



# IBM Directory Server Version 4.1 Installation and Configuration Guide for Multiplatforms





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**Note**

Before using this information and the product it supports, read the general information under Appendix F, "Notices" on page 115.

**First Edition (April 2002)**

This edition applies to version 4, release 1, of The IBM® Directory and to all subsequent releases and modifications until otherwise indicated in new editions.

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## Preface

This document describes how to install, configure, and remove the IBM Directory. Please check Chapter 2, "System requirements" on page 3 before you install.



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## Chapter 1. Installation, configuration, and migration overview

This chapter briefly describes the recommended installation, configuration and migration procedures for IBM Directory version 4.1.

If you have a pre-existing version of Lightweight Directory Access Protocol (LDAP) from a vendor other than IBM, you must remove it before installing the IBM Directory. If you attempt to install the IBM Directory without removing the other vendor's version, the resulting file name conflicts might prevent either version from working.

If you have IBM SecureWay® Directory Version 3.1.1.5, Version 3.2 or Version 3.2.2 installed and you want to migrate your data, see Chapter 11, "Migration" on page 57 before beginning the installation process for the IBM Directory 4.1.

**Attention:** If you have SecureWay Directory Version 3.1.1.5 currently installed and you want to migrate your data, you must upgrade to level 3.2.2 before installing IBM Directory 4.1. You can download SecureWay Directory version 3.2.2 from the IBM SecureWay Directory Web site: <http://www-4.ibm.com/software/network/directory/downloads/>.

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### Installation

You can install either the IBM Directory client or the IBM Directory server that includes the client.

IBM Directory 4.1 has several installation options. You can install using an InstallShield Graphical User Interface (GUI), or use platform-specific installation methods, such as the command line or smitty. Instructions for using the InstallShield GUI are found in Chapter 3, "Common installation using InstallShield GUI" on page 11.

For platform-specific installation instructions, see the Installation chapter for the platform for which you are installing. For example, "**Installing using AIX® Utilities**"

**Notes:**

1. InstallShield GUI installation is not available for HP-UX, Linux 390 or TurboLinux operating systems.
2. Do not use special characters, such as "-" and "." in the name of the installation directory for IBM Directory. If you do not choose the default location for the software installation, choose a name such as "ldap" or "ldapdir". Do not choose a name such as "ldap-dir" or "ldap.dir".

See Chapter 2, "System requirements" on page 3 for any prerequisites.

---

### Configuration

You can use either the Server Administration (**ldapxcfg**) or the **ldapcfg** command-line utility to configure the IBM Directory server.

**Note:** Web server configuration does not apply to Linux and HP-UX operating systems.

For either the **ldapxcfg** or the **ldapcfg** program, IBM Directory server configuration consists of three parts:

- Defining the IBM Directory administrator distinguished name (DN) and a password. This operation can be compared to defining the root user ID and password on a UNIX<sup>®</sup> system. DNs are not case sensitive. If you are unfamiliar with X.500 format, or if for any other reason you do not want to define a new DN, accept the default DN. You need to define a password.
- Modifying a Web server configuration to access the IBM Directory Web administration pages.
- Configuring the database.

For configuration of a Web server, verify that the Web server is installed. You also need to know:

- The name of the Web server that you are using
- The full path and name of the configuration file for the Web server

Instructions for configuring using **ldapxcfg** and **ldapcfg** are found in Chapter 9, “Configuration” on page 45.

---

## Migration

If you have a previous version of the IBM Directory, for example SecureWay 3.2.2, migration is necessary to preserve any changes that you have made to the schema definitions and to preserve your directory server configuration. Use the migration procedures in Chapter 11, “Migration” on page 57.

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## Chapter 2. System requirements

To install the IBM Directory, administer the IBM Directory server, and use the Global Security Kit (GSKit), your computer must meet the following minimum system requirements.

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### For IBM Directory client:

#### AIX operating system

Before installing, see the client README file in the root directory of the CD for the latest information on supported versions of AIX operating system. After installing, the README file is located in `/usr/ldap/web/<lang>/readme/client.txt` or `/usr/ldap/web/<lang>/readme/client.pdf`, or using a Web browser, at `/usr/ldap/web/<lang>/readme/client.htm`.

- A minimum of 128 MB RAM (256 MB is strongly recommended).
- If installing either `ldap.server.cfg` or `ldap.client.dmt` on AIX 4.3.3 or later, the following filesets and fixes must be installed:
  - X11.adt.lib 4.3.3.10
  - X11.adt.motif 4.3.3.0

**Note:** The IBM AIX Developer Kit, Java™ Technology Preview Edition, Version 1.3.0 requires AIX 4.3.3.10 (or later). You need to install the 4330-02 or later (for example 4330-03 ) Recommended Maintenance package. You can order the 4330-02 package (or download required filesets from the FixDist Web site) with APAR IY06844. You can also get it on the 2/2000 Update CD that is shipped with AIX. In the United States, you can call IBM at 800-879-2755 and request a refresh of the AIX 4.3.3 media.

To check the current level of `bos.rte.libc`, using the following command:

```
lslpp -ah bos.rte.libc
```

#### Hewlett-Packard UNIX (HP-UX) operating system

Before installing, see the client README file in the root directory of the CD for the latest information on supported versions of HP-UX operating system. After installing, the README file is located in `/usr/ldap/web/<lang>/readme/client.txt` or `/usr/ldap/web/<lang>/readme/client.pdf`, or using a Web browser, at `/usr/ldap/web/<lang>/readme/client.htm`.

- Hewlett-Packard UNIX (HP-UX) 11.0 or later.
- A minimum of 128 MB RAM. (256 MB is strongly recommended).

#### Linux operating system

Before installing, see the client README file in the root directory of the CD for the latest information on supported versions of Linux operating system. After installing, the README file is located in `/usr/ldap/web/<lang>/readme/client.txt` or `/usr/ldap/web/<lang>/readme/client.pdf`, or using a Web browser, at `/usr/ldap/web/<lang>/readme/client.htm`.

- Linux Operating System from Red Hat Version 7.1 or later, SuSE Version 7.2 or later, or Turbolinux Version 6.5 or later.
- A minimum of 128 MB RAM (256 MB or more is strongly recommended).

- The latest levels of glibc (Red Hat 7.1 systems only). To get the latest levels of glibc, download the following files in order from the Red Hat Web site:
  1. glibc-2.2.4-19.3.i686.html
  2. glibc-devel-2.2.4-19.3.i386.html
  3. glibc-2.2.4-19.3.i686.html

## Solaris operating system

Before installing, see the client README file in the root directory of the CD for the latest information on supported versions of Solaris operating system. After installing, the README file is located in `/opt/IBM1daps/web/<LANG>/readme/client.pdf`, or using a Web browser, `/opt/IBM1daps/web/<LANG>/readme/client.htm`.

- Solaris Operating Environment(TM) Software versions 7 and 8 or later. On Solaris 7, the following patch levels are required to run the Directory Management Tool on the client and server. They are also needed to run the LDAP configuration programs (`ldapcfg`, `ldapxcfg`, `ldapucfg`) on the server:
  - 109104-01 (needed for 106541-12)
  - 107544-02 (needed for 106541-12)
  - 106541-12 (needed for 106980-13)
  - 106980-13
  - 107081-22
  - 107636-05
  - 108376-07 (needed for Asian locales only)
  - 107544-03 109104-04 X11.adt.lib 4.3.3.0

**Note:** You can download Solaris operating system patches directory from Sun Microsystems, Inc. at the following Web site:

<http://sunsolve.Sun.COM>

In order for Java 1.3 to function correctly, Solaris Operating Environment(TM) Software Version 7 and Solaris 8 require patches. For the latest information about recommended and required patches for the Java 2 SDK, go to the following Web site:

<http://java.sun.com/>.

- A minimum of 128 MB RAM. (256 MB is strongly recommended.)
- Ensure that the code page conversion routines (`en_US.UTF-8 1.0`) are installed.
- GSKit5 at a level of 5.0.4 or later.

## Windows<sup>®</sup> 98, Windows 2000 or Windows NT operating systems

Before installing, see the client README file in the root directory of the CD for the latest information on supported versions of Windows 98, Windows 2000 or Windows NT<sup>®</sup> operating systems. After installing, the README file is located in `/usr/ldap/web/<lang>/readme/client.txt` or `/usr/ldap/web/<lang>/readme/client.pdf`, or using a Web browser, at `/usr/ldap/web/<lang>/readme/client.htm`.

- Microsoft<sup>®</sup> Windows 98, Windows 2000 or Windows NT 4.0 with Service Pack 4 or higher; a Windows NT file system (NTFS) is required for security support.

- A minimum of 128 MB RAM (256 MB is strongly recommended).

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## For IBM Directory server (including the client):

### AIX operating system

Update the ldap.client.rte fileset and see the server README file on the root directory of the CD. After you install, the README is located in /usr/ldap/web/<lang>/readme/server.txt or /usr/ldap/web/<lang>/readme/server.pdf, or using a Web browser, at /usr/ldap/web/<lang>/readme/server.htm.

In addition to the client requirements, the server requires the following:

- A minimum of 256 MB RAM (512 MB or more is strongly recommended).
- One of the following Web servers (or a later version) installed and configured:
  - IBM HTTP Server 1.3.12 (IBM HTTP Server 1.3.19 is included with IBM Directory)
  - Lotus® Domino™ Enterprise 5.0.2b Webserver™
  - Apache Server 1.3.12
  - iPlanet FastTrack Server 3.01
  - iPlanet Enterprise Server 3.6.3, 4.0
- DB2® Universal Database for AIX version 7.2 Enterprise Edition (DB2) is included with the IBM Directory, although DB2 version 7.1 with Fix Pack 3, is also supported. If you have a version of DB2 earlier than 7.1 with Fix Pack 3, you must remove it or upgrade it before installing the IBM Directory Version 4.1.

**Attention:** If you have a 3.2.x version of SecureWay Directory installed, read and understand the migration process in Chapter 11, “Migration” on page 57 before removing or upgrading DB2. If you remove DB2 before migrating, you will lose your data.

#### Notes:

1. If you already have DB2 installed, you need approximately 45 MB of disk space. You need approximately 135 MB of disk space for both LDAP and DB2.
2. Disk space required for data storage is dependent upon the number and size of database entries. You need to allow a minimum of 80 MB for your database on UNIX systems. Also, ensure there is approximately another 4 MB of disk space in the /home directory to create the DB2 instance. See the README file for any last minute changes on database requirements.

Customers can choose to have more than one version of DB2 installed on a machine. IBM Directory always defaults to the highest (newest) version of DB2 found on a system. Customers who wish to use an older (supported) version of DB2 are required to manually reset two links to enable that version:

#### Notes:

1. If DB2 UDB 7.1 with Fix Pack 3 or later is installed, but not installed as the default database, issue the following commands as *root* to use it:

```
ln -fs /usr/lpp/db2_07_01 /usr/ldap/db2
ln -fs /usr/lpp/db2_07_01/lib/libdb2.a /usr/ldap/lib/libdb2.a
```
2. You must have a license to use any DB2 product other than DB2 UDB 7.2, which is delivered with IBM Directory.
3. If you are upgrading your level of DB2, ensure that you follow the DB2 migration procedure which requires you to stop all applications. If you have

a server up and running and you uninstall DB2 without reinstalling the IBM Directory Server, the directory server cannot start.

## HP-UX operating system

See the server README file on the root directory of the CD in for the latest information on supported versions of HP-UX. After you install, the README is located in `/usr/ldap/web/<lang>/readme/server.txt` or `/usr/ldap/web/<lang>/readme/server.pdf`, or using a Web browser, at `/usr/ldap/web/<lang>/readme/server.htm`.

- HP-UX 11.0 or later.
- A minimum of 256 MB RAM (512 MB is strongly recommended).
- DB2 Universal Database™ for HP-UX Workgroup or Enterprise edition version 7.1 with FixPak 3 or later (DB2).
- HP-UX Runtime Environment for the Java 2 Platform Version 1.3. HP-UX Runtime Environment for the Java 2 Platform Version 1.3. is included with IBM Directory.
- XSWGR1100 B.11.00.47.08 General Release Patch, November 1999 (ACE). Verify that you have the B.11.00.47.08 patch installed by running the following command:  

```
swlist
```
- Current kernel configuration parameters. See “Setting the current kernel configuration parameters” on page 29 for the required parameters.

## Linux operating system

Before installing, see the server README file in the root directory of the CD for the latest information on supported versions of Linux operating system. After installing, the README file is located in After you install, the README is located in `/usr/ldap/web/<lang>/readme/server.txt` or `/usr/ldap/web/<lang>/readme/server.pdf`, or using a Web browser, at `/usr/ldap/web/<lang>/readme/server.htm`.

In addition to the client requirements, the server requires the following:

- A minimum of 256 MB RAM (512 MB or more is strongly recommended).
- DB2 Universal Database for Linux - Personal or Enterprise edition - version 7.1 with FixPak 3 or later (DB2). DB2 Version 7.2 Personal edition is included with the IBM Directory and is installed if a supported version of DB2 is not detected on your system. If you have a version of DB2 earlier than Version 7.1 with FixPak 3 installed on your system, you must remove it or upgrade it before installing the IBM Directory version 4.1.

**Attention:** If you have a 3.2.x version of SecureWay Directory installed, read and understand the migration process in Chapter 11, “Migration” on page 57 before removing or upgrading DB2. If you remove DB2 before migrating, you will lose your data.

### Notes:

1. DB2 Version 7.2 Personal edition is included with the IBM Directory.
2. If you already have DB2 installed, you need approximately 45 MB of disk space. You need approximately 135 MB of disk space for both LDAP and DB2.
3. Disk space required for data storage is dependent upon the number and size of database entries. You need to allow a minimum of 80 MB for your database on UNIX systems. Also allow approximately another 4 MB of disk

space in the /home directory to create the db2 instance. See the README file for any additional information on database requirements.

## Solaris operating system

Before installing, see the server README file in the root directory of the CD for the latest information on supported versions of Solaris operating system. After installing, the README file is located in /opt/IBM1daps/web/<LANG>/README/server.txt or /opt/IBM1daps/web/<LANG>/README/server.htm, or using a Web browser, at/opt/IBM1daps/web/<LANG>/README/server.pdf.

In addition to the client requirements, the server requires the following:

- A minimum of 256 MB RAM (512 MB is strongly recommended)
- One of the following Web servers (or a later version), installed and configured:
  - IBM HTTP Server 1.3.12 (IBM HTTP Server 1.3.19 is included with IBM Directory)
  - Lotus Domino Enterprise 5.0.2b Webserver™
  - Apache Server 1.3.12
  - iPlanet FastTrack Server 3.01
  - iPlanet Enterprise Server 3.6.3, 4.0
- DB2 Universal Database for Solaris Enterprise edition - version 7.1 with FixPak 3 or later (DB2). The minimum supported level is DB2 Version 7.1 with FixPak 3 or later. DB2 Version 7.2 Extended Enterprise edition is included with the IBM Directory and is installed if a supported version of DB2 is not detected on your system. If you have a version of DB2 earlier than Version 7.1 with FixPak 3 installed on your system, you must remove it or upgrade it before installing the IBM Directory version 4.1.

**Attention:** If you have a 3.2.x version of SecureWay Directory installed, read and understand the migration process in Chapter 11, “Migration” on page 57 before removing or upgrading DB2. If you remove DB2 before migrating, you will lose your data.

### Notes:

1. If you already have DB2 installed, you need approximately 45 MB of disk space. You need approximately 155 MB of disk space for both LDAP and DB2.
  2. Disk space required for data storage is dependent upon the number and size of database entries. You need to allow a minimum of 80 MB for your database on UNIX systems. Also allow another 2 to 3 MB of disk space to create the DB2 instance. See the README file for any last minute changes on database requirements.
- Current kernel configuration parameters. See “Setting the current kernel configuration parameters” on page 29 for the required parameters.

## Windows 2000 or Windows NT operating systems

Before installing, see the server README file in the root directory of the CD for the latest information on supported versions of Windows 2000 or Windows NT operating system. After installing, the README file is located in /usr/ldap/README/<lang>/README/server.txt or /usr/ldap/README/<lang>/README/server.pdf, or using a Web browser, at /usr/ldap/web/<lang>/README/server.htm.

In addition to the client requirements, the server requires the following:

- Windows 2000, or Windows NT 4.0 with Service Pack 4 or later.
- A minimum of 256 MB RAM (512 MB is strongly recommended.)
- One of the following Web servers (or a later version), installed and configured:
  - IBM HTTP Server 1.3.12
  - Lotus Domino Enterprise 5.0.2b Webserver™
  - Microsoft Internet Information Server 4.0
  - Apache Server 1.3.12
  - iPlanet FastTrack Server 3.01
  - iPlanet Enterprise Server 3.6.3, 4.0

If a supported Web server is not detected on your system, the installation process automatically installs the IBM HTTP Server 1.3.19 that is included in the IBM Directory package.

- DB2(R) Universal Database for Windows- Personal or Enterprise edition (DB2). The minimum supported level is DB2 Version 7.1 with FixPak 3 or later. DB2 Version 7.2 Personal edition is included with the IBM Directory and is installed, if a supported version of DB2 is not detected on your system. If you have a version of DB2 earlier than Version 7.1 with FixPak 3 installed on your system, you must remove it or upgrade it before installing the IBM Directory version 4.1.  
**Attention:** If you have a 3.2.x version of SecureWay Directory installed, read and understand the migration process in Chapter 11, “Migration” on page 57 before removing or upgrading DB2. If you remove DB2 before migrating, you will lose your data.

**Notes:**

1. If you already have DB2 installed, you need approximately 25 MB of disk space. You need approximately 135 MB of disk space for both the IBM Directory and DB2.
2. Disk space required for data storage is dependent upon the number and size of database entries. You need to allow a minimum of 80 MB for your database on Windows 2000 or Windows NT systems. Also allow another 2 to 3 MB of disk space when creating the DB2 instance. See the README file for any last minute changes on database requirements.

## Additional AIX operating system requirements

- In addition to the two filesets required for AIX 4.3.3 you must install AIX Maintenance Level Fix Pack 8 or higher.

**Note:** If you have no locale specific requirements, after you apply all the services that you need for your system, restart your system to enable the changes.

- The bos.loc.iso.ZH\_TW fileset must be set for the Taiwan locale. The fileset is available from the AIX 4.3.3 installation medium.

---

## IBM Directory WebAdmin server requirements

To administer the IBM Directory server you need the following:

- A frame-enabled browser that supports:
  - HTML version 3.0 or later
  - Java™ 1.1.7 features including the Java Development Kit (JDK) 1.1 Abstract Window (AWT) events

- JavaScript™ 1.2
- The browser must be enabled to accept cookies.

The following Web browsers support these specifications:

- Microsoft Internet Explorer (MS IE) version 4.0 plus service pack 1 or higher
- Netscape Navigator version 4.07 or later (4.08 is recommended)
- Netscape Communicator version 4.7, 4.8 or later

---

## **Secure Socket Layer (SSL) Global Security Kit (GSKit):**

Global Security Kit (GSKit) version 5.0.4 is an optional software package that is required only if Secure Socket Layer (SSL) Security is required.

The IBM Directory 4.1 alone does not provide the capability for SSL connections from IBM Directory clients. You can add the SSL feature by installing the IBM GSKit 5.0.4 package. The GSKit package includes SSL support and associated RSA Data Security, Inc. (4) technology.

The IBM Directory server works without the GSKit installed. In this case the IBM Directory server accepts only non-SSL connections from any Directory client. Similarly, the IBM Directory client works without the GSKit installed.



---

## Chapter 3. Common installation using InstallShield GUI

You can use the InstallShield GUI to install IBM Directory on AIX, Solaris, Windows 98, Windows 2000 or Windows NT platforms. It is also available for Linux SuSE and Linux Red Hat platforms. If you do not wish to use InstallShield GUI to install, this guide contains a manual installation chapter for each platform. For example "Installing using AIX operating system utilities".

The InstallShield GUI requires a substantial amount of temporary disk space. Before installing, ensure that you have at least 400 MB of available space in your /tmp directory.

### Attention:

You cannot migrate from a 3.2.x version of SecureWay Directory or reinstall over an existing version of IBM Directory 4.1 on an AIX platform using InstallShield GUI. Use "SMIT Installation" on page 23 to install IBM Directory if you want to migrate or reinstall. See "Migration from SecureWay Directory Version 3.2.x for AIX installations" on page 59 for instructions on migrating and restoring backed-up files after reinstallation on an AIX system.

If you have a 3.2.x version of SecureWay Directory installed on a Linux SuSE, Linux Red Hat, Solaris, system, read and understand the migration process in "Migration from SecureWay Directory Version 3.2.x for UNIX installations" on page 60. If you have a 3.2.x version of SecureWay Directory installed on a Windows 2000 or Windows NT system, read and understand the migration process in or "Migration from SecureWay Directory Version 3.2.x for Windows 2000 or Windows NT InstallShield GUI installations" on page 57 before installing IBM Directory 4.1.

It is very important that you backup and export previous versions of schema files and slapd32.conf before installing IBM Directory 4.1.

### Notes:

1. References to Web servers do not apply to Linux or HP-UX operating systems.
2. If you install using InstallShield GUI, you must also uninstall using the InstallShield GUI. See "Removing IBM Directory" on page 53 for instructions on removing using the InstallShield GUI.
3. Once installation using InstallShield GUI has begun, do not try to cancel the installation by closing the InstallShield Window or using the **Ctrl+c** keystroke. If you inadvertently cancel installation, see "Recovering from a failed installation" on page 63 before attempting to re-install.

---

## Before installing on a Windows 98, Windows 2000 or Windows NT operating system using InstallShield GUI

Before installing, make sure the below conditions are met. If these conditions are not met, the install will exit.

- **If you have pre-3.2.x version of SecureWay Directory installed on your system:**  
Upgrade to 3.2 or later before installing IBM Directory 4.1.
- **If you have a downlevel version of DB2:**

Upgrade to DB2 7.1 Fix Pack 3 or later. DB2 7.2 is included with IBM Directory.

**Attention:** Export your data using **db2ldif** before unconfiguring and removing your current database. Do not use the **DB2BACKUP** command. If you do not export before unconfiguring and removing the database, you will lose your data.

- **If you have a 3.2.x version of SecureWay Directory installed on your computer:**

1. Export the database using **db2ldif**

**Note:** Read the **db2ldif** documentation in the *SecureWay Administration Guide* for your release before exporting the database.

```
db2ldif -o <outputfile>[-s <subtree DN>]
```

where *outputfile* specifies the LDIF output file to contain the directory entries in LDIF and *subtree DN* identifies the top entry of the subtree that is to be dumped to the LDIF output file.

**Attention:** Export your data using **db2ldif** and remove the db2admin id from the operating system before unconfiguring and removing the database (step 2). Do not use the **DB2BACKUP** command. If you do not export before unconfiguring and removing the database, you will lose your data.

2. Unconfigure and remove the database:

```
ldapucfg -d
```

Press *y* to confirm to the removal. Default LDAP databases are automatically removed from the system when the command successfully completes.

**Note:**

- If you use a custom database, you must manually remove the DB2 database from the system.
- Data contained in the SecureWay Directory 3.2.x database is not compatible with IBM Directory 4.1 unless it is exported via **db2ldif** and imported through the **bulkload** or **ldif2db** utilities provided with IBM Directory 4.1.
- The server will not start if you do not migrate.
- Changelog is removed during migration.
- If you have a downlevel version of DB2, you must upgrade to 7.1 Fix Pack 3 or later.

**Attention:** Export your data using **db2ldif** and remove the db2admin id from the operating system before unconfiguring and removing the database (step 2). Do not use the **DB2BACKUP** command. If you do not export before unconfiguring and removing the database, you will lose your data.

- **If you are installing on a Windows 2000 or Windows NT system:** Windows NT and Windows 2000 Service Pack 2 users must perform the following before installation:
  - a. Go to **Start->Run...** and type `secpol.msc`.
  - b. Double-click **Local Policies**.
  - c. Double-click **User Rights Assignments**.

At this point, a list of policies is displayed. The user needs to add the Administrator group to the following policies:

- Act as part of the operating system

- Increase quotas
- Replace a process level token

Do the following to add the Administrator group to these policies:

- a. Right-click on the appropriate policy, and click **Security...**
- b. Click **Add...** in the new window.
- c. Select the **Administrators** group in the scrollbox, then click **Add...**
- d. Click **OK**.
- e. Click **OK** again to exit.

Repeat these procedures for each of the 3 policies above. When finished, restart your computer.

## Installing IBM Directory 4.1 on a Windows 98, Windows 2000 or Windows NT platform

InstallShield GUI has two installation options: Typical and Custom. If you want to accept the default settings, select Typical during installation. If you are an experienced user and want to customize your installation, select Custom.

### Typical installation for a Windows 98, Windows 2000 or Windows NT operating system

Typical installation uses default settings and is recommended for new users.

To begin installing IBM Directory 4.1:

1. Insert the CD in your CD-ROM drive. If the CD-ROM does not automatically start, click **Start->Run**. Depending on whether you are installing locally from a CD or remotely from the network, select the drive for your CD-ROM or for the appropriate network path and then select the package you want to install. Double-click the **Setup.exe** icon. A language panel is displayed.
2. Select the language you want to use during IBM Directory installation. Click **OK**.

**Note:** This is the language used in the installation wizard, not in the IBM Directory. You choose the language used in the IBM Directory in step 6 on page 14.

3. If a previous or current version of IBM Directory is not installed on your system, go to 4 on page 14. If a previous or current version of IBM Directory is installed on your system, do one of the following:
  - **If you have a previous version of IBM Directory Server installed on your system:** You are asked if you want to migrate your configuration. Click **Yes** to migrate or **No** to overwrite your previous installation. If you click **Yes**, some migration processes will take place automatically during installation. See "Migration from SecureWay Directory Version 3.2.x for Windows 2000 or Windows NT InstallShield GUI installations" on page 57 for complete migration instructions.
 

**Attention:** If you choose to click **No** and overwrite your previous installation, you will lose your data.
  - **If you have a previous version of the IBM Directory Client SDK installed on your system:** You are asked if you wish to continue with the installation. Click **Yes** to install over the previous version of IBM Directory Client SDK, or click **No** to exit the install.

- **If you have a current version of IBM Directory and/or IBM Directory Client SDK installed on your system:** You will be asked if you want to exit the install. If you do not exit and backup your files, they will be overwritten during the installation.
4. After reading the Software license, select **I accept the terms in the license agreement**.
  5. Click **Next**. Any preinstalled components and corresponding version levels are displayed. Click **Next**.
  6. Select the language you want to use in IBM Directory 4.1. Click **Next**.
  7. To install to the default directory, click **Next**. You can specify a different directory by clicking the **Browse** button.
  8. Select **Typical** installation. Click **Next**.
  9. The following list displays:
    - Client SDK 4.1
    - DMT 4.1 and Java 1.3
    - Server 4.1

**Note:** If you have an earlier version of a component installed on your machine, you must install the most current version of the component.

10. Click **Next**. If you selected **Server 4.1** in 9, continue. If you did not select **Server 4.1** in 9, go to step 11.  
Do one of the following only:
  - If you have more than one Web server installed and you selected to install the server, select which Web server you want IBM Directory to use and click **Next**. Enter the full pathname of the Web server configuration file for the Web Server. Click **Next**.
  - If you have only one Web server installed, enter the full pathname of the Web server configuration file for the Web Server. Click **Next**.
  - If you are installing Server 4.1, and you have no Web server installed, the IBM HTTP Web server is installed. A panel appears that prompts you for the Windows user ID and password of an existing Windows administrator ID. After entering the user ID and password, click **Next**.
11. Enter a distinguished name and password. The default distinguished name is **cn=root**. Enter the password again to confirm.  
The IBM Directory administrator DN is the DN used by the directory's administrator.

**Notes:**

- a. Record this password for future reference.
  - b. The IBM Directory administrator DN must contain **cn=** as part of the DN.
- .
12. Click **Next**. If you selected **Server 4.1** in step 9, and DB2 is not installed on your system DB2 7.2 will be installed for you. You will see a panel prompting you to enter a Windows user ID and password for the DB2 system ID. If you are using an existing Windows user ID, be sure your password is correct. The user ID default is **db2admin**. Type the password. Type the password again to confirm.  
  
**Note:** If you have an existing Windows user ID for the DB2 system ID, you must enter the correct password for the ID here in order to install the DB2 correctly.

13. Click **Next**. A screen summarizing the components selected for installation and configuration is displayed. If you wish to change any of your selections, use the **Back** button. To begin installation, click **Next**.

**Note:** Any corequisite products needed by IBM Directory, such as DB2 or a Web server, are automatically installed. These products are listed in the summary described in this step.

14. After the files are installed, the Client README opens. If you installed the server, the server README also opens.
15. Select to reboot your computer now or later.

**Note:** You must restart your system to complete the IBM Directory configuration and to create the DB2 database. You are unable to use the IBM Directory product until this is completed. During the restart, a configuration program is run. No user input is required. The program must complete before you can use the IBM Directory.

16. Click **Finish**. You have completed a Typical installation and configuration. Click **Start->Programs->IBM Directory 4.1** to see a list of the installed components.

## Custom installation for Windows 98, Windows 2000 or Windows NT operating system

Custom installation is for experienced users who want to customize their installation.

1. Insert the CD in your CD-ROM drive. If the CD-ROM does not automatically start, click **Start->Run**. Depending on whether you are installing locally from a CD or remotely from the network, select the drive for your CD-ROM or for the appropriate network path and then select the package you want to install. Double-click the **Setup.exe** icon. The small language panel displays.
2. Select the language you want to use during IBM Directory installation. Click **OK**.

**Note:** This is the language used in the installation wizard, not in the IBM Directory. You choose the language used in the IBM Directory in step 7 on page 16.

3. If a previous or current version of IBM Directory is not installed on your system, go to 5 on page 16. If a previous version of IBM Directory is installed on your system, do one of the following:
  - **If you have a previous version of IBM Directory Server installed on your system:** You are asked if you want to migrate your configuration. Click **Yes** to migrate or **No** to overwrite your previous installation. If you click **Yes**, some migration processes will take place automatically during installation. See "Migration from SecureWay Directory Version 3.2.x for Windows 2000 or Windows NT InstallShield GUI installations" on page 57 for complete migration instructions.

**Attention:** If you choose to click **No** and overwrite your previous installation, you will lose your data.
  - **If you have a previous version of the IBM Directory Client SDK installed on your system:** You are asked if you wish to continue with the installation. Click **Yes** to install over the previous version of IBM Directory Client SDK, or click **No** to exit the install.

- **If you have a current version of IBM Directory and/or IBM Directory Client SDK installed on your system:** You will be asked if you want to exit the install. If you do not exit and backup your files, they will be overwritten during the installation.
4. To continue with installation, click **Next**.
  5. After reading the the Software license, select **I accept the terms in the license agreement**. Click **Next**.
  6. Any preinstalled components and corresponding version levels display. Click **Next**.
  7. Select the language you want to use in IBM Directory 4.1. Click **Next**.
  8. Select **Custom** installation.
  9. Click **Next**. This panel displays the following install components:
    - Client SDK 4.1
    - DMT 4.1 and Java 1.3
    - Server 4.1
    - IBM HTTP Server 1.3.19
    - DB2 7.2
    - GSKit 5.0.4 (SSL packages only.)

The components that are not yet installed are preselected. You can choose to reinstall the Server or the Client, if they were previously installed. You can also choose to install the IBM HTTP Server even if other Web servers are already installed.

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

10. Click **Next**. On this panel, you can choose to perform any or all of the following:
  - Set the directory administration name and password
  - Create the directory DB2 database
  - Configure a Web server
 Click **Next**.

A panel displays.

Depending on what you have selected to do, the following options are displayed in sequence:

- a. Do one of the following:
  - If you have more than one Web server installed on your system and are not installing the IBMHTTP Web server, select the Web Server you want to use to configure IBM Directory and click **Next**. Verify the location of the configuration file is correct and then click **Next**.
  - If you are installing the IBM HTTP Web server, a panel appears prompting you for a userid and password. Enter a userid and password that have administrative privileges. This id will be used to start the Web server. Click **Next**.
- b. Accept or change the default distinguished name. Enter a password twice. If the password entries match, the **Next** button becomes active. Click **Next**.
- c. If you are installing DB2, a panel appears prompting a userid and password. You will see a panel prompting you to enter a Windows user ID and password for the DB2 system ID. If you are using an existing

Windows user ID, be sure your password is correct. The user ID default is **db2admin**. Type the password. Type the password again to confirm. Click **Next**.

- d. Select the type of database you want to use. Click **Next**.
  - e. Select the drive where you want to create the database. Click **Next**.
11. Installation now has enough information to begin installing. A panel appears containing the following information, depending on your selections:
- Files will be installed to the following directory C:\Program Files\IBM\LDAP (or to the drive path that you provided)
  - Password for administration DN cn=root will be set
  - LDAP UCS-2(UTF-8) DB2 database will be created on drive C
  - IBM HTTP will be installed in C:\Program Files\IBMHTTP Server
  - Web server IBM HTTP Server will be configured using the file C:\Program Files\IBM HTTP Server\conf\httpd.conf
  - GSKit 5.0.4 will be installed in C:\Program Files\IBM\GSK5
  - DB2 7.2 will be installed in C:\Program Files\SQLLIB

Click **Back** to change any of your selections. Click **Next** to begin installation.

12. After the files are installed, the Client README opens. If you installed the server, the server README also opens.
13. Select to reboot your computer now or later.

**Note:** You must restart your system to complete the IBM Directory configuration and to create the DB2 database. You are unable to use the IBM Directory product until this is completed. During the restart, a configuration program is run. No user input is required. The program must complete before you can use the IBM Directory.

14. Click **Finish**.
15. Click **Start->Programs->IBM Directory 4.1**. You have completed a Custom installation and configuration.

---

## Before installing on UNIX-based platforms

**Note:** You cannot migrate from a 3.2.x version of SecureWay Directory or reinstall over an existing version of IBM Directory 4.1 on an AIX platform using InstallShield GUI. Use “SMIT Installation” on page 23 to install IBM Directory if you want to migrate or reinstall.

- **If you are installing remotely:**  
Make sure that the / . . . / string is not part of the remote install path where the setup program is located.
- **If you have a current or previous version of SecureWay Directory or IBM Directory installed on your system:**  
Complete the following steps before installing:
  1. Export the database using **db2ldif**

**Note:** Read the **db2ldif** documentation in the *SecureWay Administration Guide* for your release before exporting the database.

```
db2ldif -o <outputfile>[-s <subtree DN>]
```

where *outputfile* specifies the LDIF output file to contain the directory entries in LDIF and *subtree DN* identifies the top entry of the subtree that is to be dumped to the LDIF output file.

**Attention:** Export your data using **db2ldif** and remove the db2admin id from the operating system before unconfiguring and removing the database (step 2). Do not use the **DB2BACKUP** command. If you do not export before unconfiguring and removing the database, you will lose your data.

2. Unconfigure and remove the database:

```
ldapucfg -d
```

Press *y* to confirm to the removal. Default LDAP databases are automatically removed from the system when the command successfully completes.

**Note:**

- If you use a custom database, you must manually remove the DB2 database from the system.
- Data contained in the SecureWay Directory 3.2.x database is not compatible with IBM Directory 4.1 unless it is exported via **db2ldif** and imported through the **bulkload** or **ldif2db** utilities provided with IBM Directory 4.1.
- The server will not start if you do not migrate.
- Changelog is removed during migration.
- If you have a downlevel version of DB2, you must upgrade to 7.1 Fix Pack 3 or later.

**Attention:** Export your data using **db2ldif** and remove the db2admin id from the operating system before unconfiguring and removing the database (step 2). Do not use the **DB2BACKUP** command. If you do not export before unconfiguring and removing the database, you will lose your data.

**Note:** If you have non-IBM Directory applications using a downlevel version of DB2, and you are using InstallShield GUI to install on a UNIX system, you can leave the downlevel version on your machine. InstallShield GUI will install DB2 7.2 during installation. We recommend, however, that you remove the downlevel version of DB2 if you are not using it.

3. Save your server configuration (slapd32.conf) in the following location:

```
<install path>etc/userV41
```

4. Save your Schema files in the following location:

```
<install path>etc/userV41
```

5. If you have any existing IBM JNDI applications, IBMJNDI.JAR or any associated JNDI files, save them in the following location:

```
<install path>etc/userV41/java
```

JNDI related files:

- Ibmjcefw.jar
- Ibmjceprovider.jar
- IBMjgssprovider.jar
- Local\_policy.jar
- US\_export\_policy.jar

- Krb5.ini
- Ibmjndi.jar
- Ibmjndi.zip

JNDI related directories:

- etc/java/bin
- etc/java/lib

6. Save the webk file to the following location:  
    <install path>/webk/webk.bak
7. Uninstall SecureWay Directory.

## Installing IBM Directory on a UNIX-based platform

You cannot migrate or reinstall over an existing version of IBM Directory 4.1 on an AIX platform using InstallShield GUI. Use “SMIT Installation” on page 23 to install IBM Directory if you want to migrate or reinstall. See “Migration from SecureWay Directory Version 3.2.x for AIX installations” on page 59 for instructions on migrating and restoring backed-up files after reinstallation on an AIX system.

InstallShield GUI has two installation options: Typical and Custom. If you want to accept the default settings, select Typical during installation. If you are an experienced user and want to customize your installation, select Custom.

### Typical

1. Go to the root directory on your CD. Invoke setup. A language panel is displayed.
2. Select the language you want to use during IBM Directory installation. Click **OK**.

**Note:** This is the language used in the installation wizard, not in the IBM Directory. You choose the language used in the IBM Directory in step 5.

**Attention:** If you have a version of IBM Directory already installed on your system, a message appears telling you that you must remove it before installing. **If you do not save and back up your data before uninstalling, you will lose it.** See “Before installing on UNIX-based platforms” on page 17 for instructions on how to save and back up your data.

3. After reading the Software license, click **I accept the terms in the license agreement**.
4. Click **Next**. Any preinstalled components and corresponding version levels are displayed. Click **Next**.
5. Select the language you want to use in IBM Directory 4.1. Click **Next**.
6. Select **Typical** installation. Click **Next**.
7. The following list displays:
  - Client SDK 4.1
  - DMT 4.1 and Java 1.3
  - Server 4.1

Select the features you want to install.

8. Click **Next**. A screen summarizing the components selected for installation and configuration is displayed. If you wish to change any of your selections, use the **Back** button. To begin installation, click **Next**.

**Note:** Any corequisite products needed by IBM Directory, such as DB2 or a Web server, are automatically installed. These products are listed in the summary described in this step.

9. After the files are installed, the Client README opens. After reading the Client README, click **Next**. If you installed the server, the server README also opens. After reading the Server README, click **Next**.
10. Click **Finish**. At this point we recommend you configure the IBM Directory. See Chapter 9, "Configuration" on page 45 for instructions on how to configure IBM Directory.

## Custom

1. Insert the CD in your CD-ROM drive. Go to the root directory on the CD and invoke setup. A language panel displays.
2. Select the language you want to use during IBM Directory installation. Click **OK**.

**Note:** This is the language used in the installation wizard, not in the IBM Directory. You choose the language used in the IBM Directory in step 5.

**Attention:** If you have a version of IBM Directory already installed on your system, a message appears telling you that you must remove it before installing. Before you uninstall, see "Before installing on UNIX-based platforms" on page 17 for instructions on how to save and back up your data. **If you do not save and back up your data, you will lose it during the uninstall.**

3. After reading the the Software license, select **I accept the terms in the license agreement**. Click **Next**.
4. Any preinstalled components and corresponding version levels display. Click **Next**.
5. Select the language you want to use in IBM Directory 4.1. Click **Next**.
6. Select **Custom** installation.
7. Click **Next**. This panel displays the following install components:
  - Client SDK 4.1
  - DMT 4.1 and Java 1.3
  - Server 4.1
  - IBM HTTP Server 1.3.12
  - DB2 V7.2
  - GSKit 5.0.4 (SSL packages only.)

The components that are not yet installed are preselected. You can choose to install the IBM HTTP Server if other Web servers are already installed.

**Note:** The IBM HTTP Server feature is not offered for Linux platforms.

This panel also indicates the amount of disk space required and available on the selected drive. Click **Next**.

8. Installation now has enough information to begin installing. A summary panel displays the components you selected and the locations where the selected components will be installed. Click **Back** to change any of your selections. Click **Next** to begin installation.
9. After the files are installed, the Client README opens. After reading the Client README, click **Next**. If you installed the server, the server README also opens. After reading the Server README, click **Next**.

10. Click **Finish**. Installation is complete. At this point we recommend you configure the IBM Directory. See Chapter 9, "Configuration" on page 45 for instructions on how to configure IBM Directory.



---

## Chapter 4. Installing using AIX utilities

You can use either “**SMIT Installation**” (the preferred installation method) or **installp** from “Command Line Installation” on page 25 to install the IBM Directory.

### Attention:

Use “SMIT Installation” to install IBM Directory if you want to migrate from a 3.2.x version of SecureWay Directory or reinstall over an existing version of IBM Directory 4.1. Read and understand the migration process in “Migration from SecureWay Directory Version 3.2.x for AIX installations” on page 59 before installing IBM Directory. “Migration from SecureWay Directory Version 3.2.x for AIX installations” on page 59 contains instructions on migrating and restoring backed-up files after reinstallation on an AIX system. It is very important that you backup and export previous versions of schema files and slapd32.conf before installing IBM Directory 4.1. .

### Notes:

1. Full client and server versions require an X11 environment. Versions of IBM Directory Client and Server with no X11 requirements are available in this release. For a client with no X11 requirements, install the minimal client that provides IBM Directory Client Runtime (ldap.client.rte) and IBM Directory Client SDK (ldap.client.adt).

For a server with no X11 requirements, do not install the IBM Directory Server Configuration GUI (**ldapxcfg**). **ldapxcfg** is located in the ldap.server.cfg fileset.

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 IBM Directory 4.1.
3. If you are installing the IBM Directory on a node within an RS/6000® SP™ environment, see “Before Installing on a Node within an RS/6000 SP Environment” on page 26 before beginning installation.

For more detailed information on AIX operating system installation procedures and commands, see the *AIX Installation Guide* that comes with the operating system.

---

## SMIT Installation

To install IBM Directory using smit:

1. Log on as **root**.
2. Insert the CD containing IBM Directory Version 4.1 into the CD-ROM drive or download the files from the IBM Directory Web site at:  
<http://www.ibm.com/software/network/directory>.

3. At the command prompt, type the following:

```
smit install
```

and press **Enter**. The **Software Installation and Maintenance** window is displayed.

4. Click **Install and Update Software**. The **Install and Update Software** window is displayed.
5. Click **Install and Update from the LATEST Available Software**.
6. Click **List** beside the **INPUT device/directory for software** field.

7. Select the appropriate CD-ROM drive or the directory containing the IBM Directory images.
8. Move your cursor to **Software to install**. Do one of the following:
  - Type `ldap` to install all the ldap filesets (or `ldap.server`, or `ldap.client`, if appropriate).
  - Click **List** to list all the filesets on the compact disc, and then select the filesets that you want to install, including different translations of IBM Directory messages.

**Note:** By default `smit` installs translated messages based on the language you configured into your AIX system.

If you select the list option, you see:

```

> ldap.client                                ALL
   4.1.0.0  IBM Directory Client DMT
   4.1.0.0  IBM Directory Client Java
   4.1.0.0  IBM Directory Client Runtime (No SSL)
   4.1.0.0  IBM Directory Client SDK

> ldap.html.de_DE                            ALL
   4.1.0.0  IBM Directory HTML Install/Config Gd-German
   4.1.0.0  IBM Directory HTML Man Pages - German

> ldap.html.en_US                            ALL
   4.1.0.0  IBM Directory HTML Install/Config Gd-U.S. English
   4.1.0.0  IBM Directory HTML Man Pages - U.S. English

> ldap.server                                ALL
   4.1.0.0  IBM Directory Server Administrative Interface
   4.1.0.0  IBM Directory Server Config GUI
   4.1.0.0  IBM Directory Server Framework
   4.1.0.0  IBM Directory Server Runtime (No SSL)

```

**Note:** The `ldap.html` packages are language specific. The `ldap.html.en_US` and `ldap.html.de_DE` packages are used as examples.

When you finish selecting filesets, click **OK**.

- Click **OK**. The message **Are You Sure?** is displayed.
- Click **OK** to start the installation.
- Check the installation summary at the end of the output to verify successful installation of the filesets.
- Click **Done**.
- Exit `smit` by pressing **F12** or by clicking **Cancel** until you are back to a command prompt. Verify that IBM Directory was installed successfully by typing the following at a command prompt:

```
lslpp -L | grep ldap
```

The output displayed lists all the filesets starting with `ldap`. This includes the server, client, HTML, and message filesets. For example:

```

ldap.client.adt          4.1.0.0  C  IBM Directory SDK
ldap.client.rte          4.1.0.0  C  IBM Directory Client
ldap.html.en_US.config  4.1.0.0  C  IBM Directory HTML
ldap.html.en_US.man     4.1.0.0  C  IBM Directory HTML man
ldap.msg.en_US           4.1.0.0  C  IBM Directory Messages
ldap.server.admin        4.1.0.0  C  IBM Directory Server
ldap.server.com          4.1.0.0  C  IBM Directory Server
ldap.server.rte          4.1.0.0  C  IBM Directory Server

```

---

## Command Line Installation

**Note:** If you want to migrate from a 3.2.x version of SecureWay Directory or reinstall over an existing version of IBM Directory 4.1, use the instructions in “SMIT Installation” on page 23 to install IBM Directory.

To install IBM Directory from a command prompt:

1. Log on as **root**.
2. Insert the AIX 4.3.3 or higher CD into the CD-ROM drive.
3. Determine which IBM Directory packages you need. For the server and client, the package name is `ldap.server`, and for just the client, the package name is `ldap.client`. For all packages, including all language translations of the message files and documentation, the package name is `ldap`.
4. Determine which language versions of the message files and documentation you need. To see the language versions that are available, type the following command:

```
installp -ld /dev/cd0 | grep ldap
```

A list all of the installable IBM Directory packages is displayed.

Some examples of United States English-specific packages are:

```
ldap.html.en_US.man  
ldap.msg.en_US
```

5. At the command prompt, install the required packages with the following command:

```
installp -acgXd /dev/cd0 <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**

### Examples:

To install only the IBM Directory server and client files, type:

```
installp -acgXd /dev/cd0 ldap.server
```

To install all of the IBM Directory filesets (including every language translation of messages), type:

```
installp -acgXd /dev/cd0 ldap
```

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 IBM Directory was installed successfully by typing the following at a command prompt:

```
lslpp -L | grep ldap
```

The output displayed lists all the filesets starting with `ldap`. This includes the server, client, HTML, and message filesets. For example:

```
ldap.client.adt      4.1.0.0 C IBM Directory SDK  
ldap.client.dmt     4.1.0.0 C IBM Directory Client DMT  
ldap.client.java    4.1.0.0 C IBM Directory Client Java
```

ldap.client.rte	4.1.0.0	C	IBM Directory Client Runtime
ldap.html.en_US.config	4.1.0.0	C	IBM Directory Install/Config
ldap.html.en_US.man	4.1.0.0	C	IBM Directory Man Pages - U.S.
ldap.msg.en_US	4.1.0.0	C	IBM Directory Messages - U.S.
ldap.server.admin	4.1.0.0	C	IBM Directory Server
ldap.server.cfg	4.1.0.0	C	IBM Directory Server Config GUI
ldap.server.com	4.1.0.0	C	IBM Directory Server Framework
ldap.server.rte	4.1.0.0	C	IBM Directory Server Runtime

7. If you want to include security functions, install GSKit 5.0.4. See "Installing GSKit".

---

## Before Installing on a Node within an RS/6000 SP Environment

If you are installing the IBM Directory 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 out to the nodes using `/var/sysamn/supper update`.

1. Add ldap user and group on the CWS.

```
mkgroup id=300 ldap
mkuser id=300 ldap
chgrpmem -m + ldap ldap
```

2. You need to create the userID **ldapdb2** and group **dbsysadm** only if you are using the default database. For any other database you must add the user and the group through the Control Workstation.

```
mkgroup id=350 dbsysadm
mkuser id=350 ldapdb2
chgrpmem -m + ldapdb2 dbsysadm
```

**Note:** The user ids and group ids used are just for the purpose of this example. You can choose different user ids and group ids for your environment or use the system defaults.

3. Remove the home directory of ldap user.

```
rm -rf /home/ldap
```

4. Update the RS/6000 SP nodes with the new users and groups.

```
/var/sysamn/supper update
```

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

---

## Installing GSKit

If you installed an SSL-enabled version of IBM Directory, you need to install GSKit to take advantage of the security features.

To install using the System Management Interface tool (SMIT)

1. Invoke SMIT by typing **smit** at the command line.
2. Select **Software Installation & Maintenance**.
3. Select **Install and Update Software**.
4. Select **Install and Update Software by Package Name**.
5. On the device/directory window specify the directory which contains the installable software.
6. Select **Package gskkm** from the Multi-select List
7. Select the file sets of the software package to install

8. Select the options appropriate to your installation requirements from the Options window.

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

9. Confirm to complete the installation.

To Install GSKit from the command line:

```
installp -acdggW gskkm.rte
```

The **installp** command installs available software products in a compatible installation package.

#### Options:

**a** apply

**c** commit

**d**device, specifies where the installation media can be found.

**g** automatically installs or commits any requisite software product.

**p** runs preinstallation checks for the specified action.

**q** suppresses the prompt for the device.

**W** does not wildcard FilesetName. By default, the system installs foo.rte.bar when foo.rte is chosen.

## Setting System variables for AIX operating systems

Ikeyman GUI sets up its own environment except for JAVA\_HOME. To see how ikeyman sets its environment edit /usr/opt/ibm/gskkm/bin/gsk5ikm

The user will need to set the following AIX variable so ikeyman can run:

**JAVA\_HOME**=*location* where *location* in the location where the user installed JDK 1.1.7

**Note:** If you are prompted to set JAVA\_HOME, you can set it to either the system-installed Java or the Java version included with the IBM Directory Server. If you use the IBM Directory Server version, you also need to set the LIBPATH environment variable as follows:

```
export LIBPATH=/usr/ldap/java/bin:/usr/ldap/java/bin/classic:$LIBPATH
```

## Removing GSKit

To remove GSKit using SMIT:

1. Invoke SMIT by typing **smit** at the command line.
2. Select Software Installation and Maintenance from the menu.
3. Select **Software Maintenance and Utilities**.
4. From the Maintenance window, select **Remove Installed Software** to open the **Remove Software Product** window.
5. Enter the name of the software package
6. Turn 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 the command line:

```
installp -u -g -V2 <gskkm.rte>
```

**u** Removes the specified software and any of its installed updates from the system.

**g** this flag removes or rejects dependents of the specified software.

**V2** prints alphabetically ordered list of FAILURES and WARNINGS.

---

## Chapter 5. Installing using Hewlett-Packard (HP-UX) utilities

**Attention:** If you have a 3.2.x version of SecureWay Directory installed, and you want to migrate your data, use the the instructions in “SMIT Installation” on page 23 to install IBM Directory. Read and understand the migration process in “Migration from SecureWay Directory Version 3.2.x for UNIX installations” on page 60 before installing IBM Directory 4.1. It is very important that you backup and export previous versions of schema files and slapd32.conf before installing IBM Directory 4.1.

---

### Before installing the IBM Directory

The following sections step you through setting the current configuration parameters and installing the Java Runtime Environment. You must have the current kernel configuration parameters set, and Java Runtime Environment 1.3 and DB2 Version 7.1 Fix Pack 3 or later installed before installing the IBM Directory.

Instructions given in this chapter assume you are logged in as **root** and have the IBM Directory Version 4.1 CD mounted at /SD\_CDROM.

**Note:** Before installing the DB2, you must remove any existing versions of DB2 that might have been installed previously. If you try to install DB2 over an existing version of DB2, DB2 does not install correctly. If this occurs you must remove DB2 and then reinstall it.

### Setting the current kernel configuration parameters

The following table contains the parameters and values that must be set before installing IBM Directory Server.

*Table 1. HP-UX operating system kernel configuration parameters*

Kernel parameter	Value 256MB+ physical memory
maxuprc	512
maxfiles	256
nproc	1024
nflocks	8192
ninode	2048
nfile	(4 * ninode)
msgseg	32768
msgmnb	65535 (1)
msgmax	65535 (1)
msgtql	1024
msgmap	258
msgmni	256
msgssz	16

Table 1. HP-UX operating system kernel configuration parameters (continued)

Kernel parameter	Value 256MB+ physical memory
semnmi	512
semmap	514
semmns	1024
semmnu	1024
shmmax	268435456 (2)
shmseg	16
shmmni	300

To set a kernel configuration parameter:

1. At a command prompt, type: `sam`  
The System Administration Manager opens.
2. Double-click **Kernel Configuration**.
3. Double-click **Configurable Parameters**.
4. Double-click the parameter you want to edit and specify the new value in the **Enter New Formula\Value** field.
5. Click **OK**.
6. Repeat steps 5 and 6 for each parameter that needs to be set.
7. Click **Actions-->Process New Kernel**.
8. To process the modifications, click **Yes**.
9. Select **Move Kernel Into Place and Shutdown/Reboot Now** and click **OK**.

## Installing HP-UX Runtime Environment for the Java 2 Platform Version 1.3.

Do the following to install HP-UX Runtime Environment for the Java 2 Platform Version 1.3.:

1. Type `swinstall` at a command prompt.
2. Select **B9789AA**
3. Click **Actions -->Mark For Install**.
4. Click **Actions -->Install (analysis)** . . . Analysis is complete when the **Status** field reads **Ready**.
5. Click **OK**.
6. To begin installation, click **Yes**. Installation is complete when the **Status** field reads **Done**.
7. Click **File --> Exit**.

---

## Installing the IBM Directory

Before installing the IBM Directory, you must remove any non-IBM versions of LDAP that might have been installed previously. If you try to install the IBM Directory over an existing non-IBM version of LDAP, such as OpenLDAP, the IBM Directory does not install correctly. If this occurs you must remove the IBM Directory and then reinstall it. See "Removing IBM Directory" on page 53.

Before installing the IBM Directory, make sure you have the correct kernel configuration parameters set, and Java Runtime Environment 1.3. and DB2 Version 7.1 Fix Pack 3 or later installed.

To install IBM Directory:

1. Type `swinstall` at a command prompt.
2. Select the IBM Directory 4.1 version you want to install. You can select from the following list:

```
LDAPServer
LDAPClient
LDAPServer_noSSL
LDAPClient_noSSL
```

Selecting **LDAPServer** installs both the server and client. Selecting **LDAPClient** installs the client only. Selecting **LDAPServer\_noSSL** or **LDAPClient\_noSSL** installs the client and server or client only with SSL disabled.

**Note:** If you select an SSL-enabled version of IBM Directory, you must also install GSKit. See "Installing GSKit".

3. Click **Actions -->Mark For Install**.
4. Click **Actions -->Install (analysis) . . .** Analysis is complete when the Status field reads **Ready**.
5. Click **OK**.
6. Click **Yes** to begin installation. Installation is complete when the Status field reads **Done**.
7. Click **File --> Exit**.

---

## Installing GSKit

You can install the GSKit package (`gsk5bas.tar.Z`) through command line or through **sam**, a GUI utility for system administration.

To install GSKit:

1. Download or copy the GSKit package to `/tmp`.
2. Run the following command:  

```
cd /tmp
```
3. Uncompress and untar the package:  

```
zcat gsk5bas.tar.Z | tar -xvf - cd
```
4. Run the following command:  

```
swinstall -s /var/spool/pkg/gsk5bas gsk5bas
```

**Options:**

**-p** Preview the install task by running the session through the analysis phase only.  
**-s** The `full_path` of the software source  
**sw\_selection** The name of the install package  
**gsk5bas** Contains the Restricted GSKit Base Toolkit install image

## System Setting variables for HP-UX

Please set and verify that the following path have been set in your `.profile`.  
`SHLIB_PATH=/usr/lib`

To set this path the following example is provided:

```
export SHLIB_PATH=/usr/lib:$SHLIB_PATH
```

## Removing GSKit

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

```
swremove gsk5bas
```

### Options:

- p Preview the install task by running the session through the analysis phase only.
- sw\_selection The name of the install package.

---

## Configuring the environment

You need to add NLS to your environment.

1. Run the following commands to modify your environment:

```
echo 'export NLSPATH=/usr/lib/nls/msg/%L/%N' >>~/.profile
```

**Note:** Ensure that you include the tilde character before `/.profile` in the previous commands.

---

## Chapter 6. Installing using Linux utilities

The following instructions tell you how to set up a basic IBM Directory. You can find more detailed information in subsequent sections of this documentation.

Instructions given in this chapter assume you are logged in as *root* and have the IBM Directory Version 4.1 CD mounted at */SD\_CDROM*.

**Attention:** If you have a 3.2.x version of SecureWay Directory installed, and you want to migrate your data, use the the instructions in “SMIT Installation” on page 23 to install IBM Directory. Read and understand the migration process in “Migration from SecureWay Directory Version 3.2.x for UNIX installations” on page 60 before installing IBM Directory 4.1. It is very important that you backup and export previous versions of schema files and *slapd32.conf* before installing IBM Directory 4.1.

---

### Installing the IBM Directory

**Note:** Before installing the IBM Directory, you must remove any existing versions of LDAP that might have been installed previously. If you try to install the IBM Directory over an existing version of LDAP, the IBM Directory does not install correctly. If this occurs you must remove the IBM Directory and then reinstall it. See “Removing IBM Directory” on page 53.

One method to determine if you have a previously installed version of LDAP is to issue the following command to query the installed packages:

```
rpm -qa | grep -i ldap
```

This command finds any installed applications containing the name *ldap*. This method works only if you have a version of LDAP that contains the string *ldap* in its application names.

The IBM Directory for Linux operating system is shipped in the following packages.

Intel-based Linux packages:

- *ldap-server-4.1-1.i386.rpm* (no SSL)
- *ldap-client-4.1-1.i386.rpm* (no SSL)
- *ldap-serverd-4.1-1.i386.rpm* (SSL enabled)
- *ldap-clientd-4.1-1.i386.rpm* (SSL enabled)
- *ldap-msg-xxx-4.1-1.i386.rpm* (Where *xxx* is language dependent.)
- *ldap-html-xxx-4.1-1.i386.rpm* (Where *xxx* is language dependent.)
- *ldap-dmtjava-4.1-1.i386.rpm* (no SSL)
- *ldap-dmtjavad-4.1-1.i386.rpm* (SSL enabled)

Linux S/390<sup>®</sup> packages:

- *ldap-server-4.1-1.s390.rpm* (no SSL)
- *ldap-client-4.1-1.s390.rpm* (no SSL)
- *ldap-serverd-4.1-1.s390.rpm* (SSL enabled)

- ldap-clientd-4.1-1.s390.rpm (SSL enabled)
- ldap-msg-xxx-4.1-1.s390.rpm (Where xxx is language dependent.)
- ldap-html-xxx-4.1-1.s390.rpm (Where xxx is language dependent.)
- ldap-dmtjava-4.1-1.s390.rpm (no SSL)
- ldap-dmtjavad-4.1-1.s390.rpm (SSL enabled)

**Notes:**

1. The examples in this chapter use Linux Intel-based packages.
2. For Turbolinux Version 6.5, during the install, the install tool (rpm) thinks there is a dependency on the file **libstdc++.so.2.9** and cannot find it even though a more recent version is on the system. To fix this problem specify **--nodeps** (dash dash nodeps) in the rpm input parameters. For example:

```
rpm --nodeps -hiv ldap-client-4.1-1.i386.rpm
```

Specifying **--nodeps** bypasses dependency checking. It allows the code to be installed.

To install the IBM Directory with no SSL:

1. Install the client:  
rpm -hiv ldap-client-4.1-1.i386.rpm
2. Install the DMT:  
rpm -hiv ldap-dmtjava-4.1-1.i386.rpm
3. Install the server:  
rpm -hiv ldap-server-4.1-1.i386.rpm
4. Verify that the packages have been installed correctly:  
rpm -qa | grep ldap

If the product has been successfully installed, the following is displayed:

```
ldap-client-4.1-1
ldap-dmtjava-4.1-1
ldap-server-4.1.1
```

5. Install the language-dependant messages or documents:  
rpm -hiv ldap-msg-xxx-4.1-1.i386.rpm  
rpm -hiv ldap-html-xxx-4.1-1.i386.rpm

After installing the messages, you need to set the following environment variables:

```
export NLSPATH=/usr/share/i18n/msg/%L/%N
export LANG=xxx
LC_ALL=xxx
```

where xxx is the language. For example, de\_DE.

To install the IBM Directory with SSL enabled:

1. Install the client:  
rpm -hiv ldap-clientd-4.1-1.i386.rpm
2. Install the DMT:  
rpm -hiv ldap-dmtjavad-4.1-1.i386.rpm
3. Install the server:  
rpm -hiv ldap-serverd-4.1-1.i386.rpm
4. Verify that the packages have been installed correctly:  
rpm -qa | grep ldap

If the product has been successfully installed, the following is displayed:

```
ldap-clientd-4.1-1
ldap-dmtjavad-4.1-1
ldap-serverd-4.1.1
```

5. Install the language-dependant messages or documents:

```
rpm -hiv ldap-msg-xxx-4.1-1.i386.rpm
rpm -hiv ldap-html-xxx-4.1-1.i386.rpm
```

After installing the messages, you need to set the following environment variables:

```
export NLS_PATH=/usr/share/i18n/msg/%L/%N
export LANG=xxx
LC_ALL=xxx
```

where *xxx* is the language. For example, *de\_DE*.

---

## Installing GSKit

The following information is provided as a guide to those who wish to install the software package *gsk5bas.tar* on Linux operating system. You can install the package through command line.

The rpm commands to perform the installation are:

1. Install in the default location: */usr/local* (need to be "root") `rpm -ivv <rpm_file>`  
`rpm -ivv gsk5bas-5.0.1-X.i386.rpm`
2. Install `rpm -ivv --prefix` in a user specified location (need to have write access) to avoid the errors of the post-install script, (which will crop up if the user is not "root") use the `--noscripts` flag  
`rpm -hiv --prefix <new_location><rpm_file> --noscripts`

Example:

```
rpm -hiv --prefix /tmp/usr gsk5bas-5.0.1-X.i386.rpm --noscripts
```

## Removing GSKit

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

```
rpm -evv <package_name>
```

Options:

`-evv` Erase `<package_name>` and display debugging information.

Could use just the `-e` if no trace or debug information is desired.

`<package_name>` Name of the rpm package to be removed.

Example:

```
rpm -evv gsk5bas-5.0.1
```

---

## Configuring the environment

You need to add `DB2INSTANCE` and `LD_LIBRARY_PATH` to your environment. The following examples assume that you are using the bash shell. If you use a different shell, substitute the appropriate `.login` or `.profile` for `.bashrc`.

1. Log on as **root**, or enter the command:  
`su -`
2. Run the following commands to modify your environment:

```
echo 'export DB2INSTANCE=ldapdb2' >> ~/.bashrc
echo 'export LD_LIBRARY_PATH=/usr/IBMdb2/V7.1/lib:/usr/
ldap/lib:$LD_LIBRARY_PATH' >> ~/.bashrc
. ~/.bashrc
```

**Note:** Ensure that you include the tilde character before `/.bashrc` in the previous commands.

For information about starting, stopping and populating the directory, see the *IBM Directory Server Version 4.1 Administration Guide*.

---

## Chapter 7. Installing using Solaris utilities

Instructions given in this chapter assume you are logged in as **root** and have the IBM Directory Version 4.1 CD mounted at `/SD_CDROM`.

**Attention:** If you have a 3.2.x version of SecureWay Directory installed, and you want to migrate your data, use the the instructions in “SMIT Installation” on page 23 to install IBM Directory. Read and understand the migration process in “Migration from SecureWay Directory Version 3.2.x for UNIX installations” on page 60 before installing IBM Directory 4.1. It is very important that you backup and export previous versions of schema files and `slapd32.conf` before installing IBM Directory 4.1.

---

### Installing

**Note:** Before installing the IBM Directory, you must remove any existing versions of LDAP that might have been installed previously. If you try to install the IBM Directory over an existing version of LDAP, the IBM Directory does not install correctly. See “Removing IBM Directory” on page 53.

Use either the **admintool** utility or **pkgadd** from a command prompt to install IBM Directory.

**Note:** 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).

The following instructions assume that you are installing from a CD-ROM with the device name `/dev/cd0`.

### Package dependencies

The following five IBM Directory packages are available for installation:

- `IBMldapc` IBM Directory Client
- `IBMldapdj` IBM Directory DMT
- `IBMldaps` IBM Directory Server
- `IBMldixxx` IBM Directory Documentation (where xxx is language dependent)
- `IBMldmxxx` IBM Directory Messages (where xxx is language dependent)

**Note:** The English messages are automatically installed with the `IBMldaps` (server) package. There is no separate messages package for English.

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

- Client
- DMT
- Server
- Documentation and Messages

If installing only the client software, the order is:

- Client

- DMT
- Documentation and Messages

If the client package is not installed first, the installation fails.

## Non-IBM version of LDAP on your system

During the installation of the server or client on Solaris Operating Environment Software Version 8, or the server on Version 7, you might encounter the following message:

```
A non-IBM version of LDAP has been located on your system. In order
to use the command line version of the IBM supplied files, the
existing files (ldapadd, ldapdelete, ldaplist, ldapmodify,
ldapmodrdn, ldapsearch) must be relocated. Specify the new
directory in which to move the files (/usr/bin/ldapsparc) [?,q]
```

Press **Enter** to accept the default directory (/usr/bin/ldapsparc), or type a new path name and press **Enter**, or type q and press **Enter** to quit.

After relocating the files, you might see these additional messages:

```
## Processing system information.
WARNING: /usr/bin/ldapadd <no longer a linked file>
WARNING: /usr/bin/ldapdelete <no longer a linked file>
WARNING: /usr/bin/ldapmodify <no longer a linked file>
WARNING: /usr/bin/ldapmodrdn <no longer a linked file>
WARNING: /usr/bin/ldapsearch <no longer a linked file>
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
```

The following files are already installed on the system and are being used by another package:

```
/usr/bin/ldapadd
/usr/bin/ldapdelete
/usr/bin/ldapmodify
/usr/bin/ldapmodrdn
/usr/bin/ldapsearch
```

Do you want to install these conflicting files [y,n,?,q]

Type y and press **Enter** to continue the installation. The existing files are moved to the directory previously specified and the IBM Directory files are installed in the /usr/bin directory.

## AdminTool Installation

To install IBM Directory using the **admintool** utility:

1. Type the following at a root command prompt: `admintool&`  
The **Users** window is displayed.
2. Click **Browse--> Software**. The **Software** window is displayed.
3. Click **Edit--> Add**. The **Set Source Media** window is displayed.  
**Attention:** Do not click the **Customize** button in the lower left corner of the **Set Source Media** window. If you click **Customize**, AdminTool crashes. Because LDAP does not have any customizable options, there is no need for you to use this button.
4. Select **CD with Volume Management**. The CD-ROM path defaults to:  
/cdrom/cdrom0/
5. Change the path to /cdrom/cdrom0/ldap41\_us and click **OK**.
6. Click **OK**.

7. Select from the following list of installable packages:

- IBM Directory Client
- IBM Directory DMT
- IBM Directory Server
- IBM Directory Documentation (for all languages)
- IBM Directory Messages (for all languages)

Remember that you must install the IBMldapc package first. See “Package dependencies” on page 37 for the correct installation sequence.

8. Click **Add**.
9. You are asked if you want to use /opt as the base directory. If space permits, use /opt as the base installation directory. To accept /opt as the base directory, press **Enter**.

**Notes:**

- a. With the installation of client and server packages, the system prompts you with the notice, This package contains scripts which will be executed with super-user permission during the process of installing the package. These scripts create the IBM Directory user ID. Type **y** to continue.
- b. If you are installing the Server package, you also see the prompt, Do you want to install these as setuid/setgid files? The CGI programs need to be able to start daemons, run DB2 commands, and create the IBM Directory DB2 instance user ID and group, so they occasionally need to run as root. Type **y** to continue.

After the package is installed, the Software window is displayed.

10. Repeat steps 6 through 11 for each additional package you want to install. If you are finished installing the packages, Select **File--> Exit** to exit the **admintool** utility.

## Command line installation

To install IBM Directory from a command prompt:

1. At the command prompt, install the required packages with the following command:

```
pkgadd -d /cdrom/cdrom0/ldap41_us
```

The following packages are available:

```
IBMldapc    IBM Directory Client
(sparc) 4.1.0.0
IBMldapdj   IBM Directory DMT
(sparc) 4.1.0.0
IBMldaps    IBM Directory Server
(sparc) 4.1.0.0
IBMldixxx   IBM Directory documentation
(sparc) 4.1.0.0
IBMldmxxx   IBM Directory messages
(sparc) 4.1.0.0
```

where *xxx* is a specific language identifier.

**Note:** The English messages are automatically installed with the IBMldaps (server) package. There is no separate messages package for English.

2. Specify the IBM Directory packages you want to install. Do not use the system default of **ALL**. The system does not sequence the packages correctly and the installation fails.

Examples:

- To install all IBM Directory packages, enter:  
`pkgadd -d /cdrom/cdrom0/1dap41 IBM1dapc IBM1dapdj IBM1daps IBM1dixxx IBM1dmxxx`

**Note:** The order in which the packages are listed is crucial. If package dependencies are not met, the installation fails.

- To install the client only, enter:  
`pkgadd -d /cdrom/cdrom0/1dap41 IBM1dapc`
  - To install the client and documentation packages, enter:  
`pkgadd -d /cdrom/cdrom0/1dap41 IBM1dapc IBM1dixxx`
  - To install the client and DMT only, enter:  
`pkgadd -d /cdrom/cdrom0/1dap41 IBM1dapc IBM1dapdj`
  - To install the client, DMT and server packages, enter:  
`pkgadd -d /cdrom/cdrom0/1dap41 IBM1dapc IBM1dapdj IBM1daps`
  - To install the client, DMT, server, and message packages, enter:  
`pkgadd -d /cdrom/cdrom0/<1dap41> IBM1dapc IBM1dapdj IBM1daps IBM1dmxxx`
3. During installation, you are asked if you want to use /opt as the base directory. If space permits, use /opt as the base installation directory. To accept /opt as the base directory, press **Enter**.

**Notes:**

- a. With the installation of client and server packages, the system prompts you with the query, This package contains scripts which will be executed with super-user permission during the process of installing the package. Continue with installation? These scripts create the IBM Directory user ID. Type **y** to continue.
  - b. If you are installing the Server package, you also see the prompt, Do you want to install these as setuid and/or setgid files? The CGI programs need to be able to start daemons, run DB2 commands, and create the IBM Directory DB2 instance user ID and group, so they occasionally need to run as root. Type **y** to continue.
4. When the installation is completed, type **q** to return to the command prompt.

---

## Installing GSKit

You can install GSKit 5 using either the AdminTool or the command line.

To install IBM Directory using the **admintool** utility:

1. Log in as *root*.
2. Type the following at a root command prompt: **admintool&**  
The **Users** window is displayed.
3. Click **Browse--> Software**. The **Software** window is displayed.
4. Click **Edit--> Add**. The **Set Source Media** window is displayed.
5. Type the full path name to the directory that contains the GSKit installation code in the **Path** field. For example, if you are installing from a CD-ROM :  
`/cdrom/cdrom0/gskit`
6. Click **OK**.
7. Select **Certificate and SSL Base Runtime (gsk5bas)**
8. Click **Add**. You are asked if you want to continue the installation.

9. Type **y** and press **Enter**. After the package is installed, a message is displayed and you are instructed to press **Return**.
10. Press **Enter**.
11. If you are finished installing packages, click **File-->Exit** to exit the **admintool** utility.

To install GSKit using the command line:

1. Insert the CD-ROM.
2. Log in as root.
3. At the command prompt, install the required tar file sets with the following command:

```
pkgadd -d /cdrom/cdrom0/gskit
```

## Removing GSKit

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

```
pkgrm gsk5bas
```



---

## Chapter 8. Installing using Windows 98, Windows 2000 or Windows NT utilities

---

### Silent Installation

The following options and conditions apply to Silent Installation:

- You must have at least 100 MB available memory before invoking Silent Installation.
- If you install the client/server package, you do not need to install both the client and the server. You can choose to install the client only.
- Silent installation does not install GSKit.
- If you choose to install the server, you must already have a Web server and DB2 installed.
- You must uninstall any existing LDAP directory on your system before beginning silent installation. If an existing LDAP directory is detected during installation, silent install exits and no migration takes place.
- To edit installation path settings, copy the /options file to a writable location.
- Configuration cannot be specified.

To begin installing IBM Directory 4.1:

1. Run the following command at a command prompt:

```
setup -is:silent -options d:\ldap\optionsFiles\InstallServer.txt
```

where *d:* is your CD-ROM drive.

If installation exits for any reason, you can find information about the exit in ldapinst.log.

Installation is complete when the last log entry in the `<installpath>\ldap\ldapinst.log` reads: **Exiting LdapExit.**

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

---

### Installing GSKit

If you have a previous version of GSKit installed, remove it before installing GSKit 5.

Installation Instructions for Windows 98, Windows 2000 or Windows NT operating systems

1. Run the following command

**Note:** Do not start the setup.exe by the clicking on the icon.

```
setup <LDAP> <PATH>  
s -f1"<extracted file location>\ setup.iss"
```

Where *LDAP* is the name of your application and will be registered as a registered user of GSK in the Windows Registry (under the key SOFTWARE\IBM\GSK\REGAPPS)

And where *PATH* is the path where you want the installation to put the code. Please note our installation program will append "\ibm\gsk5" to any path you enter.

**Options:** **-s** to run the setup in the SILENT mode.

**-f1** "..\setup.iss" the RESPONSE file needed to run the Setup in the SILENT mode.

For example:

```
gsk5bas setup LDAP PATH -s -f1"<extracted file location>\setup.iss"
```

## Removing GSKit

To remove GSKit, run the following command:

```
gsk5BUI LDAP
```

---

## Chapter 9. Configuration

You can use either the Server Administration (**ldapxcfg**) or the **ldapcfg** command-line utility to configure the IBM Directory server. To configure a UNIX system, you must be logged in as **root**. On a Windows 2000 or Windows NT system, log in as **Administrator** to configure.

You must have at least 80 MB available to configure the sample database.

If you are using a Windows 2000 or Windows NT system, and you used the InstallShield GUI Typical option to install, IBM Directory was automatically configured.

If you are configuring a UNIX-based system, you must run the three command line utilities, **ldapcfg**, **ldapxcfg**, and **ldapucfg**, from a directory that has execute permission for **other**. That is, a directory that has at least the -----x permission set. If this permission is not set, you might see an error message and experience a subsequent failure during the database creation step. To set this permission for your current directory, you can enter the command:

```
chmod o+x .
```

**Note:** The period ( . ) in the command is required to indicate "this directory".

For either the Server Administration or the command line program, IBM Directory server configuration consists of three parts:

- Defining the IBM Directory administrator distinguished name (DN) and a password. This operation can be compared to defining the root user ID and password on a UNIX system. DNs are not case sensitive. If you are unfamiliar with X.500 format or if for any other reason you do not want to define a new DN, accept the default DN. You need to define a password.
- Modifying a Web server configuration to access the IBM Directory Web administration pages. Web servers are available on AIX, Solaris, Windows 2000 or Windows NT platforms only.
- Configuring the database.

For configuration of a Web server, verify that the Web server is installed. You also need to know:

- The name of the Web server that you are using
- The full path and name of the configuration file for the Web server:
  - **IBM HTTP Server**
    - AIX operating systems: **/usr/HTTPServer/conf/httpd.conf**
    - Solaris operating systems: **/opt/HTTPServer/conf/httpd.conf**
    - Windows 2000 or Windows NT operating systems: **C:/Program Files/ IBM HTTP Server/conf/httpd.conf**
  - **Domino Webserver**
    - AIX and Solaris operating systems: **/local/notesdata/httpd.cnf**
    - Windows 2000 or Windows NT operating systems: **C:/Lotus/Domino/Data/httpd.cnf**
  - **Apache Server**

- AIX and Solaris operating systems: `/usr/local/apache/conf/httpd.conf`
- Windows 2000 or Windows NT operating systems: `C:/Program Files/Apache Group/Apache/conf/httpd.conf`
- **iPlanet Webserver**
  - AIX and Solaris operating systems: `/usr/netscape/server4/https/<fully qualified domain name>/config/obj.conf`
  - Windows 2000 or Windows NT operating systems: `C:/netscape/server4/https<fully qualified domain name>/config/obj.conf`

When configuration is complete, restart the Web server manually for the changes to take effect.

**Note:** To run the configuration utilities (`ldapcfg`, `ldapxcfg`, and `ldapucfg`) on a TurboLinux 6.5 operating system, you must have the `sh-utils-2.0.5-exit.patch` installed to enable the configuration utilities.

To work around this problem, obtain the following patch and additional information from the Linux Technology Center Web site, located at [http://bugzilla.linux.ibm.com/show\\_bug.cgi?id=495](http://bugzilla.linux.ibm.com/show_bug.cgi?id=495)

**Attention:** Before configuring a Red Hat 7.1 system, you need to make special system modifications to the configuration tools (`ldapxcfg`, `ldapcfg`, `ldapucfg`):

1. Download `sh-utils-2.0.11-5.i386.rpm` from the following Red Hat site: <ftp://ftp.redhat.com/pub/redhat/linux/7.2/en/os/i386/RedHat/RPMS/>
2. Log in as root and update the `sh-utils` package using the following command:
 

```
rpm -Fvh sh-utils-2.0.11-5.i386.rpm
```

---

## IBM Directory Configuration (ldapxcfg)

To configure the IBM Directory using Server Administration:

1. Type `ldapxcfg` at a command prompt.
2. You can set the Directory administrator name and password, create the directory DB2 database, or configure a Web server for directory server administration. You can select one of these tasks or you can select multiple tasks. If you select more than one task, the information entry windows are displayed consecutively.
  - To set the administrator DN and password:
    - a. Select **Set the directory administrator name and password**.
    - b. Click **Next**. Type the administrator DN (or accept the default DN), type in a password, and retype to confirm the password.
    - c. Click **Next**.
    - d. Review the **Configuration Summary** panel. Click **Configure**.
    - e. The **Configuration Completion** panel is displayed. Click **OK**.
  - To configure or reconfigure a directory database:
    - a. Select **Create the LDAP DB2 database** (the selection is **Reconfigure the directory DB2 database**, if a DB2 database already exists), and click **Next**.
    - b. Select either **Create a default directory DB2 database** (if a database is currently configured, the selection is **Reconfigure the existing default LDAPDB2 database**) or **Use my own DB2 database** (this selection is also referred to as a custom database). For information on creating a database

manually, see Appendix C, “Creating a database manually” on page 77. The default directory selections are recommended.

- c. Click **Next**.
- d. If prompted, select **Create a Universal DB2 database (UTF-8)** to create the database in the Universal Character Set or select **Create a local codepage DB2 database** to create the database in the local codepage. You can also select **Create a database for changelog support** to enable the change log.
- e. If prompted, specify the directory where you want the database to reside or accept the default directory. Click **Next**.
- f. If you selected **Use my own DB2 database**, fill in the four required fields. Click **Next**.
- g. The Configuration Completion panel is displayed; click **OK**.
- To configure a Web server:
  - a. Ensure that the Web server is installed.
  - b. Select **Configure a Web server for directory administration**.
  - c. Choose only one of the following:
    - IBM HTTP
    - Apache
    - Lotus Domino
    - iPlanet Netscape
    - Microsoft Internet Information server (for Windows 2000 or Windows NT systems only)
  - d. If prompted, enter the full pathname of the Web server configuration file.
  - e. Review the Configuration Summary panel, and then click **Configure**.
  - f. The Configuration Completion panel is displayed. Make note of the administration Web address, and then click **OK**.
  - g. Restart the configured Web server. For the appropriate command, see the **ldapcfg** utility step 2. Pick the appropriate Web server and perform Step c for your Web server.
3. Start the IBM Directory server by using a Web browser and the administration Web address that was listed on the **Configuration Completion** panel to access Server Administration. Click **Server->Startup/Shutdown**, and on the Server startup page click **Startup**. When startup is finished, a completion window is displayed.

---

## Configuring or Reconfiguring the Database from a Web Browser

If you have previously set the administrator DN and password, and configured a Web server, you can configure or reconfigure a database from a Web browser. Using a Web browser connect to `http://hostname/ldap`, and then log on as the administrator DN (for example, use Netscape Navigator to connect to this page, and then log on).

**Note:** Some Web servers might require you to specify `index.html` in the Web address. If you are unable to get to the Server Administration tool with `http://hostname:portnumber/ldap`, try `http://hostname:portnumber/ldap/index.html`.

1. Click **Database** to expand its selections.
2. Click **Configure**.

3. Click the type of database you want to use, and then click **Next**.
4. If you want to back up your database, type the fully qualified file name in the field. Select if you want to create the backup directory or to stop the configuration process if the directory that you specified is not found. Otherwise, click **Do not backup the current data**. Be aware that if you do not back up your database, the database is deleted and the data is lost. Click **Next**.
5. Do *one* of the following depending on the type of database you are configuring:
  - If you are configuring a default database, select the directory where you want to create the database, click the type of database you want to create, and then click **Finish**.
  - If you are configuring a custom database, type the Database name, the Database instance, the Database system administrator, and the Database system administrator password. Retype the password in the Confirm the password field, and then click **Finish**. This configures the database.
  - Restart the LDAP server.

---

## Idapcfg Utility

To configure the IBM Directory using the command-line utility:

1. To define the admin DN and password, type the following command at a command prompt:

```
ldapcfg -u "cn=root" -p secret
```

**Note:** Do not use single quotes (') to define DN's with spaces in them. They are not interpreted correctly.

To accept the default administrator DN of "cn=root" and define a password, type the following command at a command prompt:

```
ldapcfg -p secret
```

2. Pick the appropriate Web server and configure the Web server. You need to know the full pathname of the Web server configuration file. Use that path name instead of the paths shown after the **-f** options in the following examples. The example paths are based upon system defaults for an AIX system.

### IBM HTTP Server

- a. Type the following command at a command prompt:

```
ldapcfg -s ibmhttp -f /usr/HTTPServer/conf/httpd.conf
```

- b. After the Web server configuration is complete, stop the Web server by typing the following command at a command prompt:

```
/usr/HTTPServer/bin/apachectl stop
```

- c. Restart the Web server by typing the following command at a command prompt:

```
/usr/HTTPServer/bin/apachectl start
```

### Domino Enterprise 5.0.2b Webserver

- a. Type the following command at a command prompt:

```
ldapcfg -s domino -f /etc/httpd.conf
```

- b. After the Web server configuration is complete, stop the Web server by typing the following at a command prompt:

```
stopsrc -s httpd
```

- c. Restart the Web server by typing the following at a command prompt:

```
startsrc -s httpd
```

## Apache Server

- a. Type the following command at a command prompt:

```
ldapcfg -s apache -f /usr/local/apache/conf/srm.conf
```

**Note:** The location of the Apache Server might differ. Apache v1.4.1 uses /usr/local/apache as the default.

- b. After the Web server configuration is complete, stop the Web server by typing the following at a command prompt:

```
kill -TERM `cat /usr/local/apache/logs/httpd.pid`
```

- c. Restart the Web server by typing the following at a command prompt:

```
/usr/local/apache/src/httpd -f /usr/local/apache/config/httpd.conf
```

## iPlanet Webserver Enterprise or Fast Track Edition

- a. Type the following command at a command prompt:

```
ldapcfg -s iplanet -f /usr/netscape/server4/https-<fully qualified hostname>/config/obj.conf
```

Where the variable *<fully qualified hostname>* refers to the server id, which by default is the local hostname.

**Note:** The path given in the examples assumes a iPlanet Enterprise server. For iPlanet FastTrack, the default path is:

```
/usr/netscape/server4/httpd-<fully qualified hostname>/config/obj.conf
```

- b. After the Web server configuration is complete, you can stop and restart the Web server from either the iPlanet Server Administration page or a command prompt.

- From the iPlanet Server Administration page:

- 1) Click iPlanet Server **OFF** to stop the Web server.
- 2) Click iPlanet Server **ON** to restart the Web server.

- From a command prompt:

- 1) Stop the Web server by typing:

```
/usr/netscape/server4/https-<fully qualified hostname>/stop
```

- 2) Restart the Web server by typing:

```
/usr/netscape/server4/https-<fully qualified hostname>/start
```

## Microsoft IIS Web server (Windows 2000 and Windows NT only)

- a. Type the following at a command prompt:

```
ldapcfg -s iis
```

- b. From the desktop, double-click the **My Computer** icon.
  - c. Double-click the **Control Panel** icon. Double-click the **Services** icon.
  - d. Select **World Wide Web Publishing Service** and click **Stop**.
  - e. Select **World Wide Web Publishing Service** and click **Start**.
3. To configure a database, the following options are available:

**-l location**

Location of the DB2 database. For UNIX systems, this is a directory or filesystem name.

**-a id.** DB2 administrator ID.

- c** Create a database in UTF8 format.
- i** DB2 instance name.
- w** *password*  
DB2 administrator password.
- d** *database*  
DB2 database name.
- o** Overwrite database if one previously exists. If **-o** is not specified and a database currently exists, then DB2 configuration is not performed.

For default configuration, use the **-l** option.

- To configure a default database on `/home/ldapdb2` when there is not an existing database configured (that is, the first time), the command is:  
`ldapcfg -l /home/ldapdb2`
- To configure a default database on `/home/ldapdb2`, when a database is already configured, the command is:  
`ldapcfg -l /home/ldapdb2 -o`

**Note:** To enable the change log use the **-g** option. The change log is a separate database that records changes to the main directory. You need an additional 30 MB to create it.

For configuration into your own existing (custom) database, use the **-a**, **-w**, **-i**, and **-d** options. Because an instance in DB2 must be the name of an existing user, the **-a** and **-i** values must be the same on UNIX platforms.

- To configure a custom database with a DB2 administrator name of **db2admin**, an instance name of **dbInstanceName** and a database name of **dbName** when there is not an existing database configured (that is, the first time), the command is:  
`ldapcfg -a dbInstanceName -w mypassword -i dbInstanceName -d dbName`

**Attention:** Do not use `ldapdb2` as a custom database name. Any custom database named `ldapdb2` will be destroyed during unconfiguration.

- To configure a custom database similar to the previous example when a database is already configured, the command is:  
`ldapcfg -a db2admin -w mypassword -i dbInstanceName -d dbName -o`

Return to the Chapter 1, “Installation, configuration, and migration overview” on page 1.

---

## Chapter 10. Unconfiguring the server and removing IBM Directory

---

### Unconfiguring the server

The options for the **ldapucfg** utility are the same as for the **ldapcfg** utility except that in the **ldapucfg** utility the **-d** option removes the LDAPDB2 database backend and the **-g** option disables the change log. Disabling the change log removes the change log database and any data (change records) that are in it. The **-g** option does not affect the main directory database.

**Attention:** Back up any existing schema files and your directory before performing the following steps.

1. Log in as *root*.
2. Stop all clients that are connected to the IBM Directory server.
3. Use the **ldapucfg** utility to remove the DB2 configuration information from the IBM Directory server. At the command prompt, type:

```
ldapucfg -d
```

You are prompted to enter **Y** or **N** to confirm the unconfiguration.

**Note:** If the default database was configured, the **ldapucfg** utility deletes the database from the system by this step. If a custom database was configured, the database remains on the system. You must remove the custom database if its removal is necessary.

To remove a custom database:

- a. If you are on a Windows 2000 or Windows NT system, open a db2 window. If you are using a UNIX system, log in as the instance owner. Type:  
db2stop
  - b. Type:  
db2 drop db <instance name>
  - c. Type:  
db2idrop <instance name>
4. Pick the appropriate Web server and follow the steps to remove the configuration information from the Web server. Microsoft IIS Web Server applies to Windows 2000 or Windows NT systems only. The remaining examples show you how to remove a Web server configuration on an AIX system.

#### IBM HTTP Server

- a. Type the following command at a command prompt:  
ldapucfg -s ibmhttp -f /usr/HTTPServer/conf/httpd.conf
- b. After you remove the Web server configuration information, stop the Web server by typing the following command at a command prompt:  
/usr/HTTPServer/bin/apachectl stop
- c. Restart the Web server by typing the following command at a command prompt:

```
/usr/HTTPServer/bin/apachectl start
```

### Microsoft IIS Web Server (Windows 2000 or Windows NT operating systems only) **Windows 2000**

- a. Click **Start-->Settings-->Control Panel**.
- b. Double-click **Administrative Tools**.
- c. Double-click **Computer Management**.
- d. Double-click **Services and Applications**.
- e. Double-click **Internet Information Services**.
- f. Double-click **Default Web Site**.
- g. Delete the **Idap** icon.

### **Windows NT**

- a. Click **Start-->Programs-->Windows NT 4.0 Option Pack-->Microsoft Personal Web Server-->Internet Service Manager**.
- b. Double-click **Internet Information Server**.
- c. Double-click the *machine name*.
- d. Double-click **Default Web site**.
- e. Delete the **Idap** icon.

### **Domino Enterprise Webserver**

- a. Type the following command at a command prompt:  

```
ldapucfg -s domino -f /etc/httpd.conf
```
- b. After you remove the Web server configuration information, stop the Web server by typing the following command at a command prompt:  

```
stopsrc -s httpd
```
- c. Restart the Web server by typing the following command at a command prompt:  

```
startsrc -s httpd
```

### **Apache Server**

- a. Type the following command at a command prompt:  

```
ldapucfg -s apache -f /usr/local/apache/conf/srm.conf
```

**Note:** The location of the Apache Server might differ from the example. Apache v1.2.5 uses /usr/local/apache as the default.

- b. After you remove the Web server configuration information, stop the Web server by typing the following command at a command prompt:  

```
kill -TERM `cat /usr/local/apache/logs/httpd.pid`
```
- c. Restart the Web server by typing the following command at a command prompt:  

```
/usr/local/apache/src/httpd -f /usr/local/apache/config/httpd.conf
```

### **iPlanet Webserver Enterprise or Fast Track Edition**

- a. Type the following command at a command prompt:  

```
ldapucfg -s netscape -f /usr/netscape/server4/https-<fully qualified hostname>/config/obj.conf
```

Where the variable *<fully qualified hostname>* refers to the server ID, which by default is the local host name.

**Note:** The path in the examples assumes an iPlanet Enterprise server. For iPlanet FastTrack, the default path is:

```
/usr/netscape/server4/httpd-  
fully qualified hostname>/config/obj.conf
```

- b. After you remove the Web server configuration information, you can stop and restart the Web server from either the iPlanet Server Administration page or a command prompt.
  - From the iPlanet Server Administration page:
    - 1) Stop the Web server by selecting **iPlanet Server OFF**.
    - 2) Restart the Web server by selecting **iPlanet Server ON**.
  - From a command prompt:
    - 1) Stop the Web server by typing at a command prompt:

```
/usr/netscape/server4/https-<fully qualified hostname>/stop
```
    - 2) Restart the Web server by typing at a command prompt:

```
/usr/netscape/server4/https-<fully qualified hostname>/start
```

---

## Removing IBM Directory

### Uninstalling using operating system utilities

After you remove the configuration information, you can uninstall the IBM Directory.

#### Notes:

1. If you installed IBM Directory using the InstallShield GUI, uninstall using the process in “Uninstalling using InstallShield GUI” on page 55.
2. During removal no attempt is made to see if Web servers still contain IBM Directory modifications. If the IBM Directory is removed before removing the IBM Directory configuration information from the Web server, the Web server configuration files have to be unconfigured manually. If you reinstall the IBM Directory, you do not need to reconfigure the Web server.
3. Removing the IBM Directory does not remove any databases you created using IBM Directory.

#### AIX operating system

To uninstall the IBM Directory server or client, type the following:

```
installp -u ldap
```

This removes only IBM Directory filesets. It does not remove other components such as DB2.

#### HP-UX

To remove the IBM Directory, complete the following steps:

1. At a command prompt, type `swremove`
2. Select the installed IBM Directory.
3. Click **Actions-->Mark For Remove**.
4. Click **Actions-->Remove/Uninstall**.
5. Click **OK**.
6. When removal is complete, click **Done**.

7. Click **File-->Exit**.

## Linux operating system

Before removing the IBM Directory, ensure that the server is stopped and issue the following commands.

**Note:** If the IBM Directory server is installed, you must remove the server before you remove the client (the reverse order of the installation).

```
rpm -ev ldap-server-4.1-1
rpm -ev ldap-dmtjava-4.1-1
rpm -ev ldap-client-4.1-1
rpm -ev ldap-msg-xxx-4.1-1.i386.rpm (Where xxx is
language dependent.)
rpm -ev ldap-html-xxx-4.1-1.i386.rpm (Where xxx is
language dependent.)
```

## Solaris operating system

You can uninstall the IBM Directory using the **admintool** utility or from a command line using **pkgrm**.

**AdminTool Removal:** To Remove the IBM Directory using the admintool utility:

1. Log in as **root**.
2. Type the following at a root command prompt:  
admintool&

The **Users** window is displayed.

3. Click **Browse -> Software**. The **Software** window is displayed.
4. Select the packages to delete from the displayed list.

```
IBM Directory Client
IBM Directory Documentation
IBM Directory DMT and Java
IBM Directory Server
```

5. Click **Edit ->Delete**. The **AdminTool: Warning** window is displayed.
6. Click **Delete**.

### Notes:

- a. With the removal of client and server packages, the system prompts you with the query, This package contains scripts which will be executed with super-user permission during the process of installing the package. Continue with the removal of this package? Type **y** to continue. If you are removing the Server package, you also see the prompt, Do you want to remove these as setuid and/or setgid files?Type **y** to continue.
7. After the package is removed, the **Software** window is displayed. When the removal is complete, type **q** to return to the command prompt.

Installing the IBM Directory using the default settings creates the **opt/IBMldaps** and **opt/IBMldapc** directories. If you uninstall the IBM Directory, the removal procedure might not remove these directories. If one or both of these directories exist, they create a problem if you later reinstall the IBM Directory in non-default directories.

To ensure that the directories are completely removed issue this command at a command line:

```
rm -fr /opt/IBMldaps /opt/IBMldapc
```

You can now reinstall the IBM Directory to a non-default directory.

**Note:** This problem does not occur if you reinstall to the default directories.

**Command Line Removal:** To see what IBM Directory components are installed, type:

```
pkinfo | grep -i ibml
```

The output displayed is similar to the following:

```
IBMldapc    IBM Directory Client
(sparc) 4.1.0.0
IBMldapdj   IBM Directory DMT
(sparc) 4.1.0.0
IBMldaps    IBM Directory Server
(sparc) 4.1.0.0
IBMldixxx   IBM Directory documentation
(sparc) 4.1.0.0
IBMldmxxx   IBM Directory messages
(sparc) 4.1.0.0
```

Use `pkgrm` to remove the desired packages:

```
pkgrm IBMldapc IBMldapdj IBMldaps
```

You can specify either the package name or its listing number. Remove the packages in the reverse order of the installation sequence.

### Windows 2000 or Windows NT operating system

1. Click **Start-->Settings-->Control Panel-->Add/Remove Programs**.
2. Select **IBM Directory 4.1**. Click the **Change/Remove** button.
3. Select the language you want to use during the uninstall. Click **OK**.
4. Click **Next**.
5. Select the features you want to uninstall. Click **Next**.
6. To uninstall the selected features, click **Next**.

## Uninstalling using InstallShield GUI

### Windows 98, Windows 2000 or Windows NT operating system

1. Click **Start-->Settings-->Control Panel-->Add/Remove Programs**.
2. Select **IBM Directory 4.1**. Click the **Change/Remove** button.
3. Select the language you want to use during the uninstall. Click **OK**.
4. Click **Next**.
5. Select the features you want to uninstall. Click **Next**.
6. To uninstall the selected features, click **Next**.

### UNIX operating system

1. From a command prompt, go to the IBM Directory `_uninst` directory.

**AIX and Linux operating systems:**

```
/usr/ldap/_uninst
```

**Solaris operating system:**

```
/opt/IBMldapc/_uninst
```

2. Run the uninstall command:

```
./uninstall
```



---

## Chapter 11. Migration

Migrating is necessary to preserve any changes that you have made to the schema definitions and to preserve your data and directory server configuration. Use these procedures when you are migrating an existing directory server on the same physical machine. The level of SecureWay Directory you are migrating must be 3.2.0 or higher.

If you have SecureWay Directory 3.1.1.5 version currently installed, you must upgrade to level 3.2.2 before installing IBM Directory 4.1. You can download SecureWay Directory version 3.2.2 from the IBM SecureWay Directory Web site: <http://www-4.ibm.com/software/network/directory/downloads/>.

Audit log and change log are not migrated. If you want to preserve your audit log and change log settings, record them before uninstalling. Once you have reinstalled, you can reset the audit log and change log settings in WebAdmin.

**Attention:** Run the **db2ldif** application before uninstalling the 3.2.x version of SecureWay Directory. Do not use the **DB2BACKUP** command.

---

### Migration from SecureWay Directory Version 3.2.x for Windows 2000 or Windows NT InstallShield GUI installations

If you are upgrading from a 3.2.x version of SecureWay Directory, and you are installing IBM Directory on a 2000 or Windows NT system using the InstallShield GUI, the installation automatically completes some migration for you.

To migrate, do the following:

1. If you have not done so already:
  - a. Export the database using **db2ldif**

**Note:** Read the **db2ldif** documentation in the *SecureWay Administration Guide* for your release before exporting the database.

```
db2ldif -o <outputfile>[-s <subtree DN>]
```

where *outputfile* specifies the LDIF output file to contain the directory entries in LDIF and *subtree DN* identifies the top entry of the subtree that is to be dumped to the LDIF output file.

**Attention:** Export your data using **db2ldif** before unconfiguring and removing the database. Do not use the **DB2BACKUP** command. If you do not export before unconfiguring and removing the database, you will lose your data.

- b. Unconfigure and remove the database:

```
ldapucfg -d
```

Press *y* to confirm to the removal. Default LDAP databases are automatically removed from the system when the command successfully completes.

**Note:**

- If you use a custom database, you must manually remove the DB2 database from the system.
- Data contained in the SecureWay Directory 3.2.x database is not compatible with IBM Directory 4.1 unless it is exported via **db2ldif** and imported through the **bulkload** or **ldif2db** utilities provided with IBM Directory 4.1.
- The server will not start if you do not migrate.
- Changelog is removed during migration.
- If you have a downlevel version of DB2, you must upgrade to 7.1 Fix Pack 3 or later.

**Attention:** Export your data using **db2ldif** before uninstalling or upgrading your level of DB2. Do not use the **DB2BACKUP** command. If you do not export the data using **db2ldif** before unconfiguring, upgrading or removing your current level of DB2, you will lose the contents of your data base.

2. Install IBM Directory 4.1. The InstallShield GUI automatically performs the following migration processes for you:

- Saves your server configuration (slapd32.conf) in the following location:  
*<install path>etc/userV41*
- Saves your Schema files in the following location:  
*<install path>etc/userV41*
- Saves any existing IBM JNDI applications, IBMJNDI.JAR or any associated JNDI files in the following location:  
*<install path>etc/userV41/java*

JNDI related files:

- Ibmjcefw.jar
- Ibmjceprovider.jar
- IBMjgssprovider.jar
- Local\_policy.jar
- US\_export\_policy.jar
- Krb5.ini
- Ibmjndi.jar
- Ibmjndi.zip

JNDI related directories:

- etc/java/bin
- etc/java/lib
- Saves the webk file to the following location:  
*<install path>/webk/webk.bak*
- Migrates the configuration and schema by executing the migrate41 script.

**Note:** You might be asked if you want to replace some configuration files. Select **Yes** to replace.

3. After you complete installation and reboot your machine, create a new default LDAP database, use **ldapcfg** or **ldapxcfg**. See Chapter 9, “Configuration” on page 45 for instructions on how to create a new default LDAP database. To create a custom database, use DB2 commands. See Appendix C, “Creating a database manually” on page 77 for instructions on how to create a new default LDAP database.

**Note:** If you want a changelog database, make sure changelog is enabled in **ldapxcfg** or the **-d** option in **ldapcfg**.

4. Use the **bulkload** utility to import the **db2ldif** exported data:

**Note:** Read the **bulkload** documentation in the *IBM Directory Server Version 4.1 Administration Guide* for new command line settings that provide additional levels of functionality.

```
bulkload -i <ldiffile>-c -d
```

Where *ldiffile* is the name of the input file containing the LDIF data to be loaded into the directory.

**Note:** You can also use **ldif2db** and **ldapadd** to import, but for performance reasons we recommend that you use **bulkload** to import the **db2ldif** exported data.

---

## Migration from SecureWay Directory Version 3.2.x for AIX installations

To migrate an existing directory server on the same physical machine:

1. Export the database using **db2ldif**

**Note:** Read the **db2ldif** documentation in the *SecureWay Administration Guide* for your release before exporting the database.

```
db2ldif -o <outputfile>[-s <subtree DN>]
```

where *outputfile* specifies the LDIF output file to contain the directory entries in LDIF and *subtree DN* identifies the top entry of the subtree that is to be dumped to the LDIF output file.

**Attention:** Export your data using **db2ldif** and remove the db2admin id from the operating system before unconfiguring and removing the database (step 2). Do not use the **DB2BACKUP** command. If you do not export before unconfiguring and removing the database, you will lose your data.

2. Unconfigure and remove the database:

```
ldapucfg -d
```

Press *y* to confirm to the removal. Default LDAP databases are automatically removed from the system when the command successfully completes.

**Notes:**

- a. If you use a custom database, you must manually remove the DB2 database from the system.
- b. Data contained in the SecureWay Directory 3.2.x database is not compatible with IBM Directory 4.1 unless it is exported via **db2ldif** and imported through the **bulkload** or **ldif2db** utilities provided with IBM Directory 4.1.
- c. The server will not start if you do not migrate.
- d. If you have a downlevel version of DB2, you must upgrade to 7.1 Fix Pack 3 or later.

**Attention:** Export your data using **db2ldif** before unconfiguring and removing the database. Do not use the **DB2BACKUP** command. If you do not export before unconfiguring and removing the database, you will lose your data.

3. Save the webk file to the following location:

`<install path>/webk/webk.bak`

4. Install IBM Directory 4.1 using “SMIT Installation” on page 23. SMIT installation automatically performs the following migration processes for you:
  - Saves your server configuration (slapd32.conf) in the following location:  
`<install path>etc/userV41`
  - Saves your Schema files in the following location:  
`<install path>etc/userV41`
5. Do one of following:
  - If you are migrating, migrate the configuration and schema by executing the migrate41 script:  
`<installpath>/sbin/migrate41`
6. To create a new default LDAP database, use **ldapcfg** or **ldapxcfg**. See Chapter 9, “Configuration” on page 45 for instructions on how to create a new default LDAP database. To create a custom database, use DB2 commands. See Appendix C, “Creating a database manually” on page 77 for instructions on how to create a new default LDAP database.

**Note:** You must run the migrate41 script even if you didn’t modify the previous schema. There are new schema files and entries in the slapd32.conf file that are not compatible with previous versions.

- If you are reinstalling over an existing version of IBM Directory 4.1, copy the files that were saved in the `<install path>etc/userV41` directory in step 4 to the `etc\` directory.

**Note:** If you want a changelog database, make sure changelog is enabled in **ldapxcfg** or the **-d** option in **ldapcfg**.

7. Use the **bulkload** utility to import the **db2ldif** exported data:

**Note:** Read the **bulkload** documentation in the *IBM Directory Server Version 4.1 Administration Guide* for new command line settings that provide additional levels of functionality.

```
bulkload -i <ldiffile>-c -d
```

Where *ldiffile* is the name of the input file containing the LDIF data to be loaded into the directory.

**Note:** You can also use **ldif2db** and **ldapadd** to import, but for performance reasons we recommend that you use **bulkload** to import the **db2ldif** exported data.

---

## Migration from SecureWay Directory Version 3.2.x for UNIX installations

**Attention:** Do not use these instructions to migrate on an AIX system. If you are migrating on an AIX system, see “Migration from SecureWay Directory Version 3.2.x for AIX installations” on page 59.

To migrate an existing directory server on the same physical machine:

**Note:** If you are installing using InstallShield GUI, you might have completed some of these steps already. See “Before installing on UNIX-based platforms” on page 17

1. Export the database using **db2ldif**

**Note:** Read the **db2ldif** documentation in the *SecureWay Administration Guide* for your release before exporting the database.

```
db2ldif -o <outputfile>[-s <subtree DN>]
```

where *outputfile* specifies the LDIF output file to contain the directory entries in LDIF and *subtree DN* identifies the top entry of the subtree that is to be dumped to the LDIF output file.

**Attention:** Export your data using **db2ldif** and remove the db2admin id from the operating system before unconfiguring and removing the database (step 2). Do not use the **DB2BACKUP** command. If you do not export before unconfiguring and removing the database, you will lose your data.

2. Unconfigure and remove the database:

```
ldapucfg -d
```

Press *y* to confirm to the removal. Default LDAP databases are automatically removed from the system when the command successfully completes.

**Notes:**

- a. If you use a custom database, you must manually remove the DB2 database from the system.
- b. Data contained in the SecureWay Directory 3.2.x database is not compatible with IBM Directory 4.1 unless it is exported via **db2ldif** and imported through the **bulkload** or **ldif2db** utilities provided with IBM Directory 4.1.
- c. The server will not start if you do not migrate.
- d. If you have a downlevel version of DB2, you must upgrade to 7.1 Fix Pack 3 or later.

**Attention:** Export your data using **db2ldif** before unconfiguring and removing the database. Do not use the **DB2BACKUP** command. If you do not export before unconfiguring and removing the database, you will lose your data.

**Note:** If you have non-IBM Directory applications using a downlevel version of DB2, and you are using InstallShield GUI to install on a UNIX system, you can leave the downlevel version machine on your machine. InstallShield GUI will install DB2 7.2 during installation. We recommend that you remove the downlevel version of DB2 if you are not using it.

3. Save your server configuration (slapd32.conf) in the following location:

```
<install path>etc/userV41
```

4. Save your Schema files in the following location:

```
<install path>etc/userV41
```

5. If you have any existing IBM JNDI applications, IBMJNDI.JAR or any associated JNDI files, save them in the following location:

```
<install path>etc/userV41/java
```

JNDI related files:

- Ibmjcefw.jar
- Ibmjceprovider.jar
- IBMjgssprovider.jar

- Local\_policy.jar
- US\_export\_policy.jar
- Krb5.ini
- Ibmjndi.jar
- Ibmjndi.zip

JNDI related directories:

- etc/java/bin
- etc/java/lib

6. Save the webk file to the following location:  
`<install path>/webk/webk.bak`
7. If you have an earlier version of IBM Directory installed, for example SecureWay Directory 3.2.2, remove it before installing IBM Directory 4.1.
8. Install IBM Directory 4.1 using **pkgadd** (Solaris), **RPM** (Linux Intel/390) or the InstallShield GUI.
9. Migrate the configuration and schema by executing the migrate41 script:  
`<installpath>/sbin/migrate41`

**Note:** You must run the migrate41 script even if you didn't modify the previous schema. There are new schema files and entries in the slapd32.conf file that are not compatible with previous versions.

10. To create a new default LDAP database, use **ldapcfg** or **ldapxcfg**. See Chapter 9, "Configuration" on page 45 for instructions on how to create a new default LDAP database. To create a custom database, use DB2 commands. See Appendix C, "Creating a database manually" on page 77 for instructions on how to create a new default LDAP database.

**Note:** If you want a changelog database, make sure changelog is enabled in **ldapxcfg** or the **-d** option in **ldapcfg**.

11. Use the **bulkload** utility to import the **db2ldif** exported data:

**Note:** Read the **bulkload** documentation in the *IBM Directory Server Version 4.1 Administration Guide* for new command line settings that provide additional levels of functionality.

```
bulkload -i <ldiffile>-c -d
```

Where *ldiffile* is the name of the input file containing the LDIF data to be loaded into the directory.

**Note:** You can also use **ldif2db** and **ldapadd** to import, but for performance reasons we recommend that you use **bulkload** to import the **db2ldif** exported data.

---

## Chapter 12. Troubleshooting

If you are having problems installing or configuring the IBM Directory 4.1 product, refer to this section for possible fixes.

---

### InstallShield GUI installation

If your install does not complete, the first place you should look for information is the `ldapinst.log`. If the install destination directory (`ldaphome`) was created, this log will be in the `ldaphome` root directory. For example, on a Windows 98, Windows 2000 or Windows NT system, the `ldapinst.log` would be in `c:\Program Files\IBM\LDAP\`. If the install destination was not created before the installation failed, the log may be in a temporary directory. To find it, do a search for "`ldapinst.log`". Review this log for any messages about why the install failed. Because some of the `ldap` features require corequisite products, it's possible that a failure in the corequisite installation caused the IBM Directory installation to fail. For example, if the server feature is being installed, but the DB2 install fails, the server feature cannot be installed.

### Failed installation

Another reason for failed installation is lack of disk space. IBM Directory attempts to verify that there is enough space and generates messages if the requisite disk space is not found, but it is possible that InstallShield GUI cannot progress far enough to issue a message. Before installing, make sure you have the recommended free disk space. All platforms use temporary space, and in addition, UNIX platforms use the `/var` directory. When install is first executed, the JVM is installed to the install directory, so be sure that your installation destination directory has enough space.

### Recovering from a failed installation

The first step to recovering from a failed install is to run the InstallShield Uninstall GUI to clean up any registry entries that may have been made by the install. If you do not run the InstallShield Uninstall GUI, the InstallShield GUI might fail the next time you try to install using the InstallShield GUI. See the following sections on how to do this for each platform. See "Uninstalling using InstallShield GUI" on page 55 for information on uninstalling using the InstallShield GUI.

When installing on UNIX platforms, the IBM Directory GUI install uses the native packages (i.e. AIX `installp` files, Solaris `.pkg` files, or RPM files) to do the install. Because of this, you will see these packages when you run the platform commands (such as "`rpm -qa`" on Linux operating system) to query what is installed. Even though you can use the platform commands (such as `rpm -e`) to uninstall, you **MUST** use the InstallShield GUI to uninstall so that the InstallShield Registry is cleaned up.

#### AIX operating system

- Uninstall using the InstallShield GUI.

- Execute:

```
lslpp -L |grep ldap
```

If any packages were left on the system, use **installp** to uninstall them:

```
installp -u <package name>
```

- Issue:

```
lsipp -l
```

If you see any other entries that were installed by the InstallShield GUI, remove them using **installp**.

- Remove the /usr/ldap directory.
- Correct any other problems that were listed in the ldapinst.log.

**Note:** AIX operating system install will generate an additional log called **installp\_ismpl.log**. You should review this log to determine if there were failures in the **installp** commands issued by the InstallShield GUI.

### Linux operating system

- Uninstall using the InstallShield GUI.

- Execute

```
rpm -qa
```

If any packages were left on the system, use:

```
rpm -ev
```

to uninstall them:

```
rpm -ev <package names>
```

- If an rpm command hangs, try running the command with the noscripts options:  

```
rpm -ev - - noscripts <package names>
```
- Remove the /usr/ldap directory
- Correct whatever other problems that were listed in the ldapinst.log.

### Solaris operating system

- Uninstall using the InstallShield GUI.

- Execute:

```
pkginfo
```

If any packages were left on the system, use pkgrm to uninstall them:

```
pkgrm <package names>
```

**Note:** If you encounter problems removing these packages, try to remove the directories containing the packages from /var/sadm/pkg

- Remove the /opt/IBMldapc and /opt/IBMldaps directories, and any other directories left from the install, such as a language directory.
- Correct whatever other problems that were listed in the ldapinst.log.

### Windows 98, Windows 2000 or Windows NT operating system

- Uninstall using the InstallShield GUI.
- Remove the ldap directory. The default directory is C:\Program Files\IBM\LDAP
- Correct any other problems listed in the ldapinst.log.

---

## Configuration

If you see the following message during the configuration of the database

```
Failed to start database manager for instance: ldapdb2
```

you might have a problem with your electronic DB2 license. To verify this, type the following at the command prompt:

```
db2start
```

If your license is correct, you see the message:

```
SQL1063N DB2START processing was successful.
```

Otherwise, you see the message that starts:

```
SQL8007W There are xx day(s) left in the evaluation period for the product.....
```

If there is a problem with your electronic DB2 license, one of the following situations might be the cause:

- You have a demonstration license.

To upgrade your DB2 product from a demonstration license to a product license, you need to copy the license file from the DB2 CD to the system where DB2 is installed; you do not need to reinstall the product.

**Note:** Your Proof of Entitlement and License Information booklets identify the products for which you are licensed.

- You have purchased a different product.

If you install a DB2 product as Try-and-Buy, and you buy a different product, you must uninstall the Try-and-Buy product and then install the new one that you have purchased. Perform the following to upgrade your DB2 license:

1. Put the product CD in the CD-ROM drive.
2. Double-click the **Nodelock Administration Tool** icon in the **License Use Runtime - Client** folder to start the Nodelock Administration Tool.
3. Select **Products->New** from the menu bar.
4. Click **Import**.
5. In the **Import** window, locate the db2\license directory on your CD-ROM. A list of files is shown. Select the license file that corresponds to the specific product that you have purchased and installed on your system:  

db2pers.lic	DB2 Universal Database Personal Edition
-------------	---
6. Click **OK**.
7. Manually remove the DB2 database using the instructions in "DB2 does not configure properly".

## DB2 does not configure properly

If something fails during configuration or unconfiguration, you might need to clean up your database by performing some or all of the following steps. If a step fails, continue to the next step. You are now ready for configuration.

### Windows 98, Windows 2000 or Windows NT platforms

1. Log on as the DB2 administrator (db2admin by default), not as Administrator.
2. Type db2cmd at a command prompt.
3. From the **Windows services** window, start the service labeled **DB2 - LDAPDB2**.
4. In the db2cmd window, type:  
DB2 drop database ldapdb2
5. From the services window, stop the service labeled **DB2 - LDAPDB2**.

6. In the db2cmd window, type:
 

```
db2 uncatalog database ldapdb2
db2 uncatalog node ldapdb2
db2idrop ldapdb2
```
7. Edit the slapd32.conf file in `<ldaphome>\etc\`
 where *ldaphome* is the directory where you installed IBM Directory. Remove these lines that follow the database rdbm line:
 

```
ibm-slapdDbName:      ldapdb2
ibm-slapdDbInstance:  ldapdb2
ibm-slapdDbUserPW:   >.....<
ibm-slapdDbUserID:   ldapdb2
```
8. Remove the ldapdb2 database directory and all subdirectories. The directory is located on the drive that you selected when configuring the database. From the command prompt, type:
 

```
rd /s ldapdb2
```

## UNIX platforms

1. Log onto the system as *root*.
2. At a command prompt, type:
 

```
su - ldadb2
```
3. Type
 

```
db2
```

 to start the DB2 command shell.
4. In the DB2 command shell window, type:
 

```
db2 uncatalog database ldapdb2
db2 uncatalog node ldapdb2
db2idrop ldapdb2
```
5. Edit the slapd32.conf file in `<ldaphome>\etc\`
 where *ldaphome* is the directory where you installed IBM Directory. Remove these lines that follow the database rdbm line:
 

```
ibm-slapdDbAlias: ldapdb2b
ibm-slapdDbName:      ldapdb2
ibm-slapdDbInstance:  ldapdb2
ibm-slapdDbUserPW:   >.....<
ibm-slapdDbUserID:   ldapdb2
```
6. Edit the `/etc/services` file by removing the following two lines:
 

```
ldapdb2svc 3702/tcp
ldapdb2svci 3703/tcp
```
7. Remove the ldapdb2 database directory and all subdirectories. The directory is located on the filesystem you selected when configuring the database. The default directory is `/home/ldapdb2/` for most systems. From the command prompt, type:
 

```
rm -rf ldapdb2
```

## Database performance is poor

The BUFFPAGE and DBHEAP database configuration parameters can affect performance. The default BUFFPAGE included with DB2 is 1000 (4 KB pages), which might not be big enough for a large database. Also, if you increase the BUFFPAGE parameter, you must also increase the DBHEAP size by 1 for every 30 incremented in the BUFFPAGE.

DB2 database supports multiple buffer pools. However, unless you know how to do specialized tuning on DB2, it is recommended that you use a single buffer pool. This can be specified using the command:

```
db2 alter bufferpool ibmdefaultbp size -1
```

To update the database configuration parameters for a database, use the command:

```
db2 update database configuration for <database> using  
    <param> <value>
```

For example, to increase the BUFFPAGE and DBHEAP size, use the command:

```
db2 update database configuration for <database> using  
    BUFFPAGE 20000 DBHEAP 1866
```

**Note:** For more detailed performance information, see the *IBM Directory Server Version 4.1 Tuning Guide*.

## Replication command line interface error ( 2000 or Windows NT operating system only)

If you are using a Windows 2000 or Windows NT and have a master server configured to do replication, you might see an error like the following in the slapd error log during updates :

```
[IBM][CLI Driver] CLI0157E Error opening a file.  SQLSTATE=S1507
```

This problem can be resolved by adding the following stanza to the \sqllib\db2cli.ini file:

```
[COMMON]  
TempDir=x:\<your directory>
```

where x:\<your directory> specifies an existing directory on a drive that has space available. DB2 database writes temporary files to this directory. The amount of space required depends on the size of the directory entries you are adding or updating, but generally does require more space than the size of the largest entry you are updating.

## Server does not start after making changes to configuration files attributes

The attributes defined in IBM Directory Server configuration files are significant to only the first 18 characters. Names longer than 18 characters are truncated to meet the DB2 restriction.

If you want to index the attribute, the limit is further restricted to 16 characters. If you add attributes longer than 18 characters, the server might not start. For additional information, see the Server Administration helps under **Reference**, Directory Schema.

## Transaction log is full

The following messages might be displayed at IBM Directory Server startup if the schema defines too many attributes:

```
SQL0965C The transaction log for the database is full  
SQLSTATE=57011 slapd unable to start because all backends failed to configure
```

You might need to increase the DB2 transaction log sizes by typing:

```
db2 update db cfg for ldaptest using logprimary X
db2 update db cfg for ldaptest using logsecond X
```

where X is greater than what is currently defined.

## Error running DB2 commands against the LDAPDB2 database on a Windows 2000 or Windows NT operating system

Running certain DB2 commands, such as **list database directory** and **connect to ldapdb2**, against the LDAPDB2 database on a Windows NT , Windows 2000 or Windows NT system results in the following error:

```
SQL1031N: "The database directory cannot be found on the indicated filesystem."
```

To work around this problem, perform one of the following workarounds:

- Log in to your NT system as **ldapdb2 user** and set the **DB2INSTANCE** environment variable to **ldapdb2**.

This workaround assumes you are using the default database, **ldapdb2** .

- Open a DB2 window and run:

```
db2cmd
```

Set the **DB2INSTANCE** environment variable to **ldapdb2**:

```
set DB2INSTANCE=LDAPDB2
```

---

## Debugging

### DB2 Errors Logged

In addition to the `slapd.errors` log file that can be accessed through the Server Administration, DB2 errors are logged in the `cli.errors` file. Both files are located in the `tmp` subdirectory of the IBM Directory installation directory on the Windows NT, Windows 2000 or Windows NT operating system.

**Note:** The `tmp` subdirectory might include other DB2 files.

The IBM Directory server errors are logged to:

```
/tmp/slapd.errors
```

The DB2 errors are logged to:

```
/tmp/cli.errors
```

### Server Debug Mode

If the error logs do not provide enough information to resolve a problem, you can run the IBM Directory server in a special debug mode that generates very detailed information. The server executable `slapd` must be run from a command prompt to enable debug output. The syntax is as follows:

```
ldtrc on
slapd -h bitmask
```

where the specified `bitmask` value determines which categories of debug output are generated.

For example, the following `ldtrc` search:

```
ldapsearch -l 60 -h ddejesus -D "o=IBM_US, c=US" -w
secret -b "ou=Austin, o=IBM_US, c=US" "cn=Cindy Corn"
```

might return results similar to the following:

```

Connection received from 9.53.95.251 on socket 540.
86366975      704 usec SQLAllocStmt() => 0
86367557      73 usec SQLBindParameter() => 0
86367974      33 usec SQLBindParameter() => 0
86435508      52 usec SQLFetch => 0
86436039      49 usec SQLGetData => 0
86436835      454 usec SQLFreeStmt => 0
86458726      629 usec SQLAllocStmt() => 0
86459708      561 usec SQLPrepare(SELECT distinct
DB2ADMIN.LDAP_ENTRY.EID FROM DB2ADMIN.LDA
P_ENTRY,DB2ADMIN.LDAP_DESC WHERE
(DB2ADMIN.LDAP_ENTRY.EID=DB2ADMIN.LDAP_DESC.DEID
AND DB2ADMIN.LDAP_DESC.AEID=?) AND DB2ADMIN.LDAP_ENTRY.EID
IN (SELECT EID FROM DB2ADMIN.CN WHERE CN_T= ?)) => 0

```

See Table 2 for a description of debug categories.

*Table 2. Debug categories*

Hex	Decimal	Value	Description
0x0001	1	LDAP_DEBUG_TRACE	Entry and exit from routines
0x0002	2	LDAP_DEBUG_PACKETS	Packet activity
0x0004	4	LDAP_DEBUG_ARGS	Data arguments from requests
0x0008	8	LDAP_DEBUG_CONNS	Connection activity
0x0010	16	LDAP_DEBUG_BER	Encoding and decoding of data
0x0020	32	LDAP_DEBUG_FILTER	Search filters
0x0040	64	LDAP_DEBUG_MESSAGE	Messaging subsystem activities and events
0x0080	128	LDAP_DEBUG_ACL	Access Control List activities
0x0100	256	LDAP_DEBUG_STATS	Operational statistics
0x0200	512	LDAP_DEBUG_THREAD	Threading statistics
0x0400	1024	LDAP_DEBUG_REPL	Replication statistics
0x0800	2048	LDAP_DEBUG_PARSE	Parsing activities
0x1000	4096	LDAP_DEBUG_PERFORMANCE	Relational backend performance statistics
0x1000	8192	LDAP_DEBUG_RDBM	Relational backend activities (RDBM)
0x4000	16384	LDAP_DEBUG_REFERRAL	Referral activities
0x8000	32768	LDAP_DEBUG_ERROR	Error conditions
0xffff	65535	ALL	
0x7fffffff	2147483647	LDAP_DEBUG_ANY	All levels of debug

For example, specifying a bitmask value of 65535 turns on full debug output and generates the most complete information.

When you are finished, issue the following command at a command prompt:

```
ldtrc off
```

It is recommended that you contact IBM Service for assistance with interpreting the debug output and resolving the problem.

---

## Migration

During migration, some log files might be created:

### All platforms

Errors that occurred during schema migration are logged to:

/tmp/migrate.errors

Detailed messages concerning schema migration are logged to:

/tmp/migrate41.log

### Windows 2000 or Windows NT only

IBM Directory migration errors are logged to:

/tmp/migrate41.err

IBM Directory information messages are logged to:

/tmp/migrate41.out

---

## Web Browser Problems

### Microsoft Internet Explorer

#### Cache Setup

Click **View->Internet Options**, and select **General**. Then, click **Settings**. Under **Check for newer versions of stored pages**, click **Every visit to the page**.

If you are getting unpredictable results using the browser, the cache might be storing pages with errors. On the General folder page, click **Delete files** and **Clear History** to clear the cache. Use these options as often as necessary.

Shutting down and restarting the browser can also repair some intermittent problems.

#### HTTP Level Setup

In **View->Internet Options**, select **Advanced**. Under **HTTP 1.1 settings**, if you are not using the iPlanet Fastrack Server, select **Use HTTP 1.1**. If you are using the iPlanet Fastrack Server, clear both check boxes, if you want the browser to use HTTP 1.0. If you change this option, the change does not become effective until you shut down and restart the browser.

#### Scroll Bars in Navigational Area

You might see small scroll bars in the IBM Directory Entry area on the left-side frame of the browser. To remove the scroll bars double-click in the area as if you are going to select a menu item. The menu area in the left-side frame is displayed correctly. Resizing the window also removes the scroll bars.

### iPlanet Communicator and Netscape Navigator

#### Cache Setup

Click **Edit->Preferences->Advanced->Cache**. Under **Document in cache is compared to document on network**, click **Every time**.

On this same page, if you are getting unpredictable results using the browser, click **Clear Memory Cache** and **Clear Disk Cache** to clear the cache. You can use these buttons as often as necessary.

Shutting down and restarting the browser can also improve some intermittent problems.

### **Resizing Windows**

If you resize the browser window, the Java applets on the left side and top frame are not painted to the new size. In addition, a Data Missing browser error might occur. For these reasons, resizing the Netscape browser window is not recommended.

### **Disappearing Fields**

The fields in the work area on the right side of the screen sometimes appear momentarily and then disappear. Minimize the browser window and then maximize it to repaint the form correctly.

### **Shutdown**

The Netscape browser takes some time to shut down Java. You need to wait sufficient time before restarting the Netscape browser.

If you have more than one Netscape session open, you probably started the browser before it shut down Java. If you find multiple Netscape processes running at the same time, stop all of them, and then restart the browser.

### **Page cannot be displayed error**

If you receive a "Page cannot be displayed" error when trying to access Web Administration, make sure the location field contains one of the following values:

`http://hostname/ldap/` or `http://hostname/ldap/index.html`

The Netscape browser sometimes has problems if the trailing slash is not included.



---

## Appendix A. Database configuration planning

---

### Before Configuring the Database

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 are 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 IBM Directory applications and users to get search results as expected for the collation sequence of the native language. Using UTF-8 enables the storing of any UTF-8 character data in the directory. IBM Directory 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. For more information, see the Online Help in the Server Administration. Under **Tell me about**, select **UTF-8 Support**.

#### 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. This makes it easier for clients to determine which branch of the tree contains the information they are trying to locate. If you are storing data about the people in an organization, it is easy to map the structure of the organization onto the structure of the directory. If you are storing descriptions of applications, machine configuration data, or data on customers, it might take more planning to decide how to structure your directory.

#### Your data security requirements

See the SSL section under **References** and the Password Encryption section under **Tell me about** in the Server Administration Online Help for information about how your data is secured.

#### How you want to allocate access permissions

See the ACL section under **References** in the Server Administration Online Help for information about using access permissions.

Return to Chapter 1, "Installation, configuration, and migration overview" on page 1 or to Chapter 9, "Configuration" on page 45.



---

## Appendix B. Creating a change log database with a non-default database (Windows, Windows 2000, Windows NT, AIX and Solaris operating systems only)

To use change log with a non-default database you must configure it manually. You need to have the following information:

- The Instance name of the non-default database.
  - The location of the non-default database.
  - The user ID and password of the owner of the non-default database.
1. Using DB2 commands, create the change log database in the same instance as the main database. The actual steps to do this vary by platform. For example, you do the following:
    - a. Become the user who owns the main database:

```
db2cmd
```
    - b. Run:

```
db2start
```
    - c. Run:

```
db2 create database <changelog_db_name>  
[using codeset UTF-8 TERRITORY <territory>]
```

**Note:** If the main database was created as UTF-8, then the change log must be created as UTF-8.

2. After the database is created, you must edit the `<ldap root>/etc/slapd32.conf` file.

In the directory section that starts,

```
dn:cn=Directory,cn=RDBM Backends,cn=IBM Directory,cn=Schemas,cn=Configuration
```

add the following line:

```
ibm-slapdPlugin:preoperation /bin/libcl.dll CLInit cn=changelog
```

After that section insert the following change log section:

```
dn:cn=Change Log,cn=RDBM Backends,cn=IBM SecureWay,cn=Schemas,cn=Configuration  
cn:Change Log  
cn:changelog  
ibm-slapdChangeLogMaxEntries:0  
ibm-slapdDbConnections:2  
ibm-slapdDbInstance:<your_db2_instance>  
ibm-slapdDbName:<your_new_changelog_database_name>  
ibm-slapdDbUserId:<your_database_id>  
ibm-slapdDbUserPW:<your_database_password>  
ibm-slapdPlugin:database /bin/libback-rdbm.dll rdbm_backend_init  
ibm-slapdPlugin:preoperation /bin/libcl.dll CLInit cn=changelog  
ibm-slapdReadOnly:FALSE  
ibm-slapdSuffix:cn=changelog  
ibm-slapdUseProcessIdPw:FALSE  
objectClass:top  
objectClass:ibm-slapdRdbmBackend
```

In schema section that starts,

```
dn:cn=SchemaDB,cn=LDCF Backends,cn=IBM SecureWay,cn=Schemas,  
cn=Configuration
```

add the line:

```
ibm-slapdPlugin:preoperation /bin/libcl.dll CLInit cn=changelog
```

Restart the slapd service for the changes to take effect.

---

## Appendix C. Creating a database manually

IBM Directory uses a DB2 database to store directory data. Use the following steps to create that database on your system.

**Note:** For a Windows, Windows 2000 or Windows NT operating system you must issue the **db2cmd** command instead of the UNIX **su - ldapdb2** command. If **db2cmd** does not work on your machine, click **Start->Programs->IBM DB2->Command Line Processor**.

1. Create a group named **dbsysadm** for the database administrators:

```
groupadd [-g <gid>] dbsysadm
```

**Note:** The **groupadd** command on some Linux distributions requires that the group ID number (gid) be specified using the **-g <gid>** syntax. Type `cat /etc/group` to find an available group ID number. Red Hat automatically assigns the next available gid if the **-g** option is not specified.

2. Add users **root** and **ldap** to the **dbsysadm** group.
  - a. Open `/etc/group` in your favorite editor.
  - b. Add the users **root,ldap** to the last line

**Note:** There are no spaces in the syntax.

```
dbsysadm:x:<gid>:root,ldap
```

or

```
sed -e 's/^dbsysadm:.*:$/&root,ldap/g' /etc/group > group.tmp  
cp group.tmp /etc/group  
rm group.tmp
```

3. Create a user account (ldapdb2) for the DB2 instance:

```
useradd -g dbsysadm -m ldapdb2
```
4. Set the password for the user account (ldapdb2):

```
passwd ldapdb2
```

Enter the new password when prompted. You might want to record your password for future reference.

5. Create the DB2 Instance (ldapdb2):
  - a. Create a system user whose primary group is **dbsysadm**
  - b. Create a db2 instance named after the user you created in step a.
  - c. Login as the user you created in step a. and set the **DB2INSTANCE** to the user. For example, if the user you created in step a. is *ldapuser*:

```
DB2INSTANCE=ldapuser
```

```
/usr/IBMdb2/V7.2/instance/db2icrt -u ldapdb2 ldapdb2
```

6. Create the DB2 database:

```
su - ldapdb2
```

Log in using password created in step 4.

```
db2start  
df -k  
db2 create db ldapdb2 on /home/ldapdb2 using codeset UTF-8 territory US  
exit
```

**Notes:**

- a. The database requires at least 80 MB. By default it is created in the /home/ldapdb2 directory. If you do not have sufficient space on the /home filesystem, create it now or select an alternate location where user ldapdb2 has full access privileges. Substitute that path for /home/ldapdb2 in the previous command.
- b. You must configure the IBM Directory server before you can begin populating the database. See Chapter 9, "Configuration" on page 45 for instructions on completing this task.

---

## Configuration settings

The following DB2 configuration settings must be made to ensure proper operations. This must be done for databases used by the slapd server, including ldapdb2 (the default backend database) and ldaplog (the changelog database, if enabled).

1. Log on as ldapdb2.  
`su - ldapdb2`
2. View current database configuration settings, issue from command line:  
`db2 get db cfg for <dbname>`

View current database manager configuration settings, issue from command line:

`db2 get dbm cfg`

3. Update the following database configuration settings with  
`db2 update db cfg for <dbname>  
> using <parm><newvalue>`

DB2 Parameter	Minimum value allowed
APPLHEAPSZ	1280
PCKCACHESZ	360

For example:

`db2 update db cfg for ldapdb2 using applheapsz 1280`

4. Restart DB2  
`DB2STOP`  
`DB2START`

---

## Examples:

To create a Traditional Chinese database, issue the following command from a Traditional Chinese machine:

`db2 create database TTW using codeset Big5 territory tw`

To create a database in your current locale issue the following command:

`db2 create database <dbname>`

To create a UTF-8 database issue the following command:

`db2 create database UTF8 using codeset UTF-8 territory US`

**Note:** Use the same command to create the UTF-8 database regardless of the target locale.

---

## Appendix D. Modifications to Web server configuration files

Programs `ldapcfg` and `ldapxcfg` make the following server-specific modifications to the configuration files of the following Web servers:

**Note:** Does not apply to Linux and HP-UX operating systems.

### **iPlanet Enterprise Webserver:**

Adds to the *obj.conf*

```
Init fn="init-cgi" timeout=0
```

```
NameTrans from=/ldap/cgi-bin fn=pfx2dir dir="/usr/ldap/web/cgi-bin" name="cgi"
```

```
NameTrans from=/ldap fn=pfx2dir dir="/usr/ldap/web"
```

```
Init fn="init-cgi" LANG="...."
```

```
Init fn="init-cgi" LIBPATH="...."
```

```
Init fn="init-cgi" LOCPATH="...."
```

```
Init fn="init-cgi" NLSPATH="...."
```

### **iPlanet FastTrack Webserver:**

Adds to the *httpd.conf*

```
Init fn="init-cgi" timeout=0
```

```
NameTrans from=/ldap/cgi-bin fn=pfx2dir dir="/usr/ldap/web/cgi-bin" name="cgi"
```

```
NameTrans from=/ldap fn=pfx2dir dir="/usr/ldap/web"
```

```
Init fn="init-cgi" LANG="...."
```

```
Init fn="init-cgi" LIBPATH="...."
```

```
Init fn="init-cgi" LOCPATH="...."
```

```
Init fn="init-cgi" NLSPATH="...."
```

### **Domino Enterprise 5.0.2b Webserver:**

Adds to the *httpd.conf*

```
Exec /ldap/cgi-bin/* /usr/ldap/web/cgi-bin/*
```

```
Pass /ldap/* /usr/ldap/web/*
```

### **Apache Server:**

Adds to the *srn.conf*

```
ScriptAlias /ldap/cgi-bin/ /usr/ldap/web/cgi-bin/
```

```
Alias /ldap /usr/ldap/web
```

```
PassEnv LANG
```

```
PassEnv NLSPATH
```

```
PassEnv LOCPATH
```

### **IBM HTTP Server:**

Adds to the *httpd.conf*

```
ScriptAlias /ldap/cgi-bin/ /usr/ldap/web/cgi-bin/
```

```
Alias /ldap /usr/ldap/web
```

```
PassEnv LANG
```

```
PassEnv NLSPATH
```

```
PassEnv LOCPATH
```



---

## Appendix E. IBM Directory configuration schema

This appendix describes the Directory Information Tree (DIT) and the Attributes that are used to configure the slapd32.conf file. In previous releases the directory configuration settings were stored in a proprietary format in the slapd32.conf file. With the Version 3.2 release the directory settings are stored using the LDIF format in the slapd32.conf file.

---

### Directory Information Tree (DIT)

- cn=Configuration
  - cn=Event Notification
  - cn=Front End
  - cn=Kerberos
  - cn=Master Server
  - cn=Referral
  - cn=Schema
    - cn=IBM SecureWay
      - cn=RDBM Backends
        - cn=Directory
        - cn=ChangeLog
      - cn=LDCF Backends
        - cn=SchemaDB
  - cn=SSL
    - cn=CRL
  - cn=Transaction

#### cn=Configuration

DN cn=Configuration

##### Description

This is the top-level entry in the configuration DIT. It holds data of global interest to the server, although in practice it also contains miscellaneous items. Every attribute in this entry comes from the first section (global stanza) of slapd32.conf.

##### Number

1 (required)

##### Object Class

ibm-slapdTop

##### Mandatory Attributes

- cn
- ibm-slapdAdminDN
- ibm-slapdAdminPW
- ibm-slapdConcurrentRW
- ibm-slapdErrorLog
- ibm-slapdPort

- ibm-slapdPwEncryption
- ibm-slapdSizeLimit
- ibm-slapdSysLogLevel
- ibm-slapdTimeLimit
- objectClass

**Optional Attributes**

- None

## cn=Event Notification

DN cn=Event Notification, cn=Configuration

**Description**

Global event notification settings for IBM Directory 4.1

**Number**

1 (required)

**Object Class**

ibm-slapdEventNotification

**Mandatory Attributes**

- cn
- ibm-slapdEnableEventNotification
- objectClass

**Optional Attributes**

- ibm-slapdMaxEventsPerConnection
- ibm-slapdMaxEventsTotal

## cn=Front End

DN cn=Front End, cn=Configuration

**Description**

Global environment settings that the server applies at startup.

**Number**

0 or 1 (optional)

**Object Class**

ibm-slapdFrontEnd

**Mandatory Attributes**

- cn
- objectClass

**Optional Attributes**

- ibm-slapdPlugin
- ibm-slapdSetenv
- ibm-slapdIdleTimeOut

## cn=Kerberos

DN cn=Kerberos, cn=Configuration

**Description**

Global Kerberos authentication settings for IBM Directory 4.1.

**Number**

0 or 1 (optional)

**Object Class**

ibm-slapdKerberos

**Mandatory Attributes**

- cn
- ibm-slapdKrbEnable
- ibm-slapdKrbRealm
- ibm-slapdKrbKeyTab
- ibm-slapdKrbIdentityMap
- ibm-slapdKrbAdminDN
- objectClass

**Optional Attributes**

- None

## cn=Master Server

DN cn=Master Server, cn=Configuration

**Description**

When configuring a replica, this entry holds the bind credentials and referral URL of the master server.

**Number**

0 or 1 (optional)

**Object Class**

ibm-slapdReplication

**Mandatory Attributes**

- cn
- ibm-slapdMasterDN
- ibm-slapdMasterPW (If using Kerberos authentication, this attribute is optional.)
- ibm-slapdMasterReferral
- objectClass

**Optional Attributes**

- ibm-slapdMasterPW (If not using Kerberos authentication, this attribute is mandatory.)

## cn=Referral

DN cn=Referral, cn=Configuration

**Description**

This entry contains all the "referral" entries from the first section (global stanza) of slapd32.conf. If there are no referrals (there are none by default), this entry is optional.

**Number**

0 or 1 (optional)

**Object Class**

ibm-slapdReferral

**Mandatory Attributes**

- cn
- ibm-slapdReferral
- objectClass

**Optional Attributes**

- None

**cn=Schemas**

DN cn=Schemas, cn=Configuration

**Description**

This entry serves as a container for the schemas. This entry is not really necessary because the schemas can be distinguished by the object class `ibm-slapdSchema`. It is included to improve the readability of the DIT.

Only one schema entry is currently allowed: `cn=IBM SecureWay`.

**Number**

1 (required)

**Object Class**

Container

**Mandatory Attributes**

- cn
- objectClass

**Optional Attributes**

- None

**cn=IBM SecureWay**

DN cn=IBM SecureWay, cn=Schemas, cn=Configuration

**Description**

This entry contains all the schema configuration data from the first section (global stanza) of `slapd32.conf`. It also serves as a container for all the backends which use the schema. Multiple schemas are not currently supported, but if they were, then there would be one `ibm-slapdSchema` entry per schema. Note that multiple schemas are assumed to be incompatible. Therefore, a backend can only be associated with a single schema.

**Number**

1 (required)

**Object Class**

`ibm-slapdSchema`

**Mandatory Attributes**

- cn
- `ibm-slapdSchemaCheck`
- `ibm-slapdIncludeSchema`
- objectClass

**Optional Attributes**

- None

## cn=RDBM Backends

DN cn=RDBM Backends, cn=IBM SecureWay, cn=Schemas, cn=Configuration

### Description

This entry serves as a container for the RDBM backends. It effectively replaces the "database rdbm" line from slapd32.conf by identifying all sub-entries as DB2 backends. This entry is not really necessary because the RDBM backends can be distinguished by object class `ibm-slapdRdbmBackend`. It is included to improve the readability of the DIT

### Number

1 (required)

### Object Class

Container

### Mandatory Attributes

- cn
- objectClass

### Optional Attributes

- UseProcessIdPw
- PagedResAllowNonAdmin
- PagedResLmt
- PageSizeLmt
- SortKeyLimit
- SortSrchAllowAnon

## cn=Directory

DN cn=Directory, cn=RDBM Backends, cn=IBM SecureWay, cn=Schemas, cn=Configuration

### Description

This entry contains all the database configuration settings for the default RDBM database backend.

Although multiple backends with arbitrary names can be created, the Server Administration assumes that "cn=Directory" is the main directory backend, and that "cn=Change Log" is the optional changelog backend. Only the suffixes displayed in "cn=Directory" are configurable through the Server Administration (except for the changelog suffix, which is set transparently by enabling changelog).

### Number

0 - n (optional)

### Object Class

`ibm-slapdRdbmBackend`

### Mandatory Attributes

- cn
- `ibm-slapdDbConnections`
- `ibm-slapdDbInstance`
- `ibm-slapdDbName`
- `ibm-slapdDbUserID`
- `ibm-slapdPlugin`

- objectClass

#### Optional Attributes

- ibm-slapdChangeLogMaxEntries
- dbusridibm-slapdDbUserPW
- roibm-slapdReadOnly
- ibm-slapdSuffix
- ibm-slapdUseProcessIdPw
- PagedResAllowNonAdmin
- PagedResLmt
- PageSizeLmt
- SortKeyLimit
- SortSrchAllowAnon

## cn=Change Log

**DN** cn=Change Log, cn=RDBM Backends, cn=IBM SecureWay, cn=Schemas, cn=Configuration

#### Description

This entry contains all the database configuration settings for the change log backend.

#### Number

0 - n (optional)

#### Object Class

ibm-slapdRdbmBackend

#### Mandatory Attributes

- cn
- ibm-slapdDbConnections
- ibm-slapdDbInstance
- ibm-slapdDbName
- ibm-slapdDbUserID
- ibm-slapdPlugin
- objectClass

#### Optional Attributes

- ibm-slapdChangeLogMaxEntries
- ibm-slapdDbUserPW
- ibm-slapdReadOnly
- ibm-slapdSuffix
- ibm-slapdUseProcessIdPw
- PagedResAllowNonAdmin
- PagedResLmt
- PageSizeLmt
- SortKeyLimit
- SortSrchAllowAnon

## cn=LDCF Backends

**DN** cn=LDCF Backends, cn=IBM SecureWay, cn=Schemas, cn=Configuration

**Description**

This entry serves as a container for the LDCF backends. It effectively replaces the "database ldcf" line from slapd32.conf by identifying all sub-entries as LDCF backends. This entry is not really necessary because the LDCF backends can be distinguished by the object class `ibm-slapdLdcfBackend`. It is included to improve the readability of the DIT.

**Number**

1 (required)

**Object Class**

Container

**Mandatory Attributes**

- `cn`
- `objectClass`

**Optional Attributes**

- `ibm-slapdPlugin`

**cn=SchemaDB**

**DN** `cn=SchemaDB, cn=LDCF Backends, cn=IBM SecureWay, cn=Schemas, cn=Configuration`

**Description**

This entry contains all the database configuration data from the `ldcf` database section of `slapd32.conf`.

**Number**

1 (required)

**Object Class**

`ibm-slapdLdcfBackend`

**Mandatory Attributes**

- `cn`
- `objectClass`

**Optional Attributes**

- `ibm-slapdPlugin`
- `ibm-slapdSuffix`

**cn=SSL**

**DN** `cn=SSL, cn=Configuration`

**Description**

Global SSL connection settings for IBM Directory 4.1.

**Number**

0 or 1 (optional)

**Object Class**

`ibm-slapdSSL`

**Mandatory Attributes**

- `cn`
- `ibm-slapdSecurity`
- `ibm-slapdSecurePort`

- ibm-slapdSslAuth
- ibm-slapdSslCipherSpecs
- ibm-slapdSslKeyDatabase
- objectClass

#### Optional Attributes

- ibm-slapdSslCertificate
- ibm-slapdSslKeyDatabasePW

## cn=CRL

DN cn=CRL, cn=SSL, cn=Configuration

#### Description

This entry contains certificate revocation list data from the first section (global stanza) of slapd32.conf. It is only needed if "ibm-slapdSslAuth = serverclientauth" in the cn=SSL entry and the client certificates have been issued for CRL validation.

#### Number

0 or 1 (optional)

#### Object Class

ibm-slapdCRL

#### Mandatory Attributes

- cn
- ibm-slapdLdapCrlHost
- ibm-slapdLdapCrlPort
- objectClass

#### Optional Attributes

- ibm-slapdLdapCrlUser
- ibm-slapdLdapCrlPassword

## cn=Transaction

DN cn = Transaction, cn = Configuration

#### Description

Specifies Global transaction support settings. Transaction support is provided using the plugin:

*Windows98, Windows 2000 or Windows NT operating system:*

```
extendedop /bin/libtranext.dll tranExtOpInit 1.3.18.0.2.12.5
1.3.18.0.2.12.6
```

*AIX:*

```
extendedop /lib/libtranext.a tranExtOpInit 1.3.18.0.2.12.5
1.3.18.0.2.12.6
```

*Solaris operating system:*

```
extendedop /lib/libtranext.so tranExtOpInit 1.3.18.0.2.12.5
1.3.18.0.2.12.6
```

The server (**slapd**) loads this plugin automatically at startup if **ibm-slapdTransactionEnable = TRUE**. The plugin does not need to be explicitly added to **slapd32.conf**.

**Number**

1 (required)

**Object Class**

ibm-slapdTransaction

**Mandatory Attributes**

- cn
- ibm-slapdMaxNumOfTransactions
- ibm-slapdMaxOpPerTransaction
- ibm-slapdMaxTimeLimitOfTransactions
- ibm-slapdTransactionEnable
- objectClass

**Optional Attributes**

- None

---

**Attributes**

- cn
- ibm-slapdAdminDN
- ibm-slapdAdminPW
- ibm-slapdChangeLogMaxEntries
- ibm-slapdConcurrentRW
- ibm-slapdDbConnections
- ibm-slapdDbInstance
- ibm-slapdDbName
- ibm-slapdDbUserID
- ibm-slapdDbUserPW
- ibm-slapdEnableEventNotification
- ibm-slapdErrorLog
- ibm-slapdIncludeSchema
- ibm-slapdKrbAdminDN
- ibm-slapdKrbEnable
- ibm-slapdKrbIdentityMap
- ibm-slapdKrbKeyTab
- ibm-slapdKrbRealm
- ibm-slapdLdapCrlHost
- ibm-slapdLdapCrlPassword
- ibm-slapdLdapCrlPort
- ibm-slapdLdapCrlUser
- ibm-slapdMasterDN
- ibm-slapdMasterPW
- ibm-slapdMasterReferral
- ibm-slapdMaxEventsPerConnection
- ibm-slapdMaxEventsTotal
- ibm-slapdMaxNumOfTransactions
- ibm-slapdMaxOpPerTransaction
- ibm-slapdMaxTimeLimitOfTransactions

- ibm-slapdPagedResAllowNonAdmin
- ibm-slapdPagedResLmt
- ibm-slapdPageSizeLmt
- ibm-slapdPlugin
- ibm-slapdPort
- ibm-slapdPwEncryption
- ibm-slapdReadOnly
- ibm-slapdReferral
- ibm-slapdSchemaAdditions
- ibm-slapdSchemaCheck
- ibm-slapdSecurePort
- ibm-slapdSecurity
- ibm-slapdSetenv
- ibm-slapdSizeLimit
- ibm-slapdSortKeyLimit
- ibm-slapdSortSrchAllowNonAdmin
- ibm-slapdSslAuth
- ibm-slapdSslCertificate
- ibm-slapdSslCipherSpecs
- ibm-slapdSslKeyDatabase
- ibm-slapdSslKeyDatabasePW
- ibm-slapdSuffix
- ibm-slapdSysLogLevel
- ibm-slapdTimeLimit
- ibm-slapdTransactionEnable
- ibm-slapdUseProcessIdPw
- objectClass

## cn

### Description

This is the X.500 common Name attribute, which contains a name of an object.

### Syntax

Directory string

### Maximum Length

256

**Value** Multi-valued

### Modified by

Do not modify.

## ibm-slapdAdminDN

### Description

The administrator bind DN for IBM Directory server.

### Default

cn=root

**Syntax**

DN

**Maximum Length**

1000

**Value** Single-valued**Modified by**The `ldapcfg -u admin DN` command or the `ldapxcfg` command.

## ibm-slapdAdminPW

**Description**

The administrator bind Password for IBM Directory server.

**Default**

secret

**Syntax**

Binary

**Maximum Length**

128

**Value** Single-valued**Modified by**The `ldapcfg -p admin PW` command or the `ldapxcfg` command.

## ibm-slapdChangeLogMaxEntries

**Description**

This attribute is used by a changelog plugin to specify the maximum number of changelog entries allowed in the RDBM database. Each changelog has its own `changeLogMaxEntries` attribute.

Minimum = 0 (unlimited)

Maximum = 2,147,483,647 (32-bit, signed integer)

**Default**

0

**Syntax**

Integer

**Maximum Length**

11

**Value** Single-valued**Modified by**Server Administration: **Database -> Settings**. The default is 0 (unlimited) when change log is first created or enabled.

## ibm-slapdConcurrentRW

**Description**

Setting this to TRUE allows searches to proceed simultaneously with updates. It allows for 'dirty reads', that is results that might not be consistent with the committed state of the database.

**Default**

FALSE

**Syntax**  
Boolean

**Maximum Length**  
5

**Value** Single-valued

**Modified by**  
Manually editing slapd32.conf

## ibm-slapdDbConnections

**Description**  
Specify the number of DB2 connections the server will dedicate to the DB2 backend. The value must be between 5 & 50 (inclusive).

**Note:** ODBCCONS environment variable overrides the value of this directive.

If `ibm-slapdDbConnections` (or `ODBCCONS`) is less than 5 or greater than 50, the server will use 5 or 50 respectively. 1 additional connection will be created for replication (even if no replication is defined). 2 additional connections will be created for the change log (if change log is enabled).

**Default**  
15

**Syntax**  
Integer

**Maximum Length**  
50

**Value** Single-valued

**Modified by**  
Server Administration: **Settings -> Performance**.

## ibm-slapdDbInstance

**Description**  
Specifies the DB2 database instance for this backend.

**Default**  
ldapdb2

**Syntax**  
Directory string with case-exact matching

**Maximum Length**  
8

**Value** Single-valued

**Modified by**  
Created with the `cn=Directory` object when configuring the database using the `ldapcfg`, `ldapxfg` commands or using Server Administration: **Database -> Configure**. The default is `ldapdb2`. This can be edited using Server Administration: **Database -> Settings**.

**Note:** All `ibm-slapdRdbmBackend` objects must use the same `ibm-slapdDbInstance`, `ibm-slapdDbUserID`, `ibm-slapdDbUserPW` and DB2 character set.

## ibm-slapdDbName

### Description

Specifies the DB2 database name for this backend.

### Default

ldapdb2

### Syntax

Directory string with case-exact matching

### Maximum Length

8

**Value** Single-valued

### Modified by

Created with the cn=Directory object when configuring the database using the **ldapcfg**, **ldapxcfg** commands or using Server Administration: **Database -> Configure**. The default for the cn=Directory object is ldapdb2, and for the cn=Change Log object is chng\_log. The cn=Directory value can be edited using Server Administration: **Database -> Settings**.

**Note:** All other ibm-slapdRdbmBackend objects, except change log (Server Administration: **Database -> Settings**), must be edited manually.

## ibm-slapdDbUserID

### Description

Specifies the user name with which to bind to the DB2 database for this backend.

### Default

ldapdb2

### Syntax

Directory string with case-exact matching

### Maximum Length

8

**Value** Single-valued

### Modified by

Created with the cn=Directory object when configuring the database using the **ldapcfg**, **ldapxcfg** commands or using Server Administration: **Database -> Configure**. The default is ldapdb2. This can be edited using Server Administration: **Database -> Settings**.

**Note:** All ibm-slapdRdbmBackend objects must use the same ibm-slapdDbInstance, ibm-slapdDbUserID, ibm-slapdDbUserPW and DB2 character set.

## ibm-slapdDbUserPW

### Description

Specifies the user password with which to bind to the DB2 database for this backend. The password can be plain text or imask encrypted.

### Default

ldapdb2

**Syntax**

Binary

**Maximum Length**

128

**Value** Single-valued

**Modified by**

Created with the cn=Directory object when configuring the database using the **ldapcfg**, **ldapxcfg** commands or using Server Administration: **Database -> Configure**. The default password is randomly generated every time that the database is reconfigured. This can be edited using Server Administration: **Database -> Settings**.

**Note:** All ibm-slapdRdbmBackend objects must use the same ibm-slapdDbInstance, ibm-slapdDbUserID, ibm-slapdDbUserPW and DB2 character set.

## ibm-slapdEnableEventNotification

**Description**

Specifies whether to enable Event Notification. It must be set to either TRUE or FALSE.

If set to FALSE, the server rejects all client requests to register event notifications with the extended result LDAP\_UNWILLING\_TO\_PERFORM.

**Default**

TRUE

**Syntax**

Boolean

**Maximum Length**

5

**Value** Single-valued

**Modified by**

Server Administration: **Settings -> Event notification**.

## ibm-slapdErrorLog

**Description**

Specifies the file path or device on the IBM Directory server machine to which error messages are written. On Windows 98, Windows 2000 or Windows NT operating systems, forward slashes are allowed, and a leading slash not preceded by a drive letter (D:) is assumed to be rooted at the install directory, that is /tmp/slapd.errors = D:\Program Files\IBM\ldap\tmp\slapd.errors.

**Default**

/tmp/slapd.errors

**Syntax**

Directory string with case-exact matching

**Maximum Length**

1024

**Value** Single-valued

Modified by  
Server Administration: **Logs -> Error log -> Settings.**

## **ibm-slapdIdleTimeOut**

### **Description**

Maximum time to keep a LDAP connection open when there is no activity on the connection. The idle time for a LDAP connection is the time (in seconds) between the last activity on the connection and the current time. If the connection has expired, based on the idle time being greater than the value of this attribute, the LDAP server will clean up and end the LDAP connection, making it available for other incoming requests.

### **Default**

300

### **Syntax**

Integer

### **Length**

11

### **Count** Single

### **Usage** Directory operation

### **User Modify**

Yes

### **Access Class**

Critical

### **Required**

No

## **ibm-slapdIncludeSchema**

### **Description**

Specifies a file path on the IBM Directory server machine containing schema definitions. On Windows 98, Windows 2000 or Windows NT operating systems, forward slashes are allowed, and a leading slash not preceded by a drive letter (D:) is assumed to be rooted at the install directory, that is, /etc/V3.system.at = D:\Program Files\IBM\ldap\etc\V3.system.at.

### **Default**

/etc/V3.system.at  
/etc/V3.system.oc  
/etc/V3.ibm.at  
/etc/V3.ibm.oc  
/etc/V3.user.at  
/etc/V3.user.oc  
/etc/V3.ldapsyntaxes  
/etc/V3.matchingrules

### **Syntax**

Directory string with case-exact matching

### **Maximum Length**

1024

**Value** Multi-valued

**Modified by**

Server Administration: **Settings -> Schema -> Files.**

## **ibm-slapdKrbAdminDN**

**Description**

Specifies the Kerberos ID of the LDAP administrator (for example, `ibm-kn=admin1@realm1`). Used when Kerberos authentication is used to authenticate the administrator when logged onto the Server Administration interface. This may be specified instead of or in addition to `adminDN` and `adminPW`.

**Default**

No preset default is defined.

**Syntax**

Directory string with case-exact matching

**Maximum Length**

128

**Value** Single-valued

**Modified by**

Server Administration: **Security -> Kerberos.**

## **ibm-slapdKrbEnable**

**Description**

Specifies whether the server supports Kerberos authentication. It must be either `TRUE` or `FALSE`.

**Default**

`TRUE`

**Syntax**

Boolean

**Maximum Length**

5

**Value** Single-valued

**Modified by**

Server Administration: **Security -> Kerberos (Enable Kerberos authentication)**

## **ibm-slapdKrbIdentityMap**

**Description**

Specifies whether to use Kerberos identity mapping. It must be set to either `TRUE` or `FALSE`. If set to `TRUE`, when a client is authenticated with a Kerberos ID, the server searches for all local users with matching Kerberos credentials, and adds those user DN's to the bind credentials of the connection. This allows ACLs based on LDAP user DN's to still be usable with Kerberos authentication.

**Default**

`FALSE`

**Syntax**  
Boolean

**Maximum Length**  
5

**Value** Single-valued

**Modified by**  
Server Administration: **Security -> Kerberos.**

## **ibm-slapdKrbKeyTab**

**Description**  
Specifies the LDAP server Kerberos keytab file. This file contains the LDAP server private key, that is associated with its Kerberos account. This file is to be protected (like the server SSL key database file).

On Windows 98, Windows 2000 or Windows NT operating systems, forward slashes are allowed, and any path not preceded by a drive letter. (D:) is assumed to be rooted at the install directory (that is: /tmp/slapd.errors = D:\Program Files\IBM\ldap\tmp\slapd.errors).

**Default**  
No preset default is defined.

**Syntax**  
Directory string with case-exact matching

**Maximum Length**  
1024

**Value** Single-valued

**Modified by**  
Server Administration: **Security -> Kerberos.**

## **ibm-slapdKrbRealm**

**Description**  
Specifies the Kerberos realm of the LDAP server. It is used to publish the ldapservicename attribute in the root DSE. Note that an LDAP server can serve as the repository of account information for multiple KDCs (and realms), but the LDAP server, as a kerberized server, can only be a member of a single realm.

**Default**  
No preset default is defined.

**Syntax**  
Directory string with case-insensitive matching

**Maximum Length**  
256

**Value** Single-valued

**Modified by**  
Server Administration: **Security -> Kerberos.**

## ibm-slapdLdapCrIHost

### Description

Specifies the host name of the LDAP server that contains the Certificate Revocation Lists (CRLs) for validating client x.509v3 certificates. This parameter is needed when `ibm-slapdSslAuth=serverclientauth` and the client certificates have been issued for CRL validation.

### Default

No preset default is defined.

### Syntax

Directory string with case-insensitive matching

### Maximum Length

256

**Value** Single-valued

### Modified by

Server Administration: **Security -> SSL -> Certificate revocation.**

## ibm-slapdLdapCrIPassword

### Description

Specifies the password that server-side SSL uses to bind to the LDAP server that contains the Certificate Revocation Lists (CRLs) for validating client x.509v3 certificates. This parameter might be needed when `ibm-slapdSslAuth=serverclientauth` and the client certificates have been issued for CRL validation.

**Note:** If the LDAP server holding the CRLs permits unauthenticated access to the CRLs (that is, anonymous access), then `ibm-slapdLdapCrIPassword` is not required.

### Default

No preset default is defined.

### Syntax

Binary

### Maximum Length

128

**Value** Single-valued

### Modified by

Server Administration: **Security -> SSL -> Certificate revocation.**

## ibm-slapdLdapCrIPort

### Description

Specifies the port used to connect to the LDAP server that contains the Certificate Revocation Lists (CRLs) for validating client x.509v3 certificates. This parameter is needed when `ibm-slapdSslAuth=serverclientauth` and the client certificates have been issued for CRL validation. (IP ports are unsigned, 16-bit integers in the range 1 - 65535)

### Default

No preset default is defined.

**Syntax**

Integer

**Maximum Length**

11

**Value** Single-valued**Modified by**Server Administration: **Security -> SSL -> Certificate revocation.**

## ibm-slapdLdapCrlUser

**Description**

Specifies the bindDN that the server-side SSL uses to bind to the LDAP server that contains the Certificate Revocation Lists (CRLs) for validating client x.509v3 certificates. This parameter might be needed when `ibm-slapdSslAuth=serverclientauth` and the client certificates have been issued for CRL validation.

**Note:** If the LDAP server holding the CRLs permits unauthenticated access to the CRLs (that is, anonymous access), then `ibm-slapdLdapCrlUser` is not required.

**Default**

No preset default is defined.

**Syntax**

DN

**Maximum Length**

1000

**Value** Single-valued**Modified by**Server Administration: **Security -> SSL -> Certificate revocation.**

## ibm-slapdMasterDN

**Description**

Specifies the bind DN of master server. The value must match the `replicaBindDN` in the `replicaObject` defined for the master server. When Kerberos is used to authenticate to the replica, `ibm-slapdMasterDN` must specify the DN representation of the Kerberos ID (for example, `ibm-kn=freddy@realm1`). When Kerberos is used, `MasterServerPW` is ignored.

**Default**

No preset default is defined.

**Syntax**

DN

**Maximum Length**

1000

**Value** Single-valued**Modified by**Server Administration: **Replication -> Settings.**

## ibm-slapdMasterPW

### Description

Specifies the bind password of master replica server. The value must match replicaBindDN in the replicaObject defined for the master server. When Kerberos is used to authenticate to the replica, ibm-slapdMasterDN must specify the DN representation of the Kerberos ID (for example, ibm-kn=freddy@realm1). When Kerberos is used, MasterServerPW is ignored.

### Default

No preset default is defined.

### Syntax

Binary

### Maximum Length

128

**Value** Single-valued

### Modified by

Server Administration: **Replication -> Settings.**

## ibm-slapdMasterReferral

### Description

Specifies the URL of the master replica server. For example:  
ldap://master.us.ibm.com

For security set to SSL only:

ldaps://master.us.ibm.com:636

For security set to none and using a nonstandard port:

ldap://master.us.ibm.com:1389

### Default

none

### Syntax

Directory string with case-insensitive matching

### Maximum Length

256

**Value** Single-valued

### Modified by

Server Administration: **Replication -> Settings.**

## ibm-slapdMaxEventsPerConnection

### Description

Specifies the maximum number of event notifications which can be registered per connection.

Minimum = 0 (unlimited)

Maximum = 2,147,483,647

### Default

100

**Syntax**

Integer

**Maximum Length**

11

**Value** Single-valued**Modified by**Server Administration: **Settings -> Event notification.****ibm-slapdMaxEventsTotal****Description**

Specifies the maximum total number of event notifications which can be registered for all connections.

Minimum = 0 (unlimited)

Maximum = 2,147,483,647

**Default**

0

**Syntax**

Integer

**Maximum Length**

11

**Value** Single-valued**Modified by**Server Administration: **Settings -> Event notification.****ibm-slapdMaxNumOfTransactions****Description**

Specifies the maximum number of transactions per server.

Minimum = 0 (unlimited)

Maximum = 2,147,483,647

**Default**

20

**Syntax**

Integer

**Maximum Length**

11

**Value** Single-valued**Modified by**Server Administration: **Settings -> Transactions.****ibm-slapdMaxOpPerTransaction****Description**

Specifies the maximum number of operations per transaction.

Minimum = 0 (unlimited)

Maximum = 2,147,483,647

**Default**

5

**Syntax**

Integer

**Maximum Length**

11

**Value** Single-valued**Modified by**Server Administration: **Settings -> Transactions.**

## **ibm-slapdMaxTimeLimitOfTransactions**

**Description**

Specifies the maximum timeout value of a pending transaction in seconds.

Minimum = 0 (unlimited)

Maximum = 2,147,483,647

**Default**

300

**Syntax**

Integer

**Maximum Length**

11

**Value** Single-valued**Modified by**Server Administration: **Settings -> Transactions.**

## **ibm-slapdPagedResAllowNonAdmin**

**Description**

Whether or not the server should allow non-Administrator bind for paged results requests on a search request. If the value read from the slapd32.conf file is FALSE, the server will process only those client requests submitted by a user with Administrator authority. If a client requests paged results for a search operation, does not have Administrator authority, and the value read from the slapd32.conf file for this attribute is FALSE, the server will return to the client with return code insufficientAccessRights - no searching or paging will be performed.

**Default**

FALSE

**Syntax**

Boolean

**Length**

5

**Count** Single**Usage** directoryOperation**User Modify**

Yes

**Access Class**

critical

**Objectclass**  
ibm-slapdRdbmBackend

**Required**  
No

## ibm-slapdPagedResLmt

**Description**  
Maximum number of outstanding paged results search requests allowed active simultaneously. Range = 0.... If a client requests a paged results operation, and a maximum number of outstanding paged results are currently active, then the server will return to the client with return code of busy - no searching or paging will be performed.

**Default**  
3

**Syntax**  
Integer

**Length**  
11

**Count** Single

**Usage** directoryOperation

**User Modify**  
Yes

**Access Class**  
critical

**Required**  
No

**Objectclass**  
ibm-slapdRdbmBackend

## ibm-slapdPageSizeLmt

**Description**  
Maximum number of entries to return from search for an individual page when paged results control is specified, regardless of any "pagesize" that may have been specified on the client search request. Range = 0.... If a client has passed a page size, then the smaller value of the client value and the value read from slapd32.conf will be used.

**Default**  
50

**Syntax**  
Integer

**Length**  
11

**Count** Single

**Usage** directoryOperation

**User Modify**  
Yes

**Access Class**  
critical

**Required**  
No

**Objectclass**  
ibm-slapdRdbmBackend

## ibm-slapdPlugin

### Description

A plugin is a dynamically loaded library which extends the capabilities of the server. An `ibm-slapdPlugin` attribute specifies to the server how to load and initialize a plugin library. The syntax is:

*keyword filename init\_function [args...]*

The syntax is slightly different for each platform because of library naming conventions. See the *Server Plugin Reference* for a list of plugins shipped with IBM Directory.

Most plugins are optional, but the RDBM backend plugin is required for all RDBM backends.

### Default

*database /bin/libback-rdbm.dll rdbm\_backend\_init*

### Syntax

Directory string with case-exact matching

### Maximum Length

2000

**Value** Multi-valued

### Modified by

Must be modified manually.

## ibm-slapdPort

### Description

Specifies the TCP/IP port used for non-SSL connections. It can not have the same value as `ibm-slapdSecurePort`. (IP ports are unsigned, 16-bit integers in the range 1 - 65535.)

### Default

389

### Syntax

Integer

### Maximum Length

5

**Value** Single-valued

### Modified by

Server Administration: **Settings -> General**.

## ibm-slapdPWEncryption

### Description

Specifies the encoding mechanism for the user passwords before they are stored in the directory. It must be specified as *none*, *imask*, *crypt*, or *sha* (you must use the keyword **sha** in order to get SHA-1 encoding). The value must be set to *none*, for the SASL *cram-md5* bind to succeed.

### Default

*none*

### Syntax

Directory string with case-insensitive matching

### Maximum Length

5

**Value** Single-valued

### Modified by

Server Administration: **Settings -> General**.

## ibm-slapdReadOnly

### Description

This attribute is normally applied to only the Directory backend. It specifies whether the backend can be written to. It must be specified as either *TRUE* or *FALSE*. It defaults to *FALSE* if unspecified. If set to *TRUE*, the server returns *LDAP\_UNWILLING\_TO\_PERFORM* (0x35) in response to any client request which would change data in the *readOnly* database.

### Default

*FALSE*

### Syntax

Boolean

### Maximum Length

5

**Value** Single-valued

### Modified by

Server Administration: **Database -> Settings**.

## ibm-slapdReferral

### Description

Specifies the referral LDAP URL to pass back when the local suffixes do not match the request. It is used for superior referral (that is, the suffix is not within the naming context of the server).

### Default

No preset default is defined.

### Syntax

Directory string with case-exact matching

### Maximum Length

32700

**Value** Multi-valued

**Modified by**  
Server Administration: **Settings -> Referrals.**

## ibm-slapdSchemaAdditions

### Description

The `ibm-slapdSchemaAdditions` attribute is used to identify explicitly which file holds new schema entries. This is set by default to be `/etc/V3.modifiedschema`. If this attribute is not defined, the server reverts to using the last `ibm-slapdIncludeSchema` file as in previous releases.

Before Version 3.2, the last "includeSchema" entry in `slapd.conf` was the file to which any new schema entries were added by the server if it received an add request from a client. Normally the last "includeSchema" is the `V3.modifiedschema` file, which is an empty file installed just for this purpose.

**Note:** The name modified is misleading, for it only stores new entries. Changes to existing schema entries are made in their original files.

### Default

`/etc/V3.modifiedschema`

### Syntax

Directory string with case-exact matching

### Maximum Length

1024

**Value** Single-valued

## ibm-slapdSchemaCheck

### Description

Specifies the schema checking mechanism for the add/modify/delete operation. It must be specified as `V2`, `V3`, or `V3_lenient`.

- `V2` - Retain v2 and v2.1 checking. Recommended for migration purpose.
- `V3` - Perform v3 checking.
- `V3_lenient` - Not all parent object classes are needed. Only the immediate object class is needed when adding entries.

### Default

`V3_lenient`

### Syntax

Directory string with case-insensitive matching

### Maximum Length

10

**Value** Single-valued

### Modified by

Server Administration: **Schema -> Settings.**

## ibm-slapdSecurePort

### Description

Specifies the TCP/IP port used for SSL connections. It can not have the same value as `ibm-slapdPort`. (IP ports are unsigned, 16-bit integers in the range 1 - 65535.)

**Default**  
636

**Syntax**  
Integer

**Maximum Length**  
5

**Value** Single-valued

**Modified by**  
Server Administration: **Security -> SSL -> General settings**.

## ibm-slapdSecurity

**Description**  
Enables SSL connections. Must be none, SSL, or SSLOnly.

- none - server listens on the non-ssl port only.
- SSL - server listens on both the ssl and the non-ssl ports.
- SSLOnly - server listens on the ssl port only.

**Default**  
none

**Syntax**  
Directory string with case-insensitive matching

**Maximum Length**  
7

**Value** Single-valued

**Modified by**  
Server Administration: **Security -> SSL -> General settings** (SSL status).

## ibm-slapdSetenv

**Description**  
The server runs **putenv()** for all values of **ibm-slapdSetenv** at startup to modify the server runtime environment. Shell variables (like **%PATH%** or **\$LANG**) are not expanded.

**DB2CODEPAGE=1208** is required for unicode databases (this is set automatically when you configure a unicode database using Server Administration, or using either of the **ldapcfg** or **ldapxcfg** commands).

**setenv LDAP\_CONCURRENTRW=ON** turns off the locking that prevents searches from proceeding during updates. It allows for 'dirty reads', that is results that might not be consistent with the committed state of the database.

**Default**  
No preset default is defined.

**Syntax**  
Directory string with case-exact matching

**Maximum Length**  
2000

**Value** Multi-valued

**Modified by**  
Must be edited manually.

## **ibm-slapdSizeLimit**

### **Description**

Specifies the maximum number of entries to return from search, regardless of any size limit that might have been specified on the client search request (Range = 0...). If a client has passed a limit, then the smaller value of the client values and the value read from **slapd32.conf** are used. If a client has not passed a limit and has bound as admin DN, the limit is considered unlimited. If the client has not passed a limit and has not bound as admin DN, then the limit is that which was read from the **slapd32.conf** file. 0 = unlimited.

### **Default**

500

### **Syntax**

Integer

### **Maximum Length**

12

**Value** Single-valued

### **Modified by**

Server Administration: **Settings -> Performance.**

## **ibm-slapdSortKeyLimit**

### **Description**

Must be one of { "serverauth" | "serverclientauth" } Specify authentication type for ssl connection. serverauth - supports server authentication at the client. serverclientauth - supports both server and client authentication.

### **Default**

3

### **Syntax**

cis

### **Length**

11

**Count** Single

**Usage** directoryOperation

### **User Modify**

Yes

### **Access Class**

critical

### **Objectclass**

ibm-slapdRdbmBackend

### **Required**

No

## ibm-slapdSortSrchAllowNonAdmin

### Description

Whether or not the server should allow non-Administrator bind for sort on a search request. If the value read from the slapd32.conf file is FALSE, the server will process only those client requests submitted by a user with Administrator authority. If a client requests sort for a search operation, does not have Administrator authority, and the value read from the slapd32.conf file for this attribute is FALSE, the server will return to the client with return code insufficientAccessRights - no searching or sorting will be performed.

### Default

FALSE

### Syntax

Boolean

### Length

5

### Count

Single

### Usage

directoryOperation

### User Modify

Yes

### Access Class

critical

### Objectclass

ibm-slapdRdbmBackend

### Required

No

## ibm-slapdSslAuth

### Description

Specifies the authentication type for the ssl connection, either serverauth or serverclientauth.

- serverauth - supports server authentication at the client. This is the default.
- serverclientauth - supports both server and client authentication.

### Default

serverauth

### Syntax

Directory string with case-insensitive matching

### Maximum Length

16

### Value

Single-valued

### Modified by

Server Administration: **Security -> SSL -> General settings.**

## ibm-slapdSslCertificate

### Description

Specifies the label that identifies the server Personal Certificate in the key database file. This label is specified when the server private key and certificate are created with the **gsk4ikm** application. If **ibm-slapdSslCertificate** is not defined, the default private key, as defined in the key database file, is used by the LDAP server for SSL connections.

### Default

No preset default is defined.

### Syntax

Directory string with case-exact matching

### Maximum Length

128

**Value** Single-valued

### Modified by

Server Administration: **Security -> SSL -> General settings** (Key label).

## ibm-slapdSslCipherSpecs

### Description

Specifies the decimal representation of a bitmask specifying the allowable key encryption methods for establishing an SSL connection. Add the decimal values of all the desired encryption methods to determine the value of **ibm-slapdSslCipherSpecs**.

Table 3.

256	(0x0100)	Triple DES encryption with a 168-bit key and a SHA-1 MAC (SLAPD_SSL_TRIPLE_DES_SHA_US)
512	(0x0200)	DES encryption with a 56-bit key and a SHA-1 MAC (SLAPD_SSL_DES_SHA_US)
1024	(0x0400)	RC4 encryption with a 128-bit key and a SHA-1 MAC (SLAPD_SSL_RC4_SHA_US)
2048	(0x0800)	RC4 encryption with a 128-bit key and a MD5 MAC (SLAPD_SSL_RC4_MD5_US)
4096	(0x01000)	RC2 encryption with a 40-bit key and a MD5 MAC (SLAPD_SSL_RC2_MD5_EXPORT)
8192	(0x02000)	RC4 encryption with a 40-bit key and a MD5 MAC (SLAPD_SSL_RC4_MD5_EXPORT)

### Default

12288 (SLAPD\_SSL\_RC2\_MD5\_EXPORT + SLAPD\_SSL\_RC4\_MD5\_EXPORT)

### Syntax

Integer

### Maximum Length

12

**Value** Single-valued

### Modified by

Server Administration: **Security -> SSL -> Encryption**.

## ibm-slapdSslKeyDatabase

### Description

Specifies the file path to the LDAP server SSL key database file. This key database file is used for handling SSL connections from LDAP clients, as well as for creating secure SSL connections to replica LDAP servers.

On Windows 98, Windows 2000 or Windows NT operating systems, forward slashes are allowed, and a leading slash not preceded by a drive specifier (D:) is assumed to be rooted at the install directory (that is, /etc/key.kdb = D:\Program Files\IBM\ldap\etc\key.kdb).

### Default

/etc/key.kdb

### Syntax

Directory string with case-exact matching

### Maximum Length

1024

**Value** Single-valued

### Modified by

Server Administration: **Security -> SSL -> General settings.**

## ibm-slapdSslKeyDatabasePW

### Description

Specifies the password associated with the LDAP server SSL key database file, as specified on the `ibm-slapdSslKeyDatabase` parameter. If the LDAP server key database file has an associated password stash file, then the `ibm-slapdSslKeyDatabasePW` parameter can be omitted, or set to none.

**Note:** The password stash file must be located in the same directory as the key database file and it must have the same file name as the key database file, but with an extension of `.sth` instead of `.kdb`.

### Default

none

### Syntax

Binary

### Maximum Length

128

**Value** Single-valued

### Modified by

Server Administration: **Security -> SSL -> General settings.**

## ibm-slapdSuffix

### Description

Specifies a naming context to be stored in this backend.

**Note:** This has the same name as the object class.

### Default

No preset default is defined.

**Syntax**

DN

**Maximum Length**

1000

**Value** Multi-valued**Modified by**

Server Administration: **Settings -> Suffixes** for editing suffixes in the cn=Directory object only. The suffix for the cn=Change Log object is created automatically with a fixed value when enabling changelog. the suffix in the cn=SchemaDB object is hard coded. Suffixes in all other backend objects must be edited manually.

## ibm-slapdSysLogLevel

**Description**

Specifies the level at which debugging and operation statistics are logged in the slapd.errors file. It must be specified as l, m, or h.

- h - high (provides the most information)
- m - medium (the default)
- l - low (provides the least information)

**Default**

m

**Syntax**

Directory string with case-insensitive matching

**Maximum Length**

1

**Value** Single-valued**Modified by**Server Administration: **Logs -> Error log -> Settings**

## ibm-slapdTimeLimit

**Description**

Specifies the maximum number of seconds to spend on a search request, regardless of any time limit that might have been specified on the client request. If a client has passed a limit, then the smaller value of the client values and the value read from **slapd32.conf** are used. If a client has not passed a limit and has bound as admin DN, the limit is considered unlimited. If the client has not passed a limit and has not bound as admin DN, then the limit is that which was read from the **slapd32.conf** file. 0 = unlimited.

**Default**

900

**Syntax**

Integer

**Maximum Length****Value** Single-valued**Modified by**Server Administration: **Settings -> Performance.**

## ibm-slapdTransactionEnable

### Description

If the transaction plugin is loaded but `ibm-slapdTransactionEnable` is set to `FALSE`, the server rejects all `StartTransaction` requests with the response `LDAP_UNWILLING_TO_PERFORM`.

### Default

TRUE

### Syntax

Boolean

### Maximum Length

5

**Value** Single-valued

### Modified by

Server Administration: **Settings -> Transactions**.

## ibm-slapdUseProcessIdPw

### Description

If set to `TRUE`, the server ignores the `ibm-slapdDbUserID` and the `ibm-slapdDbUserPW` attributes and uses its own process credentials to authenticate to DB2.

### Default

FALSE

### Syntax

Boolean

### Maximum Length

5

**Value** Single-valued

### Modified by

Must be edited manually.

## objectClass

### Description

The values of the `objectClass` attribute describe the kind of object which an entry represents.

### Syntax

Directory string

### Maximum Length

128

**Value** Multi-valued

### Modified by

Do not modify.



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