online backup for a directory server instance using either the Instance Administration Tool or the Configuration Tool, you can unconfigure it through the Configuration Tool or the command line.

   For the most reliable results, use the Instance Administration Tool or the Configuration Tool to administer online backup.

c. Click the type of database you want to create. You can create a UCS Transformation Format (UTF-8) database, in which LDAP clients can store UTF-8 character data, or a local code page database, which is a database in the local code page.

Create a universal database if you plan to store data in multiple languages in the directory. A universal database is also most efficient because less data
translation is needed. If you want to use language tags, the database must be a UTF-8 database. For more information about UTF-8, see "UTF-8 support," on page 217.

d. Click Next.

5. If you selected the **Show advanced tablespace options** check box, the Select database tablespace type window is displayed. In the window:

   a. In the **Select database tablespace type** field, **DMS** is selected. DMS tablespace support is used only for the USERSPACE1 and LDAPSPACE tablespaces. All other tablespaces, such as catalog and temporary tablespace, are of type SMS.

   If you select **SMS** instead, all other fields are disabled.

   b. In the **USERSPACE1 tablespace details** section of the window:

      1) In the **Tablespace container** field, click **File** if you want the USERSPACE1 tablespace to be located in a file system or **Raw device** if you want the USERSPACE1 tablespace created in a raw device. (A raw device is a device where no file system is installed, such as a hard disk that has no file system.)

      If the database tablespace container location is in a file system, a DMS cooked tablespace will be created. In this case, you can specify the initial size for the tablespace and an extendable unit size, and the tablespace will be automatically expanded if needed.

      If the database tablespace container location is in a raw device, a DMS raw tablespace will be created. In this case, the size of the database tablespace container is fixed and cannot be expanded. If you do this, specify the size along with the container location instead of accepting the default values.

      2) Do one of the following:

         • If you selected **File** in the **Tablespace container** field:

            a) In the **Directory path** field, specify the path where you want the USERSPACE1 tablespace created. You can click **Browse** to select the path.

            b) In the **File** field, type the file name where you want the tablespace created or accept the default file name, USPACE. (By default, the path and file name is: `database_location\instance name\NODE0000\SQL00001\USPACE` on AIX, Linux, and Solaris systems, or `database_location\instance name\NODE0000\SQL00001\USPACE` on Windows systems.)

         • If you selected **Raw device** in the **Tablespace container** field, type the location of the raw device in the **Device path** field. On Windows systems, this path must start with `\\.` (for example, `\\device_name`); on AIX, Linux, and Solaris systems, this must be a valid path.

   **Note:** in the **Tablespace container** field:

   • If you select **File**, the USERSPACE1 tablespace container will be the auto-incremental type, where you can provide the initial size (in the **Initial size (Pages)** field) and an extendable unit size (in the **Extendable size (Pages)** field). If you do not change these fields, the initial size defaults to 16K pages, and the extendable unit size defaults to 8K pages. (The page size for the USERSPACE1 tablespace is 4 KB per page.)
If you select **Raw Device**, the size of the USERSPACE1 tablespace container is fixed. The default size is 16K pages, but for best results, specify the size you want.

3) In the **Initial size (Pages)** field, type the initial size for the USERSPACE1 tablespace or accept the default.

c. In the **LDAPSPACE tablespace details** section of the window:

1) In the **Tablespace container** field, click **File** if you want the LDAPSPACE tablespace to be located in a file system or **Raw device** if you want the LDAPSPACE tablespace created in a raw device. (A raw device is a device where no file system is installed, such as a hard disk having no file system.)

2) Do one of the following:

   • If you selected **File** in the **Tablespace container** field:
      
      a) In the **Directory path** field, specify the path where you want the LDAPSPACE tablespace created. You can click **Browse** to select the path.

      b) In the **File** field, type the file name where you want the tablespace created or accept the default file name, which is `database location/ldap32kcont_instance name/ldapspace`.

   • If you selected **Raw device** in the **Tablespace container** field, type the location of the raw device in the **Device path** field. On Windows systems, this path must start with `\\` (for example, `\\device_name`); on AIX, Linux, and Solaris systems, this must be a valid path.

**Note:** in the **Tablespace container** field:

   • If you select **File**, the LDAPSPACE tablespace container will be the auto-incremental type, where you can provide the initial size (in the **Initial size (Pages)** field) and an extendable unit size (in the **Extendable size (Pages)** field). If you do not change these fields, the initial size defaults to 16K pages, and the extendable unit size defaults to 8K pages. (The page size for the LDAPSPACE tablespace is 32 KB per page.)

   • If you select **Raw Device**, the size of the LDAPSPACE tablespace container is fixed. The default size is 16K pages, but for best results, specify the size you want.

3) In the **Initial size (Pages)** field, type the initial size for the LDAPSPACE tablespace or accept the default.

d. In the **Other properties** section of the window, if you selected **File** in one or both of the **Tablespace container** fields, use the **Extendable size (Pages)** field to specify the number of pages by which the tablespace containers that are of type **File** will be expanded if needed.

e. Click **Finish**.

6. Messages are displayed while the database is being configured. Click **Close** when database configuration is complete.

**Configuring the database with the command line**

You can use the `idscfgdb` command to configure a database for a directory server instance.

This command cannot be used for a proxy server instance.
The `idsicrt` command must have already run successfully to create the database instance. In addition, the database instance owner must be set up correctly. Otherwise, the command fails.

The directory server instance owner specifies a database administrator user ID, a database administrator password, the location to store the database, and the name of the database. The database administrator ID specified must already exist on the system. See Appendix D, “Setting up users and groups: directory server instance owner, database instance owner, and database owner,” on page 187 for information about requirements for this ID.

By using the `-w` option, you can reset the password for the database administrator and the change log database owner in the configuration file for the directory server instance.

After successfully creating the database, the command adds information about the database to the `ibmslapd.conf` file of the directory server instance. The database and local loopback settings are created, if they do not exist. You can specify whether to create the database as a local codepage database or as a UTF-8 database, which is the default.

**Attention:**

1. Before configuring the database, be sure that the environment variable `DB2COMM` is not set.
2. The server must be stopped before you configure the database.

For example:

To configure a database called `ldapdb` for directory server instance `ldapdb` in the location `/home/ldapdb` with a DB2 database administrator ID of `ldapdb` whose password is `secret`, issue the command:

```
idsicfgdb -I ldapdb -a ldapdb -w secret -t ldapdb -l /home/ldapdb
```

If the password is not specified, you are prompted for the password. The password is not displayed on the command line when you type it.

The previous command configures the database with DMS tablespaces with default sizes.

To configure a database with a DMS tablespace located in a file system and with a specific size for the tablespace, use the following command:

```
idsicfgdb -I ldapinst -a dbadmin -t ldapdb -w password -n -l c:\dblocation
-w c:\dblocation\ldapinst\tablespaceloc\USPACE -U 10000 -z 16
```

In the previous command:
- The instance name is `ldapinst`
- The database administrator ID is `dbadmin`
- The database name is `ldapdb`
- The database administrator password is `password`
- The database location is `c:\dblocation`
- The location of the USERSPACE1 tablespace is `c:\dblocation\ldapinst\tablespaceloc\USPACE`
- The container size of the USERSPACE1 tablespaces specified is 10000 pages and the extension size specified is 16 pages.

To configure the same database with SMS tablespaces, use the following command:

```
idsicfgdb -I ldapinst -a dbadmin -t ldapdb -w password -n -l c:\dblocation
-w c:\dblocation\ldapinst\tablespaceloc\USPACE -U 10000 -z 16
```
Changing the password for the database owner

If you change the system password for the database owner after the database is configured for a directory server instance, the password is not automatically changed in the configuration file for the directory server instance. When the password for the database owner in the configuration file does not match the system password for the database owner user ID, the directory server instance starts only in configuration mode until you update the password in the configuration file.

Changing the password for the database owner with the Configuration Tool

To change the password for the database owner in the configuration file for the directory server instance:

1. In the task list on the left navigational pane of the Configuration Tool, click Configure database.
2. Type the database owner's new password in the Password field. Passwords are case sensitive.
3. Click Next.
4. Click Finish.
5. Messages are displayed while the password is being changed. Click Close when processing is complete.

Note: If the change log is enabled, this procedure also updates the password for the change log database owner in the configuration file.

Changing the password for the database owner with the command line

When the password for the database owner is changed on the system, the directory server must be notified to update its configuration file. This update can be done in one of two ways:

- Using the idscfgdb command when the server is stopped
- Using the idsldapmodify command

You can use the idscfgdb command to change the password for the database owner in the configuration file for the directory server instance if the directory server is stopped.

For example, to change the password to newpassword on a system with only one directory server instance, use the following command:

```
idsldapmodify -w newpassword
```
You are prompted to either continue or exit.

You can use the `idsldapmodify` command to change the password while the directory server instance is running. The `idsldapmodify` command must be used by the primary directory server administrator or by a directory administrator with dirdata authority. Use the `idsldapmodify` command with an LDIF file that has the following contents:

```ldif
dn: cn=Directory, cn=RDBM Backends, cn=IBM Directory, cn=Schemas, cn=Configuration
changetype: modify
replace: ibm-slapdDbUserPW
ibm-slapdDbUserPW: newPassword
```

See the *IBM Tivoli Directory Server Version 6.3 Command Reference* for detailed information about the `idscfgdbe` and `idsldapmodify` commands.

---

### Unconfiguring the database for a directory server instance

When you unconfigure the database, the Configuration Tool removes the database information for the directory server instance from the configuration file. Based on your selections, it might also delete the database (and all data in it).

**Note:** This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.

You can use either the Configuration Tool or the command line to unconfigure the database.

#### Unconfiguring the database with the Configuration Tool

To unconfigure the database using the Configuration Tool:

1. In the Configuration Tool, click **Unconfigure database** in the task list on the left.
2. In the Unconfigure database window, click one of the following:
   - **Unconfigure only**
     - Does not destroy any existing LDAP DB2 data. However, the configuration information for the database will be removed from the configuration file for the directory server instance, and the database will be inaccessible to the directory server instance.
   - **Unconfigure and destroy database**
     - Removes the existing database and its contents, and removes the configuration information for the database from the configuration file for the directory server instance.
3. If the database is configured for online backup and you do not want to save the backed-up copy, select the **Remove the backup copy of the database** check box.
4. Click **Unconfigure**.
5. In response to the confirmation message that is displayed, click **Yes**.

#### Unconfiguring the database with the command line

You can use the `idsucfgdb` command to unconfigure a database for a directory server instance.

By default, the command only unconfigures the database from the `ibmslapd.conf` file and does not delete the database. However, you can use the `specify` that you...
want to delete the database during the unconfiguration process. You are prompted to confirm that you want to continue with the actions you requested.

This command cannot be used for a proxy server instance.

For example:

To unconfigure the database for directory server instance myinstance and not prompt before unconfiguring, issue the command:

idsucfgdb -n -I myinstance

To unconfigure and delete the database for directory server instance myinstance and not prompt for confirmation before removing the directory server instance, issue the command:

idsucfgdb –r –n -I myinstance

See the IBM Tivoli Directory Server Version 6.3 Command Reference for detailed information about the idsucfgdb command.

**Optimizing the database**

Optimize the database to update statistics related to the data tables; this can improve performance and query speed. Perform this action periodically or after heavy database updates; for example, after importing database entries.

This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.

**Using the Configuration Tool**

To optimize the database using the Configuration Tool:

1. In the Configuration Tool, click **Optimize database** in the task list on the left.
2. In the Optimize database window on the right, click **Optimize**.

**Using the command line**

For information about using the idsrunstats command to optimize the database, see the IBM Tivoli Directory Server version 6.3 Command Reference.

This command cannot be used for proxy server instances.

**Maintaining the database**

You can use the Configuration Tool or the command line to perform DB2 index reorganization or DB2 row compression.

As the DB2 tables used in the directory database are updated with many insertions and deletions, searches and updates in the database become slower. Reorganizing the DB2 index makes these searches and updates more efficient, and therefore faster, again.

DB2 row compression improves performance by searching for repeating patterns and replacing them with shorter symbol strings. (The tool performs some analysis and then performs the row compression only if the compression would result in a benefit greater than 30%.)
Performing database maintenance tasks with the Configuration Tool

To perform DB2 index reorganization or DB2 row compression using the Configuration Tool:

1. Be sure that the server is stopped.
2. In the Configuration Tool, click **Maintenance** in the task list on the left. (If necessary, expand **Database tasks** first.)
3. In the Database maintenance window, click the task you want to perform:
   - To perform DB2 index reorganization, click **Perform index reorganization**.
   - To perform DB2 row compression, click **Inspect the tables and perform row compression**.
4. Click **OK**.

Performing database maintenance tasks with the command line

You can use the `idsdbmaint` command to perform DB2 index reorganization or row compression. The directory server must be stopped before you perform either of these tasks.

- To perform DB2 index reorganization, use the following command:
  
  `idsdbmaint -I instance_name -i`

- To perform DB2 row compression, use the following command:
  
  `idsdbmaint -I instance_name -r`

**Note:** You can also use the `idsdbmaint` command to convert an SMS table space to a DMS table space or a DMS table space to an SMS table space. You cannot perform these conversions with the Configuration Tool or other GUIs.

See the IBM Tivoli Directory Server Version 6.3 Command Reference for detailed information about the `idsdbmaint` command.

Backing up the directory server instance

You can use the Configuration Tool or the command line to back up the following:

- The configuration settings for the directory server instance. You can back up these settings for a proxy server or a full directory server.
- The data in the database, for a full directory server.
- The data in the change log, for a full directory server with the change log configured.

**Note:** There are several ways to back up and restore directory server instance information and data. See Appendix G, “Backup and restore methods,” on page 195 for information that will help you decide how to back up and restore your directory server instances.

Backing up the database with the Configuration Tool

To back up the database using the Configuration Tool:

1. In the Configuration Tool, click one of the following:
   - If you are configuring a full directory server, click **Backup database** in the task list on the left.
If you are configuring a proxy server, click **Backup instance** in the task list on the left.

2. In the Backup database window on the right, in the **Backup directory** field, type the directory path in which to back up all directory data and configuration settings. Alternatively, click **Browse** to locate the directory path.

3. Do one of the following:
   - If this is a full directory server and the database has not been configured for online backup, select the **Update database configuration to support online backup** check box if you want to prepare the database for online backup support.

   **Note:** You can also configure online backup for a directory server instance using the command line. However, if you do this, you cannot unconfigure online backup through the command line (using the `idscfgdb` command with the `-c` flag).

   If you configure online backup for a directory server instance using either the Instance Administration Tool or the Configuration Tool, you can unconfigure it through the Configuration Tool or the command line.

   For the most reliable results, use the Instance Administration Tool or the Configuration Tool to administer online backup.

   - If online backup has been configured on the server, select the **Perform online backup** check box to perform online backup for the directory server instance. (If this is a proxy server, this check box is not available.) Then, if the change log is configured for this instance and you also want to back up the change log, select the **Include change log data in backup** check box.

   **Note:** Do not exit the Configuration Tool while the backup operation is running.

4. Select the **Do not backup database files** check box to exclude the database files from backup. If you select this check box, the database and changelog database files for the directory server instance are not backed up, but directory server instance files such as key stash files, schema, and configuration files, are backed up. (If this is a proxy server, only proxy backup is available.)

5. Click one of the following:
   - **Create backup directory as needed** if you want the directory to be created if it does not exist.
   - **Halt if backup directory is not found** if you do not want the directory you specified to be created. If this directory does not exist and you select this option, the database will not be backed up.

6. Click **Backup**.

**Backing up the database with the command line**

You can use the `idsdbback` command to back up the database. For information, see the *IBM Tivoli Directory Server version 6.3 Command Reference*.

This command cannot be used for proxy server instances because there is no database associated with a proxy server. However, you can use the `migbkup` command to back up the configuration files and schema files for a proxy server. See step 3 on page 17 in “Before you upgrade” on page 17 for instructions.
Restoring the database

You can use the Configuration Tool or the command line to restore data and, optionally, configuration settings that were previously backed up. For a proxy server, only configuration settings are restored.

The server must be stopped before you can restore the database or configuration settings or both.

Notes:
1. A database can be restored only into a database and database instance with the same names that were used for the database backup.
2. For a directory server (not a proxy server), the restore function works only if a database is currently configured for a given directory server instance. The restore function restores the backup database into the currently configured database. The command fails if the backed up database instance and database do not match the configured database instance and database. Additionally, the restore function requires that the database location of the backed up database and the database it is restoring are the same.

Using the Configuration Tool

To restore the database using the Configuration Tool:
1. In the Configuration Tool, click **Restore database** in the task list on the left. For a proxy server, click **Restore instance**.
2. In the Restore database window on the right, in the **Restore directory** field, type the path in which the directory server instance was previously backed up. Alternatively, click **Browse** to locate the path.
3. If you want to restore only the directory data, but not the configuration settings from the backed up copy, select the **Preserve current configuration settings** check box. If you want to restore both data and configuration settings, be sure that the check box is cleared.
4. If the change log is configured for this directory server instance and you want to restore the change log data, select the **Include change log data in restore** check box.
5. Click **Restore**.

Using the command line

For information about using the **idsdbrestore** command to restore a previously backed up database, see the *IBM Tivoli Directory Server version 6.3 Command Reference*.

This command cannot be used for proxy server instances.

Tuning the performance of the directory server

The Performance Tuning tool makes recommendations about performance tuning settings (the directory server caches and DB2 buffer pools) based on input you provide about the directory server instance. The tool can also update these settings.

Additionally, if your directory server instance has been deployed and running for some time, the tool monitors the performance of the directory server instance and displays database "health check" information.
For best performance, always run the Performance Tuning tool on new directory server instances, as soon as the initial directory data is loaded. Then run the tool again periodically, especially after you add a significant number of entries or make major changes to the content of entries (such as adding a new set of attributes to each entry).

This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.

**Performance tuning with the Configuration Tool**

To run the Performance Tuning tool with the Configuration Tool:

1. In the Configuration Tool, click **Performance tuning** in the task list on the left. The Performance tuning: administrator input window opens.

   Use this window to provide information that the Performance Tuning tool will use to calculate the following settings for the directory server instance:
   - Entry cache size
   - Filter cache size
   - Group Member Cache size
   - Group Member Cache Bypass Limit
   - DB2 LDAPDB buffer pool size
   - DB2 IBMDEFAULTTDB buffer pool size

   **Notes:**
   a. The Performance Tuning tool backs up the ibmslapd.conf file and saves it in the logs/ibmslapd.conf.save file in the directory for this directory server instance.
   b. The information you provide is logged in the logs/perftune_input.conf file in the directory for this directory server instance.

   Additionally, if the directory server instance has been running for some time and a substantial amount of database activity has occurred, the tool monitors the performance of the directory server instance and displays database "health check" information about the following DB2 parameters:
   - DB2 NUM_IOSERVERS
   - DB2 NUM_IOCLEANERS
   - CATALOGCACHE_SZ
   - PCKCACHESZ
   - LOGFILSIZ
   - LOCKLIST

2. Type the percentage of system memory you want allocated to this directory server instance in the **Percentage of available system memory to be allocated to this directory instance** field. This allows available system memory to be divided between multiple instances of Tivoli Directory Server, or between Tivoli Directory Server and other servers you plan to run on this system. This information will be used for calculating the sizes of the entry and filter caches.

3. In the **Planned number of groups** field, type the estimated number of groups in the directory server instance. This information will be used for calculating sizes for the directory server caches.

4. In the **Maximum number of members in a group that will be referenced frequently** field, type the average number of members for groups that will be referenced frequently.
5. In the Number of entries and average entry size section, do one of the following:
   • If you want to estimate the number of entries in the directory and the average size of an entry, do the following:
     a. In the **Planned number of entries** field, type your estimate of the total number of entries planned for the directory server instance. The Performance Tuning tool attempts to discover the number of entries in the directory server instance. If it cannot, it uses a default of 10,000 entries. This information will be used for calculating sizes for the directory server caches.
     b. In the **Average size of an entry (Bytes)** field, type the estimated average size of an entry in the directory server instance. The Performance Tuning tool attempts to compute the size of an entry in the directory server instance. If it cannot, it uses a default of 2650 bytes. This information will be used for calculating sizes for the directory server caches.
   • If you want the Configuration Tool to obtain the total number of entries and average entry size for you, click **Load from server instance database**. The Configuration Tool will complete the **Planned number of entries** and **Average size of an entry (Bytes)** fields.

6. In the **Update frequency** section, click one of the following:
   • **Frequent updates expected** if there will be frequent updates to the directory server instance. (As a guideline, an average of more than one update for every 500 searches would be considered frequent updates.)
   • **Batch updates** if you expect less frequent updates or if updates are grouped and made at certain times during the day.

   This information is used to set the filter cache size. The filter cache is useful only when there are infrequent updates to the directory and the same searches are run more than once. If frequent updates are expected, the filter cache will be set to 0. If infrequent or batch updates are expected, the filter cache will be set to 1024 filter cache entries.

7. If you want the tool to provide the most thorough performance analysis, select the **Enable collection of additional system data for extended tuning** check box. The Performance Tuning tool will run for 5 minutes and collect and analyze data about the directory server instance, and then make recommendations about the settings for the following DB2 parameters in addition to the settings recommended when you do not enable extended tuning:
   • SORTHEAP
   • MAXFILOP
   • DBHEAP
   • CHNGPGS_THRESH
   • NUM_IOSERVERS
   • NUM_IOCLEANERS

   Recommendations for these DB2 parameters are provided in the perftune_stat.log file for the directory server instance.

   **Notes:**
   a. The directory server instance must have been running for some time before there will be enough DB2 data available to do the database health check analysis and make any recommendations for these settings.
b. Selecting this check box enables the DB2 monitor switches BUFFERPOOL and SORTHEAP. The performance of the directory server instance is likely to degrade while these switches are enabled and the data is being collected.

c. To get accurate data for the best tuning for your directory server instance, select the **Enable collection of additional system data for extended tuning** check box during a time when directory activity is typical for your environment. Running the database health check when the directory server is less busy than usual does not result in optimum performance recommendations.

8. Click **Next**. The Performance tuning: verification window opens. Use this window to verify that you want to use the performance tuning settings calculated by the Performance Tuning tool. You can also use this window to tune database parameters.

9. Inspect the settings recommended by the tool.

   The Database health status table is not completed if this is a new directory server instance with no database activity yet. The table is completed if the Performance Tuning tool has collected information about at least one DB2-related parameter. The information is also logged in the perftune_stat.log file.

   If the database is populated and has had enough activity, information about the following DB2 parameters is displayed:
   - DB2 NUM_IOSERVERS
   - DB2 NUM_IOCLEANERS
   - CATALOGCACHE_SZ
   - PCKCACHESZ
   - LOGFILSZ
   - LOCKLIST

   If you selected the **Enable collection of additional system data for extended tuning** check box on the Performance tuning: administrator input window, information about the following DB2 parameters is also displayed:
   - SORTHEAP
   - MAXFILOP
   - DBHEAP
   - CHNGPGS_THRESH
   - NUM_IOSERVERS
   - NUM_IOCLEANERS

   The health status displayed for the DB2 parameters can be one of the following:
   - OK
   - Increase
   - Decrease
   - Not Collected

   Parameters not analyzed have a health status of **Not Collected**.

   Use the information to decide which DB2 parameters you can tune to obtain better performance.

10. To modify the values of database parameters, click **Tune database parameters** to display the Database input panel. On the Database input panel you can specify values for the following database parameters:
**Database heap**
The maximum memory to be used by database heap. The database heap contains control block information for tables, indexes, table spaces, and buffer pools. It also contains space for the log buffer and temporary memory used by utilities.

**Package cache size**
Used for caching of sections for static and dynamic SQL and XQuery statements on a database.

**Log buffer size (Pages)**
The size of the buffer allocated for log records. Specify the amount of the database heap to use as a buffer for log records.

**Maximum database files open per application**
The maximum number of file handles that can be open for each database agent.

**Changed pages threshold (Percentage)**
The level (percentage) of changed pages.

**Sort heap size (Pages)**
The maximum number of private memory pages to be used for private sorts, or the maximum number of shared memory pages to be used for shared sorts.

**Log file size (KB)**
The size to be allocated for the log files. This parameter defines the size of each primary and secondary log file.

**Database log path**
The location where you want the log files to be stored. You can click Browse to find the location.

Click OK to save your selections and update the database parameters to the values specified. Any parameters you do not specify will be set to default values.

11. Do one of the following:
- If you want to update the settings for your directory server instance to the settings recommended in the Calculated directory cache sizes and Calculated database buffer pool sizes boxes, click Yes, use the recommended values to update the directory and database configuration settings.
- If you do not want to use the settings recommended, click No, keep the current settings. When you click Finish, no configuration settings will be updated. Your current settings will be kept.

12. Click Finish.

**Performance tuning with the command line**
To perform basic tuning of the directory server, run the following command:

\`idsperftune -I myinst -i property file -B -u\`

Because the previous command is specified using the -u option, the recommended LDAP cache and DB2 bufferpool values are updated in the server and the database instance respectively. If specified without the -u option, the recommended settings are updated in the perftune_stat.log file only.
To obtain the number of entries and average entry size from the directory server and its database, run the following command:

```
idsperftune -I myinst -s
```

To perform advanced tuning of the directory server, run the following command:

```
idsperftune -I myinst -i property file -A -m
```

The `-m` option causes the monitor switches for BUFFERPOOL and SORT to be turned on. After you run the `idsperftune` command with the `-m` option, the tool waits for 5 minutes. Run this command at a time when directory activity is typical for your environment. The tool then can collect and analyze data from which it can make recommendations.

For more information about the `idsperftune` command and more examples, see the IBM Tivoli Directory Server version 6.3 Command Reference.

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## Enabling or disabling the change log for a directory server instance

The change log database is used to record changes to the schema or directory entries in the typical LDAP entry structure that can be retrieved through the LDAP API. The change log records all update operations: add, delete, modify, and modrdn. The change log enables a Tivoli Directory Server client application to retrieve a set of changes that have been made to a Tivoli Directory Server database. The client might then update its own replicated or cached copy of the data.

You can use the Configuration Tool or the command line to enable or disable the change log.

**Notes:**

1. The server must be stopped before you enable or disable the change log.
2. This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.

### Enabling the change log

You can use either the Configuration Tool or the command line to enable the change log.

**Enabling the change log with the Configuration Tool**

To use the Configuration Tool to enable the change log:

1. Stop the server.
2. In the Configuration Tool, click **Manage changelog** in the task list on the left.
3. In the Configure/unconfigure changelog window, select the **Enable change log database** check box.
4. In the **Maximum number of log entries** box, click **Unlimited** if you want an unlimited number of entries in the change log. If you want to limit the number of entries, click **Entries** and type the maximum number of entries you want recorded. The default is 1,000,000 entries.
5. In the **Maximum age** box, accept the default of **Unlimited** if you want entries to remain in the change log indefinitely, or click **Age** and type the number of days and hours for which you want each entry to be kept.
6. Click **Update**.
7. Messages are displayed while the change log is being enabled. Click **Close** when the task is complete.
Enabling the change log with the command line

You can use the `idscfgchglg` command to configure a change log for a directory server instance.

The change log is a database that is created in the same database instance as the directory server instance database. An additional 30 MB of hard disk space are required. The change log information is added to the directory server instance’s `ibmslapd.conf` file. A change log requires the following:

- A database instance with the same name as the directory server instance must already exist.
- A database for the directory server instance must already be configured.
- For AIX, Linux, and Solaris platforms, the local loopback service must be registered in the `/etc/services` file.

Otherwise, the command fails.

This command cannot be used for a proxy server instance.

You can optionally specify the maximum number of entries to keep in the change log and the maximum age to which each entry in the change log is kept until it is automatically destroyed. If you do not specify any options, the entries in the change log never expire and the size of the change log is a maximum of 1,000,000 entries.

For example:

To configure a change log for directory server instance `ldapdb` with no age limit or size limit, issue the command:

```
idscfgchglg -I ldapdb -m 0
```

To configure a default change log for directory server instance `ldapdb` with a size limit of 1,000,000 and an entry age of 25 hours, issue the command:

```
idscfgchglg -I ldapdb -y 1 -h 1
```

**Note**: After the change log is configured, the `-y`, `-h`, and `-m` options can be used to update the maximum age and maximum size of the entries in the change log.

See the *IBM Tivoli Directory Server Version 6.3 Command Reference* for detailed information about the `idscfgchglg` command.

Disabling the change log

You can use either the Configuration Tool or the command line to unconfigure the change log. When you unconfigure the change log, the change log database is also deleted.

Disabling the change log with the Configuration Tool

To use the Configuration Tool to disable the change log:

1. In the Configuration Tool, click Manage changelog in the task list on the left.
2. In the Configure/unconfigure changelog window, clear the Disable change log database check box.
3. Click Update.
4. In response to the confirmation message, click Yes.
5. Messages are displayed while the change log is being disabled. Click Close when the task is complete.

**Disabling the change log with the command line**

You can use the `idsucfgchglg` command to unconfigure a change log for a directory server instance. A change log must be currently configured in the `ibmslapd.conf` file for the directory server instance. No parameters are needed to remove the change log and the change log information from the `ibmslapd.conf` file. The directory server instance owner is prompted to confirm the action before the change log is deleted.

This command cannot be used for a proxy server instance.

For example:

To unconfigure the change log for the directory server instance on a computer with only one directory server instance without prompting the user for confirmation, issue the command:
```
idsucfgchglg -n
```

To unconfigure the change log for the directory server instance myinstance on a computer with multiple instances, issue the command:
```
idsucfgchglg -I myinstance
```

See the *IBM Tivoli Directory Server Version 6.3 Command Reference* for detailed information about the `idsucfgchglg` command.

**Managing suffixes**

A suffix (also known as a naming context) is a DN that identifies the top entry in a locally held directory hierarchy. Because of the relative naming scheme used in LDAP, this DN is also the suffix of every other entry within that directory hierarchy. A directory server can have multiple suffixes, each identifying a locally held directory hierarchy; for example, `o=sample`.

You can use either the Configuration Tool or the command line to add and remove suffixes.

**Notes:**
1. The specific entry that matches the suffix must be added to the directory.
2. This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.

Entries to be added to the directory must have a suffix that matches the DN value, such as `ou=Marketing,o=sample`. If a query contains a suffix that does not match any suffix configured for the local database, the query is referred to the LDAP server that is identified by the default referral. If no LDAP default referral is specified, an **Object does not exist** result is returned.

**Note:** The server must be stopped before you add or remove suffixes.

**Adding a suffix**

You can use either the Configuration Tool or the command line to add suffixes.
Adding a suffix with the Configuration Tool

To add a suffix using the Configuration Tool:
1. Be sure the directory server instance is stopped.
2. In the Configuration Tool, click **Manage suffixes** in the task list on the left. (This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.)
3. In the Manage suffixes window, type the suffix you want to add in the **SuffixDN** field, and click **Add**.
4. When you have added all the suffixes you want, click **OK**.

**Note:** When you click **Add**, the suffix is added to the list in the **Current suffix DN** box; however, the suffix is not actually added to the directory until you click **OK**.

Adding a suffix with the command line

You can use the `idscfgsuf` command to configure a suffix for a directory server instance. The suffix is added to the directory server instance's `ibmslapd.conf` file. This command fails if the directory server instance is a proxy server or if the suffix already exists in the configuration file.

For example:

To configure the suffix `o=sample` on a computer with a single directory server instance, issue the command:

```
idscfgsuf -s o=sample
```

To configure the suffix `o=sample` for directory server instance `myinstance` on a computer with a multiple directory server instances, issue the command:

```
idscfgsuf -I myinstance -s o=sample
```

See the IBM Tivoli Directory Server Version 6.3 Command Reference for detailed information about the `idscfgsuf` command.

Removing a suffix

Removing a suffix does not remove the entry from the directory, but only removes it from the configuration file. You can use either the Configuration Tool or the command line to remove suffixes.

Removing a suffix with the Configuration Tool

To use the Configuration Tool to remove a suffix:
1. In the Configuration Tool, click **Manage suffixes** in the task list on the left. (This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.)
2. In the Manage suffixes window, click the suffix you want to remove in the **Current suffix DN** box, and click **Remove**.
3. When you have selected all the suffixes you want to remove, click **OK**. The following suffixes cannot be removed:
   - `cn=localhost`
   - `cn=configuration`
   - `cn=ibmpolicies`
   - `cn=Deleted Objects`
Removing a suffix with the command line

You can use the `idsucfgsuf` command to remove a suffix from a directory server instance's `ibmslapd.conf` file. This command fails if the directory server instance is a proxy server or if the suffix does not exist in the configuration file.

For example:

To remove the suffix `o=sample` from the `ibmslapd.conf` file on a computer with a single directory server instance, run the following command:

```
idsucfgsuf -s o=sample
```

To remove the suffix `o=sample` from the `ibmslapd.conf` file of directory server instance `myinstance` on a computer with multiple directory server instances, issue the command:

```
idsucfgsuf -I myinstance -s o=sample
```

**Note:** These system defined suffixes cannot be removed:

- `cn=localhost`
- `cn=configuration`
- `cn=ibmpolicies`
- `cn=Deleted Objects`

See the *IBM Tivoli Directory Server Version 6.3 Command Reference* for detailed information about the `idsucfgsuf` command.

Managing schema files

You can use the Configuration Tool or the command line for the following schema file tasks:

- Adding a schema file to the list of schema files that will be loaded at startup
- Removing a schema file from the list of schema files that will be loaded at startup
- Changing the type of validation checking that is done for schema files

**Note:** The server must be stopped before you add or remove schema files.

**Adding a schema file**

You can use either the Configuration Tool or the command line to add a schema file to the list of schema files that will be loaded at startup. The schema file must exist on the computer.

**Adding a schema file with the Configuration Tool**

To use the Configuration Tool to add a schema file to the list of schema files that will be loaded at startup:

1. In the Configuration Tool, click **Manage schema files** in the task list on the left.
2. In the Manage schema files window, type the path and file name of the schema file you want to load at startup. (Alternatively, click **Browse** to search for the file.)
3. Click **Add**.

   **Note:** When you click **Add**, the schema file is added to the list in the **Current schema files** box; however, the schema file is not actually added until you click **OK**.

4. When you have added all the schema files you want, click **OK**.

**Adding a schema file with the command line**

You can use the `idscfgsch` command to add a schema file to the list of schema files that will be loaded at startup. The schema file must exist on the computer. The directory server instance owner must specify the schema file to add to the directory server instance's `ibmslapd.conf` file. For example, to configure the schema file `/home/mydir/myschema.oc` in the directory server instance's `ibmslapd.conf` file, run the following command:

```
idscfgsch -s /home/mydir/myschema.oc
```

See the *IBM Tivoli Directory Server Version 6.3 Command Reference* for detailed information about the `idscfgsch` command.

**Removing a schema file**

You can use either the Configuration Tool or the command line to remove a schema file from the list of schema files that will be loaded at startup.

**Removing a schema file with the Configuration Tool**

To use the Configuration Tool to remove a schema file from the list of schema files that will be loaded at startup:

1. In the Configuration Tool, click **Manage schema files** in the task list on the left.
2. In the Manage schema files window, click the schema file you want to remove in the **Current schema files** box.
3. Click **Remove**.

   **Notes:**
   
   a. The following schema files cannot be removed:
      
      - V3.system.at
      - V3.system.oc
      - V3.config.at
      - V3.config.oc
      - V3.ibm.at
      - V3.ibm.oc
      - V3.user.at
      - V3.user.oc
      - V3.ldapsyntaxes
      - V3.matchingrules
      - V3.modifiedschema
   
   b. When you click **Remove**, the schema file is removed from the list in the **Current schema files** box; however, the schema file is not actually removed until you click **OK**.

4. In response to the confirmation message, click **Yes**.
5. When you have selected all the schema files you want to remove, click **OK** to process the files.
Removing a schema file with the command line

You can use the `idsucfgsch` command to unconfigure a schema file for a directory server instance. The schema file must be currently configured in the directory server instance's `ibmslapd.conf` file. The directory server instance owner must specify the schema file to remove from the directory server instance's `ibmslapd.conf` file.

For example, to unconfigure the schema file `/home/mydir/myschema.oc` from the directory server instance's `ibmslapd.conf` file, run the following command:

```
idsucfgsch -s /home/mydir/myschema.oc
```

**Note:** The following system-defined schema files cannot be removed:

1. V3.system.at
2. V3.system.oc
3. V3.config.at
4. V3.config.oc
5. V3.ibm.at
6. V3.ibm.oc
7. V3.user.at
8. V3.user.oc
9. V3.ldapsyntaxes
10. V3.matchingrules
11. V3.modifiedschema

See the *IBM Tivoli Directory Server Version 6.3 Command Reference* for detailed information about the `idsucfgsch` command.

Changing the type of validation checking that is done

To change the type of validation checking that is done on schema files:

1. In the Configuration Tool, click **Manage schema files** in the task list on the left.
2. In the Manage schema files window, accept the default schema validation rule in the **Schema validation rules** box, or click the rule you want. You can select one of the following rules:
   - Version 3 (Strict)
     LDAP version 3 strict validation checking is done. With this type of validation checking, all parent object classes must be present when adding entries.
   - Version 3 (Lenient)
     LDAP version 3 lenient validation checking is done. With this type of validation checking, all parent object classes do not need to be present when adding entries.
     This is the default.
   - Version 2
     LDAP version 2 checking is done.
   - None
     No validation checking is done.
3. Click **OK**.
Importing and exporting LDIF data

You can use the Configuration Tool to import data from an LDAP Data Interchange Format (LDIF) file or to export data from the database to an LDIF file. LDIF is used to represent LDAP entries in text form. When importing, you can add entries to an empty directory database or to a database that already contains entries. You can also use the Configuration Tool to validate the data in the LDIF file without adding the data to the directory.

This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.

You can also use the command line to import, export, or validate LDIF data.

- To import data from an LDIF file, you can use either the idsldif2db or the idsbulkload utility.
- To export data to an LDIF file, use the idsdb2ldif utility.
- To validate the data in the LDIF file, use the idsbulkload utility.

See the IBM Tivoli Directory Server Version 6.3 Command Reference for information about the idsldif2db, idsdb2ldif, and idsbulkload commands.

Importing LDIF data with the Configuration Tool

Attention: If you want to import LDIF data from another server instance, the LDIF import file must be cryptographically synchronized with the server instance that is importing the LDIF file; otherwise any AES-encrypted entries in the LDIF file will not be imported. See Appendix E, “Synchronizing two-way cryptography between server instances,” on page 191 for information about synchronizing directory server instances. If you selected the Export data for AES-enabled destination server check box when exporting the data with the Configuration Tool (see step 5 on page 150), the LDIF import file is cryptographically synchronized with the server instance that is importing the LDIF file.

Before you being to import data, also consider the following information:

Notes:
1. This option is not available if you are configuring a proxy server or if you have not installed the full directory server on the computer.
2. Before you import the data from an LDIF file, be sure to add any necessary suffixes. See “Adding a suffix” on page 144 for information about adding a suffix.
3. The server must be stopped before you import LDIF data.

To import data from an LDIF file:

1. In the Configuration Tool, click Import LDIF data in the task list on the left.
2. In the Import LDIF data window on the right, type the path and file name of the LDIF file in the Path and LDIF file name field. Alternatively, you can click Browse to locate the file.
3. If you want trailing spaces removed from the data, select the Remove trailing spaces in Standard import or Bulkload check box.
4. Click Standard import if you want to import the data using the idsldif2db utility, or click Bulkload if you want to import the data using the idsbulkload utility.
Note: For large LDIF files, the idsbulkload utility is a faster alternative to idsldif2db if you are importing a large number of entries.

5. If you clicked Bulkload, select the type or types of checking you want to perform on the LDIF data in the Bulkload options box. You can select one or more of the following:
   • Enable schema checking
   • Enable ACL checking
   • Enable password policy
   
   Click Import.

Note: After loading large amounts of data, especially after populating the database using idsbulkload, be sure to optimize the database. This can make a significant improvement to the performance of the database.

Validating LDIF data without adding it to the database using the Configuration Tool

To validate the data in the LDIF file without adding it to the database:

1. In the Configuration Tool, click Import LDIF data in the task list on the left.
2. In the Import LDIF data window on the right, type the path and file name of the LDIF file in the Path and LDIF file name field. Alternatively, you can click Browse to locate the file.
3. Click Data validation only.
4. Click Import.

Exporting LDIF data with the Configuration Tool

Before you export LDIF data, be sure that you have enough space to export all the data.

To export data from the database to an LDIF file:

1. In the Configuration Tool, click Export LDIF data in the task list on the left.
2. In the Export LDIF data window on the right, type the path and file name of the LDIF file in the Path and LDIF file name field. Alternatively, you can click Browse to locate the file.
3. If you want to overwrite the data in an existing file, select the Overwrite if file exists check box.
4. If you want to export the creatorsName, createTimestamp, modifiersName, and modifyTimestamp operational attributes, select the Export operational attributes check box.
   
   These operational attributes are created and modified by the server when a directory entry is created or modified; they are also modified any time the entry is modified. They contain information about the user who created or modified the entry and the time the entry was created or modified. These entries are stored as a base-64-encoded control in the LDIF file.

5. If you are exporting data that will be imported into an Advanced Encryption Standard (AES)-enabled server and if the two servers are not cryptographically synchronized, select the Export data for AES-enabled destination server check box. Then complete the Encryption seed and Encryption salt fields with the values for the destination server. (See Appendix E, “Synchronizing two-way cryptography between server instances,” on page 191 for information about cryptographic synchronization of servers.)
When the source server (the server you are exporting data from) and the destination server (the server into which you will be importing the data) are using non-matching directory key stash files, and you specify the encryption seed and salt values of the destination server, any AES-encrypted data will be decrypted using the source server's AES keys, then re-encrypted using the destination server's encryption seed and salt values. This encrypted data is stored in the LDIF file.

You can obtain the destination server's salt value by searching (using the `ldapsearch` utility) the server's 'cn=crypto,cn=localhost' entry. The attribute type is `ibm-slapdCryptoSalt`. For example:

```
ldapsearch -D adminDN -w adminPw -b "cn=crypto,cn=localhost" objectclass=* ibm-slapdCryptoSalt
```

A value similar to the following is returned:

```
ibm-slapdCryptoSalt=:SxaQ+.qdKor
```

The part of the string after the equal to sign (=) is the encryption salt. In this example, the encryption salt is `:SxaQ+.qdKor`.

6. Select **Export deleted entries** if you want to export entries that have been deleted but are still stored in the tombstone subtree. For more information about the tombstone subtree, see the *IBM Tivoli Directory Server 6.3 Administration Guide*.

7. If you want to specify a filter for entries that are exported to the LDIF file, in the **Filter entry DN** field, type the DN of a valid replication filter. This filter is used to export only some of the directory database entries to the LDIF file. For more information about replication filters, see the *IBM Tivoli Directory Server 6.3 Administration Guide*.

8. If you want comments to be added into the LDIF file, add these comments to the **Comments** field.

9. If you want to export only some of the data in the directory, complete the **Subtree DN** field. The subtree DN identifies the top entry of the subtree that is to be written to the LDIF output file. This entry, plus all entries below it in the directory hierarchy, are written to the file. If you do not specify this option, all directory entries stored in the database are written to the output file based on the suffixes specified in the Tivoli Directory Server configuration file.

10. Click **Export**.

---

**Configuring Active Directory synchronization**

Active Directory synchronization is a tool for synchronizing users and groups in Active Directory with Tivoli Directory Server 6.3. Synchronization is one-way, from Active Directory to Tivoli Directory Server only.

Active Directory synchronization uses IBM Tivoli Directory Integrator for synchronizing the directories. You must have IBM Tivoli Directory Integrator installed before Active Directory synchronization can be run.

**Notes:**

1. If you configure or change the administrator DN or password (or both) for the directory server instance after configuring Active Directory synchronization, you must reconfigure Active Directory synchronization.

2. If the user or group container names from Active Directory are changed dynamically (while Active Directory synchronization is running), you must
reconfigure Active Directory synchronization with the new names or Active Directory synchronization will no longer run.

3. Active Directory synchronization synchronizes only users and groups. It does not synchronize other objects in the directory.

4. Active Directory synchronization does not synchronize nested organizational units (OUs).

5. Multiple attributes from Active Directory cannot be mapped to a single attribute in Tivoli Directory Server.

6. Mapping of the userPassword attribute is not allowed.

7. Active Directory synchronization can synchronize users and groups from one or more Active Directory user containers to a single Tivoli Directory Server OU. However, it will not synchronize multiple Active Directory user containers to multiple Tivoli Directory Server OUs.

After you install Tivoli Directory Server 6.3 and IBM Tivoli Directory Integrator, and have created and configured a directory server instance, use the following steps to configure and use Active Directory synchronization:

1. If you use a copy of IBM Tivoli Directory Integrator that you did not install in the default path (on UNIX based systems: /opt/IBM/TDI/V7.1 and on Windows systems: C:\Program Files\IBM\TDI\V7.1), you must set the IDS_LDAP_TDI_HOME environment variable to the directory where you installed IBM Tivoli Directory Integrator V7.1.

   **Note:** On Windows systems, if there are spaces in this path, Active Directory synchronization will not work properly. Set the environment variable to a path with no spaces and no quotation marks, or use the short name when you specify the path.

2. Optionally, load the sample users.ldif and groups.ldif files into the Active Directory Server. Use the documentation for Active Directory Server.

3. Configure Active Directory synchronization using the IBM Tivoli Directory Server Configuration Tool or the idsacscfg command. Configuring Active Directory synchronization generates the adsync_private.prop and adsync_public.prop files. See "Configuring Active Directory synchronization with the Configuration Tool" on page 153 for information.

4. Modify the adsync_public.prop file to customize optional attributes and SSL parameters, if needed. See the IBM Tivoli Directory Server Version 6.3 Administration Guide for information. (If you are using SSL, be sure to see the SSL setup information also.)

5. Start Active Directory synchronization, using the idsadsrun command. You are asked if you want to fully synchronize, followed by real time synchronization, or only start real time synchronization. See the IBM Tivoli Directory Server Version 6.3 Command Reference for information.

   **Note:** If there are errors in the parameters specified for Active Directory, these errors will not be found during configuration, but during runtime (when you use the idsadsrun command). If errors are reported during runtime in the Active Directory parameters, you must reconfigure the Active Directory parameters correctly using the Configuration Tool (in the Active Directory synchronization: Active Directory details window) or the idsacscfg command.

Changes made to the Active Directory entries will be read by the Active Directory synchronization, which listens for changes.
Active Directory synchronization will synchronize any changes to the Tivoli Directory Server directory. The IBM Tivoli Directory Integrator Administration and Monitoring Console can be used for further administration and monitoring.

Configuring Active Directory synchronization with the Configuration Tool

The server must be stopped before you can configure Active Directory synchronization.

To configure Active Directory synchronization with the Configuration Tool:

1. In the Configuration Tool, click **Active directory synchronization** in the task list on the left. The Active Directory synchronization: Instance Details window opens. Use this window to provide information about the directory server instance you want to synchronize with Active Directory. The information you provide will be saved in the adsync_private.properties and adsync_public.properties files, which are in the /etc/tdisoldir subdirectory of the directory server instance.

2. In the **Directory suffix** field, type the Tivoli Directory Server suffix you want to use for Active Directory synchronization. (The **LDAP URL** field is completed with the URL for the directory server instance. You cannot edit this field.)

3. In the **Group container entry DN** field, type the DN of the container into which groups from Active Directory will be copied. (This container must exist.) Groups and the memberships of users in groups are kept synchronized between Active Directory and Tivoli Directory Server. When a user is added to or removed from a group in Active Directory, the user will be added to or removed from the corresponding group in Tivoli Directory Server.

4. In the **User container entry DN** field, type the DN of the container into which users from Active Directory will be copied. (This container must exist.)

5. If you want to use an SSL connection to Active Directory, select the **Use SSL connection to Active directory** check box. (Using an SSL connection to Tivoli Directory Server is not supported.) See the IBM Tivoli Directory Server Administration Guide for information about additional setup that is required for an SSL connection.

6. Click **Next**. The Active Directory synchronization: Active Directory details window opens. Use this window to provide information about your Active Directory setup before you synchronize with Tivoli Directory Server.

7. In the **Host address** field, type the hostname or IP address of the Active Directory domain controller.

8. In the **Host port** field, type the port used by Active Directory.

9. In the **Login name** and **Login password** fields, type the login name and password that IBM Tivoli Directory Integrator will use to bind to Active Directory. The ID must have sufficient permission to read the Active Directory entries that are to be propagated to the directory server instance.

10. In the **Search base** field, type the subtree in Active Directory from which the changes to the directory server instance will be made. Only changes to users in this subtree will be propagated to the directory server instance. In most cases, set the search base to the top of the Active Directory tree, so that all users in Active Directory groups will be found and copied to the directory server instance.
11. In the Group container entry DN field, type the DN for the Active Directory container from which groups in Active Directory will be synchronized to the directory server instance.

12. In the User container entry DN field, type the DN for the Active Directory container that contains the user entries in Active Directory to be synchronized to the directory server instance.

   When a user is added to Active Directory, the user will be added to the directory server instance only if it is in this container. When an existing user is moved into this container, the user will be added to the directory server instance. The user's group memberships will also be checked and the user will be added to any groups in Tivoli Directory Server that are synchronized with Active Directory. When an existing user is moved out of this container, the user will be deleted from Tivoli Directory Server, and the user will be deleted from all groups in Tivoli Directory Server.

   If the user container names from Active Directory are changed dynamically (while Active Directory synchronization is running), you must reconfigure Active Directory synchronization with the new names or Active Directory synchronization will stop and no longer run until the names are reconfigured. You can specify multiple user containers to synchronize with a single organizational unit (OU) in Tivoli Directory Server by using the semicolon (;) as a separator. (Other characters used as separators are not supported.) If you use the semicolon (;) separator, enclose the argument in quotation marks ("), as shown in the following example:

   "ou=SWUGroups,dc=adsync,dc=com;ou=STGGroups,dc=adsync,dc=com"

   The sAMAccountName attribute from Active Directory will be used to compose the $dn attribute in Tivoli Directory Server. Because the sAMAccountName attribute is unique in a domain, there will not be conflicts when synchronizing multiple Active Directory user containers to a single Tivoli Directory Server OU.

13. Click Finish. The Active Directory synchronization: Results window opens. This window shows the time at which Active Directory synchronization configuration started, the amount of time that has passed since Active Directory synchronization configuration began, and any messages that occur during configuration.

14. Click Close when the configuration process is complete.

**Configuring Active Directory synchronization with the command line**

You can use the idsadscfg command to configure Active Directory synchronization. For example:

   idsadscfg -I inst1 -adH ldap://9.182.191.134:389 -adb dc=adsynctest,dc=com -adD cn=administrator,cn=users,dc=adsynctest,dc=com -adw sec001ret -adg ou=testgroup1, dc=adsynctest,dc=com -adu ou=testuser1,dc=adsynctest,dc=com -idss o=ibm,c=us -idsg ou=Testgroup1,ou=groups,o=ibm,c=us -idsu ou=Testuser1,ou=users,o=ibm,c=us
Chapter 15. After you install and configure

After you install the server, create the directory server instance, set the administrator DN and password, and configure the database (for a full directory server only), you can start the directory server instance. If you installed the Web Administration Tool and Embedded WebSphere Application Server, you can also start the Web application server.

Starting the directory server instance

You can start the directory server instance in several ways:

• Using the command line:
  To start the directory server instance using the command line, go to the sbin subdirectory of the directory where you installed Tivoli Directory Server. This directory is:
  – C:\Program Files\IBM\LDAP\V6.3\sbin by default on Windows systems
  – /opt/IBM/ldap/V6.3/sbin on AIX and Solaris systems
  – /opt/ibm/ldap/V6.3/sbin on Linux systems
  Type the following commands at a command prompt:
    idsslapd -I instancename
    idsdiradm -I instancename

  *instancename* is the name of the directory server instance you want to start. (You must start both the directory server instance and the administration server for the instance for all functions of the Web Administration Tool to work.)

• Through the Instance Administration Tool:
  To start the directory server instance using the Instance Administration Tool:
  1. In the Instance Administration Tool, select the directory server instance you want to start, and then click Start/Stop. (You can start the server only if it is stopped.)
  2. In the Manage Server State window, click Start server.
  3. To start the administration server, click Start administration server.

• Through the Configuration Tool:
  To start the directory server instance using the Configuration Tool:
  1. In the Configuration Tool, click Manage server state in the task list on the left.
  2. To start the directory server instance, click Start server.
  3. To start the administration server, click Start administration server.

• Through the Services folder (Windows systems only):
  On Windows systems, you can also start and stop the directory server instance through the Services folder.
    – To start the directory server instance, in the Services folder:
      2. Click IBM Tivoli Directory Admin Server V6.3 - *instancename*. Then click Action -> Start.
    – To stop the directory server instance, in the Services folder:
1. Click IBM Tivoli Directory Server Instance V6.3 - instancename. Then click Action -> Stop.

2. Click IBM Tivoli Directory Admin Server V6.3 - instancename. Then click Action -> Stop.

instancename is the name of the directory server instance you want to start or stop.

If you want the directory server instance or instances to start automatically at operating system startup, see “Starting the directory server instance at operating system startup.”

For information about starting and stopping the server and performing other administrative tasks using the Web Administration Tool and the command line, see the IBM Tivoli Directory Server Version 6.3 Administration Guide.

---

**Starting the directory server instance at operating system startup**

If you want the directory server instance to start automatically at operating system startup, use one of the following sections:

- "Autostart on Windows systems"
- "Autostart on AIX, Linux, and Solaris systems" on page 157

**Autostart on Windows systems**

On Windows systems, the server (the idsslapd process) is started manually through the Services window or by using the idsslapd command. If you try to start the server automatically by updating the Startup Type in the Services window to Automatic, errors occur when you restart the computer. This is because DB2 must be running before the idsslapd process can start.

If you want the server to start automatically, use the following procedure:

1. Open the Services window in one of the following ways:
   - Click Start -> Run, and then type services.msc in the Open field. Click OK.
   - Click Start -> Settings -> Control Panel. In the Control Panel, double-click Administrative Tools, and then double-click Services.

2. Find the DB2 Service name for the directory server instance you want to autostart. The service starts with DB2 - TDSV63DB2 - (for example, DB2 - TDSV63DB2 - 0SRDBM01). Double-click the service and look in the **Display name** field. Make a note of the name that comes after DB2 - TDSV63DB2 - . (In this example, make a note of 0SRDBM01.) You will use this DB2 name later.

3. Find the service for the directory server instance you want to autostart. The service starts with IBM Tivoli Directory Server Instance 6.3 - (for example, IBM Tivoli Directory Server Instance 6.3 - dsrdbm01). Double-click the service and look in the **Display name** field. Make a note of the name that comes after IBM Tivoli Directory Server Instance 6.3 - , with idsslapd- prepended. (In this example, make a note of idsslapd-dsrdbm01.) You will use this instance name later.

4. While still in the IBM Tivoli Directory Server Instance V6.3 - instance_name window, set the **Startup type** field to Automatic, and then click OK. The service will be set to start automatically at system startup.

5. Close the Services window.
6. To open the Windows Registry, click **Start** -> **Run**. Type `regedit` in the **Open** field. Click **OK**. The Registry Editor window is displayed.

7. On the left side of the window, go to the following: **My Computer** -> **HKEY_LOCAL_MACHINE** -> **SYSTEM** -> **CurrentControlSet** -> **Services**.

8. Find the service corresponding to the directory server instance from step 3 on page 156 (in the example, this is `idsslapd-dsrdbm01`). Click the service.

9. On the right side of the window, double-click the **DependOnService** attribute.

10. In the Edit Multi-String window, add the DB2 service name from step 2 on page 156 (DSRDBM01 in our example) under **LanmanServer**, and then click **OK**. (This adds a dependency on the DB2 service.)

11. Exit the Registry Editor.

After you restart the system, the directory server instance will start automatically.

**Note:** The proxy server does not require DB2. Therefore, to make the proxy server start automatically at system startup, use only steps 1, 3, and 4.

**Autostart on AIX, Linux, and Solaris systems**

To start the directory server instance at operating system startup on AIX, Linux, and Solaris systems, you must edit the `/etc/inittab` file and add a line. The inittab file specifies which processes are started at system startup and during normal operation. An entry in the inittab file has the following format:

```
id:runlevels:action:process
```

where:
- `id` is a 1-4 digit unique ID in the file.
- `runlevels` indicates the runlevel mode of the operating system in which the process should start automatically. Runlevel refers to the mode of operation of an AIX, Linux, or Solaris operating system. Runlevel configuration differs among operating systems. Refer to the operating system manual for your operating system for specific runlevel configuration details.
- `action` describes the action to be taken. In this case it has the value `boot` to indicate that the process starts at system startup.
- `process` is the process to be started.

Add one of the following lines to your inittab file:

**For AIX systems**

```
srv1:2:once:/opt/IBM/ldap/V6.3/sbin/idsslapd -I server_name > /dev/null 2>&1
#Autostart IBM LDAP Directory Server Instance
```

**For Linux systems**

```
srv1:2345:once:/opt/ibm/ldap/V6.3/sbin/ibmslapd -I server_name > /dev/null 2>&1
#Autostart IBM LDAP Directory Server Instance
```

**For Solaris systems**

```
srv1:234:once:/opt/IBM/ldap/V6.3/sbin/ibmslapd -I server_name > /dev/null 2>&1
#Autostart IBM LDAP Directory Server Instance
```

where `server_name` is the name of the directory server instance you want to start automatically.

After the entry is added to the `/etc/inittab` file, the directory server instance (full or proxy) is ready for autostart after system restart.
Be sure that all of the full directory servers are up and running before the proxy server starts. If you have full directory servers and a proxy server on the same computer, add a delay between the full directory server and the proxy server startup. In the following example, this done in the lines starting with

```
srv3:2345:wait: and srv4:2345:wait:
```

# Autostart IBM LDAP Directory Server Instance
```
srv1:2345:wait:/opt/IBM/ldap/V6.3/sbin/idsslapd -I server1 > /dev/null 2>&1
```

# Autostart IBM LDAP Directory Server Instance
```
srv2:2345:wait:/opt/IBM/ldap/V6.3/sbin/idsslapd -I server2 > /dev/null 2>&1
```

# Autostop IBM LDAP Directory Server proxy instance
```
srv3:2345:wait:/opt/IBM/ldap/V6.3/sbin/idsslapd -I proxy -k > /dev/null 2>&1
```

# Autostart IBM LDAP Directory Server proxy instance
```
srv4:2345:wait:/opt/IBM/ldap/V6.3/sbin/idsslapd -I proxy > /dev/null 2>&1
```

where server1 and server2 are full directory server instances, and proxy is a proxy server instance.

Starting the Web application server to use the Web Administration Tool

If you installed Tivoli Directory Server using the InstallShield GUI installation program, the Web application server is started automatically on Windows systems. Instructions are provided for Windows systems in case you need to start it manually.

To start the Web application server if you are using Embedded WebSphere Application Server as your Web application server, use one of the following files, which contain the command to start the Web application server:

- On Windows systems, `installpath\idsapps\bin\startWpgsApp.bat`
- On AIX, Linux, and Solaris systems, `installpath/idsapps/bin/startWpgsApp`

where `installpath` is the path where you installed Tivoli Directory Server. This path is:

- By default on Windows: `C:\Program Files\IBM\LDAP\V6.3`
- On AIX and Solaris: `/opt/IBM/ldap/V6.3`
- On Linux: `/opt/ibm/ldap/V6.3`

**Note:** Files are also provided with commands for starting the Web application server for Directory White Pages. The files are:

**For Directory White Pages**

- For Windows systems, `installpath\idsapps\bin\startWpgsApp.bat`
- For AIX, Linux, and Solaris systems, `installpath/idsapps/bin/startWpgsApp`

Starting the Web Administration Tool

To start the Web Administration Tool:

1. After the Web application server is started, you can start the Web Administration Tool in several ways:
   - In a Web browser, type the following address:
     http://localhost:12100/IDSWebApp
   - On Windows systems, click one of the following:
For non-SSL: Start -> All Programs -> IBM Tivoli Directory Server 6.3 -> Web Administration Tool

For SSL: Start -> All Programs -> IBM Tivoli Directory Server 6.3 -> Web Administration Tool (secure)

- Open the following file in a Web browser:
  - On Windows systems:
    - `<installpath>/idstools/bin/idswebadmin.html` for non-SSL
    - `<installpath>/idstools/bin/idswebadminssl.html` for SSL
  - On AIX, Linux, or Solaris systems:
    - `<installpath>/idstools/bin/idswebadmin.html` for non-SSL
    - `<installpath>/idstools/bin/idswebadminssl.html` for SSL

  `<installpath>` is the path where you installed Tivoli Directory Server. By default this is C:\Program Files\IBM\LDAP\V6.3
  - On AIX, Linux, or Solaris systems:
    - `/opt/IBM/ldap/V6.3` for AIX and Solaris systems, and
    - `/opt/ibm/ldap/V6.3` for Linux systems.

  This file points to localhost. You can modify it as needed.

  The IBM Tivoli Directory Server Web Administration Tool Login page is displayed.

  **Note:** This address works only if you are running the browser on the computer on which the Web Administration Tool is installed. If the Web Administration Tool is installed on a different computer, replace `localhost` with the hostname or IP address of the computer where the Web Administration Tool is installed. You can use the `ipconfig` command to find the IP address of the computer.

2. Log in to the console as the console administrator, using the following instructions:
   a. In the **User ID** field, type `superadmin`.
   b. In the **Password** field, type `secret`.
   c. Click **Login**.

   The IBM Tivoli Directory Server Web Administration Tool console is displayed.

3. Add the server to the console, using the following instructions:
   a. Do one of the following:
      • Click **Manage console servers** in the right side of the window.
      • Expand **Console administration** in the navigation area, and then click **Manage console servers**.

      A table of server host names and port numbers is displayed.
   b. Click **Add**.
   c. Type the hostname or the IP address of the server in the **Hostname** field; for example, myserver.mycity.mycompany.com
   d. Specify the server port number in the **Port** field and the Administration server port number in the **Administration port** field.
   e. Select the **Enable SSL encryption** check box if the server is SSL-enabled.
   f. Click OK, and then click OK again on the confirmation panel.

4. Click **Logout** in the navigation area.

5. Log in as the directory server instance administrator:
a. On the IBM Tivoli Directory Server Web Administration Login Tool page, select the LDAP host name or IP address for your computer from the drop-down menu for the **LDAP Hostname** field.

b. Type the administrator DN and the password for the directory server instance. You specified these fields during instance creation.

c. Click **Login** on the lower left side of the window.

For detailed information about using the Web Administration Tool, see the *IBM Tivoli Directory Server Version 6.3 Administration Guide*.

### Stopping the Web application server

You can stop the Web application server in one of the following ways:

- On Windows systems, type the following command:
  
  ```
  WASPath\profiles\TDSWebAdminProfile\bin\stopServer.bat server1
  ```

  **Note:** You can also stop the service for your Web application server through the Windows **Services** folder.

- On AIX, Linux, and Solaris systems, type the following command:
  
  ```
  WASPath/profiles/TDSWebAdminProfile/bin/stopServer.sh server1
  ```

  where **WASPath** is the path where Embedded WebSphere Application Server is installed. This path is:

  - By default on Windows systems: C:\Program Files\IBM\LDAP\V6.3\appsrv
  - On AIX and Solaris systems: /opt/IBM/ldap/V6.3/appsrv
  - On Linux systems: /opt/ibm/ldap/V6.3/appsrv

### Setting kernel parameters on Solaris systems

On Solaris systems, you might need to update kernel parameters in the `/etc/system` file before you use the database.

A utility called **db2osconf** is provided with some versions of DB2 for Solaris SPARC. The **db2osconf** utility determines the correct kernel settings for your computer. The command for configuring kernel parameters varies by operating system, hardware, and DB2 version.

For more information, see the [DB2 documentation](#). You can also search DB2 technotes for additional information.

**Note:** The **db2osconf** utility can be run only from the global zone on Solaris with zones configured, and it is not available for Solaris x86-64. For these installations, use the **projmod** utility.
Chapter 16. Uninstalling Tivoli Directory Server

Use the following sections to uninstall Tivoli Directory Server.

Notes:
1. If you uninstall Tivoli Directory Server without unconfiguring your databases or deleting your directory server instances, they are left intact. If you plan to install Tivoli Directory Server again and you want to preserve your data, do not unconfigure the database or remove the directory server instance or instances before you uninstall.
2. The idsldap user and group are left on the system after you uninstall Tivoli Directory Server. Consider the following information when uninstalling on AIX, Linux, or Solaris systems:
   • If you do not want this user and group defined, you can remove them using operating system utilities for your operating system. This user and group are needed by both the proxy and the full directory server and they must remain defined if you have either server installed.
   • If you remove the idsldap user but do not remove the idsldap user's home directory, problems can occur when the idsldap user is created if you reinstall Tivoli Directory Server. Therefore, be sure to remove the idsldap user's home directory if you remove the idsldap user.
     For example, if you use the userdel command to remove the idsldap user, be sure to use the -r option to remove the home directory also (for example, userdel -r idsldap).
3. On Windows systems, the Administration Server and Server services are removed when you uninstall, and they are not replaced if you reinstall Tivoli Directory Server. You can use the idslapd command to add the Server service and the idsdiradm command to add the Administration Server service. See the IBM Tivoli Directory Server Version 6.3 Command Reference for information.

Uninstalling Tivoli Directory Server using the InstallShield GUI

This section describes how to uninstall Tivoli Directory Server using the InstallShield GUI.

Notes:
1. If you installed Tivoli Directory Server using the InstallShield GUI, use the InstallShield GUI to uninstall.
   If you inadvertently uninstall Tivoli Directory Server using operating system utilities after installing using the InstallShield GUI, follow the process in “Uninstalling Tivoli Directory Server using the InstallShield GUI” and the instructions in the IBM Tivoli Directory Server Version 6.3 Problem Determination Guide for a failed installation to clean up your system files and registry.
2. On Windows systems, if you are uninstalling DB2, be sure to drop all DB2 instances before uninstalling. If there are DB2 instances on the system when you try to remove DB2, you will be prompted for more information during uninstallation.
3. If you are uninstalling Embedded WebSphere Application Server, you must stop the Web application server. (See “Stopping the Web application server” on page 160.
Before you start to uninstall, close all windows to make sure that the installpath/appsrv (installpath\appsrv on Windows) directory is not in use.

After uninstalling Embedded WebSphere Application Server, verify that the installpath/appsrv directory (installpath\appsrv on Windows) is removed. If it is not, you must remove it before you attempt to install again.

To remove Tivoli Directory Server using the InstallShield GUI:

1. To start the InstallShield GUI uninstallation program:
   - On Windows systems:
     a. In the Control Panel, click Add or Remove Programs.
     b. Select IBM Tivoli Directory Server 6.3. Click Change/Remove.
   - On AIX, Linux, and Solaris systems:
     a. At a command prompt, go to the Tivoli Directory Server _uninst directory.
        – On AIX and Solaris systems, this directory is /opt/IBM/ldap/V6.3/_uninst.
        – On Linux systems, this directory is /opt/ibm/ldap/V6.3/_uninst.
     b. Run the uninstall command:
        .\uninstall_tds
2. Select the language you want to use during the uninstallation procedure. Click OK.
3. On the Welcome window, click Next.
4. Select the features you want to uninstall. Click Next. Be sure that you do not select:
   - The client unless you also select the Server and the Proxy Server
   - The java client unless you also select the Server and the Proxy Server
   - DB2 unless you also select the Server

   If you remove features that are required for other features, your system is left in an inconsistent state and unpredictable results will occur.

   Notes:
   a. If features are deselected, and then you re-select all features, be sure to select the top check box (the Product Uninstallation check box) so that the InstallShield GUI removes everything associated with the product. The Product Uninstallation check box must always be selected unless you want to leave one or more features installed.
   b. On Windows systems, if you select DB2 for uninstallation and there are DB2 instances defined, the following message is displayed:
      DB2 instances still exist in the DB2 copy that is being uninstalled.
      If you continue, these DB2 instances will be removed. DB2 databases will not be removed.
      Do you want to continue with the uninstallation?
      You can select Yes or No. If you select Yes, DB2 and the DB2 instances will be removed. If you select No, DB2 will remain installed. Although DB2 will remain on the system, it will no longer be displayed in the Tivoli Directory Server uninstallation program. If you want to remove DB2 later, you must use Add or Remove Programs in the Windows Control Panel.
5. On the confirmation window, to uninstall the selected features, click Next.
6. If you are asked if you want to restart your computer now or later, select the option you want. Click Finish.
Uninstalling language packs using the InstallShield GUI

This section describes how to uninstall the Tivoli Directory Server language packs using the InstallShield GUI.

Note: If you installed the language packs using the InstallShield GUI, use the InstallShield GUI to uninstall.

To remove language packs using the InstallShield GUI:

1. To start the InstallShield GUI uninstallation program:
   - On Windows systems:
     a. In the Control Panel, click Add or Remove Programs.
   - On AIX, Linux, and Solaris systems:
     a. At a command prompt, go to the Tivoli Directory Server language pack uninstallation directory.
        – On AIX and Solaris systems, this directory is /opt/IBM/ldap/V6.3/LangPack/uninstall
        – On Linux systems, this directory is /opt/ibm/ldap/V6.3/LangPack/uninstall
     b. Run the uninstall command: ./uninstaller.bin

2. On the Welcome window, click Next.
3. On the confirmation window, to uninstall the selected features, click Next.
4. Click Finish when the uninstallation is complete.

Uninstalling using operating system utilities

Use one of the following procedures to uninstall Tivoli Directory Server using operating system utilities for your operating system.

Notes:

1. If you installed Tivoli Directory Server using the InstallShield GUI, uninstall using the process in "Uninstalling Tivoli Directory Server using the InstallShield GUI" on page 161.
2. If you inadvertently uninstall Tivoli Directory Server using operating system utilities after installing using the InstallShield GUI, follow the process in "Uninstalling Tivoli Directory Server using the InstallShield GUI” on page 161 and the instructions in the IBM Tivoli Directory Server Problem Determination Guide for a failed installation to clean up your system files and registry.

AIX systems

You can uninstall Tivoli Directory Server from an AIX system using SMIT or installp.

SMIT removal

To uninstall Tivoli Directory Server using SMIT:

1. Log in as root.
2. Type smit at a command prompt and press Enter.
3. Select **Software Installation and Maintenance**.
4. Select **Software Maintenance and Utilities**.
5. Select **Remove Installed software**.
6. In the **Software Name** field, you can press F4 to display a list of installed software. (You can search for `idsldap` in the list to display only the Tivoli Directory Server packages.)
7. Select the packages you want to remove, and press Enter.

**installp removal**

To uninstall the Tivoli Directory Server filesets using the **installp** command-line utility:
1. Log in as `root`.
2. Type the following at a command prompt:
   ```bash
   installp -u pkgname
   ```
   where `pkgname` is the package you want to remove. For example, to remove the 32-bit client, type:
   ```bash
   installp -u idsldap.clt32bit63
   ```

**Linux systems**

The following procedures show how to remove Tivoli Directory Server from a System x Linux computer. If you do not have the full directory server installed, remove only the packages that you do have installed, but be sure that you follow the order shown. See "Installing Tivoli Directory Server" on page 69 for package names. Before removing Tivoli Directory Server, ensure that the server is stopped and then issue the following commands.

**Note:** These instructions use Linux Intel-based packages. For System z, System i, or System p Linux, substitute the appropriate package names.
1. Log in as `root`.
2. Uninstall the English messages:
   ```bash
   rpm -ev idsldap-msg63-en-6.3.0-0
   ```
3. Do one of the following, based on what you want to uninstall:
   - For a 32-bit server (such as System x Linux):
     - Uninstall the full directory server (and the client) by typing the following at a command prompt:
       ```bash
       rpm -ev idsldap-srv32bit63-6.3.0-0
       rpm -ev idsldap-srvbase32bit63-6.3.0-0
       rpm -ev idsldap-cltjava63-6.3.0-0
       rpm -ev idsldap-clt32bit63-6.3.0-0
       rpm -ev idsldap-cltbase63-6.3.0-0
       ```
     - Uninstall the proxy server (and the client) by typing the following at a command prompt:
       ```bash
       rpm -ev idsldap-srvproxy32bit63-6.3.0-0
       rpm -ev idsldap-srvbase32bit63-6.3.0-0
       rpm -ev idsldap-cltjava63-6.3.0-0
       rpm -ev idsldap-clt32bit63-6.3.0-0
       rpm -ev idsldap-cltbase63-6.3.0-0
       ```
     - Uninstall only the 32-bit client by typing the following at a command prompt: (If you have a server installed, you must uninstall it before you can uninstall the client.)
rpm -ev idsldap-clt32bit63-6.3.0-0
rpm -ev idsldap-cltbase63-6.3.0-0

For a 64-bit server (such as System i Linux):

- Uninstall the full directory server (and the client) by typing the following at a command prompt:
  rpm -ev idsldap-srv64bit63-6.3.0-0
  rpm -ev idsldap-srvbase64bit63-6.3.0-0
  rpm -ev idsldap-cltjava64bit63-6.3.0-0
  rpm -ev idsldap-clt64bit63-6.3.0-0
  rpm -ev idsldap-cltbase64bit63-6.3.0-0

- Uninstall the proxy server (and the client) by typing the following at a command prompt:
  rpm -ev idsldap-srvproxy64bit63-6.3.0-0
  rpm -ev idsldap-srvbase64bit63-6.3.0-0
  rpm -ev idsldap-cltjava64bit63-6.3.0-0
  rpm -ev idsldap-clt64bit63-6.3.0-0
  rpm -ev idsldap-cltbase64bit63-6.3.0-0

- Uninstall only the 64-bit client by typing the following at a command prompt: (If you have a server installed, you must uninstall it before you can uninstall the client.)
  rpm -ev idsldap-clt64bit63-6.3.0-0
  rpm -ev idsldap-cltbase64bit63-6.3.0-0

To uninstall only the Web Administration Tool, type the following at a command prompt:

rpm -ev idsldap-webadmin63-6.3.0-0

Solaris systems

You can uninstall Tivoli Directory Server from a command line using **pkgrm**.

**Command line removal using pkgrm**

To see what Tivoli Directory Server components are installed, type:

```
pkginfo | grep -i IDSl
```

The output displayed is similar to the following: (Only the installed packages are displayed.)

```
application IDSl32c63 IBM Directory Server - 32 bit Client
application IDSl64p63 IBM Directory Server - Proxy Server
application IDSl64s63 IBM Directory Server - 64 bit Server
application IDSl64c63 IBM Directory Server - 64 bit Client
application IDSlbc63 IBM Directory Server - Base Client
application IDSlbs63 IBM Directory Server - Base Server
application IDSljc63 IBM Directory Server - Java Client
application IDSlen63 IBM Directory Server - Messages U.S. English (en)
application IDSlweb63 IBM Directory Server - Web Administration
application IDSlent63 IBM Directory Server - Entitlement
```

Use **pkgrm** to remove the desired packages. For example:

- To uninstall the full directory server (with the client and English messages), type the following:
  
  ```
pkgrm IDSlen63 IDSlen63 IDSl64s63 IDSl64c63 IDSlbc63
  ```

- To uninstall the proxy server (with the client and English messages), type the following:
  
  ```
pkgrm IDSlen63 IDSlen63 IDSl64p63 IDSl64c63 IDSljc63 IDSlbc63
  ```

- To uninstall only the 32-bit client, type the following:
pkgrm IDSl32c63 IDSlbc63

(You cannot uninstall only the client if you have a server installed.)

- To uninstall the 64-bit client, type the following:
  pkgrm IDSl64c63 IDSlbc63

- To uninstall the Web Administration Tool package, type the following:
  pkgrm IDSlweb63

Remove the packages in the reverse order of the installation sequence. (The order in which you remove the Web Administration Tool is not important.)

**HP-UX (Itanium) systems**

To uninstall Tivoli Directory Server v6.3 client package from HP-UX (Itanium) system, do the following:

1. Log in as root.
2. To verify the Tivoli Directory Server packages that are installed on the system, run the following command:
   swlist | grep idsldap
3. To remove the Tivoli Directory Server v6.3 client package, run the following command at command prompt:
   swremove idsldap.cltjava63.depot
   swremove idsldap.clt64bit64.depot
   swremove idsldap.clt32bit63.depot
   swremove idsldap.cltbase63.depot
Appendix A. Directory structure of downloaded files

For each type of operating system, there are:

- .iso files that you can use to create a DVD for installation
- .zip files (for Windows systems) or .tar files (for non-Windows systems) that you can uncompress and use for installation

The sections that follow show the directory structure and, at a high level, the contents of the .iso, .zip and .tar files for Tivoli Directory Server 6.3 for each type of operating system.

Directory structure for Windows files

The file names for the Tivoli Directory Server 6.3 for Windows packages are:

**Intel 32-bit Windows packages**
- DVD image: tds63-win-ia32.iso
- .zip files:
  - tds63-win-ia32-base.zip (Tivoli Directory Server 6.3 Client and Server)
  - tds63-win-ia32-db2.zip (DB2 v9.7)
  - tds63-win-ia32-eWas.zip (Embedded WebSphere Application Server 7.0.0.7)
  - tds63-win-ia32-gskit.zip (GSKit 8.0)
  - tds63-win-ia32-whitepages.zip (White Pages)

After you create the DVD or uncompress the .zip files, the directory structure is as follows.

```
dsV6.3 (Top level directory for unzipped files)
  └ gskit\ (GSKit)
      - gsk8crypt32.exe
      - gsk8ssl32.exe
  └ license\ (Licenses for Tivoli Directory Server and other provided products)
  └ quickstart\ (Quick Start Guides in English and other languages)
  └ tds\ (Installer files)
      - install_tds\n      - neededFiles\n      - optionFiles\n      - install_tds.exe
      - install_tdsSilent.exe
      - media.inf (Setup information)
  └ entitlement\ (Entitlement files for Proxy server)
      - entitlement.txt
  └ tdsLangpack\ (Tivoli Directory Server language packs)
      - idslp_setup_win32.exe
      - idslp_setup_win32Silent.exe
      - setup\n      - optionFiles\n  └ tools\ (Tools including migbkup)
      - migbkup.bat
  └ db2\ (DB2)
      - db2\n```
- doc\ 
- db2prereqcheck.exe 
- db2unins.bat 
- setup.exe 
- VSAI\ 
  — appsrv\ (Embedded WebSphere Application Server) 
  — whitepages\ (Directory White Pages) 
    - install_tdsWp\ 
    - neededFiles\ 
      - install_tdsWpWin32.exe

**AMD/EM64T Windows packages**

* DVD image: tds63-win-x86-64.iso
* .zip files:
  - tds63-win-x86-64-base.zip (Tivoli Directory Server 6.3 Client and Server)
  - tds63-win-x86-64-db2.zip (DB2 v9.7)
  - tds63-win-x86-64-eWas.zip (Embedded WebSphere Application Server 7.0.0.7)
  - tds63-win-x86-64-gskit.zip (GSKit 8.0)
  - tds63-win-x86-64-whitepages.zip (White Pages)

After you create the DVD or uncompress the .zip files, the directory structure is as follows.

\tdsV6.3  (Top level directory for unzipped files) 
  — gskit\ (GSKit) 
    - gsk8crypt64.exe 
    - gsk8ssl64.exe 
    - gsk8crypt32.exe 
    - gsk8ssl32.exe 
  — license\ (Licenses for Tivoli Directory Server and other provided products) 
  — quickstart\ (Quick Start Guides in English and other languages) 
  — tds\ (Installer files) 
    - install_tds\ 
      - neededFiles\ 
      - optionsFiles\ 
      - install_tdsSilent.exe 
      - install_tds.exe 
    — entitlement\ (Entitlement files for Proxy server) 
      - entitlement.txt 
  — tdsLangpack\ (Tivoli Directory Server language packs) 
    - idslp_setup_win64.exe 
    - idslp_setup_win64Silent.exe 
    — setup\ 
      - optionFiles\ 
  — tools\ (Tools including migbkup) 
    - migbkup.bat 
  — db2\ (DB2) 
    - db2\ 
      - db2prereqcheck.exe 
      - db2unins.bat 
      - setup.exe 
      - doc\ 
    — appsrv\ (Embedded WebSphere Application Server)
— whitepages\ (Directory White Pages)
- install_tdsWp\
- neededFiles\
- install_tdsWpWin64.exe

**Intel 32-bit Windows client only package**

- .zip file:
  - tds63-win-ia32-client.zip (Tivoli Directory Server 6.3 Client)

After you uncompress the .zip file, the directory structure is as follows.

\tdsV6.3 (Top level directory for unzipped files)
- gskit\ (GSKit)
  - gsk8crypt32.exe
  - gsk8ssl32.exe
- license\ (Licenses for Tivoli Directory Server and other provided products)
- quickstart\ (Quick Start Guides in English and other languages)
- tds\ (Installer files)
  - install_tds\n  - neededFiles\n  - optionsFiles\n  - install_tds.exe
  - install_tdsSilent.exe
  - media.inf (Setup information)

**Windows IA64 (Itanium) and AMD64/EM64T Windows client only package**

- .zip file:
  - tds63-win-x86-64-client.zip (Tivoli Directory Server 6.3 Client)

After you uncompress the .zip file, the directory structure is as follows.

\tdsV6.3 (Top level directory for unzipped files)
- gskit\ (GSKit)
  - gsk8crypt64.exe
  - gsk8ssl64.exe
  - gsk8crypt32.exe
  - gsk8ssl32.exe
- license\ (Licenses for Tivoli Directory Server and other provided products)
- quickstart\ (Quick Start Guides in English and other languages)
- tds\ (Installer files)
  - install_tds\n  - neededFiles\n  - optionsFiles\n  - install_tds.exe
  - install_tdsSilent.exe
  - media.inf (Setup information)

**Directory structure for AIX files**

**Directory structure for AIX server packages**

The file names for the Tivoli Directory Server 6.3 for AIX packages are:

- DVD image: tds63-aix-ppc64.iso
- .tar files:
  - tds63-aix-ppc64-base.tar (Tivoli Directory Server 6.3 Client and Server)
After you create the DVD or uncompress the .tar files, the directory structure is as follows:

/tdsV6.3  (Top level directory for untarred files)
  — gskit/  (GSKit)
    - GSKit8.gskcrypt64.ppc.rte
    - GSKit8.gskssl64.ppc.rte
    - GSKit8.gskcrypt32.ppc.rte
    - GSKit8.gskssl32.ppc.rte
  — license/  (Licenses for Tivoli Directory Server and other provided products)
  — quickstart/  (Quick Start Guides in English and other languages)
  — tds/  (Installer files)
    - install_tds/
    - media.inf/
    - neededFiles/
    - install_tds.bin
  — tdsfiles/
  — tdsLangpack/  (Tivoli Directory Server language packs)
    - idslp_setup_aix.bin
    - setup/
    - optionFiles/
    - native/
  — tools/  (Tools including migbkup)
    - migbkup
  — entitlement/  (Entitlement files for Proxy server)
  — db2/  (DB2)
    - db2/
    - doc/
    - nlpack /
    - db2_deinstall
    - db2prereqcheck
    - db2_install
    - db2setup
    - db2ls
    - db2ckupgrade
    - installFixPack
  — appsrv/  (Embedded WebSphere Application Server)
  — whitepages/  (Directory White Pages)
    - Aix64/
    - neededFiles/
    - media.inf
    - install_AixWp.bin

**Directory structure for AIX client only package**

The file name for the Tivoli Directory Server 6.3 for AIX client only package is:

- .tar file:
  - tds63-aix-ppc64-client.tar

After you uncompress the .tar file, the directory structure is as follows:
The directory structure for the System x Linux, AMD64/EM64T Linux, System z Linux, and System i and System p Linux packages is the same, though some file names are different.

**System x Linux packages**

The file names for the Tivoli Directory Server 6.3 for System x Linux packages are:

- DVD image: tds63-linux-ia32.iso
- .tar files:
  - tds63-linux-ia32-base.tar (Tivoli Directory Server 6.3 Client and Server)
  - tds63-linux-ia32-db2.tar (DB2 v9.7 WSE)
  - tds63-linux-ia32-eWas.tar (Embedded WebSphere Application Server 7.0.0.7)
  - tds63-linux-ia32-gskit.tar (GSKit 8.0)
  - tds63-linux-ia32-whitepages.tar (White Pages)

After you create the DVD or uncompress the .tar files, the directory structure is as follows:

```
/tdsV6.3 (Top level directory for untarred files)
  — gskit/ (GSKit)
    - gskcrypt32-8.0.13.1.linux.x86.rpm
    - gskssl32-8.0.13.1.linux.x86.rpm
  — license/ (Licenses for Tivoli Directory Server and other provided products)
  — quickstart/ (Quick Start Guides in English and other languages)
  — tds/ (Installer files)
    - install_tds/
    - media.inf
    - neededFiles/
    - install_tds.bin
  — tdsfiles/
  — tdsLangpack/ (Tivoli Directory Server language packs)
    - idsldap.cltbase63
    - idsldap.cltjava63
```

**Directory structure for Linux files**

The directory structure for downloaded files is as follows:

```
/tdsV6.3 (Top level directory for untarred files)
  — gskit/ (GSKit)
    - GSKit8.gskcrypt64.ppc.rte
    - GSKit8.gskssl64.ppc.rte
    - GSKit8.gskcrypt32.ppc.rte
    - GSKit8.gskssl32.ppc.rte
  — quickstart/ (Quick Start Guides in English and other languages)
  — tdsfiles/ (Operating system utility installation files)
    - idsldap.cl32bit63
    - idsldap.cl64bit63
    - idsldap.cl_max_crypto32bit63
    - idsldap.cl_max_crypto64bit63
    - idsldap.cljava63
```
The file names for the Tivoli Directory Server 6.3 for AMD64/EM64T Linux packages are:

- DVD image: tds63-linux-x86-64.iso
- .tar files:
  - tds63-linux-x86-64-base.tar (Tivoli Directory Server 6.3 Client and Server)
  - tds63-linux-x86-64-db2.tar (DB2 v9.7 ESE)
  - tds63-linux-x86-64-eWas.tar (Embedded WebSphere Application Server 7.0.0.7)
  - tds63-linux-x86-64-gskit.tar (GSKit 8.0)
  - tds63-linux-x86-64-whitepages.tar (White Pages)

After you create the DVD or uncompress the .tar files, the directory structure is as follows:

/tdsV6.3 (Top level directory for untarred files)
- gskit/ (GSKit)
  - gskcrypt64-8.0.13.1.linux.x86_64.rpm
  - gskssl64-8.0.13.1.linux.x86_64.rpm
  - gskcrypt32-8.0.13.1.linux.x86.rpm
  - gskssl32-8.0.13.1.linux.x86.rpm
- license/ (Licenses for Tivoli Directory Server and other provided products)
- quickstart/ (Quick Start Guides in English and other languages)
- tds/ (Installer files)
  - install_tds/
  - neededFiles/
  - install_tds.bin
  - media.inf
- tdsfiles/ (Operating system utility installation files)
- tdsLangpack/ (Tivoli Directory Server language packs)
  - ids1p_setup_linux86.bin
  - setup/
  - optionFiles/
  - native/
- tools/ (Tools including migbkup)
System z Linux packages

The file names for the Tivoli Directory Server 6.3 for System z Linux packages are:

- DVD image: tds63-linux-s390x.iso
- .tar files:
  - tds63-linux-s390x-base.tar (Tivoli Directory Server 6.3 Client and Server)
  - tds63-linux-s390x-db2.tar (DB2 v9.7 ESE)
  - tds63-linux-s390x-eWas.tar (Embedded WebSphere Application Server 7.0.0.7)
  - tds63-linux-s390x-gskit.tar (GSKit 8.0)
  - tds63-linux-s390x-whitepages.tar (White Pages)

After you create the DVD or uncompress the .tar files, the directory structure is as follows:

/tdsV6.3 (Top level directory for untarred files)
  — gskit/ (GSKit)
    - gskcrypt64-8.0.13.1.linux.s390x.rpm
    - gskssl64-8.0.13.1.linux.s390x.rpm
    - gskcrypt31-8.0.13.1.linux.s390x.rpm
    - gskssl31-8.0.13.1.linux.s390x.rpm
  — license/ (Licenses for Tivoli Directory Server and other provided products)
  — quickstart/ (Quick Start Guides in English and other languages)
  — tds/ (Installer files)
    - install_tds/
    - neededFiles/
    - install_tds.bin
    - media.inf
  — tdsfiles/ (Operating system utility installation files)
  — tdsLangpack/ (Tivoli Directory Server language packs)
    - idslp_setup_linux390.bin
    - optionFiles/
    - native/
    - setup/
— tools/ (Tools including **migbkup**)
  - migbkup
— entitlement/ (Entitlement files for Proxy server)
— db2/ (DB2)
  - db2/
  - db2_deinstall
  - db2_install
  - db2ckupgrade
  - db2ls
  - db2prereqcheck
  - db2setup
  - installFixPack
  - doc/
  - nlpack/
— appsrv/ (Embedded WebSphere Application Server)
— whitepages/ (Directory White Pages)
  - Linuxs390/
  - neededFiles/
  - install_Linuxs390Wp.bin
  - media.inf

**System i and System p Linux packages**
The file names for the Tivoli Directory Server 6.3 for System i and System p Linux packages are:

- DVD image: tds63-linux-ppc64.iso
- .tar files:
  - tds63-linux-ppc64-base.tar (Tivoli Directory Server 6.3 Client and Server)
  - tds63-linux-ppc64-db2.tar (DB2 v9.7 ESE)
  - tds63-linux-ppc64-eWas.tar (Embedded WebSphere Application Server 7.0.0.7)
  - tds63-linux-ppc64-gskit.tar (GSKit 8.0)
  - tds63-linux-ppc64-whitepages.tar (White Pages)

After you create the DVD or uncompress the .tar files, the directory structure is as follows:

/tdsV6.3 (Top level directory for untarred files)
  — gskit/ (GSKit)
    - gskrypt64-8.0.13.1.linux.ppc.rpm
    - gskssl64-8.0.13.1.linux.ppc.rpm
    - gskcrypt32-8.0.13.1.linux.ppc.rpm
    - gskssl32-8.0.13.1.linux.ppc.rpm
  — license/ (Licenses for Tivoli Directory Server and other provided products)
  — quickstart/ (Quick Start Guides in English and other languages)
  — tds/ (Installer files)
    - install_tds/
    - neededFiles/
    - install_tds.bin
    - media.inf
  — tdsfiles/ (Operating system utility installation files)
  — tdsLangpack/ (Tivoli Directory Server language packs)
    - idslp_setup_linuxppc.bin
    - optionFiles/
    - native/
Directory structure for Linux client only packages

The directory structure for the System x Linux, Linux IA64 (Itanium), AMD64/EM64T Linux, System z Linux, and System i and System p Linux client only packages are listed.

System x Linux client only package

The file name for the Tivoli Directory Server 6.3 for System x Linux client only package is:

- .tar file:
  - tds63-linux-ia32-client.tar

After you uncompress the .tar file, the directory structure is as follows:

/tdsV6.3 (Top level directory for untarred files)
  - gskit/ (GSKit)
    - gskcrypt32-8.0.13.1.linux.x86.rpm
    - gskssl32-8.0.13.1.linux.x86.rpm
  - quickstart/ (Quick Start Guides in English and other languages)
  - tdsfiles/ (Operating system utility installation files)
    - idsldap-cltbase63-6.3.0.0.i386.rpm
    - idsldap-cltjava63-6.3.0.0.i386.rpm
    - idsldap-cltjava63-6.3.0.0.i386.rpm

Linux IA64 (Itanium) and AMD64/EM64T Linux client only package

The file name for the Tivoli Directory Server 6.3 for Linux IA64 (Itanium) and AMD64/EM64T Linux client only package is:

- .tar file:
  - tds63-linux-x86-64-client.tar

After you uncompress the .tar file, the directory structure is as follows:

/tdsV6.3 (Top level directory for untarred files)
  - gskit/ (GSKit)
    - gskcrypt64-8.0.13.1.linux.x86_64.rpm
System z Linux client only package

The file name for the Tivoli Directory Server 6.3 for System z Linux client only package is:

- .tar file:
  - tds63-linux-s390x-client.tar

After you uncompress the .tar file, the directory structure is as follows:

/tdsV6.3 (Top level directory for untarred files)
- gskit/ (GSKit)
  - gskcrypt64-8.0.13.1.linux.s390x.rpm
  - gskssl64-8.0.13.1.linux.s390x.rpm
  - gskcrypt32-8.0.13.1.linux.s390 rpm
  - gskssl32-8.0.13.1.linux.s390x.rpm
- quickstart/ (Quick Start Guides in English and other languages)
- tdsfiles/ (Operating system utility installation files)
  - idsldap-clt32bit63-6.3.0-0.s390x.rpm
  - idsldap-clt64bit63-6.3.0-0.s390x.rpm
  - idsldap-cltbase63-6.3.0-0.x86_64.rpm
  - idsldap-cltjava63-6.3.0-0.x86_64.rpm

System i Linux and System p Linux client only package

The file name for the Tivoli Directory Server 6.3 for System i Linux and System p Linux client only package is:

- .tar file:
  - tds63-linux-ppc64-client.tar

After you uncompress the .tar file, the directory structure is as follows:

/tdsV6.3 (Top level directory for untarred files)
- gskit/ (GSKit)
  - gskcrypt64-8.0.13.1.linux.ppc.rpm
  - gskssl64-8.0.13.1.linux.ppc.rpm
  - gskcrypt32-8.0.13.1.linux.ppc.rpm
  - gskssl32-8.0.13.1.linux.ppc.rpm
- quickstart/ (Quick Start Guides in English and other languages)
- tdsfiles/ (Operating system utility installation files)
  - idsldap-clt32bit63-6.3.0-0.ppc64.rpm
  - idsldap-clt64bit63-6.3.0-0.ppc64.rpm
  - idsldap-cltbase63-6.3.0-0.ppc.rpm
  - idsldap-cltjava63-6.3.0-0.ppc.rpm
The file names for the Tivoli Directory Server 6.3 for Solaris SPARC packages are:

- DVD image: tds63-solaris-sparc.iso
- .tar files:
  - tds63-solaris-sparc-base.tar (Tivoli Directory Server 6.3 Client and Server)
  - tds63-solaris-sparc-db2.tar (DB2 v9.7 ESE)
  - tds63-solaris-sparc-eWas.tar (Embedded WebSphere Application Server 7.0.0.7)
  - tds63-solaris-sparc-gskit.tar (GSKit 8.0)
  - tds63-solaris-sparc-whitepages.tar (White Pages)

After you create the DVD or uncompress the .tar files, the directory structure is as follows:

```
/tdsV6.3 (Top level directory for untarred files)
  - gskit/   (GSKit)
    - gsk8cry64.pkg
    - gsk8ssl64.pkg
    - gsk8cry32.pkg
    - gsk8ssl32.pkg
  - license/ (Licenses for Tivoli Directory Server and other provided products)
  - quickstart/ (Quick Start Guides in English and other languages)
  - tds/      (Installer files)
    - install_tds/
    - neededFiles/
    - install_tds.bin
    - install_tds.sp
    - media.inf
  - tdsfiles/ (Operating system utility installation files)
  - tdsLangpack/ (Tivoli Directory Server language packs)
    - idsip_setup_solaris.bin
    - setup/
    - optionFiles/
    - native/
  - tools/ (Tools including migbkup)
    - migbkup
  - entitlement/ (Entitlement files for Proxy server)
  - db2/       (DB2)
    - db2/
    - db2_install
    - db2_deinstall
    - db2prereqcheck
    - db2setup
    - installFixPack
    - doc/
    - nlpack/
  - appsrv/ (Embedded WebSphere Application Server)
  - appsrv_64/ (64-bit Embedded WebSphere Application Server)
  - whitepages/ (Directory White Pages)
    - install_tdsWp/
    - neededFiles/
    - install_SolarisWp.bin
```
Directory structure for Solaris SPARC client only package

The file name for the Tivoli Directory Server 6.3 for Solaris SPARC client only package is:
- .tar file:
  - tds63-solaris-sparc-client.tar

After you uncompress the .tar file, the directory structure is as follows:

```
/tdsV6.3 (Top level directory for unarred files)
  ├── gskit/  (GSKit)
  │    ├── gsk8cry64.pkg
  │    ├── gsk8ssl64.pkg
  │    ├── gsk8cry32.pkg
  │    └── gsk8ssl32.pkg
  └── quickstart/  (Quick Start Guides in English and other languages)
```

Directory structure for Solaris X64 files

The file names for the Tivoli Directory Server 6.3 for Solaris X64 packages are:
- DVD image: tds63-solaris-x86-64.iso
- .tar files:
  - tds63-solaris-x86-64-base.tar (Tivoli Directory Server 6.3 Client and Server)
  - tds63-solaris-x86-64-db2.tar (DB2 v9.7 ESE)
  - tds63-solaris-x86-64-eWas.tar (Embedded WebSphere Application Server 7.0.0.7)
  - tds63-solaris-x86-64-gskit.tar (GSKit 8.0)
  - tds63-solaris-x86-64-whitepages.tar (White Pages)

After you create the DVD or uncompress the .tar files, the directory structure is as follows:

```
/tdsV6.3 (Top level directory for unarred files)
  ├── gskit/  (GSKit)
  │    ├── gsk8cry64.pkg
  │    ├── gsk8ssl64.pkg
  │    ├── gsk8cry32.pkg
  │    └── gsk8ssl32.pkg
  └── license/  (Licenses for Tivoli Directory Server and other provided products)
     └── quickstart/  (Quick Start Guides in English and other languages)
         └── tds/  (Installer files)
             └── install_tds.bin
```
— tdsfiles/ (Operating system utility installation files)
— tdsLangpack/ (Tivoli Directory Server language packs)
  - native/
  - optionFiles
  - setup
  - idsdp_setup_solarisx86.bin
— tools/ (Tools including migbkup)
  - migbkup
— entitlement/ (Entitlement files for Proxy server)
— db2/ (DB2)
  - db2/
    - db2_install
    - db2_deinstall
    - db2ckupgrade
    - db2ls
    - db2prereqcheck
    - db2setup
    - installFixPack
    - doc/
    - nlpack/
— appsrv/ (Embedded WebSphere Application Server)
— whitepages/ (Directory White Pages)
  - install_tdsWp/
  - neededFiles/
  - install_SolarisX86Wp.bin
  - media.inf

Directory structure for Solaris X64 client only package

The file name for the Tivoli Directory Server 6.3 for Solaris X64 client only package is:

• .tar file:
  – tds63-solaris-x86-64-client.tar

After you uncompress the .tar file, the directory structure is as follows:

/tdsV6.3 (Top level directory for untarred files)
  — gskit/ (GSKit)
    - gsk8cry64.pkg
    - gsk8ssl64.pkg
    - gsk8cry32.pkg
    - gsk8ssl32.pkg
  — quickstart/ (Quick Start Guides in English and other languages)
  — tdsfiles/ (Operating system utility installation files)
    - IDSl32c63/
    - IDSl64c63/
    - IDSlbc63/
    - IDSljc63/
    - idsldap.clt32bit63.pkg
    - idsldap.clt64bit63.pkg
    - idsldap.cltbase63.pkg
    - idsldap.cltjava63.pkg
Directory structure for HP-UX Integrity files

The file name for the Tivoli Directory Server 6.3 for HP-UX Integrity client only package is:

- .tar file:
  - tds63-hpux-ia64-client.tar

After you uncompress the .tar file, the directory structure is as follows:

/tdsV6.3 (Top level directory for untarred files)
  - gskit/ (GSKit)
    - gskcrypt64/
    - gskssl64/
    - gskcrypt32/
    - gskssl32/
  - quickstart/ (Quick Start Guides in English and other languages)
  - tdsfiles/ (Operating system utility installation files)
    - idsldap.clt32bit63.depot
    - idsldap.clt64bit63.depot
    - idsldap.cltbase63.depot
    - idsldap.cltjava63.depot
Appendix B. Disk space requirements for installable features

Tivoli Directory Server requires the following amounts of disk space for each installable feature. Information is given for each type of supported operating system.

Windows disk space requirements

On Windows systems, the following amounts of disk space are required:

Table 4. Sizes of installable features (in MB) on Windows systems

<table>
<thead>
<tr>
<th>Installable feature</th>
<th>Installed size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client SDK</td>
<td>25 MB</td>
</tr>
<tr>
<td>Java client</td>
<td>124 MB</td>
</tr>
<tr>
<td>Deployed Web Administration Tool (includes Embedded WebSphere Application Server and Web Administration Tool deployed into Embedded WebSphere Application Server)</td>
<td>440 MB</td>
</tr>
<tr>
<td>Base server</td>
<td>23 MB</td>
</tr>
<tr>
<td>Proxy server (Be sure to add the sizes for the Client SDK, Java client, and Base server.)</td>
<td>4 MB</td>
</tr>
<tr>
<td>Full directory server (Be sure to add the sizes for the Client SDK, Java client, and Base server)</td>
<td>8 MB</td>
</tr>
<tr>
<td>DB2</td>
<td>763 MB</td>
</tr>
<tr>
<td>GSKit</td>
<td>11 MB</td>
</tr>
</tbody>
</table>

Note: If you install both the proxy server and the full directory server, add the sizes for the client, Java client, and base server only once.

AIX disk space requirements

On AIX systems, the following amounts of disk space are required:

Table 5. Sizes of installable features (in MB) on AIX systems

<table>
<thead>
<tr>
<th>Installable feature</th>
<th>Installed size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client SDK</td>
<td>8 MB</td>
</tr>
<tr>
<td>Java client</td>
<td>91 MB</td>
</tr>
<tr>
<td>Deployed Web Administration Tool (includes Embedded WebSphere Application Server and Web Administration Tool deployed into Embedded WebSphere Application Server)</td>
<td>443 MB</td>
</tr>
<tr>
<td>SSL Web Administration Tool</td>
<td>51 MB</td>
</tr>
<tr>
<td>Base server</td>
<td>39 MB</td>
</tr>
<tr>
<td>Proxy server (Be sure to add the sizes for the Client SDK, Java client, and Base server.)</td>
<td>4 MB</td>
</tr>
<tr>
<td>Full directory server (Be sure to add the sizes for the Client SDK, Java client, and Base server)</td>
<td>12 MB</td>
</tr>
</tbody>
</table>
Table 5. Sizes of installable features (in MB) on AIX systems (continued)

<table>
<thead>
<tr>
<th>Installable feature</th>
<th>Installed size</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2</td>
<td>1250 MB</td>
</tr>
<tr>
<td>GSKit</td>
<td>16 MB</td>
</tr>
</tbody>
</table>

**Note:** If you install both the proxy server and the full directory server, add the sizes for the client, Java client, and base server only once.

### Linux disk space requirements

On Linux systems, the following amounts of disk space are required:

Table 6. Sizes of installable features (in MB) on Linux systems

<table>
<thead>
<tr>
<th>Installable feature</th>
<th>Installed size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client SDK</td>
<td>9 MB</td>
</tr>
<tr>
<td>Java client</td>
<td>166 MB</td>
</tr>
<tr>
<td>Deployed Web Administration Tool (includes Embedded WebSphere Application Server and Web Administration Tool deployed into Embedded WebSphere Application Server)</td>
<td>433 MB</td>
</tr>
<tr>
<td>Base server</td>
<td>32 MB</td>
</tr>
<tr>
<td>Proxy server (Be sure to add the sizes for the Client SDK, Java client, and Base server.)</td>
<td>5 MB</td>
</tr>
<tr>
<td>Full directory server (Be sure to add the sizes for the Client SDK, Java client, and Base server.)</td>
<td>8 MB</td>
</tr>
<tr>
<td>DB2 (System x Linux)</td>
<td>460 MB</td>
</tr>
<tr>
<td>DB2 (System z Linux)</td>
<td>670 MB</td>
</tr>
<tr>
<td>DB2 (System i and System p Linux)</td>
<td>520 MB</td>
</tr>
<tr>
<td>DB2 (AMD64/EM64T Linux)</td>
<td>1300 MB</td>
</tr>
<tr>
<td>GSKit</td>
<td>40 MB</td>
</tr>
</tbody>
</table>

**Note:** If you install both the proxy server and the full directory server, add the sizes for the client, Java client, and base server only once.

### Solaris disk space requirements

On Solaris systems, the following amounts of disk space are required:

Table 7. Sizes of installable features (in MB) on Solaris systems

<table>
<thead>
<tr>
<th>Installable feature</th>
<th>Installed size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client SDK</td>
<td>11 MB</td>
</tr>
<tr>
<td>Java client</td>
<td>145 MB</td>
</tr>
<tr>
<td>Deployed Web Administration Tool (includes Embedded WebSphere Application Server and Web Administration Tool deployed into Embedded WebSphere Application Server)</td>
<td>470 MB</td>
</tr>
<tr>
<td>Base server</td>
<td>32 MB</td>
</tr>
</tbody>
</table>
Table 7. Sizes of installable features (in MB) on Solaris systems (continued)

<table>
<thead>
<tr>
<th>Installable feature</th>
<th>Installed size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proxy server (Be sure to add the sizes for the Client SDK, Java client, and Base server.)</td>
<td>35 MB</td>
</tr>
<tr>
<td>Full directory server (Be sure to add the sizes for the Client SDK, Java client, and Base server.)</td>
<td>15 MB</td>
</tr>
<tr>
<td>DB2</td>
<td>1155 MB</td>
</tr>
<tr>
<td>GSKit</td>
<td>34 MB</td>
</tr>
</tbody>
</table>

**Note:** If you install both the proxy server and the full directory server, add the sizes for the client, Java client, and base server only once.

**HP-UX disk space requirements**

On HP-UX (Itanium) systems, the following amounts of disk space are required:

Table 8. Sizes of installable features (in MB) on HP-UX (Itanium) systems

<table>
<thead>
<tr>
<th>Installable feature</th>
<th>Installed size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client SDK</td>
<td>26 MB</td>
</tr>
<tr>
<td>Java client</td>
<td>172 MB</td>
</tr>
<tr>
<td>GSKit</td>
<td>41 MB</td>
</tr>
</tbody>
</table>
Appendix C. Configuration planning

Before configuring and populating your database, determine:

**What type of data you are going to store in the directory**
Decide what sort of schema you need to support the type of data you want to keep in your directory. A standard set of attribute-type definitions and object-class definitions is included with the directory server. Before you begin adding entries to the directory, you might want to add new attribute-type and object-class definitions that are customized to your data.

*Note:* You can make schema additions after the directory is already populated with data, but schema changes might require you to unload and reload your data.

**Which code page you are going to use**
Decide whether to create your database using the local code page or using the Universal Character Set (UTF-8). Selecting the local code page enables Tivoli Directory Server applications and users to get search results as expected for the collation sequence of the native language, but allows only data in that specific code page to be stored in the directory. Using UTF-8 enables the storing of any UTF-8 character data in the directory. Tivoli Directory Server clients running anywhere in the world (in any UTF-8 supported language) can access and search the directory. In many cases, however, the client might have limited ability to properly display the results retrieved from the directory in a particular language or character set. See [Appendix O, “UTF-8 support,” on page 217](#) for more information.

*Note:* If you want to use language tags, the database must be a UTF-8 database.

**How you want to structure your directory data**
An IBM Directory is stored in a hierarchical tree structure. The names of entries in the directory are based on their relative position within the tree structure. It is important to define some logical organization to the directory. A logical organization makes it easier for clients to determine which branch of the tree contains the information they are trying to locate.

**Your data security requirements**
See the Secure Sockets Layer information in the *IBM Tivoli Directory Server Version 6.3 Administration Guide* for information about how your data is secured.

**How you want to allocate access permissions**
See the access control lists information in the *IBM Tivoli Directory Server Version 6.3 Administration Guide* for information about using access permissions.

**Whether you need a proxy server**
If the directory data is large and the environment is write-intensive, consider using a proxy server. Large directory environments that are read-heavy might be able to achieve adequate scaling by introducing replication. Before deciding to use a proxy server, refer to the list of supported features within the proxy server in the *IBM Tivoli Directory Server Version 6.3 Administration Guide*. Proxy server supports fewer features than the directory server alone.
Appendix D. Setting up users and groups: directory server instance owner, database instance owner, and database owner

When you create a directory server instance, a user ID on the operating system must exist for the directory server instance owner. For a full directory server, there must also be user IDs on the operating system for the owners of the database instance and the database. You can use the same user ID for all three roles; if you do this, the directory server instance, the database instance, and the database owner all have the same name.

If you use the Instance Administration Tool to create a directory server instance, you can create the directory server instance owner user ID through the tool. If you use the command line to create the directory server instance, you can use the idsadduser command to create the directory server instance owner user ID. This command creates a user ID that meets all requirements.

Use the following information to understand the directory server instance owner, database instance owner, and database owner roles before you create the user ID or IDs.

The roles are defined as follows:

**Directory server instance owner**
You must have a user ID for the owner of the directory server instance. The user ID for the directory server instance owner is also the name of the directory server instance. This user has the authority to manage the directory server instance.

On Windows systems, a member of the Administrators group also has the authority to manage the directory server instance.

On AIX, Linux, and Solaris systems, the primary group of the directory server instance owner also has the authority to manage the directory server instance.

**Note:** On AIX, Linux, and Solaris systems, these names are case-sensitive. You must always specify the directory server instance name and owner exactly as the user ID is specified. For example, JoeSmith and joesmith are different names.

**Database instance owner**
This user ID owns the database instance that is configured to be used by the directory server instance. The database instance name and the database instance owner name are the same. This user manages the database instance. The directory server instance owner can also manage the database instance. By default, this user ID is the same as the directory server instance owner ID.

**Database owner**
This user ID owns the database that is used by the directory server instance to store the directory data. The database resides in the database instance owned by the database instance owner. The directory server instance uses this user ID and its password to connect to the database.
Naming rules

The requirements in this section apply to the following:

- The directory server instance name (the user ID that owns the directory server instance).
- The database instance name (the user ID that owns the database instance). This is usually the same as the directory server instance name.
- On AIX, Linux, and Solaris, the primary groups of the directory server instance owner user ID and the database instance owner user ID.

These user and group IDs:

- Can be no longer than 8 characters
- Cannot be any of the following:
  - USERS
  - ADMINS
  - GUESTS
  - PUBLIC
  - LOCAL
  - idsldap
- Cannot begin with any of the following:
  - IBM
  - SQL
  - SYS
- Cannot include accented characters
- Can include the following characters:
  - A through Z
  - a through z
  - 0 through 9
  - _ (underscore)
- Must begin with one of the following characters:
  - A through Z
  - a through z

Additional restrictions for users and groups

In addition to the naming rules, be sure that the following requirements are met:

- On Windows systems,
  - The directory server instance owner and the database instance owner must be members of the Administrators group.
  - The database instance owner must have the locale set to the correct locale for the language in which you want server messages to be displayed. If necessary, log in as the user and change the locale to the correct one.
- On AIX, Linux, and Solaris systems:
  - The root ID must be a member of the primary group of the directory server instance owner and the database instance owner.
  - The root ID must be a member of the idsldap group.
  - The directory server instance owner and the database instance owner must be members of the idsldap group.
- The directory server instance owner and the database instance owner must have home directories.
- The specific permissions for the home directory of the directory server instance owner must be as follows:
  - The user ownership is the directory server instance owner.
  - The group ownership is the directory server instance owner's primary group.
  - The directory server instance owner and its primary group must have read, write, and execute permissions to the home directory.
- The directory server instance owner and its primary group must have read, write, and execute access to the location where the database will be created.
- If the directory server instance owner and the database instance owner for a given directory server instance are different users, the directory server instance owner must be a member of the database instance owner's primary group.
- The database instance owner and the database owner for a given directory server instance must have the same primary group.
- For best results, the login shell of the directory server instance owner, the database instance owner, and the database owner should be the Korn shell script (/usr/bin/ksh).
- The password of the directory server instance owner, the database instance owner, and the database owner must be set correctly and ready to use. For example, the password cannot be expired or waiting for a first-time validation of any kind. (The best way to verify that the password is correctly set is to telnet to the same computer and successfully log in with that user ID and password.)
- When configuring the database, it is not necessary, but customary, to specify the home directory of the database instance owner as the database location. However, if you specify some other location, the database instance owner's home directory still must have 3 to 4 MB of space available. This is because DB2 creates links and adds files into the home directory of the database instance owner even though the database itself is elsewhere. If you do not have enough space in the home directory, you can either create enough space or change the database instance owner's home directory.

### Creating instance owners: examples

You can use the `idsadduser` command to create instance owners that meet the requirements for a directory server instance owner.

For example:
- The following command creates a new user on an AIX, Linux, or Solaris system with user name JoeSmith. The primary group is employees, the home directory is /home/joe, and the password is joespw.

  ```
  idsadduser -u JoeSmith -g employees -l /home/joe -w joespw
  ```

- The following command creates a new user on a Windows system with user name JoeSmith and password joespw. The user is a member of the Administrators group.

  ```
  idsadduser -u JoeSmith -w joespw
  ```
Appendix E. Synchronizing two-way cryptography between server instances

If you want to use replication, use a distributed directory, or import and export LDIF data between server instances, you must cryptographically synchronize the server instances to obtain the best performance. (If you create a directory server instance as a copy of an existing directory server instance, the two directory server instances are cryptographically synchronized and you do not need to synchronize them.)

If you are creating a new directory server instance and you want it to be cryptographically synchronized with other directory server instances, use the following procedure:

1. On the original server, obtain the encryption salt value by performing the following search:
   
   ```
   ldapsearch -D adminDN -w adminPw -b "cn=crypto,cn=localhost" objectclass=* ibm-slapdCryptoSalt
   ```
   
   A value similar to the following is returned:
   
   ```
   ibm-slapdCryptoSalt=:SxaQ+.qdKor
   ```
   
   The part of the string after the equal to sign (=) is the encryption salt value. In this example, the encryption salt value is :SxaQ+.qdKor

2. Find the encryption seed value that was supplied when creating the original server.

3. Create the new server using one of the following:
   
   - Use the Instance Administration Tool and provide the encryption seed value from the original server in the **Encryption seed string** field and the encryption salt value from the original server in the **Encryption salt string** field.
   
   - Use the `idsicrt` command, and specify the `-e encryptionseed` and `-g encryptsalt` options.

If you already have a server instance, and you have another server instance that you want to cryptographically synchronize with the first server instance, use the following procedure **before** you do any of the following:

- Start the second server instance
- Run the `idsbulkload` command from the second server instance
- Run the `idsldif2db` command from the second server instance

To cryptographically synchronize two server instances, assuming that you have already created the first server instance:

1. Create the second server instance if you have not already created it, but do not run the `idsbulkload` command, or run the `idsldif2db` command on the second server instance.

2. Use the `idsgendirksf` utility on the second server instance to recreate the `ibmslapddir.ksf` file (the key stash file) from the first server instance. This file is used to replace the second server instance's original `ibmslapddir.ksf` file. For information about the `idsgendirksf` utility, see the *IBM Tivoli Directory Server Version 6.3 Administration Guide*. The file is in the `idsslapd-instance_name/etc`
directory on Windows systems, or in the idsslapd-instance_name/etc directory on AIX, Linux, and Solaris systems. (instance_name is the name of the directory server instance).

**Note:** The `idsgendirksf` utility requires the encryption salt value from the first server as a parameter. To obtain the encryption salt value:

a. On the first server, obtain the encryption salt value by performing the following search:
   
   ```bash
   ldapsearch -D adminDN -w adminPw -b "cn=crypto,cn=localhost" ibm-slapdCryptoSalt
   ```

b. A value similar to the following is returned:
   
   ```bash
   ibm-slapdCryptoSalt=:SxaQ+.qdKor
   ```

   The part of the string after the equal to sign (=) is the encryption salt value. In this example, the encryption salt value is `:SxaQ+.qdKor`

3. Start the second server instance, run the `idsbulkload` command, or run the `idsldif2db` command on the second server instance.

The server instances are now cryptographically synchronized, and AES-encrypted data will load correctly. (Although the procedure discusses two server instances, you might need a group of server instances that are cryptographically synchronized.)

**Note:** When importing LDIF data, if the LDIF import file is not cryptographically synchronized with the server instance that is importing the LDIF data, any AES-encrypted entries in the LDIF import file will not be imported.
Appendix F. Directory server instances

A directory server instance consists of all files that are required for a directory server and its corresponding administration server to run on a computer. The administration server (idsdiradm) enables remote management of the directory server instance. When it is running, the administration server supports starting, stopping, restarting, and monitoring the status of the directory server instance.

Directory server instance files include:
- The ibmslapd.conf file (the configuration file)
- Schema files
- Log files
- Key stash files
- Temporary status files

In addition, the idsinstances.ldif file is not specific to any particular directory server instance but contains information about all directory server instances that are present on the computer. These can be from the 6.0, 6.1, or 6.2 version of Tivoli Directory Server.

The idsinstances.ldif file is in one of the following locations:
- On Windows systems, X:idsinstinfo\idsinstances.ldif (where X is the drive where Tivoli Directory Server 6.3 is installed.)
- On AIX and Solaris systems, /opt/IBM/ldap/idsinstinfo/idsinstances.ldif
- On Linux systems, /opt/ibm/ldap/idsinstinfo/idsinstances.ldif

The files for a specific directory server instance are stored in a directory named idsslapd-instance_name, where instance_name is the name of the directory server instance.

Note: If you are using SSL, the SSL key database, Java keystore, and the Kerberos key tab files are not directly part of a directory server instance. A default SSL key database attribute value exists in the ibmslapd.conf file of each directory server instance. However, it is the responsibility of the directory server instance owner to do the following:
- Create the SSL key database, the key stash file, and the Kerberos key tab as needed
- Add the information into the ibmslapd.conf file of the directory server instance

These files can be shared by multiple directory server instances on the computer and should be stored in a secure location on the system that is independent of a given directory server instance.

Directory server instance content on Windows systems

On Windows systems, the idsslapd-instance_name directory is in a drive that you specify during instance creation. The directory server instance owner user ID and members of the Administrators group have read and write access to files in the idsslapd-instance_name directory.
The idsslapd-instance_name directory on Windows systems contains the following subdirectories and files:

- etc
- tmp
- logs
- idsprofile.bat
- userprofile.bat

The idsprofile.bat file is used to set the environment for the directory server instance. The userprofile.bat file is used to customize the environment. The idsprofile.bat file invokes the userprofile.bat file after setting the environment. If you want to customize the environment, be sure to change the userprofile.bat file and not the idsprofile.bat file.

### Directory server instance content on AIX, Linux, and Solaris systems

On AIX, Linux, and Solaris systems, the idsslapd-instance_name directory is, by default, in the directory server instance owner’s home directory, but you can specify a different location during instance creation.

For AIX, Linux, and Solaris systems, the idsslapd-instance_name directory contains the following subdirectories and files:

- adworkdir
- db2instance —> DB2_instance_directory (for example, /home/ldapdb2/sqlib)
- etc
- idsprofile
- logs
- tmp
- userprofile
- workdir

The idsprofile file is used to set the environment for the directory server instance. The userprofile file is used to customize the environment. The idsprofile file invokes the userprofile file after setting the environment. If you want to customize the environment, be sure to change the userprofile file and not the idsprofile file.

Files in the idsslapd-instance_name directory are owned by the directory server instance owner user ID and the primary group of the directory server instance owner user ID.
Appendix G. Backup and restore methods

Tivoli Directory Server provides methods for backing up and restoring directory server instance information. There are methods that back up complete information for a directory server instance, and methods that back up only the data in the database. Use the information in "Methods that back up complete directory server instance information" and "Methods that back up database information only" on page 196 to help you choose a backup and restore method.

Methods that back up complete directory server instance information

Tivoli Directory Server provides two mechanisms for backing up and restoring complete directory server instance information: basic and enhanced. These mechanisms can back up not only the directory server instance data (stored in a DB2 database), but also the associated configuration and schema files for the directory server instance.

You can find information about the basic method in "Creating a new instance for which you specify all settings" on page 98 and "Backing up the directory server instance" on page 135, and in the IBM Tivoli Directory Server Version 6.3 Command Reference (see the information about the idsdbback and idsdbrestore commands).

Information about the enhanced method is contained in the IBM Tivoli Directory Server Version 6.3 Administration Guide (see the chapter entitled "Directory Server backup and restore") and in the IBM Tivoli Directory Server Version 6.3 Command Reference (see the information about the ldapexop utility with the extended operations option -op backuprestore).

Both methods provide the option to perform online or offline backups. (Online backups can be performed while the server is running or stopped; offline backups must be performed while the server is stopped.) The backups are always stored on the server where they are taken. However, there are differences in where and how you can request the backup.

With either of these two methods, the backups do not back up the following files, which you must back up separately:
- idsinstances.ldif
- SSL related files: keys, key stash files, CRL files
- Tivoli Directory Integrator solution files

After investigating these methods, choose one and use it exclusively. Do not mix the two methods.

The following table compares the two methods.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Basic method</th>
<th>Enhanced method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Request from</td>
<td>Local server</td>
<td>Remote or local server</td>
</tr>
<tr>
<td>Interface used</td>
<td>Instance Administration Tool or the idsdbback and idsdbrestore commands</td>
<td>Web Administration Tool or ldapexop utility</td>
</tr>
</tbody>
</table>
### Table 9. Comparison of basic and enhanced backup and restore methods (continued)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Basic method</th>
<th>Enhanced method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backup location</td>
<td>Can be taken to a different location each time; overwrites the previous backup only if the backup is performed to the same location.</td>
<td>Provides a way to configure the backup location and method that will be used for all the backups requested through this mechanism.</td>
</tr>
<tr>
<td>Store one or multiple backups</td>
<td>Multiple backups</td>
<td>Stores only one backup at a time and overwrites previous backups when the new backup is successfully taken</td>
</tr>
<tr>
<td>Restores</td>
<td>Administrator can choose from any backup location on the disk</td>
<td>Allows a restore only from the most current backup taken</td>
</tr>
<tr>
<td>Scheduling</td>
<td>One time request that backs up or restores to a specific location specified at the time of the backup</td>
<td>Provides the option to schedule backups one time, daily or weekly.</td>
</tr>
<tr>
<td>Online or offline</td>
<td>Can perform online or offline backups.</td>
<td>Can perform online or offline backups.</td>
</tr>
<tr>
<td>Backs up directory server data and associated configuration and schema files</td>
<td>Provides option to back up only configuration files</td>
<td>Backs up data and associated configuration and schema files</td>
</tr>
<tr>
<td>Administrator management</td>
<td>More required. Administrators must better manage their disk space.</td>
<td>Less required. Only one backup location.</td>
</tr>
<tr>
<td>Backs up and restores DB2 parameters</td>
<td>Backs up and restores DB2 configuration parameters and database optimization parameters</td>
<td>Backs up and restores DB2 configuration parameters and database optimization parameters</td>
</tr>
</tbody>
</table>

### Methods that back up database information only

As an alternative to the Tivoli Directory Server complete backup and restore mechanisms, there are two other methods that you can use to back up and restore only the directory server instance data that is stored in the DB2 database. These methods back up the DB2 data but not Tivoli Directory Server-specific configurations such as the schema. One method also preserves DB2 configurations. The two methods are described in the following list:

- You can use the Tivoli Directory Server LDAP LDIF export and import commands, `idsdb2ldif` and `idsldif2db`, to export the data into an LDIF file and restore it from the LDIF file. See “Importing and exporting LDIF data” on page 149 [149](#) for information about using the Configuration Tool, or the IBM Tivoli Directory Server Version 6.3 Command Reference for information about the commands. These commands do not preserve DB2 configurations. They work across all dissimilar hardware platforms, but they are relatively slow.

- You can use DB2 backup and restore commands to back up and restore the data. This method preserves the DB2 configurations and is fast. This method works across some dissimilar hardware and platforms, depending on whether DB2 supports it. See the IBM Tivoli Directory Server Version 6.3 Administration Guide for information.
For best results, use either the basic or enhanced method described in “Methods that back up complete directory server instance information” on page 195 unless there are special circumstances you must address, such as backing up and restoring data across dissimilar hardware platforms.
Appendix H. Installing, configuring, and uninstalling Embedded WebSphere Application Server

To use the Web Administration Tool, a Web application server is required. Embedded WebSphere Application Server is provided with Tivoli Directory Server 6.3 as a Web application server.

If you use the InstallShield GUI to install the Web Administration Tool, you can select Embedded WebSphere Application Server for installation. In this case, configuration is also done automatically.

If you use operating system utility installation methods, you can install and configure Embedded WebSphere Application Server manually. If you already have Embedded WebSphere Application Server installed, you must configure manually before you can use the Web Administration Tool.

Manually installing and configuring Embedded WebSphere Application Server

The following instructions show how to manually install Embedded WebSphere Application Server, and then how to deploy the Web Administration Tool into it. If you install the Web Administration Tool and Embedded WebSphere Application Server through the InstallShield GUI, this setup is done for you.

Installing Embedded WebSphere Application Server

To manually install Embedded WebSphere Application Server, use the following procedure:

1. After you download and unzip (or untar) the Tivoli Directory Server zip or tar files, go to the directory where you extracted the files, and then change to the appsrv subdirectory.

2. Type the following command at a command prompt:
   - On Windows systems:
     ```
     install.bat -installRoot EWAS_installpath
     ```
   - On AIX, Linux, and Solaris systems:
     ```
     install.sh -installRoot EWAS_installpath
     ```

   where `EWAS_installpath` is the directory where you are installing Embedded WebSphere Application Server. By convention, this directory is the appsrv subdirectory of the directory where Tivoli Directory Server is installed, but you can use any directory. (This directory is `/opt/IBM/ldap/V6.3/appsrv` on AIX and Solaris systems, `/opt/ibm/ldap/V6.3/appsrv` on Linux systems, and `C:\Program Files\IBM\LDAP\V6.3\appsrv` on Windows systems, by convention.)

3. Install the Web Administration Tool, using either the InstallShield GUI or an operating system utility for your operating system.
Deploying the Web Administration Tool into Embedded WebSphere Application Server

The `deploy_IDSWebApp` command deploys the IDSWebApp.war file into Embedded WebSphere Application Server or WebSphere Application Server, retaining the configuration settings of the currently deployed IDSWebApp.war file if there are any.

Deploy the Web Administration Tool into Embedded WebSphere Application Server by using the following command:

1. Go to the idstools subdirectory of the `installpath`. (`installpath` is the directory where Tivoli Directory Server is installed.) This directory is:
   - By default on Windows systems: `C:\Program Files\IBM\LDAP\V6.3\idstools`
   - On AIX and Solaris systems: `/opt/IBM/ldap/V6.3/idstools`
   - On Linux systems: `/opt/ibm/ldap/V6.3/idstools`
2. Be sure that the `deploy_IDSWebApp.bat` file is present in the idstools directory.
3. Type the following command:
   - On Windows systems: `deploy_IDSWebApp.bat`
   - On AIX, Linux, and Solaris systems: `.deploy_IDSWebApp`

Note: If you install the Web Administration Tool and Embedded WebSphere Application Server through the InstallShield GUI, this command is run automatically.

Optionally, you can also use the following flags:

- `-a Application Name` where `Application Name` is the name of the application to deploy. If not specified, defaults to IDSWebApp.war.
- `-w path to IDSWebApp.war file` where `path to IDSWebApp.war file` is the fully qualified path of the IDSWebApp.war file to deploy.
- `-p location of application server` where `location of application server` is the location of WebSphere Application Server where the application is to be deployed.
- `-r profile` where `profile` is the profile name associated with the application. If not specified, the default is TDSWebAdminProfile.
- `-u` uninstalls an existing application.
  Option `-a` should be used to specify the application to uninstall. If not specified, the default application IDSWebApp.war will be undeployed.
- `-o ports_file` where `ports_file` is the fully qualified path of the ports definition file to use. If not specified, the default is `TDS Install directory/idstools/TDSWEBPortDef.props`.
- `-h` displays usage for the command.
- `-v` displays the version and date strings for the `deploy_IDSWebApp` script and the application war file.

Note: The `-w`, `-p`, `-r`, and `-o` flags must be used if you are deploying into a non-embedded version of WebSphere Application Server. They can be used optionally with an embedded version of WebSphere Application Server.
Uninstalling the Web Administration Tool from Embedded WebSphere Application Server

To uninstall the Web Administration Tool from Embedded WebSphere Application Server manually:

1. Be sure that the Web application server is started. See “Starting the Web application server to use the Web Administration Tool” on page 158 for instructions.

2. Type the following at a command prompt to uninstall the Web Administration Tool:

   - On Windows systems:
     ```
     deploy_IDSWebApp.bat -u
     ```
   - On AIX, Linux, and Solaris systems:
     ```
     deploy_IDSWebApp -u
     ```

   where `-u` specifies to uninstall a previously existing application. Optionally, you can also use the following flags:

   - `-a Application Name` where `Application Name` is the name of the application to undeploy. If not specified, the default application `IDSWebApp.war` is undeployed.
   - `-w path to IDSWebApp.war file` where `path to IDSWebApp.war file` is the fully qualified path of the `IDSWebApp.war` file to deploy
   - `-p location of app server` where `location of app server` is the location of WebSphere Application Server where the application is to be deployed.
   - `-r profile` where `profile` is the profile name associated with the application. If not specified, the default is `TDSWebAdminProfile`.

   **Note:** The `-w`, `-p`, and `-r` flags must be used if you are undeploying from a non-embedded version of WebSphere Application Server. They can be used optionally with an embedded version of WebSphere Application Server.

Default ports for Embedded WebSphere Application Server for the Web Administration Tool

Embedded WebSphere Application Server uses four default port settings:

- HTTP Transport (port 1): 12100
- HTTP Transport (port 2): 12101
- Bootstrap/rmi port: 12102
- Soap connector port: 12103
- Admin Console (for administering WebSphere Application Server) port: 12104
- Secure Admin Console (for administering WebSphere Application Server) port: 12105

Other ports that might be used are: 9405, 9406, 9407, 9105, 9375, 7276, 7286, 5558, 5577, 5075, 5076

If a conflict exists with another application using one or more of these default ports, you can use a text editor to change from the default ports to unused ports.

In the `TDSinstall_dir\appsrv\profiles\TDSWebAdminProfile\properties\portdef.props` file, make the following changes as needed:
HTTP Transport port 1
Find the line containing the port number 12100 and replace the 12100 with the port number that you want.

HTTP Transport port 2
Find the line containing the port number 12101 and replace the 12101 with the port number that you want.

Bootstrap/rmi port
Find the line containing the port number 12102 and replace the 12102 with the port number that you want.

Soap connector port
Find the line containing the port number 12103 and replace the 12103 with the port number that you want.

Admin Console port
Find the line containing the port number 12104 and replace the 12104 with the port number that you want.

Admin Secure Console port
Find the line containing the port number 12105 and replace the 12105 with the port number that you want.

Using HTTPS for Embedded WebSphere Application Server
Embedded WebSphere Application Server has HTTPS set up on port 12101, by default. To use HTTPS, you must change your login Web address to the following:

https://<hostname>:12101/IDSWebApp

For non-HTTPS connections, continue to use the following Web address:

http://<hostname>:12100/IDSWebApp

Additionally, if you want to change the Web application server's SSL certificate, you can create new key and trust store database files for Embedded WebSphere Application Server to use. By default, the key and trust store database files are separate and are located in the <WAS_HOME>/profiles/TDSWebAdminProfile/etc/ directory. These files are named DummyServerKeyFile.jks and DummyServerTrustFile.jks respectively.

After you have created your new jks files, you can change the key and trust store database files that IBM Websphere Application Server uses by adding or modifying the following items (highlighted in bold) in the <WAS_HOME>/profiles/TDSWebAdminProfile/config/cells/DefaultNode/security.xml file to use your new file names, passwords, and file formats:

```
<keyStores xmi:id="KeyStore_DefaultNode_10"
    name="DummyServerKeyFile"
    password="{xor}CDo9Hgw="
    provider="IBMJCE"
    location="$<WAS_HOME>/profiles/TDSWebAdminProfile/etc/DummyServerKeyFile.jks"
    type="JKS"
    fileBased="true"
    hostList=""
    managementScope="ManagementScope_DefaultNode_1"/>
<keyStores xmi:id="KeyStore_DefaultNode_11"
    name="DummyServerTrustFile"
    password="{xor}CDo9Hgw="
    provider="IBMJCE"
```
location="${WAS_HOME}/profiles/TDSWebAdminProfile/etc/DummyServerTrustFile.jks"
type="JKS"
fileBased="true"
hostList=""managementScope="ManagementScope_DefaultNode_1"/>
Appendix I. Deploying the Web Administration Tool into WebSphere

Tivoli Directory Server 6.3 provides Embedded WebSphere Application Server as an application server for the Web Administration Tool. However, you can also use WebSphere as a Web application server for the Web Administration Tool. (For versions that are provided and supported, see IBM Tivoli Directory Server Version 6.3 System Requirements.)

WebSphere Application Server is the IBM runtime environment for Java-based applications. WebSphere Application Server V7.0 offers:
- Application server purpose
- Evolving Java application development standards
- Enhanced management
- Advanced tooling and extensions
- Broader integration

For more information on WebSphere Application Server version 7.0, see http://publib.boulder.ibm.com/infocenter/wasinfo/v7r0/index.jsp.

Use the following instructions to install and deploy IBM Web Administration Tool into WebSphere.

1. Install WebSphere using the installation information provided with it, and make sure that it is running properly.

2. Install the Web Administration Tool using either the InstallShield GUI or the installation utility for your operating system. The file containing the Web Administration Tool is named IDSWebApp.war, and it is in the idstools subdirectory of the installation directory you specified during installation of Tivoli Directory Server.

3. Login to the WebSphere Admin console, the default URL is:
   http://<hostnameOfWASsystem>:9060/ibm/console

4. Enter the user ID and password of the user. This user should have sufficient permission to perform operations on WebSphere Application Server.

5. On the left navigational pane, expand Application and then click New Application.

6. On the Path to the new application panel, do one of the following depending from where the WebSphere Admin console is launched:
   - If from the local system, select Local file system and then enter the path of the IDSWebApp.war file in the Full path field. You can also click Browse to specify the path.
   - If from a remote system, select Remote file system and then enter the path of the IDSWebApp.war file in the Full path field. You can also click Browse to specify the path.

7. On the How do you want to install the application panel, select the option you want and click Next. In this example, the Fast Path option is selected.

8. On the Select installation options panel, the default options are selected. Click Next.
10. On the Map modules to server panel, user can map modules to the servers specified in the Clusters and servers field. Select the check box for the required module and then click Apply. After the mapping is done, click Next.

11. On the Map virtual hosts for Web modules panel, user can map the Web application to the specific virtual servers. If there are more virtual hosts, it requires knowledge of the WebSphere environment to select the right module. In this example, there is only one default_host option is available for selection. Click Next.

12. On the Map context roots for Web modules, enter a context root in the field. For example, /IDSWebApp.

13. A summary of options you selected is displayed. Click Finish.

14. This initiates the installation of your application. A summary of installation is displayed.

15. To start the application, you must first save the changes to the master configuration. Click Save.

16. On the left navigational pane, expand Applications and then click WebSphere enterprise applications under Application Types.

17. To start the application, from the Enterprise Applications panel select the check box adjacent to IDSWebApp_war and click Start.

18. Start the Web Administration Tool (for example, through the Administrative Console).

19. Now to launch the Web Administration Tool from a Web browser, type the following address:
   - For HTTP, type: http://<localhost>:<WAS_http_port>/IDSWebApp
   - For HTTPS, type: https://<localhost>:<WAS_https_port>/IDSWebApp

By default, the HTTP port is 9080, and the HTTPS port is 9443.

The Tivoli Directory Server Web Administration login page window is displayed.

Note: This address works only if you are running the browser on the computer on which the Web Administration Tool is installed. If the Web Administration Tool is installed on a different computer, replace localhost with the hostname or IP address of the computer where the Web Administration Tool is installed.

If Global or Administrative security is turned on for Websphere Application Server and SSL must be enabled for the Web Administration Tool when deploying the Web Administration Tool into Websphere Application Server, user can use one of the following approaches:
   - Deploy the Web Administration Tool into a new profile.
   - If it is not possible to deploy the Web Administration Tool into a new profile, user must add the directory server’s certificate to the profile’s trust store. Additionally, for server-client authentication user must add the Websphere Application Server profile certificate to the directory server’s trust store.
Appendix J. Updating the ldapdb.properties file

When you create a new full directory server instance, the version of DB2 used to create the instance is determined by the value specified in the ldapdb.properties file in the installpath\etc directory (installpath is the path where you installed Tivoli Directory Server 6.3). If you install a newer supported DB2 level after installing Tivoli Directory Server and you want a newly created instance to use the new version of DB2, you must update this file.

When a full directory server instance is created, an ldapdb.properties file is also created for that instance. This ldapdb.properties file is stored with the files of the instance.

- On Windows systems, the file is X:\idsslapd-instance_name\etc\ldapdb.properties, where X is the drive that you specify during instance creation.
- On AIX, Linux, and Solaris systems, the file is instance_home/idsslapd-instance_name/etc/ldapdb.properties, by default.

If you have installed a newer version of DB2 and migrated your database instance to the newer version, you must update the ldapdb.properties file associated with that instance.

**Note:** If you are upgrading from an earlier version of Tivoli Directory Server that also performs an implicit DB2 upgrade, the upgrade makes all necessary updates to the ldapdb.properties file. This information is only for DB2 level changes outside of a Tivoli Directory Server release upgrade.

The ldapdb.properties file has two keywords: currentDB2InstallPath and currentDB2Version. Each keyword is on its own line.

If the example contents of the ldapdb.properties file is as follows (before installing of newer version of DB2):

```
currentDB2InstallPath=/opt/ibm/db2/V9.1
currentDB2Version=9.1.0
```

To update the ldapdb.properties file:

1. Make a backup copy of the current file.
2. After you have installed the newer version of DB2 (after ensuring that it is supported by Tivoli Directory Server 6.3), migrate the DB2 database associated with the instance using the DB2 instructions.
3. Go to the directory where the newer version of DB2 is installed and run the `db2level` command. For example:

```
# /opt/ibm/db2/V9.7/bin/db2level
```

Example output is as follows:

```
DB21085I Instance "myinst1" uses "64" bits and DB2 code release "SQL09071" with level identifier "00020107".
Informational tokens are "DB2 v9.7.0.1", "s091114", "IP23035", and Fix Pack "1".
Product is installed at "/opt/ibm/db2/V9.7".
```

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Update the ldapdb.properties file. Use the "Install Path" information to update the currentDB2InstallPath field, and the "Level" information to update the currentDB2Version field. Using the example, you would change the contents of your ldapdb.properties file to the following:

```properties
currentDB2InstallPath=/opt/ibm/db2/V9.7
currentDB2Version=9.7.0.1
```
## Appendix K. ASCII characters from 33 to 126

The following table shows ASCII characters from 33 to 126. These are the characters that can be used in the encryption seed string.

<table>
<thead>
<tr>
<th>ASCII code</th>
<th>Character</th>
<th>ASCII code</th>
<th>Character</th>
<th>ASCII code</th>
<th>Character</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>! exclamation point</td>
<td>34</td>
<td>&quot; double quotation</td>
<td>35</td>
<td># number sign</td>
</tr>
<tr>
<td>36</td>
<td>$ dollar sign</td>
<td>37</td>
<td>% percent sign</td>
<td>38</td>
<td>&amp; ampersand</td>
</tr>
<tr>
<td>39</td>
<td>' apostrophe</td>
<td>40</td>
<td>( left parenthesis</td>
<td>41</td>
<td>) right parenthesis</td>
</tr>
<tr>
<td>42</td>
<td>* asterisk</td>
<td>43</td>
<td>+ plus sign</td>
<td>44</td>
<td>, comma</td>
</tr>
<tr>
<td>45</td>
<td>- hyphen</td>
<td>46</td>
<td>. period</td>
<td>47</td>
<td>/ slash</td>
</tr>
<tr>
<td>48</td>
<td>0</td>
<td>49</td>
<td>1</td>
<td>50</td>
<td>2</td>
</tr>
<tr>
<td>51</td>
<td>3</td>
<td>52</td>
<td>4</td>
<td>53</td>
<td>5</td>
</tr>
<tr>
<td>54</td>
<td>6</td>
<td>55</td>
<td>7</td>
<td>56</td>
<td>8</td>
</tr>
<tr>
<td>57</td>
<td>9 colon</td>
<td>58</td>
<td>: colon</td>
<td>59</td>
<td>; semicolon</td>
</tr>
<tr>
<td>60</td>
<td>&lt; less-than sign</td>
<td>61</td>
<td>= equals sign</td>
<td>62</td>
<td>&gt; greater-than sign</td>
</tr>
<tr>
<td>63</td>
<td>? question mark</td>
<td>64</td>
<td>@ at sign</td>
<td>65</td>
<td>A uppercase a</td>
</tr>
<tr>
<td>66</td>
<td>B uppercase b</td>
<td>67</td>
<td>C uppercase c</td>
<td>68</td>
<td>D uppercase d</td>
</tr>
<tr>
<td>69</td>
<td>E uppercase e</td>
<td>70</td>
<td>F uppercase f</td>
<td>71</td>
<td>G uppercase g</td>
</tr>
<tr>
<td>72</td>
<td>H uppercase h</td>
<td>73</td>
<td>I uppercase i</td>
<td>74</td>
<td>J uppercase j</td>
</tr>
<tr>
<td>75</td>
<td>K uppercase k</td>
<td>76</td>
<td>L uppercase l</td>
<td>77</td>
<td>M uppercase m</td>
</tr>
<tr>
<td>78</td>
<td>N uppercase n</td>
<td>79</td>
<td>O uppercase o</td>
<td>80</td>
<td>P uppercase p</td>
</tr>
<tr>
<td>81</td>
<td>Q uppercase q</td>
<td>82</td>
<td>R uppercase r</td>
<td>83</td>
<td>S uppercase s</td>
</tr>
<tr>
<td>84</td>
<td>T uppercase t</td>
<td>85</td>
<td>U uppercase u</td>
<td>86</td>
<td>V uppercase v</td>
</tr>
<tr>
<td>87</td>
<td>W uppercase w</td>
<td>88</td>
<td>X uppercase x</td>
<td>89</td>
<td>Y uppercase y</td>
</tr>
<tr>
<td>90</td>
<td>Z uppercase z</td>
<td>91</td>
<td>[ left square bracket</td>
<td>92</td>
<td>\ backslash</td>
</tr>
<tr>
<td>93</td>
<td>] right square bracket</td>
<td>94</td>
<td>^ caret</td>
<td>95</td>
<td>_ underscore</td>
</tr>
<tr>
<td>96</td>
<td>` grave accent</td>
<td>97</td>
<td>a lowercase a</td>
<td>98</td>
<td>b lowercase b</td>
</tr>
<tr>
<td>99</td>
<td>c lowercase c</td>
<td>100</td>
<td>d lowercase d</td>
<td>101</td>
<td>e lowercase e</td>
</tr>
<tr>
<td>102</td>
<td>f lowercase f</td>
<td>103</td>
<td>g lowercase g</td>
<td>104</td>
<td>h lowercase h</td>
</tr>
<tr>
<td>105</td>
<td>i lowercase i</td>
<td>106</td>
<td>j lowercase j</td>
<td>107</td>
<td>k lowercase k</td>
</tr>
<tr>
<td>108</td>
<td>l lowercase l</td>
<td>109</td>
<td>m lowercase m</td>
<td>110</td>
<td>n lowercase n</td>
</tr>
<tr>
<td>111</td>
<td>o lowercase o</td>
<td>112</td>
<td>p lowercase p</td>
<td>113</td>
<td>q lowercase q</td>
</tr>
<tr>
<td>114</td>
<td>r lowercase r</td>
<td>115</td>
<td>s lowercase s</td>
<td>116</td>
<td>t lowercase t</td>
</tr>
<tr>
<td>117</td>
<td>u lowercase u</td>
<td>118</td>
<td>v lowercase v</td>
<td>119</td>
<td>w lowercase w</td>
</tr>
<tr>
<td>120</td>
<td>x lowercase x</td>
<td>121</td>
<td>y lowercase y</td>
<td>122</td>
<td>z lowercase z</td>
</tr>
<tr>
<td>123</td>
<td>{ left curly brace</td>
<td>124</td>
<td>l vertical bar</td>
<td>125</td>
<td>} right curly brace</td>
</tr>
<tr>
<td>126</td>
<td>~ tilde</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix L. Information for bundlers

If you produce a product that bundles Tivoli Directory Server, use the information in this appendix:

How to install silently

To install Tivoli Directory Server and its corequisite products, such as DB2, silently:

On Windows systems:
Use the silent installation provided with Tivoli Directory Server. See Chapter 12, “Installing and uninstalling silently on Windows systems,” on page 83 for instructions.

On AIX, Linux, Solaris, and HP-UX (Itanium) systems:

Note: Silent installation using the Tivoli Directory Server InstallShield GUI installation is not supported on AIX, Linux, and Solaris systems.

• If you want to use InstallShield for multi-platforms to build your installation program, you can use the native install beans provided by InstallShield for multi-platforms to bundle and launch native installation of the Tivoli Directory Server native packages for the appropriate operating system.

• To use native operating system commands to install the native installation packages, you can launch a script during your installation that runs the native commands.

For information about the native installation packages for each operating system, see one of the following:

• Chapter 8, “Installing Tivoli Directory Server using AIX utilities,” on page 57
• Chapter 9, “Installing Tivoli Directory Server using Linux utilities,” on page 69
• Chapter 10, “Installing Tivoli Directory Server using Solaris utilities,” on page 75
• Chapter 11, “Installing Tivoli Directory Server clients using HP-UX utilities,” on page 81

Environment variable for silent installation with native packages

To install Tivoli Directory Server using the native installation packages, you must set the environment variable IBMLDAP_INSTALL_SILENT to yes. If you do not set this environment variable, the installation might hang when an echo or prompt statement in the native package is reached.

Note: This does not apply to Solaris or HP-UX (Itanium) systems.

Starting the instance administration tool in migration mode

If you are migrating from a Tivoli Directory Server 6.0 directory server instance to a Tivoli Directory Server 6.3 directory server instance, you can start the Instance Administration Tool in migration mode. The command for starting the Instance Administration Tool in this way is:
/opt/ibm/ldap/V6.3/sbin/idsxinst -migrate path

where path is the path where the backed-up configuration and schema files are stored.

The first window displayed in the Instance Administration Tool when you start the tool in migration mode is the Create new directory server instance window with fields completed from the backed-up files.
Appendix M. Installing and configuring DSML

Directory Services Markup Language (DSML) is installed as a .zip file named DSML.zip in the installpath/idstools (or installpath\idstools for Windows systems) directory when you install the Web Administration Tool. After you unzip the DSML.zip file, documentation files are available that tell you how to install, configure, and use DSML. These files are:

- **DSMLReadme.txt**
  Describes the files in the package and tells you how to install and configure DSML.

- **dsml.pdf**
  Describes how to use DSML. This file is in PDF format.

- **dsml.htm**
  Describes how to use DSML, in HTML format.
Appendix N. Loading the sample LDIF file into the database

Use the following procedure to load the database with data in the sample LDIF file.

1. Start the Configuration Tool if it is not already started. See “Starting and using the IBM Tivoli Directory Server Configuration Tool (idsxcfg)” on page 121 for instructions.

2. If you created a directory server instance that is not the default directory server instance, create the o=sample suffix by using the following steps. (If you created the default directory server instance, this suffix is already created.)
   a. In the task list on the left navigational pane of the Configuration Tool, click Manage suffixes.
   b. In the SuffixDN field of the Manage suffixes window, type o=sample. This is the suffix DN that will hold the sample data. Because the sample data is part of the suffix o=sample, this is the suffix DN you must add.
   c. Click Add.
   d. Click OK.

   Note: When you click Add, the suffix is added to the list in the Current suffix DNs box; however, the suffix is not actually added until you click OK.

3. In the Configuration Tool, click Import LDIF data in the task list on the left.

4. In the Import LDIF data window on the right, in the Path and LDIF file name field, type one of the following:
   • install_dir\examples\sample.ldif on Windows systems. install_dir is the directory where you installed Tivoli Directory Server. By default on Windows systems, this directory is C:\Program Files\IBM\LDAP\V6.3.
   • /opt/IBM/ldap/V6.3/examples/sample.ldif on AIX and Solaris systems.
   • /opt/ibm/ldap/V6.3/examples/sample.ldif on Linux systems.

   Alternatively, you can click Browse to locate the file.

5. Click Standard import.

6. Click Import. (Scroll down to see the Import button if it is not visible.)

7. Click OK.

   Note: As an alternative, you can use:
   • The idscfgsuf command to add the suffix:
     idscfgsuf -s "o=sample"
   • The idsldif2db utility to import the data. For example,
     idsldif2db -i install_dir\examples\sample.ldif -I myinstance

     where myinstance is the name of the directory server instance.

8. After processing is complete, click Close.

9. To start the directory server instance:
   a. Go to the sbin subdirectory of the directory where you installed Tivoli Directory Server.
   b. If you have only one directory server instance, type idss1apd at a command prompt. If you have more than one directory server instance, type
idsslapd -I instancename

where *instancename* is the name of the instance you want to start.

Messages are displayed while the server is starting. The following message is
displayed if the server starts successfully:

IBM Tivoli Directory, Version 6.3 Server started.

You have verified that the sample database is loaded correctly and that the
installation is successful.

Use the instructions in "Starting the Web Administration Tool" on page 158 to start
the Web Administration Tool if you installed it. See the *IBM Tivoli Directory Server
Version 6.3 Administration Guide* for information about using the Web
Administration Tool and using the server.
Appendix O. UTF-8 support

Tivoli Directory Server supports a wide variety of national language characters through the UTF-8 (UCS Transformation Format) character set. As specified for the LDAP Version 3 protocol, all character data that is passed between an LDAP client and a server is in UTF-8. Consequently, the directory server can be configured to store any national language characters that can be represented in UTF-8. The limitations on what types of characters can be stored and searched for are determined by how the database is created. The database character set can be specified as UTF-8 or it can be set to use the server system’s local character set (based on the locale, language, and code page environment).

If you specify UTF-8, you can store any UTF-8 character data in the directory. LDAP clients running anywhere in the world (in any UTF-8 supported language) can access and search the directory. In many cases, however, the client has limited ability to properly display the results retrieved from the directory in a particular language/character set. There is also a performance advantage to using a UTF-8 database because no data conversion is required when storing data to or retrieving data from the database.

Note: If you want to use language tags, the database must be a UTF-8 database.

Why choose anything other than UTF-8?

A UTF-8 database has a fixed collation sequence. That sequence is the binary order of the UTF-8 characters. It is not possible to do language-sensitive collation with a UTF-8 database.

If it is important to your LDAP applications or users to get results for a search using an ordering filter (for example, “name >= SMITH”) or any search specifying the control to sort the results as they would expect for their native language, then UTF-8 might not be the appropriate character set for their directory database. In that instance, the LDAP server system and all client systems should run using the same character set and locale. For example, an LDAP server running in a Spanish locale with a database created using that locale returns results of searches based on character ordering, as Spanish-language clients would expect. This configuration does limit your directory user community to a single end-user character set and collation sequence.

Server utilities

Manual creation of an LDIF file containing UTF-8 values is difficult. To simplify this process, a charset extension to the LDIF format is supported. This extension allows an Internet Assigned Numbers Authority (IANA) character set name to be specified in the header of the LDIF file (along with the version number). A limited set of the IANA character sets are supported.

Examples

You can use the optional charset tag so that the server utilities automatically convert from the specified character set to UTF-8 as in the following example:
In this instance, all values following an attribute name and a single colon are translated from the ISO-8859-1 character set to UTF-8. Values following an attribute name and a double colon (such as description:: V2hhdCBhIGNhcm... ) should be base 64-encoded, and are expected to be either binary or UTF-8 character strings. Values read from a file, such as the jpegPhoto attribute specified by the Web address in the example above, are also expected to be either binary or UTF-8. No translation from the specified "charset" to UTF-8 is done on those values.

In this example of an LDIF file without the charset tag, content is expected to be in UTF-8:

```
# IBM IBM Directorysample LDIF file
# # The suffix "o=sample" should be defined before attempting to load
# this data.

version: 1

dn: o=sample
objectclass: top
objectclass: organization
o: sample

dn: ou=Austin, o=sample
ou: Austin
objectclass: organizationalUnit
seealso: cn=Mary Smith, ou=Austin, o=sample

This same file could be used without the version: 1 header information, as in previous releases of Tivoli Directory Server:

```
# IBM IBM Directorysample LDIF file
# # The suffix "o=sample" should be defined before attempting to load
# this data.

version: 1

dn: o=sample
objectclass: top
objectclass: organization
o: sample

dn: ou=Austin, o=sample
ou: Austin
objectclass: organizationalUnit
seealso: cn=Mary Smith, ou=Austin, o=sample
```

**Supported IANA character sets**

Tivoli Directory Server supports the Internet Assigned Number Authority (IANA) character set names by platform, as shown in the following table. These are the character set names that can be specified in an LDIF file or using the C-client interface to identify the character set of input data to be used with the directory.
Go to [http://www.iana.org/assignments/character-sets](http://www.iana.org/assignments/character-sets) for more information about IANA-registered character sets.

Table 10. IANA-defined character sets

<table>
<thead>
<tr>
<th>Character Set Name</th>
<th>HP-UX</th>
<th>Linux, Linux_390, Windows</th>
<th>AIX</th>
<th>Solaris</th>
<th>UNIX</th>
<th>Windows</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO-8859-1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>819</td>
</tr>
<tr>
<td>ISO-8859-2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>912</td>
</tr>
<tr>
<td>ISO-8859-5</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>915</td>
</tr>
<tr>
<td>ISO-8859-6</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>1089</td>
</tr>
<tr>
<td>ISO-8859-7</td>
<td>X</td>
<td>X</td>
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Notes:
1. The Chinese character set standard (GB18030) is supported with appropriate patches available from www.sun.com and www.microsoft.com
2. On Windows operating systems, you must set the environment variable zhCNGB18030=TRUE.
Appendix P. Installing and uninstalling GSKit manually on Windows operating systems

If you install Tivoli Directory Server using silent installation, and have not opted for GSKit installation, you can use the following procedure to install it.

To install GSKit 8:
1. Change directories to the \gskit directory on the Tivoli Directory Server DVD or the tdsV6.3\gskit subdirectory of the directory where you unzipped the Tivoli Directory Server .zip file as you need to decompress these files to get access to the GSKit installers.
2. The following installation packages are available for 32-bit and 64-bit Windows operating systems.
   - **For 32-bit Windows systems**
     - gsk8crypt32.exe: GSKit Crypt install package is required for low level encryption support.
     - gsk8ssl32.exe: GSKit SSL install package is required for SSL handshake operations. GSKit Crypt package is a prerequisite for GSKit SSL package.
   - **For 64-bit Windows systems**
     - gsk8crypt64.exe: GSKit Crypt install package is required for low level encryption support.
     - gsk8ssl64.exe: GSKit SSL install package is required for SSL handshake operations. GSKit Crypt package is a prerequisite for GSKit SSL package.
3. Run one of the following commands.
   - To install using the GSKit8 GUI Install Wizard on 32-bit Windows systems:
     a. Go to the folder where the GSKit8 package is stored.
     b. Double-click the GSKit8 Crypt installation package. For example, gsk8crypt32.exe. On the GSKit8 Crypt InstallShield Wizard, do the following:
        1) Specify the path to install GSKit8 Crypt, for example C:\Program Files\IBM\gsk8. Click Next.
        2) Click Install.
        3) Click Finish.
     c. Double-click the GSKit8 SSL installation package. For example, gsk8ssl32.exe. On the GSKit8 SSL InstallShield Wizard, do the following:
        1) Specify the path to install GSKit8 SSL, for example C:\Program Files\IBM\gsk8. Click Next.
        2) Click Install.
        3) Click Finish.
   - To install GSKit8 in silent mode on a 32-bit Windows system, run the following command:
     ```
gsk8crypt32.exe /s /v"/quiet"
gsk8ssl32.exe /s /v"/quiet"
```
4. Set system variable for the Windows system. To run GSKit executables files from the command line, you need to set the PATH environment variable to point to the GSKit bin, and lib directories. For x86 Windows systems, you set the path using the following:

```
set PATH="C:\Program Files\ibm\gsk8\bin";%PATH%
set PATH="C:\Program Files\ibm\gsk8\lib";%PATH%
```

**Note:** For Windows x86_64, the library path should be `lib64`.

See Appendix Q, “Setting up GSKit to support CMS key databases,” on page 223 for more information about setting up GSKit after installation.

## Removing GSKit

To remove GSKit8, run one of the following commands:

- For silent uninstall of GSKit8, you must have access to the GSKit8 installation binary. For example, to perform a silent uninstall of GSKit SSL and GSKit Crypt package from a 32-bit Windows system, run the following command:

  ```
gsk8ssl32.exe /s /x /v"/quiet"
gsk8crypt32.exe /s /x /v"/quiet"
  ```

- Use **Add or Remove Programs** in the Control Panel.
Appendix Q. Setting up GSKit to support CMS key databases

To set up GSKit to support Certificate Management Services (CMS) key databases using the iKeyman GUI, complete the following procedure before starting the GUI:

1. Ensure that you have installed GSKit version 8.
2. Set JAVA_HOME to point to the java subdirectory of the Tivoli Directory Server installation directory.
3. Ensure that the local_policy.jar and US_export_policy.jar files are present in $JAVA_HOME/jre/lib/security.
4. Depending on your setup, do one of the following:

   **Configure Java Runtime Environment 1.6 (platforms other than Solaris and HP-UX (Itanium))**
   - In the $JAVA_HOME/jre/lib/security/java.security file, check if the following entry to register the CMS provider is present. If the entry does not exist, add this entry in the java.security file by entering the following:
     ```
     security.provider.X=com.ibm.security.cmskeystore.CMSProvider
     ...
     ```
     where, X is the next number in the order.

   **Configure Java Runtime Environment 1.6 with FIPS support (platforms other than Solaris and HP-UX (Itanium))**
   - In the $JAVA_HOME/jre/lib/security/java.security file, check if the following entries to register the CMS provider and IBM JCE FIPS security provider are present. If the entries do not exist, add these entries in the java.security file by entering the following:
     ```
     security.provider.X=com.ibm.security.cmskeystore.CMSProvider
     security.provider.X+1=com.ibm.crypto.fips.provider.IBMJCEFIPS
     ...
     ```
     where, X is the next number in the order.

   **Configure Java Runtime Environment 1.6 with PKCS#11 crypto hardware support (platforms other than Solaris and HP-UX (Itanium))**
   - a. Obtain the pkcs#11 native support libraries from your crypto card vendor.
   - b. In the $JAVA_HOME/jre/lib/security/java.security file, check if the following entry to register the CMS provider is present. If the entry does not exist, add this entry in the java.security file by entering the following:
     ```
     security.provider.X=com.ibm.security.cmskeystore.CMSProvider
     ...
     ```
     where, X is the next number in the order.

   **Configure Java Runtime Environment 1.6 with FIPS support and PKCS#11 crypto hardware support (platforms other than Solaris and HP-UX (Itanium))**
   - a. Obtain the pkcs#11 native support libraries from your crypto card vendor.
   - b. In the $JAVA_HOME/jre/lib/security/java.security file, check if the following entries to register the CMS provider and IBM JCE FIPS
security provider are present. If the entries do not exist, add these entries in the java.security file by entering the following:

security.provider.X=com.ibm.security.cmskeystore.CMSProvider
security.provider.X+1=com.ibm.crypto.fips.provider.IBMJCEFIPS
...

where, X is the next number in the order.

**Configure Java Runtime Environment 1.6 (Solaris and HP-UX (Itanium) platforms)**

In the $JAVA_HOME/jre/lib/security/java.security file, check if the following entry to register the CMS provider is present. If the entry does not exist, add this entry in the java.security file by entering the following:

security.provider.X=com.ibm.security.cmskeystore.CMSProvider
...

where, X is the next number in the order.

Read the file located at $JAVA_HOME/docs/READMEFIRST.

**Configure Java Runtime Environment 1.6 with FIPS support (IBM JRE for Solaris and HP-UX (Itanium) platforms)**

In the $JAVA_HOME/jre/lib/security/java.security file, check if the following entries to register the CMS provider and IBM JCE FIPS security provider are present. If the entries do not exist, add these entries in the java.security file by entering the following:

security.provider.X=com.ibm.security.cmskeystore.CMSProvider
security.provider.X+1=com.ibm.crypto.fips.provider.IBMJCEFIPS
...

where, X is the next number in the order.

Read the file located at $JAVA_HOME/docs/READMEFIRST.

**Configure Java Runtime Environment 1.6 with PKCS#11 crypto hardware support (IBM JRE for Solaris and HP-UX (Itanium) platforms)**

a. Obtain the pkcs#11 native support libraries from your crypto card vendor.

b. In the $JAVA_HOME/jre/lib/security/java.security file, check if the following entry to register the CMS provider is present. If the entry does not exist, add this entry in the java.security file by entering the following:

security.provider.X=com.ibm.security.cmskeystore.CMSProvider
...

where, X is the next number in the order.

c. Read the file located at $JAVA_HOME/docs/READMEFIRST.

**Configure Java Runtime Environment 1.6 with FIPS support and PKCS#11 crypto hardware support (IBM JRE for Solaris and HP-UX (Itanium) platforms)**

a. Obtain the pkcs#11 native support libraries from your crypto card vendor.

b. In the $JAVA_HOME/jre/lib/security/java.security file, check if the following entries to register the CMS provider and IBM JCE FIPS...
security provider are present. If the entries do not exist, add these entries in the java.security file by entering the following:

```
security.provider.X=com.ibm.security.cmskeystore.CMSProvider
security.provider.X+1=com.ibm.crypto.fips.provider.IBMJCEFIPS
...
```

where, X is the next number in the order.

c. Read the file located at $JAVA_HOME/docs/READMEFIRST.
Appendix R. Accessibility features for Tivoli Directory Server

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use information technology products successfully. The major accessibility features in this product enable users to do the following:

- Use assistive technologies, such as screen-reader software, to hear what is displayed on the screen. Consult the product documentation of the assistive technology for details on using those technologies with this product.
- Operate specific or equivalent features using only the keyboard.
- Magnify what is displayed on the screen.

In addition, the product documentation was modified to include the following features to aid accessibility:

- All documentation is available in HTML formats to give the maximum opportunity for users to apply screen-reader software.
- All images in the documentation are provided with alternative text so that users with vision impairments can understand the contents of the images.

Accessibility

The following list includes the major accessibility features in Tivoli Directory Server.

- Supports keyboard-only operation
- Supports interfaces commonly used by screen readers
- Keys are tactiley discernible and do not activate just by touching them

The IBM Tivoli Directory Server Information Center, and its related publications are accessibility-enabled. The accessibility features of the information center are described in the information center.

Keyboard navigation

Standard shortcut and accelerator keys are used by the product and are documented by the operating system. Refer to the documentation provided by your operating system for more information.

This product uses standard Microsoft® Windows navigation keys.

Magnifying what is displayed on the screen

You can enlarge information on the product windows using facilities provided by the operating systems on which the product is run. For example, in a Microsoft Windows environment, you can lower the resolution of the screen to enlarge the font sizes of the text on the screen. Refer to the documentation provided by your operating system for more information.

IBM and accessibility

See the IBM Human Ability and Accessibility Center for more information about the commitment that IBM has to accessibility:

http://www.ibm.com/able
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