

IBM® DB2 Universal Database™



Quick Beginnings for DB2 Universal Database Express Edition

Version 8.2

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Version 8.2

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Part 1. About DB2 Universal Database Express Edition

Chapter 1. About this book

This book provides information on how to install DB2 UDB Express. It also introduces DB2 UDB maintenance, administration, and development.

For a complete look at DB2 UDB, see the DB2 UDB Information Center at <http://publib.boulder.ibm.com/infocenter/db2help/>.

To install the Information Center on your own computer, see “DB2 Information Center” on page 81.

To access the traditional DB2 UDB library of books in either printed or PDF format, see “Ordering printed DB2 books” on page 95 and “Printing DB2 books from PDF files” on page 95.

Chapter 2. DB2 UDB Express product overview

IBM DB2 Universal Database Express (DB2 UDB Express) is the newest member of the DB2 Universal Database Version 8 product family. It combines the power, function, and reliability of IBM's award winning DB2 UDB relational database with simplicity in packaging, installation, and deployment at a minimal investment cost to meet the data management needs of small and medium businesses.

DB2 UDB Express is a specially tailored database offering for small and medium businesses (SMBs). DB2 UDB Express is designed for customers with minimal in house database skills who need an easy-to-install database integrated into their application software solutions. It is a multi-user version of DB2 that supports local and remote applications in standalone and local area network (LAN) environments.

DB2 UDB Express was developed in consultation with IBM Business Partners and delivers the following key functions:

Simplified deployment

The response file installation capability allows an application or solution provider to incorporate the installation of DB2 UDB Express as a transparent part of a solution. Combining response file installation with the ability to create databases and configure DB2 UDB Express using scripts supports the ability to create an up-and-running application solution.

DB2 UDB Express can be deployed on either Linux or Windows operating systems, offering you flexibility in the choice of hardware and operating system for deployment.

See Part 4, "Deploying servers using response file installation," on page 59.

Autonomic management capabilities

DB2 UDB Express incorporates a suite of advanced management and autonomic computing capabilities. These support the simplification and automation of administration tasks, eliminating many of the costs traditionally associated with managing relational databases.

The Configuration Advisor provides facilities to configure the DB2 UDB Express environment to optimize performance. The Health Center monitors your DB2 system, alerting you to potential operational issues, and providing advice about how to resolve them.

Autonomic maintenance can also be set up out of the box with a new Wizard. It creates a new database on the disk or directory of your choice, assigns disk space for your data, configures the new database for performance, and turns on automatic maintenance and configures notification by e-mail or pager if the database needs attention.

See "Automatic maintenance" on page 53.

Designed for 24-hour availability

DB2 UDB Express is designed to support 24x7 operation; you do not need to shut down the database to perform maintenance. Database backups can be performed online or offline.

Application development support

DB2 UDB Express supports most industry standard application interfaces

including SQL, X/Open, ODBC, .NET, JDBC, Java, XML and Web services. DB2 UDB Express provides add-ins for popular IDEs, such as, WebSphere Studio Application Developer, Microsoft Visual Studio .NET, Microsoft Visual Basic, Microsoft Visual C++, Microsoft Visual InterDev.

Application developers can then leverage DB2 UDB Express's advanced functions in the programming model they are familiar with, leverage their existing skills, reduce time to market, cut overall application deployment costs, and accelerate time to value.

Investment protection

DB2 UDB Express offers the same core capabilities across the entire line of IBM database servers. You can benefit from the same reliability, security, application development interfaces and optimization as your data volumes, number of users, or utilization increase. You can leverage your investment with DB2 UDB Express through upgrades to other scalable editions of DB2 UDB to support more operating systems and higher throughput on larger hardware installations.

Part 2. Installing a DB2 UDB Express server

Chapter 3. Installation overview

Installation methods

DB2 Setup wizard

The DB2 Setup wizard is an installer available on both Linux and Windows platforms. The DB2 Setup wizard provides an easy-to-use interface for installing DB2 and performing initial setup and configuration tasks.

Response file installation

A response file is an ASCII file that contains setup and configuration values. The file is passed to the db2setup program and the installation is performed according to the values that have been specified. There are a number of ways to create a response file:

- Using the response file generator (Windows)
- Using the DB2 Setup wizard (Linux and Windows)
- By customizing sample response files that are provided for each DB2 product (Linux and Windows)

Installation overview (Windows)

This topic outlines the steps for installing a DB2 UDB Express server on Windows.

Procedure:

To install a DB2 UDB Express server on Windows:

1. Review the DB2 product prerequisites.
2. Install the DB2 product using the DB2 Setup wizard. DB2 Setup wizard features include:
 - A launchpad from which you can view installation notes and release notes, and learn about DB2 UDB Version 8 features.
 - Typical, compact, and custom installation types.
 - Multiple languages installation support.
 - DB2 Administration Server setup (including DAS user setup).
 - Instance setup and configuration (including instance user setup).
 - Response file creation. You can save your installation choices in a response file for later installation or to duplicate the installation on another computer.

Installation overview (Linux)

This topic outlines the steps for installing a DB2 UDB Express server on Linux.

Procedure:

To install a DB2 UDB Express server on Linux:

1. Review the DB2 product prerequisites.
2. Mount the DB2 product CD-ROM.
3. Modify kernel parameters.

4. Install the DB2 product using the DB2 Setup wizard. DB2 Setup wizard features include:
 - A launchpad from which you can view installation notes and release notes, and learn about DB2 Version 8 features
 - Typical, Compact, and Custom installation types
 - Multiple languages installation support
 - DB2 Administration Server setup (including DAS user setup)
 - Instance setup and configuration (including instance user setup)
 - Response file creation. You can save your installation choices in a response file for later installation or to duplicate the installation on another computer.

Chapter 4. Installation requirements

Disk and memory requirements (Windows and Linux)

Disk requirements:

The disk space required for your product depends on the type of installation you choose and the type of file system you have. The DB2 Setup wizard provides dynamic size estimates based on the components selected during a typical, compact, or custom installation.

On Windows, you might require significantly more space on FAT (File Allocation Table) drives than with NTFS (New Technology File System) drives.

Remember to include disk space for required software, communication products, and documentation.

Memory requirements:

At a minimum, DB2 UDB requires 256 MB of RAM. 512MB of RAM memory is recommended if you use the DB2 tools. When determining memory requirements, be aware of the following:

- For DB2 client support, these memory requirements are for a base of 5 concurrent client connections. You will need an additional 16 MB of RAM per 5 client connections.
- Additional memory is required for other software that is running on your system.
- Additional memory might be required to improve the performance of the DB2 tools.
- Specific performance requirements can determine the amount of memory needed.
- Memory requirements are affected by the size and complexity of your database system.
- Memory requirements are affected by the extent of database activity and the number of clients accessing your system.
- On Linux, ensure that your SWAP space is at least twice as large as your RAM.

Windows installation requirements

Installation requirements (Windows)

To install DB2 UDB Express, the following operating system, software, and communications requirements must be met:

Operating system requirements

DB2 UDB Express runs on:

- Windows NT Version 4 with Service Pack 6a or higher
- Windows 2000. Service Pack 2 is required for Windows Terminal Server.
- Windows XP
- Windows Server 2003

Hardware requirements

An Intel x86 compatible processor.

Software requirements

A browser is required to view online help.

Communication requirements

You can use TCP/IP, Named Pipes, and NetBIOS. To remotely administer a DB2 Version 8 database, you must connect using TCP/IP.

- For TCP/IP, Named Pipes, and NetBIOS connectivity, no additional software is required.
- If you plan to use LDAP (Lightweight Directory Access Protocol), you require either a Microsoft LDAP client or an IBM SecureWay LDAP client V3.1.1.

Security issues when installing DB2 Universal Database

Security issues are important to the DB2[®] administrator from the moment the product is installed.

To complete the installation of DB2, a user ID, a group name, and a password are required. The GUI-based DB2 install program creates default values for different user IDs and the group. Different defaults are created, depending on whether you are installing on Linux or Windows platforms:

- On Linux platforms, the DB2 install program creates different default users for the DAS (dasusr), the instance owner (db2inst), and the fenced user (db2fenc). The DB2 install program appends a number from 1-99 to the default user name, until a user ID that does not already exist can be created. For example, if the users db2inst1 and db2inst2 already exist, the DB2 install program creates the user db2inst3. If a number greater than 10 is used, the character portion of the name is truncated in the default user ID. For example, if the user ID db2fenc9 already exists, the DB2 install program truncates the c in the user ID, then appends the 10 (db2fen10). Truncation does not occur when the numeric value is appended to the default DAS user (for example, dasusr24).
- On Windows platforms, the DB2 install program creates the default user db2admin for the DAS user, the instance owner, and fenced users. Unlike Linux platforms, no numeric value is appended to the user ID.

To minimize the risk of a user other than the administrator from inappropriately accessing the databases and/or instances, the default userid name and/or password should be changed.

Note: Response file installations do not use default values for user IDs or group names. These values must be specified in the response file.

Passwords are very important when authenticating users. If no authentication requirements are set at the operating system level and the database is using the operating system to authenticate users, users will be allowed to connect. For example on Linux operating systems, undefined passwords are treated as NULL. In this situation, any user without a defined password will be considered to have a NULL password. From the operating system's perspective, this is a match and the user is validated and able to connect to the database. Use passwords at the operating system level if you want the operating system to do the authentication of users for your database.

Note: You cannot use undefined passwords if you want your database environment to adhere to Common Criteria requirements.

After installing DB2 Universal Database also review, and change (if required), the default privileges that have been granted to users. By default, the installation process grants system administration (SYSADM) privileges to the following users on each operating system:

Windows® 9x

Any Windows 98, or Windows ME user.

Other Windows environments

On Windows NT, Windows 2000, Windows XP, or Windows Server 2003, a valid DB2 user name that belongs to the Administrators group.

Linux platforms

A valid DB2 user name that belongs to the primary group of the instance owner.

SYSADM privileges are the most powerful set of privileges available within DB2 Universal Database. As a result, you may not want all of these users to have SYSADM privileges by default. DB2 provides the administrator with the ability to grant and revoke privileges to groups and individual user IDs.

By updating the database manager configuration parameter *sysadm_group*, the administrator can control which group of users possesses SYSADM privileges. You must follow the guidelines below to complete the security requirements for both DB2 installation and the subsequent instance and database creation.

Any group defined as the system administration group (by updating *sysadm_group*) must exist. The name of this group should allow for easy identification as the group created for instance owners. User IDs and groups that belong to this group have system administrator authority for their respective instances.

The administrator should consider creating an instance owner user ID that is easily recognized as being associated with a particular instance. This user ID should have as one of its groups the name of the SYSADM group created above. Another recommendation is to use this instance-owner user ID only as a member of the instance owner group and not to use it in any other group. This should control the proliferation of user IDs and groups that can modify the instance, or any object within the instance.

The created user ID must be associated with a password to provide authentication before being permitted entry into the data and databases within the instance. The recommendation when creating a password is to follow your organization's password naming guidelines.

Authorities

Authorities provide a way both to group privileges and to control maintenance and utility operations for instances, databases, and database objects. Users can have administrative authorities that give full privileges on a set of database objects, or they can have system authorities that give full privileges on managing the system but do not allow access to the data.

SYSADM is the highest level of administrative authority. It includes all the privileges on all databases within the DB2® instance as well as the authority to grant and revoke all the other authorities and privileges.

DBADM provides administrative authority for a specific database. It allows the user to access and modify all the objects within that database. A user with DBADM authority can grant and revoke privileges on the database but cannot grant or revoke DBADM authority.

SYSCTRL is the authority for controlling the resources used by the database manager (for example, creating and deleting databases), but it does not allow access to the data within the databases.

SYSMAINT is the authority for performing maintenance operations, such as starting and stopping the DB2 server and backing up and restoring databases. It does not allow access to the data within the databases.

LOAD authority at the database level, combined with INSERT privilege on a table, allows the user to load data into that table.

Database-specific authorities are stored in the database catalogs; system authorities are stored in the database manager configuration file for the instance.

You can use the Control Center to grant and revoke database authorities.

User accounts required for installation of DB2 servers (Windows)

If you are installing on Windows NT, Windows 2000, Windows XP, or Windows Server 2003, you require the following DB2 server user accounts:

- An installation user account and
- One or more setup user accounts
 - A DB2 Administration Server (DAS) user account
 - A DB2 instance user account.

The installation user account must be defined prior to running the DB2 Setup wizard. The setup user accounts can be defined prior to installation or you can have the DB2 Setup program create them for you.

All user account names must adhere to your system naming rules and to DB2 naming rules.

DB2 server user accounts:

Installation user account

A local or domain user account is required to perform the installation. The user account must belong to the *Administrators* group on the machine where you will perform the installation.

For domain accounts, to verify user IDs on the DB2 server, the installation user ID must belong to the Domain Administrators group on the domain where the accounts are going to be created.

DB2 Administration Server (DAS) user account

A local or domain user account is required for the DB2 Administration Server (DAS). The DB2 Administration Server (DAS) is a special DB2 administration service used to support the DB2 tools and assist with administration tasks on local and remote DB2 servers. The DAS has an assigned user account that is used to log the DAS service on to the computer when the DAS service is started.

You can create the DAS user account before installing DB2 or you can have the DB2 Setup wizard create it for you. If you want to have the DB2 Setup wizard create a new domain user account, the user account you use to perform the installation must have authority to create domain user accounts. The user account must belong to the *Administrators* group on the machine where you will perform the installation. This account will be granted the following user rights:

- Act as part of the operating system
- Debug programs
- Create token object
- Lock pages in memory
- Log on as a service
- Increase quotas (Windows NT and Windows 2000)
- Adjust memory quota for a process (Windows XP and Windows Server 2003)
- Replace a process level token

The Lock pages in memory privilege is required for AWE (Advanced Windowing Extensions) support. The "Debug programs" privilege is only needed when DB2 group lookup is explicitly specified to use the access token.

If the user account is created by the install program, the user account will be granted these privileges and if the user account already exists, this account will also be granted these privileges. If the install grants the privileges, some of them will only be effective on first log on by the account that was granted the privileges or reboot.

It is recommended that the DAS user have SYSADM authority on each of the DB2 systems within your environment so that it can start or stop other instances if required. By default, any user that is part of the *Administrator* group has SYSADM authority.

DB2 instance user account

A local or domain user account is required for the DB2 instance. Every DB2 instance has one user that is assigned when the instance is created. DB2 logs on with this user name when the instance is started.

You can create the DB2 instance user account before installing DB2 or you can have the DB2 Setup wizard create it for you. If you want to have the DB2 Setup wizard create a new domain user account, the user account you use to perform the installation must have authority to create domain user accounts. The user account must belong to the *Administrators* group on the machine where you will perform the installation. This account will be granted the following user rights:

- Act as part of the operating system
- Create token object
- Increase quotas (Windows NT and Windows 2000)
- Adjust memory quota for a process (Windows XP and Windows Server 2003)
- Lock pages in memory
- Log on as a service
- Replace a process level token

The Lock pages in memory privilege is required for AWE (Advanced Windowing Extensions) support.

The installation program does not grant the Debug programs privilege The "Debug programs" privilege is only needed when DB2 group lookup is explicitly specified to use the access token.

If the user account is created by the install program, the user account will be granted these privileges and if the user account already exists, this account will also be granted these privileges. If the install grants the privileges, some of them will only be effective on first log on by the account that was granted the privileges or reboot.

Granting user rights (Windows)

This topic describes the steps required to grant user rights on Windows operating systems. Specific user rights are recommended for user accounts required to install and setup DB2.

Prerequisites:

To grant advanced user rights on Windows you must be logged on as a local Administrator.

Procedure:

Windows NT

1. Click **Start** and select **Programs** → **Administrative Tools (Common)** → **User Manager for Domains**.
2. In the User Manager window, select **Policies** → **User Rights** from the menu bar.
3. In the User Rights Policy window, select the **Show Advanced User Rights** check box then in the **Right** drop down box, select the user right you want to grant. Click **Add**.
4. In the Add Users and Groups window select the user or the group you want to grant the right to and click **OK**.
5. In the User Rights Policy window, select the user or the group you have added from the **Grant To** list box and click **OK**.

Windows 2000, Windows XP, and Windows Server 2003

1. Click **Start** and select **Settings** → **Control Panel** → **Administrative Tools**.

Note: On Windows XP and Windows Server 2003 computers, for some Windows Themes, this will be: **Settings** → **Control Panel** → **Performance and Maintenance** → **Administrative Tools**.

2. Select **Local Security Policy**.
3. In the left window pane, expand the **Local Policies** object, then select **User Rights Assignment**.
4. In the right window pane, select the user right that you want to assign.
5. From the menu, select **Action** → **Security**
6. Click **Add**, then select a user or group to assign the right to, and click **Add**.
7. Click **OK**.

Note: If your computer belongs to a Windows 2000 or Windows Server 2003 domain, the domain user rights may override your local settings. In this case, your Network Administrator will have to make the changes to the user rights.

DB2 UDB system administrator group (Windows)

By default, system administrative (SYSADM) authority is granted to any valid DB2® user account that belongs to the Administrators group on the computer where the account is defined. If the account is a local account, then it must belong to the local Administrators group. If the account is a domain account, then it must belong to the Administrators group at the domain controller.

For example, if a user logs on to a domain account and tries to access a DB2 database, DB2 goes to a domain controller to enumerate groups (including the Administrators group). You can force DB2 to always perform group lookup on the local computer by setting the registry variable `DB2_GRP_LOOKUP=local` and adding the domain accounts (or global groups) to the local group.

For a domain user to have SYSADM authority, it must belong to the Administrators group on the domain controller. Since DB2 always performs authorization at the machine where the account is defined, adding a domain user to the local Administrators group on the server does not grant the domain user SYSADM authority to this group.

To avoid adding a domain user to the Administrators group at the domain controller, create a global group and add the domain users to which you want to grant SYSADM authority to it, and then update the DB2 configuration parameter `SYSADM_GROUP` with the name of the global group. To do so, enter the following commands:

```
db2stop
db2 update dbm cfg using sysadm_group global_group
db2start
```

Linux installation requirements

Installation requirements (Linux)

This topic lists the hardware, distribution, software, and communication requirements for DB2 UDB Express.

Hardware requirements

An Intel x86 compatible processor.

Distribution requirements

For the latest information on supported distribution and kernel levels, point your browser to:

- <http://www.ibm.com/db2/linux/validate>

Software requirements

- The IBM Developer Kit for Java 1.4.1 Service Release 2 is required for DB2 servers, for using the DB2 Control Center, and for creating and running Java applications, including stored procedures and user-defined functions. During the installation process, if the correct level of the JDK is not already installed, it will be installed.
- A browser is required to view online help.

Communication requirements

TCP/IP is required to access remote databases.

Installing DB2 products or sharing instance directory on NFS

Currently, we do not support the installation of DB2 products on NFS. Installing DB2 on NFS (for example, NFS mounting /usr/opt/db2_08_01 or /opt/IBM/db2/V8.1) can be error prone and these errors can be difficult to diagnose.

The following configuration is not supported:

- Setting up an instance on a file system
- NFS mounting a file system from multiple computers, and then running DB2 on these machines using that same instance.

This configuration can cause file locking and performance problems.

NIS installation considerations

In environments that include security software, such as NIS or NIS+, there are some installation considerations. The DB2 installation scripts will attempt to update things that are under the control of the security packages, such as users and groups, and will not be able to do so.

At instance creation, without a security component present, the instance owning user's group properties will automatically be modified to add the administrative server's group as a secondary group, and the administrative server's group properties will be modified to include the instance owner's group. If the instance creation program is unable to do this (it will not if NIS/NIS+ is controlling the group), it will report that it could not, and in the warning message it will provide the necessary information to manually make the changes.

These considerations hold true for any environment where an external security program is involved that does not allow the DB2 installation or instance creation programs to modify user characteristics.

If the DB2 Setup wizard detects NIS on your computer, you will not be given the option of creating new users during the installation. Instead you must choose existing users.

The following restrictions apply if you are using NIS or NIS+:

- Groups and users must be created on the NIS server before running the DB2 Setup wizard.
- Secondary groups must be created for the DB2 instance owner and the DB2 Administration Server on the NIS server. You must then add the primary group of the instance owner to the secondary DB2 Administration Server group. Likewise, you must add the primary DB2 Administration Server group to the secondary group for the instance owner.
- Before you create an instance, there must be an entry for the instance in the etc/services file. For example, if you want to create an instance for the user db2inst1, you require an entry similar to the following:

```
db2c_db2inst1    50000/tcp
```

Chapter 5. Preinstallation tasks

Extending the directory schema (Windows)

If you plan to use LDAP with Windows 2000 or Windows Server 2003, you must extend the directory schema to contain DB2 object classes and attribute definitions. You must do this before you install any DB2 products.

Prerequisites:

Your Windows user account must have Schema Administration authority.

Procedure:

To extend the directory schema:

1. Logon to a domain controller.
2. Run the **db2schex.exe** program from the installation CD with Schema Administration authority. You can run this program with Schema Administration authority without logging off and logging on again, as follows:

```
runas /user:MyDomain\Administrator x:\db2\Windows\utilities\db2schex.exe
```

where x: represents the CD-ROM letter.

When **db2schex.exe** completes, continue the installation.

Installing the IBM Software Developer Kit for Java (Linux)

The IBM Software Developer Kit for Java 1.4.1 Service Release 2 is required for DB2 servers to use the DB2 Control Center or to create and run Java applications, including stored procedures and user-defined functions. Only the IBM Software Developer's Kit (SDK) is supported. The IBM Developer Kit for Java 1.4.1 Service Release 2 for 32-bit platforms is shipped on the product CD.

The installation of the IBM Developer Kit for Java is attempted automatically during a response file or a GUI installation. This task is only required if the automatic installation fails or if you did not install the GUI tools initially with the product.

The SDK is installed whenever a component that requires Java is being installed. However, if the installer detects that SDK 1.4.1 is already installed, it will not install it again. The SDK 1.4.1 is installed in its own directory and does not overwrite any previous levels of the SDK.

Restrictions:

The installation of the Java SDK is attempted only if you use one of the following DB2 installation methods:

- GUI install program (db2setup)
- Response file installation (db2setup -r response_file)

The db2_install script will not install the Java SDK.

Procedure:

To install the SDK manually:

1. Run the command appropriate for your operating system from the `/cdrom/db2/linux/Java-1.4` directory.

Operating System	Command	Installation directory
Linux IA32	<code>rpm -ivh IBMJava2-SDK-1.4.1-2.0.i386.rpm</code>	<code>/opt/IBMJava2-141</code>

2. To verify that the IBM SDK is installed, run the `<path>/jre/bin/java -version` command, where `<path>` represents the path where the SDK was installed. Refer to the installation directory for each platform listed above.

The IBM SDK is also available from the IBM developerWorks web site at:

- <http://www.ibm.com/developerworks/java/jdk/index.html>

Java SDK levels for DB2

You require the appropriate level of the SDK listed below to use Java-based tools like the DB2 Control Center, and to create and run Java applications, including stored procedures and user-defined functions.

If the correct level of the SDK is required by some other component being installed and the SDK is not already installed, the SDK will be installed if you use either the DB2 Setup wizard or a response file to install the product.

The appropriate level of the SDK is not installed with the DB2 Run-Time client.

For the most up-to-date SDK information, see the DB2 UDB system requirements web page at <http://www.ibm.com/software/data/db2/udb/sysreqs.html>.

The following table lists the SDK levels for DB2 according to operating system:

Operating System	SDK level
Windows 32-bit	SDK 1.4.1 Service Release 1
Linux 32-bit	SDK 1.4.1 Service Release 2
Linux Intel 64-bit	SDK 1.4.1 Service Release 2
Linux AMD 64-bit	SDK 1.4.1 Service Release 2

Creating group and user IDs for a DB2 UDB installation (Linux)

Three users and groups are required to operate DB2. The user and group names used in the following instructions are documented in the table below. You may specify your own user and group names as long as they adhere to system naming rules and DB2 naming rules.

The user IDs you create will be required to complete subsequent setup tasks.

Table 1. Required users and groups

Required user	Example user name	Example group name
Instance owner	<code>db2inst1</code>	<code>db2iadm1</code>
Fenced user	<code>db2fenc1</code>	<code>db2fadm1</code>

Table 1. Required users and groups (continued)

Required user	Example user name	Example group name
DB2 administration server user	dasusr1	dasadm1

- The *instance owner* home directory is where the DB2 instance will be created.
- The *fenced user* is used to run user defined functions (UDFs) and stored procedures outside of the address space used by the DB2 database.
- The user ID for the *DB2 administration server user* is used to run the DB2 administration server on your system.

Prerequisites:

You must have root authority to create users and groups.

Procedure:

To create a required groups and user IDs for DB2:

1. Log in as a user with root authority.
2. To create groups on Linux, enter the following commands:

```
mkgroup -g 999 db2iadm1
mkgroup -g 998 db2fadm1
mkgroup -g 997 dasadm1
```

Create users for each group:

```
mkuser -u 1004 -g db2iadm1 -m -d /home/db2inst1 db2inst1 -p mypasswd
mkuser -u 1003 -g db2fadm1 -m -d /home/db2fenc1 db2fenc1 -p mypasswd
mkuser -u 1002 -g dasadm1 -m -d /home/dasusr1 dasusr1 -p mypasswd
```

Modifying kernel parameters (Linux)

Before installing DB2, you may want to update Linux kernel parameters. DB2 will automatically raise the IPC limits where necessary. It is highly recommended that these changes permanently made on the system so that subsequent reboots do not cause unnecessary downtime.

Prerequisites:

You must have root authority to modify kernel parameters.

Procedure:

To update kernel parameters:

RedHat and SuSE

Systems using a 2.4.x series kernel have a default value for the message queue parameter (msgmni), which allows only a few simultaneous connections to DB2. Semaphore array parameters also have to be changed for DB2 to run successfully. To check shared memory segment, semaphore array, and message queue limits, issue the **ipcs -l** command.

The following is the output from the **ipcs -l** command.

```
# ipcs -l
----- Shared Memory Limits -----
max number of segments = 4096           // SHMMNI
```

```

max seg size (kbytes) = 32768
max total shared memory (kbytes) = 8388608
min seg size (bytes) = 1

----- Semaphore Limits -----
max number of arrays = 1024           // SEMMNI
max semaphores per array = 250
max semaphores system wide = 256000
max ops per semop call = 32
semaphore max value = 32767

----- Messages: Limits -----
max queues system wide = 1024       // MSGMNI
max size of message (bytes) = 65536
default max size of queue (bytes) = 16384 // MSGMAX

```

Modify the kernel parameters by adding the following entries to the default system control configuration file, `/etc/sysctl.conf`:

```

kernel.msgmni = 1024
kernel.sem = 250 256000 32 1024

```

where

```

max semaphores system wide =
max number of arrays x max semaphores/array

```

Run `sysctl` with `-p` parameter to load in `sysctl` settings from the default file `/etc/sysctl.conf`.

```
sysctl -p
```

The entries from the `sysctl.conf` file are read during startup by the network initialization script.

On some distributions you may be required to add `sysctl -p` in one of the system initialization files (for example, `rc.local`) so that kernel parameters are set after each reboot.

Chapter 6. Installation

Windows installation

Installing DB2 UDB Express using the DB2 Setup wizard (Windows)

This task describes how to install DB2 UDB Express using the DB2 Setup wizard on Windows. You will use the DB2 Setup wizard to define your installation and install DB2 UDB Express to your system.

Prerequisites:

Before you start the DB2 Setup wizard:

- Ensure that your system meets installation, memory, and disk requirements.
- If you are planning to use LDAP on Windows 2000, Windows Server 2003, or Windows XP to register the DB2 server in Active Directory, you must extend the directory schema before you install.
- You must have a local *Administrator* user account with the recommended user rights to perform the installation.

Procedure:

To start the DB2 Setup wizard:

1. Log on to the system with the Administrator account that you have defined for the DB2 UDB Express installation.
2. Close all programs so the installation program can update files as required.
3. Insert the CD-ROM into the drive. If enabled, the auto-run feature automatically starts the DB2 Setup launchpad. From this window, you can view installation prerequisites and the release notes, you can take the DB2 Quick Tour to explore the features of DB2 Universal Database Version 8, or you can proceed directly to the installation. You may want to review the installation prerequisites and release notes for late-breaking information. Select **Install Products** and select the DB2 product to install.
4. The DB2 Setup wizard will determine the system language, and launch the setup program for that language. If you want to run the setup program in a different language, or the setup program failed to auto-start, you can start the DB2 Setup wizard manually.

To start the DB2 Setup wizard manually:

- a. Click **Start** and select the **Run** option.
- b. In the **Open** field, enter the following command:

```
x:\setup /i language
```

where:

- *x*: represents your CD-ROM drive
- *language* is the territory identifier for your language (for example, EN for English).

If the */i* flag is not specified, the installation program will run in the default language of the operating system.

- c. Click **OK**.
5. Once you have initiated the installation, proceed by following the setup program's prompts. Online help is available to guide you through the remaining steps. To invoke the online help, click Help or press F1. You can click **Cancel** at any time to end the installation.

If you want to verify your installation using the sample database, be sure to install the sample database component under the Getting Started component group. The sample database is included as part of a Typical installation.

For information on errors encountered during installation, see the `db2.log` file. The `db2.log` file stores general information and error messages resulting from the install and uninstall activities. By default, the `db2.log` file is located in the 'My Documents\DB2LOG\ directory. The location of the 'My Documents' directory will depend on the settings on your computer.

Linux installation

Installing DB2 UDB Express using the DB2 Setup wizard (Linux)

This task describes how to install DB2 UDB Express using the DB2 Setup wizard on Linux systems. The DB2 Setup wizard is used to define your installation preferences and install DB2 UDB Express to your system.

Prerequisites:

Before you start the DB2 Setup wizard

- Ensure that your system meets installation, memory, and disk requirements.
- You require root authority to perform the installation.
- The DB2 UDB Express product CD-ROM must be mounted on your system.
- If NIS/NIS+ or similar security software is used in your environment, you must manually create required DB2 UDB Express users before you start the DB2 Setup wizard.

Procedure:

To start the DB2 Setup wizard:

1. Log on to the system as a user with root authority.
2. Insert the DB2 UDB Express product CD-ROM.
3. Change to the directory where the CD-ROM is mounted by entering the following command:

```
cd /mnt/cdrom
```

where `/cdrom` represents mount point of the CD-ROM.

4. Enter the `./db2setup` command to start the DB2 Setup wizard.
5. After a moment, the IBM DB2 Setup Launchpad opens.

From this window, you can view installation prerequisites and the release notes, you can take a Quick Tour to explore the features of DB2, or you can proceed directly to the installation. You may want to review the installation prerequisites and release notes for late-breaking information.

Once you have initiated the installation, proceed through the DB2 Setup wizard installation panels and make your selections. Installation help is available to

guide you through the remaining steps. To invoke the installation help, click **Help** or press **F1**. You can click **Cancel** at any time to end the installation. When you have completed your installation, DB2 UDB Express will be installed in the **/opt/IBM/db2/V8.1** directory.

Chapter 7. Postinstallation tasks

Verifying the installation using the command line processor (CLP)

Once you have completed installing DB2 UDB Express, you can verify the installation by creating a sample database and running SQL commands to retrieve sample data.

Prerequisites:

- The sample database component must be installed on your system; included in a typical installation.
- You require a user ID with SYSADM authority.

Procedure:

To verify the installation:

1. Log on to the system as a user with SYSADM authority.
2. Enter the **db2sampl** command to create the SAMPLE database.
This command may take a few minutes to process. There is no completion message; when the command prompt returns, the process is complete.
The SAMPLE database is automatically cataloged with the database alias SAMPLE when it is created.
3. Start the database manager by entering the **db2start** command.
4. Enter the following DB2 commands from a DB2 command window to connect to the SAMPLE database, retrieve a list of all the employees that work in department 20, and reset the database connection:

```
db2 connect to sample
db2 "select * from staff where dept = 20"
db2 connect reset
```

After you have verified the installation, you can remove the SAMPLE database to free up disk space. Enter the **db2 drop database sample** command to drop the SAMPLE database.

Verifying the installation of DB2 UDB Express using First Steps

You should verify that the DB2 UDB Express installation has completed successfully by accessing data from the SAMPLE database.

Prerequisites:

- You must have the Control Center and the First Steps component installed to perform this task. First Steps is part of the Getting started component grouping in the DB2 Setup wizard. It is installed as part of a Typical installation or may be selected when performing a Custom installation.
- You must have SYSADM or SYSCTRL authority to perform this task.
- For Linux, you must have Xwindow software capable of rendering a graphical user interface for First Steps to run on your machine. Ensure that you have properly exported your display. For example, export DISPLAY=9.26.163.144:0.
- On Linux, ensure that you are logged on as the instance owner.

Procedure:

1. Log on to the system with the user account that you want to use to verify the installation. Ensure that the domain user account you use to create the sample database has SYSADM or SYSCTRL authority.
2. Start First Steps by running the **db2fs** command. This command is found in the DB2 folder on Linux and in the Start menu on Windows.
3. Select **Create SAMPLE databases** on the First Steps Launchpad to open the Create SAMPLE databases window.
4. In the Create SAMPLE databases window, select **DB2 UDB Sample database**.
5. Click **OK**.

This command may take a few minutes to process. When the SAMPLE database has been created, you will receive a completion message. Click **OK**.

6. Once the database is created, select **Work with Databases** on the First Steps Launchpad to start the Control Center. The Control Center allows you to perform administration tasks on different instance and database objects. Select **Basic** in the Control Center View dialog and select **OK**. Your new sample database should appear under the All Databases folder. Expand the SAMPLE database folder and select the Tables folder. You can then see the contents of any table in the SAMPLE database by double clicking on it in the list of tables on the right.

After you have verified the installation, you can remove the SAMPLE database to free up disk space. Right click on the SAMPLE database object and select **Drop**.

Part 3. Basic administration and maintenance operations

Chapter 8. After you've installed DB2 UDB Express

Creating your own database

Now that you have installed DB2 UDB Express and verified its successful installation with the SAMPLE database, you are ready to create your own database. The following sections will guide you through the steps of creating a new database that will take advantage of DB2 automatic maintenance features.

Database Basics

A relational database presents data as a collection of tables. A table consists of a defined set of columns and any number of rows. The data in each table is logically related, and relationships can be defined between tables. Data can be viewed and manipulated based on mathematical principles and operations called relations (such as, INSERT, SELECT, and UPDATE).

A database is self-describing in that it contains, in addition to data, a description of its own structure. It includes a set of system catalog tables, which describe the logical and physical structure of the data; a configuration file, which contains the parameter values associated with the database; and a recovery log, which records ongoing transactions and transactions that can be archived.

Databases can be local or remote. A local database is physically located on the workstation in use, while a database on another machine is considered remote.

You can:

- Create a database using the Control Center
- Add a database using the Control Center or Configuration Assistant
- Drop a database from the Control Center
- Backup a database using the Control Center
- Restore a database using the Control Center
- Configure a database using the Control Center
- Connect to a database using the Control Center
- Resolve database health alerts with the Health Center

Creating your own database using the Create Database with Automatic Maintenance wizard

The Create Database with Automatic Maintenance wizard is the quickest way to set up your own database. Based on basic information that you provide, the wizard:

- creates a new database on the disk or directory of your choice
- assigns disk space for your data
- configures the new database for optimal performance
- turns on automatic maintenance
- configures notification by e-mail or pager if the database needs attention

The Create Database with Automatic Maintenance wizard can be started from First Steps or directly from within the Control Center.

Prerequisites:

- If you wish to start the wizard from First Steps, you must also have the First Steps component installed. First Steps is part of the Getting started component grouping in the DB2 Setup wizard. It is installed as part of a Typical installation or may be selected when performing a Custom installation.
- You must have SYSADM or SYSCTRL authority to perform this task.
- For Linux, you must have Xwindow software capable of rendering a graphical user interface for First Steps and the Control Center to run on your machine. Ensure that you have properly exported your display. For example, export `DISPLAY=9.26.163.144:0`.
- On Linux, ensure that you are logged on as the instance owner.

Procedure:

1. Log on to the system with the user account that you want to use to create the database.
2. Start the Create Database with Automatic Maintenance in the one of the following ways:
 - From First Steps: Click on the button marked **Create Your Own Database**
 - From the Control Center: Click on the **All Databases** folder. Click on **Create New Database** in the **All Databases** pane.
3. Follow the steps of the wizard. You will have to provide some details and preferences about your new database, including such things as its name and the contacts who can be notified under various conditions. You will also select one of two database maintenance strategies.

If you created your own database from First Steps, you will now want to start the Control Center to begin exploring and working with your database. To do this, click on the button marked **Work With Databases** in First Steps.

Reviewing your new database

Once you have launched the Control Center, you can verify that your database was created by finding it in the Object Tree that fills the left side of the Control Center window.

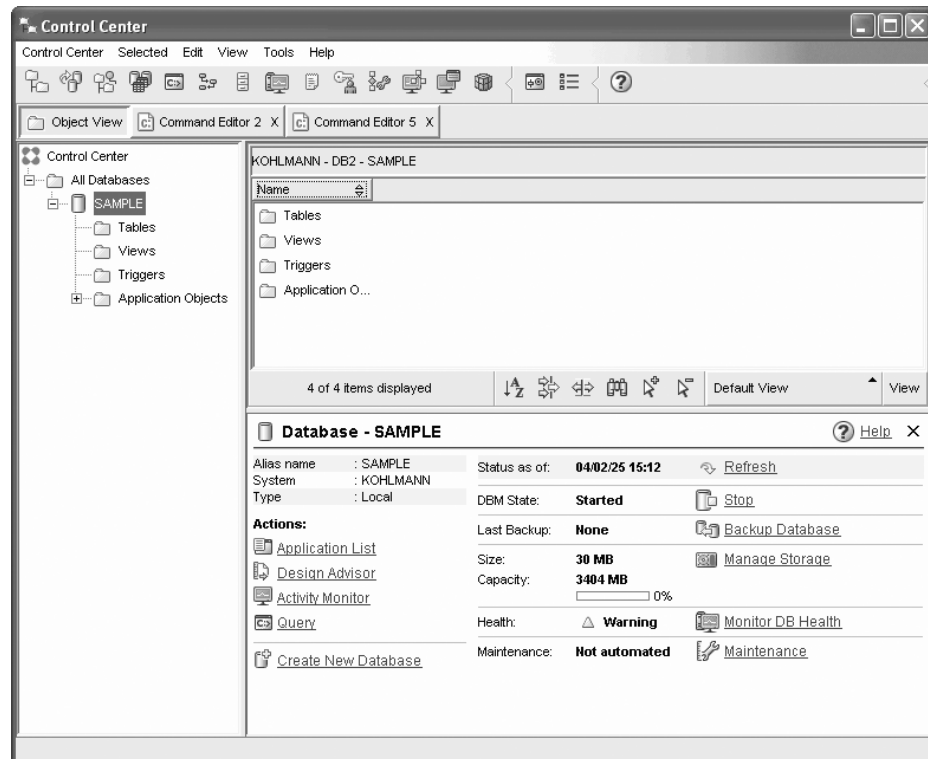


Figure 1. Control Center with a database selected

Expand the Object Tree until you can see your database and select it. The right side of the Control Center will fill with details about the database's current operation and links to relevant actions. These object details, and the way that they work for other objects, are covered in the section of this book devoted to the Control Center.

When you created your database with the Create Database with Automatic Maintenance, you enabled certain Automatic maintenance features. The features are set up and do not necessarily require any further attention. You may, however, find it useful to know where their settings can be found and further configured.

There are automatic maintenance-related tools available. The first of these is the Automatic Maintenance wizard, which you can start by clicking on the **Maintenance** link in the Object Details Pane (see the above screenshot). As the wizard's name suggests, it will allow you to change the way in which automatic maintenance is carried out for your database.

The second is the Configuration Advisor. It can be started by right clicking on the database to be configured, and selecting **Configuration Advisor**. This tool will help you easily configure your database for optimal performance.

The third and last of these tools is the Health Center. You can launch it by clicking on **Monitor DB Health** in the Object Details Pane or by selecting **Health Center** from the **Tools** menu. Under normal circumstances, you should never have to look at the Health Center. If the health of your database needs attention, you will be notified by e-mail. You can then find out more about what needs attention.

DB2 administration and development tools

This section describes the DB2 administration and development tools. It explains what each tool is used for and why you might want to use it. It tells you how to invoke a tool and presents basic usage information.

- “Control Center” on page 38
- “Replication Center” on page 51
- “Command Editor” on page 42
- “Task Center” on page 45
- “Health Center” on page 43
- “Journal” on page 47
- “Development Center” on page 49
- “Web Command Center” on page 52
- “Web Health Center” on page 53

Navigation

The administration and development tools enable you to perform your job easily; however, you need to understand how the tools work and become familiar with their features. This section explains basic navigation features.

Basic navigation tool concepts explained

Here are some basic tool concepts you should be familiar with.

Start Menu: The *Start menu* is the starting point for using the Administration tools in Windows[®] operating environments. From the **Start** menu, select **IBM DB2** —> **General Administration Tools** —> **Control Center**. You can also start other centers or tools such as the Journal, the Replication Center, and the Task Center from the Start menu as well as select the command line tools, the development tools, the monitoring tools, and the Information Center.

To start the Administration tools from the Linux desktop environment, open the *IBM[®] DB2[®]* folder on your Gnome or KDE desktop and then select **Control Center**.

Windows:

Windows are panels that open and enable you to enter information pertaining to the action you want to perform, for example, you can type information into fields within a window.

Notebooks:

A *notebook* is used to logically organize data into groups when there is too much information to fit on one page. The resulting pages are organized with tabs that reflect the particular page content.

Wizards:

Wizards are integrated into the administration tools. They assist you in completing a single task by stepping you through the task. To select a wizard, from the Control Center window, select **Tools** —> **Wizards**. The **Wizards** window opens. Select the wizard you want to use. Select the object for which you want help and follow the instructions to complete the task. The wizard task overview on the first

page of the wizard lists any prerequisite steps and briefly describes every page of the wizard. Other pages of the wizard may contain links to conceptual or reference information to help you understand the function of the wizard. From a wizard, you can launch other wizards, windows or notebooks.

Advisors:

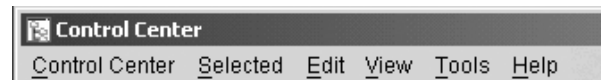
Advisors are integrated into the administration tools. They assist you with more complex tasks, such as tuning and performance tasks, by gathering information and recommending options that you may not have considered. You can accept or reject the advice of the advisor. Advisors can be called from the tools as well as from APIs and the command line interface. To select an advisor, from the Control Center window, select **Tools** → **Wizards**. The **Wizards** window opens. Select the advisor you want to use. Select the object for which you want help and follow the instructions to complete the task. Conceptual and reference information is available to help you understand the function of the advisor.

Launchpads:

Launchpads are integrated into the administration tools. They assist you in completing high-level tasks by stepping you through a set of tasks in the right order. Launchpads can call wizards or other dialogs to accomplish the high-level task. To select a launchpad, from the **Control Center** window, select **Tools** → **Wizards**. The **Wizards** window opens. Select the launchpad you want to use. Select the object for which you want help and follow the instructions to complete the task. Pages of the launchpad may contain links to conceptual or reference information to help you understand the function of the launchpad.

Menu bars:

The *Menu bar* is a special panel that is displayed at the top of the window.



It contains menu options that allow you to access drop-down menus. From the drop-down menus, you can select menu items. Items in the menu bar include actions that affect the objects in the center you are using. For example, menu items under **Control Center** include actions that affect the entire Control Center. Menu items under **Selected** dynamically change to include only those actions that apply to currently selected objects in the contents pane. Menu items under **Edit** include actions that let you work with objects in the contents pane. Menu items under **View** include actions that let you customize the display of objects in the contents pane. Menu items under **Help** include actions that display help information and allow you to work with the Information Center and Tutorials.

Toolbars:

Toolbars are panels that contain icons representing functions you can perform. Toolbars are located below the menu bar. To see a brief description of a tool, place your cursor over its icon and hover help will tell you what function each icon represents. Toolbars provide quick access to the functions you can perform. The functions can also be selected in the **View** menu.



A *Contents pane toolbar* is located below the contents pane. It allows you to tailor the information in the contents pane.



Object trees:

Object trees display the system and database objects graphically in the left navigation pane, enabling you to see the hierarchical relationship between different objects and to work with those objects. You can expand the object tree to expose the objects that are contained within the object. The exposed objects are displayed as folders beneath the object. Each folder represents an object type. If the object tree is collapsed, the folders contained within the object no longer appear in the view of the object tree.

Objects on your local workstation and any remote systems that can be connected to and from your local system are displayed in the object tree. Some objects, such as tables and views, do not contain other objects and appear at the bottom of the object tree.

When you select an object in the object tree, the objects that reside in the object are displayed in the contents pane. To invoke an action on an object, right-click the object to open a pop-up menu of available actions. You can also invoke an action on the object by selecting the object then clicking the **Selected** menu option from the menu bar.

Contents Pane:

The *Contents pane* allows you to display large amounts of complex tabular data in a flexible manner.

You can filter, sort, and customize Contents pane columns. You can also save your changes as a view, enabling you to quickly switch between different views of the same data. To create and save customized views, select View from the toolbar at the bottom of the Contents pane.

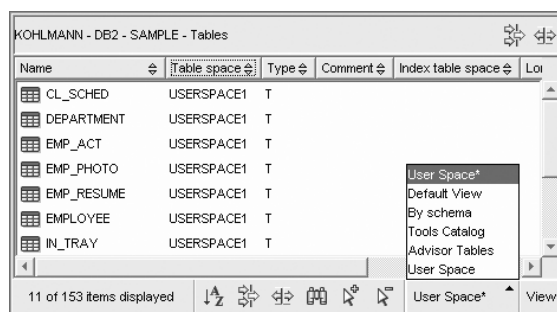


Figure 2. Working with views in the Contents pane

Filtering in the Contents pane simply hides data that has already been retrieved from the database. If your database has so many objects that retrieval time is an issue, you may prefer to retrieve only a subset of the objects (for example, tables). This filtering is referred to as Object Filtering and is explained in the next section.

Object filtering:

Object filtering enables you to work with a subset of all the objects in the database in the Control Center. For example, if you only need to work with your own tables and not those created by someone else, you can set up an object filter so that only those tables will be retrieved from the database. You will not have to wait for data about the other tables to be retrieved.

Click on an object folder in the object tree and select Filter → Create. The Filter notebook opens allowing you to select which objects you would like to retrieve from the database.

Once you have created a filter, the filter icon will appear beneath the filtered object in the object tree to indicate that a filter has been set. To remove the filter and display all the objects in the Contents pane, right click the object folder and select Filter → Remove.



You can further customize your view by selecting the filter icon from the toolbar at the bottom of Contents pane described above. This filtering will only hide data that has already been retrieved from the database.

Infopops:

An *infopop* is a pop-up window that is displayed when a control in a window or notebook has focus and you press F1. Holding the mouse cursor over a control in a window or notebook also causes the infopop to display. Infopops contain a description of the field or control. They may also list restrictions and requirements or provide instructions.

Infopops are disabled or re-enabled from the **General** page of the **Tools Settings** notebook. To disable or enable infopops for the Configuration Assistant, select the **Display Infopops** checkbox menu in the **Help** menu from the Configuration Assistant tool.

Mandatory fields:

Mandatory fields are fields for which you must supply information. Mandatory fields are displayed with thick red borders around the field. When information is entered in the mandatory field, the red border is no longer displayed.

Help:

Help is available from icons on the toolbar or by using the Help menu.



displays help for getting started with the Control Center.




opens the Information Center so you can search for help on tasks, commands, and information in the DB2 library.

The Help menu displays menu items for displaying the online help index, general information about the Control Center, and keyboard help. The menu also displays the list of tutorials available with DB2.

Control Center

You can start the Control Center in the following ways:

- Select Control Center from the Tools menu of another tool.
- Click the  icon from the toolbar of another tool.
- Enter the **db2cc** command.
- On Windows® systems, click the **Start** button and select **Programs —> IBM DB2 —> General Administration Tools —> Control Center**.
- On Linux systems, open the **IBM DB2** folder on the desktop and select **Control Center**.

In the Control Center, you can administer all of your systems, instances, databases, and database objects such as tables and views. You can also open other centers and tools to help you optimize queries, jobs, and scripts; perform data warehousing tasks; create stored procedures; and work with DB2 commands.

The following are some of the key tasks that you can perform with the Control Center:

- Add DB2 systems, instances, databases, and database objects to the object tree.
- View the details of database objects. You can look at a table's constituent columns and see the current state of a database.
- Manage database objects. You can create, alter, and drop databases, table spaces, tables, views, indexes, triggers, and schemas. You can also manage users.
- Manage data. You can load, import, export, and reorganize data. You can also gather statistics.
- Perform preventive maintenance by backing up and restoring databases or table spaces.
- Manage database connections, such as DB2 Connect™ servers and subsystems.
- Manage applications.
- Launch other tools such as the Command Editor and the Health Center.

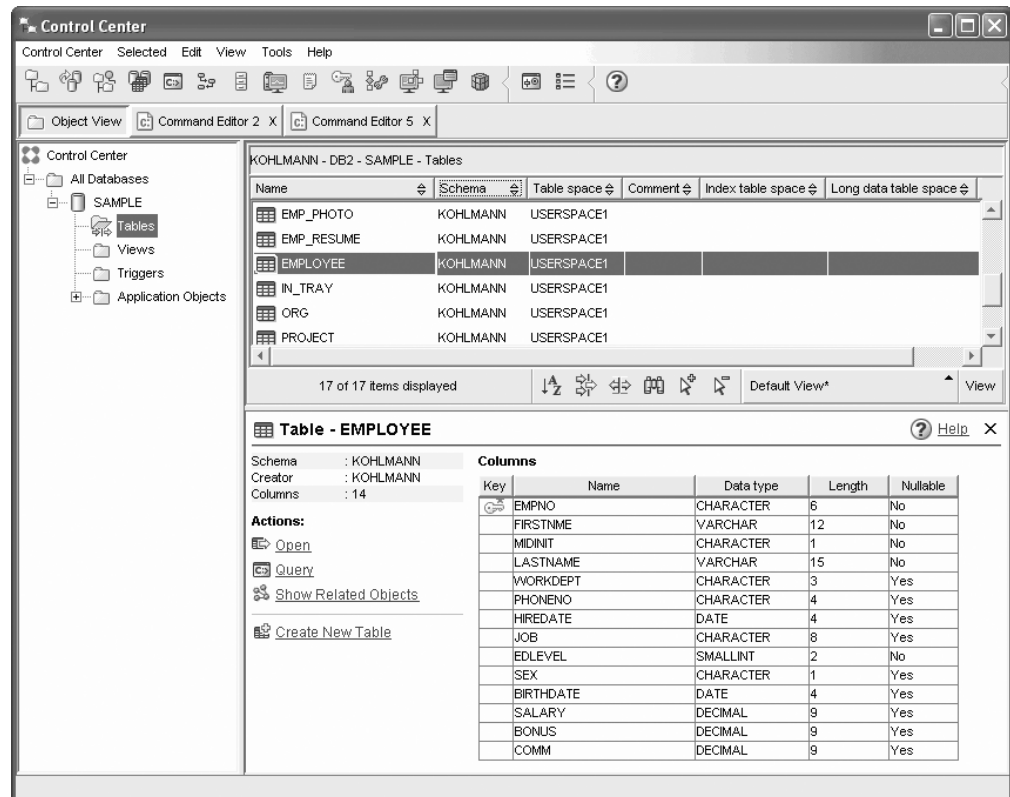


Figure 3. Control Center with a table selected

The main Control Center window is split into three sections, or panes. On the left side, there is an Object Tree. This tree displays all of your databases and their constituent objects (such as tables, views, and indexes).

When you select any one of the available database objects or object folders in the Object Tree, the Contents Pane, occupying the top half of the right side of the Control Center window, fills with a list of the relevant objects. For example, by selecting a database's **Table** folder in the object tree, you will fill the Contents Pane with all of that database's tables, as well as some information about each.

There is, however, more detail about any given object than will fit in the Contents Pane; the bottom pane on the right side, the Object Details Pane provide the additional information. Clicking on an object in the Contents Pane will bring up detailed information about that object in the Object Details Pane. When you click on a table object in the object list, you will see a listing of that table's columns, as well as other table attributes and some actions that are relevant to tables.

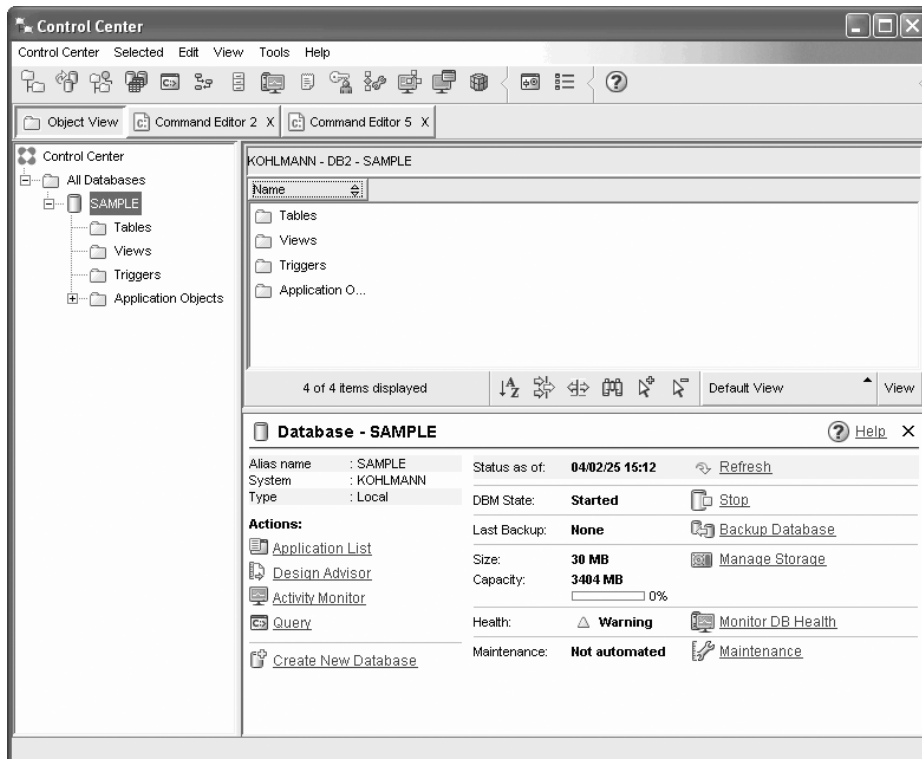


Figure 4. Control Center with a database selected

The screenshot above shows what you might see if you were to select the SAMPLE database. The object details pane displays operational information about the current state of the database, and offers possible actions related to aspects of its status.

The **Maintenance** status category will tell you whether or not automatic maintenance is enabled for the database in question. Clicking on **Maintenance** will allow you to enable, configure, and disable automatic maintenance for the database. If you created the database with the **Create Database Using Automatic Maintenance wizard**, from First Steps or within the Control Center, then Maintenance should be in the "enabled" state.

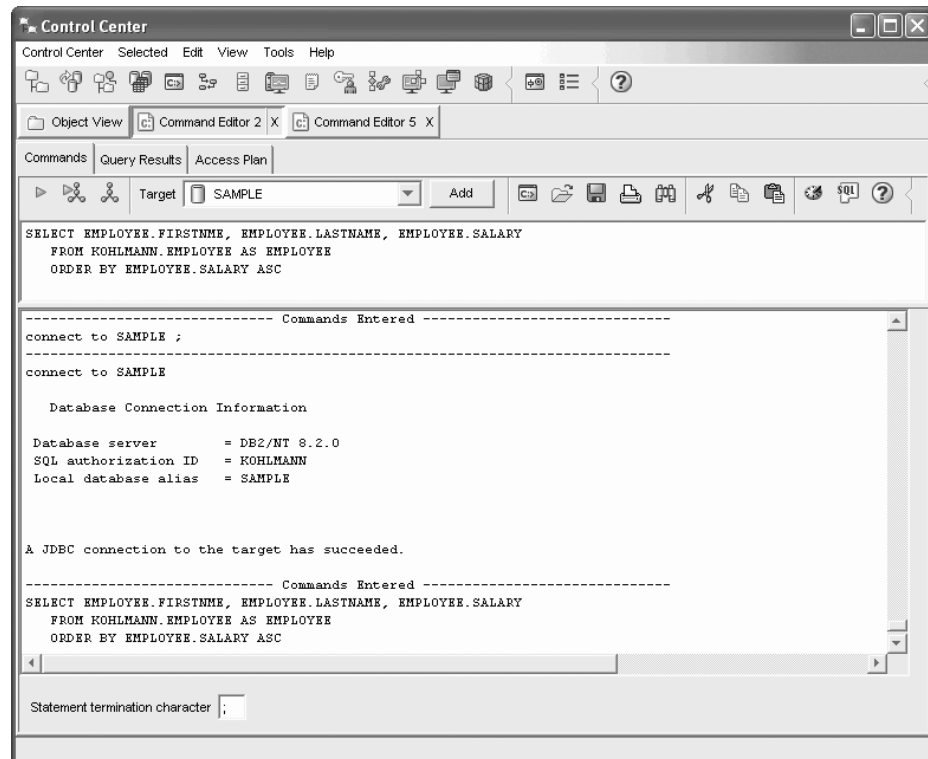


Figure 5. Control Center with a Command Editor open

Clicking on "Query" in the object details pane will start the Command Editor. With it, you can issue DB2 commands and SQL queries from within the Control Center. The Command Editor can also be launched separately, as a stand-alone tool.

Note: To schedule tasks through the Control Center, you must first create a tools catalog. If you did not create a tools catalog when you installed DB2, you can select **Tools** → **Tools Settings** → **Scheduler Settings** and create one now.

To customize objects and actions

Use the Control Center View window to select the view of the Control Center with which you want to work.

DB2 UDB is made up of various components and objects. These objects are used to store and work with data. The database itself is only one of a number of objects that make up a database product's hierarchy of objects. Other components include systems, tables, views, triggers, and indexes. DB2 UDB presents its hierarchy as an object tree in the left pane of the Control Center. Three different Control Center views are available.

To select a view:

Open the Control Center View window by clicking **Tools**→**Customize** the Control Center. Select the Control Center view that you want displayed.

Basic This view provides you with the core DB2 functions. Its first folder is the All Databases folder. From this folder you can work with all the databases to which you have been granted access, including their related objects such as tables and stored procedures. This view does not include the database

objects that are at a higher level than the database in the DB2 hierarchy (systems and instances). It provides you with the essentials for working with data.

Advanced

This view provides you with all the folders, folder objects, and actions available in the Control Center. You should select this view if you are working in an enterprise environment and want to connect to DB2 for z/OS or IMS.


Custom

This view allows you to tailor the Control Center to your needs. You select the folders, folder objects, and object actions that you want to appear in your Control Center view. Click **Custom**—>**Modify**. The Customize Control Center View window opens.

You can choose to have the Control Center View window open whenever you open the Control Center by selecting **Show this window at startup time**. Your Control Center now displays your view selection.

Command Editor

You can start the Command Editor in the following ways:

- Select Command Editor from the Tools menu of another tool.
- Click the  icon from the toolbar of another tool.
- On Windows® systems, click the **Start** button and select **Programs** —> **IBM DB2** —> **Command Line Tools** —> **Command Editor**.

Use the Command Editor to:

- Run DB2® commands and SQL statements
- Work with query results
- View a graphical representation of the access plan for explained SQL statements.
- Run commands in sequence.
- Create and save a script. You can optionally store a saved script in the Task Center, where you can schedule the script to run at a specific time.

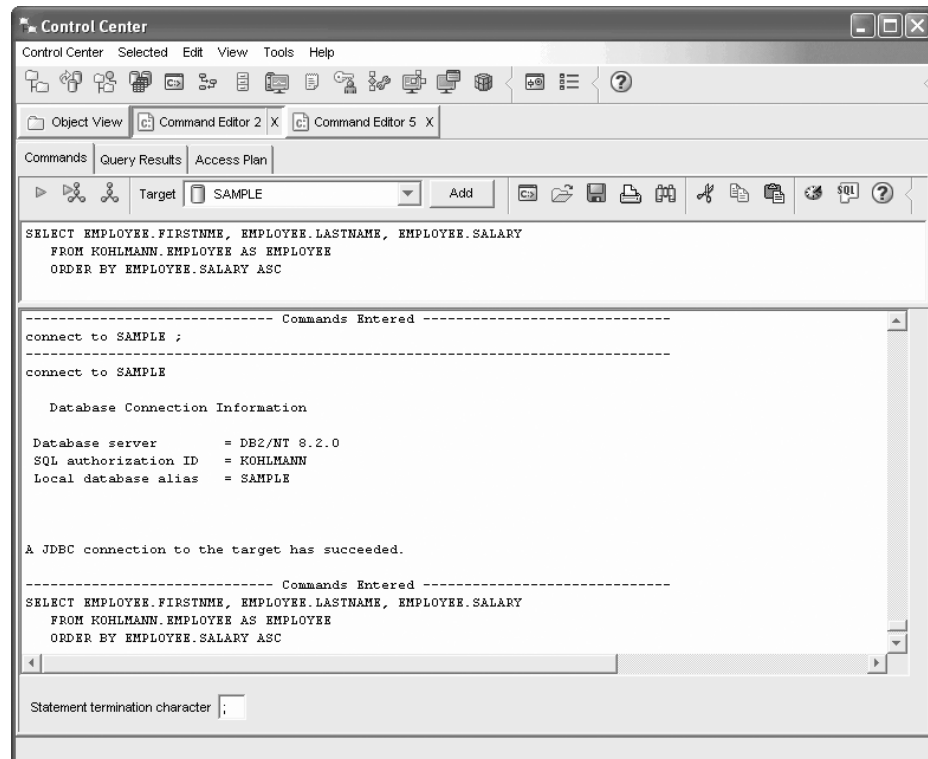



Figure 6. Command Editor window

On the **Commands** page, you can perform the following actions:

- Execute an SQL statement or DB2 CLP command. You do not need to precede the command by *DB2*.
- Run a command or statement, by clicking the  icon (at the left of the toolbar).

On the **Query Results** page, you can see the results of the queries. You can also save the results or edit the contents of the table.

On the **Access Plan** page, you can see the access plan for any explainable statement that you specified on the Interactive page or the Script page. DB2 generates the access plan when it compiles the SQL statement. You can use this information to tune your queries for better performance.

If you specify more than one statement on the Script page, an access plan is not created unless you highlight a single statement.


To invoke the SQL Assist tool, click the SQL Assist button on the Interactive page. To invoke the Visual Explain tool, execute an explainable statement on the Interactive page or the Script page.

The Web version of the Command Editor includes most of these features but it *does not* currently include Visual Explain or SQL Assist.

Health Center

You can start the Health Center in the following ways:

- Select Health Center from the Tools menu of another tool.

- Click the  icon from the toolbar of another tool.
- Enter the **db2hc** command.
- On Windows® systems, click the **Start** button and select **Programs —> IBM DB2 —> Monitoring Tools —> Health Center**.
- Click the health center status beacon when it appears on a DB2® window. On the Tools Settings window, you can configure this beacon to appear on every DB2 window whenever an alert occurs.

Use the Health Center to resolve health alerts in the database environment and make any necessary changes.

When you use DB2, a health monitor continuously monitors a set of health indicators. If the current value of a health indicator is outside the acceptable operating range defined by its warning and alarm thresholds, the health monitor generates a health alert. DB2 comes with a set of predefined threshold values, which you can later customize. For example, you can customize the alarm and warning thresholds for the amount of space used in a table space.



Depending on the configuration of the DB2 instance, the following actions can occur when the health monitor generates an alert:



- An entry is written in the administration notification log, which you can read from the Journal.
- The health center status beacon appears in the lower right corner of the DB2 Tools window.
- A script or task is executed.
- An e-mail or pager message is sent to the contacts that you specify for this instance.

The following are some of the key tasks that you can perform with the Health Center:

- View the status of the database environment. Beside each object in the navigation tree, an icon indicates the most severe alert for the object (or for any objects contained by that object). For example, a green diamond icon beside an instance means that the instance and the databases contained in the instance do not have any alerts.
- View the alerts for an instance or a database. When you select an object in the navigation tree, the alerts for that object are shown in the pane to the right.
- View details on the alert or use the Recommendation advisor to address the alert situation. When you double-click an alert, a notebook appears. The first page shows the details for the alert. The second page shows any recommended actions.
- Configure health indicator settings
- Select which contacts will be notified of alerts with an e-mail or pager message.
- Review the history of alerts for an instance.

You can use the toggle buttons at the top of the navigation bar to filter the alerts according to their severity:

-  Displays objects in alarm state (the most severe type of alert).
-  Displays objects in alarm or warning state.

-  Displays objects in any alert state.
-  Displays all objects.

The Web version of the Health Center includes a subset of these features.

Setting up notification and contact lists

For DB2 to contact you or others regarding the health of your databases, you will have to set up notification and contact lists. If you did not do this during the DB2 installation, you can manually set up these lists.

Procedure:

1. If the SMTP server was not setup during the installation process, you can configure it manually using the following command:

```
db2 update admin cfg using stmp_server host1
```

where host1 represents the TCP/IP host name for the SMTP server used for e-mail notification.

You can also be update this information using the Create Database with Automatic Maintenance wizard, or the Troubleshoot Alert Notification wizard in the Health Center.

2. If you want the contact information to be located on a remote DB2 administration server (DAS), you can specify the contact_host parameter using the following command:

```
db2 update admin cfg using contact_host host2
```

where host2 represents the TCP/IP host name for the DAS. If the contact_host parameter is not specified, the DAS assumes the contact information is local.

3. Turn on the scheduler using the following command:

```
db2 update admin cfg using sched_enable on
```

4. For these changes to take effect, you need to restart the DAS use the following commands:


```
db2admin stop
db2admin start
```

5. In the Control Center, click on the Contacts icon in the Taskbar. Select System name, then click **Add Contact**. Type in contact information and then press OK. You can also add the new contact using the Task Center, the Health Center by configuring alert notification, or the Create Database with Automatic Maintenance.

Task Center

You can start the Task Center in the following ways:

- Select Task Center from the Tools menu of another tool.

- Click the  icon from the toolbar of another tool.
- Enter the **db2tc** command.

- On Windows® systems, click the **Start** button and select **Programs —> IBM DB2 —> General Administration Tools —> Task Center**.

Note: To use the Task Center, you must first create a tools catalog. If you did not create a tools catalog when you installed DB2, you can select **Tools** → **Tools Settings** → **Scheduler Settings** and create one now.

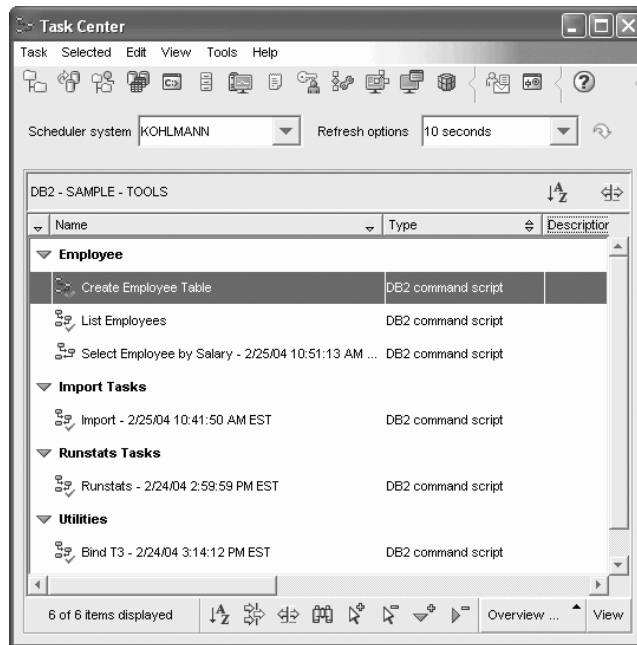


Figure 7. Task Center window

Use the Task Center to run tasks, either immediately or according to a schedule, and to notify people about the status of completed tasks. The Task Center includes functionality from the Script Center in previous versions of DB2, plus additional functionality.

A task is a script, together with the associated success conditions, schedules, and notifications. You can create a task within the Task Center, create a script within another tool and save it to the Task Center, import an existing script, or save the options from a DB2® dialog or wizard such as the Load wizard. A script can contain DB2, SQL, or operating system commands.


For each task, you can do the following:

- Schedule the task
- Specify success and failure conditions
- Specify actions that should be performed when this task completes successfully or when it fails
- Specify e-mail addresses (including pagers) that should be notified when this task completes successfully or when it fails

You can specify conditional coding by creating task actions. Each task action consists of a task and the action that should be performed on the task. For example, task 1 could have the following task actions:

- If task 1 is successful, task action A enables the schedule for task 2.
- If task 1 fails, task action B runs task 3.

You can also create a grouping task, which combines several tasks into a single logical unit of work. When the grouping task meets the success or failure conditions that you define, any follow-on tasks are run. For example, you could combine three backup scripts into a grouping task and then specify a reorganization as a follow-on task that will be executed if all of the backup scripts execute successfully.

To see the most recent information, click the  button. You can view execution results as follows:


- To see the results from the last time a task was executed, right-click the task and select **Show Results**.
- To see the results from every time a task was executed, open the Journal. In the Journal, you can right-click the task execution that you are interested in and select **Show Results**.

To see help text for a message that appears in the execution results, open the Command Center and enter the error message preceded by a question mark. For example, enter ? **SQL0100** to get more information about message SQL0100W.

Several customizable saved views are available via the pull-up menu at the bottom of the Task Center.

Journal

You can start the Journal in the following ways:

- Select Journal from the Tools menu of another tool.
- Click the  icon from the toolbar of another tool.
- On Windows® systems, click the **Start** button and select **Programs** —> **IBM DB2** —> **General Administration Tools** —> **Journal**.

The Journal displays historical information about tasks, database actions and operations, Control Center actions, messages, and alerts.

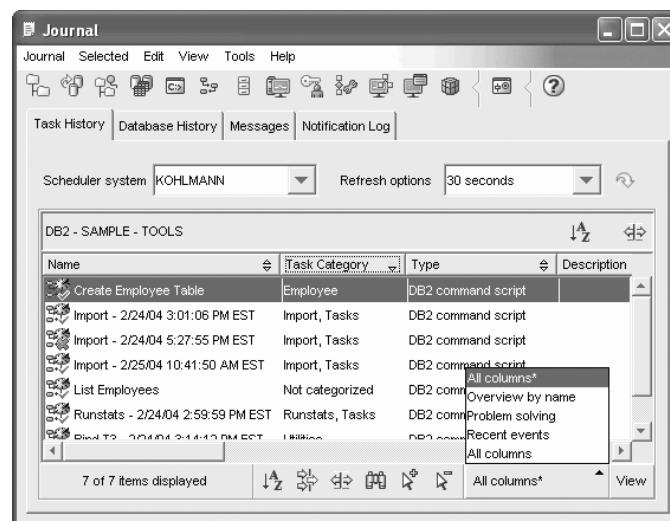


Figure 8. Journal window

To see the most recent information, click the  button.

The **Task History** page shows the results of tasks that were previously executed. You can use this information to estimate how long future tasks will run.

The Task History page contains one row for each execution of a task. The Task Center contains only one row for each task no matter how many times the task is executed. Each row in the Task Center could be directly related to multiple rows in the Task History page of the Journal.

For each completed execution of a task, you can perform the following actions:

- View the execution results
- View the task that was executed
- Edit the task that was executed
- View the task execution statistics
- Remove the task execution object from the Journal

To perform one of these actions, right-click a completed task execution and select the corresponding action from the pop-up menu that appears.

The **Database History** page shows information from the recovery history file. This file is updated when various operations are performed, including:

- Backup
- Restore
- Roll forward
- Load
- Reorg

This information could be useful if you need to restore a database or tablespace.

The **Messages** page shows messages that were previously issued from the Control Center and other GUI tools.

The **Notification Log** page shows information from the administration notification log. You can filter the list. For example, you can show only alerts from the health monitor.

Several customizable saved views are available via the pull-up menu at the bottom of the Journal.

Setting the DB2 license policy using the License Center

You can view or set your license policy using the License Center.

Procedure:

To set your license policy, perform the following depending on the type of licenses that you purchased:


1. In the License Center, select **Change** from the **License** menu.
2. In the Change License window, select the type of license that you have purchased:

- If you purchased a Concurrent Users license, select **Concurrent connect users** and enter the number of user licenses that you have purchased.
- If you purchased a Registered Users license, select **Concurrent registered users** and click **OK** to close the Change License window and return to the License Center. Click on the **Users** tab and add every user ID for which you purchased a license.

You will also need to modify the number of processor licenses that you have bought.

Development Center

You can start the Development Center in the following ways:

- Select Development Center from the Tools menu of another tool.
- Click the  icon from the toolbar of another tool.
- Enter the **db2dc** command.
- On Windows® systems, click the **Start** button and select **Programs** → **IBM DB2** → **Development Tools** → **Development Center**.

Use the Development Center to develop stored procedures, user-defined functions (UDFs), and structured types. The Development Center includes functionality from the Stored Procedure Builder in previous versions of DB2, plus additional functionality.

A set of wizards makes it easy to perform your development tasks.

With the Development Center, you can:

- Create, build, and deploy Java™ and SQL stored procedures
- Create, build, and deploy user-defined functions:
 - SQL scalar UDFs
 - SQL table UDFs
 - UDFs that read MQSeries® messages
 - UDFs that access OLE DB data sources
 - UDFs that extract data from XML documents
- Debug SQL stored procedures using the integrated debugger
- Create and build structured types
- See the contents of the server for each database connection that is in your project or that you have explicitly added to the Server View
- View and work with other database objects such as tables, triggers, and views
- Export and import routines and project information

The Development Center also provides a DB2 Development Add-In for each of the following development environments:

- Microsoft® Visual C++
- Microsoft Visual Basic
- Microsoft Visual InterDev

With the add-ins, you can easily access the features of the Development Center and other DB2 centers from your Microsoft development environment. This makes it easier for you to develop and incorporate stored procedures and UDFs into your DB2 application development.

Configuration Assistant

You can start the Configuration Assistant in the following ways:

- Enter the **db2ca** command.
- On Windows® systems, click the **Start** button and select **Programs** —> **IBM DB2** —> **Set-up Tools** —> **Configuration Assistant**.
- On Linux systems, open the **IBM DB2** folder on the desktop and select **Configuration Assistant**.

Use the Configuration Assistant to configure your clients. You can also use it as a light-weight alternative to the Control Center, in situations where you do not want to install the complete set of DB2 tools.

You must configure your DB2 clients so they can work with the available objects, as follows:

- To access an instance or database on another server or system, DB2® must catalog that system in the node directory of the client.
- To access a database, DB2 must catalog database information in the database directory of the client.

From the Configuration Assistant, you can perform various tasks including:

- Add new database objects
- Work with existing database objects
- Bind applications
- Set database manager configuration parameters
- Import and export configuration information
- Set DB2 registry parameters
- Change passwords
- Test connections
- Configure CLI parameters

The graphical interface makes these complex tasks easier through:


- Wizards that help you perform certain tasks
- Dynamic fields that are activated based on your input choices
- Hints that help you make configuration decisions
- Discovery that can retrieve information about selected database objects

The Configuration Assistant displays a list of the databases to which your applications can connect. Each database is identified by its database alias. You can use the Add Database wizard to add databases to the list. You can use the Change Database wizard to alter the information that is associated with databases in the list.

From the View menu, you can select an advanced view, which uses a notebook to organize connection information by object: Systems, Instance Nodes, Databases, Database Connection Services (DCS), and Data Sources. You can use the notebook pages to perform object-specific actions.

Replication Center

You can start the Replication Center in the following ways:

- Select Replication Center from the Tools menu of another tool.
- Click the  icon from the toolbar of another tool.
- Enter the **db2rc** command.
- On Windows® systems, click the **Start** button and select **Programs** —> **IBM DB2** —> **General Administration Tools** —> **Replication Center**.

Use the Replication Center to administer replication between a DB2® database and another relational database (DB2 or non-DB2). From the Replication Center, you can define replication environments, apply designated changes from one location to another, and synchronize the data in both locations.

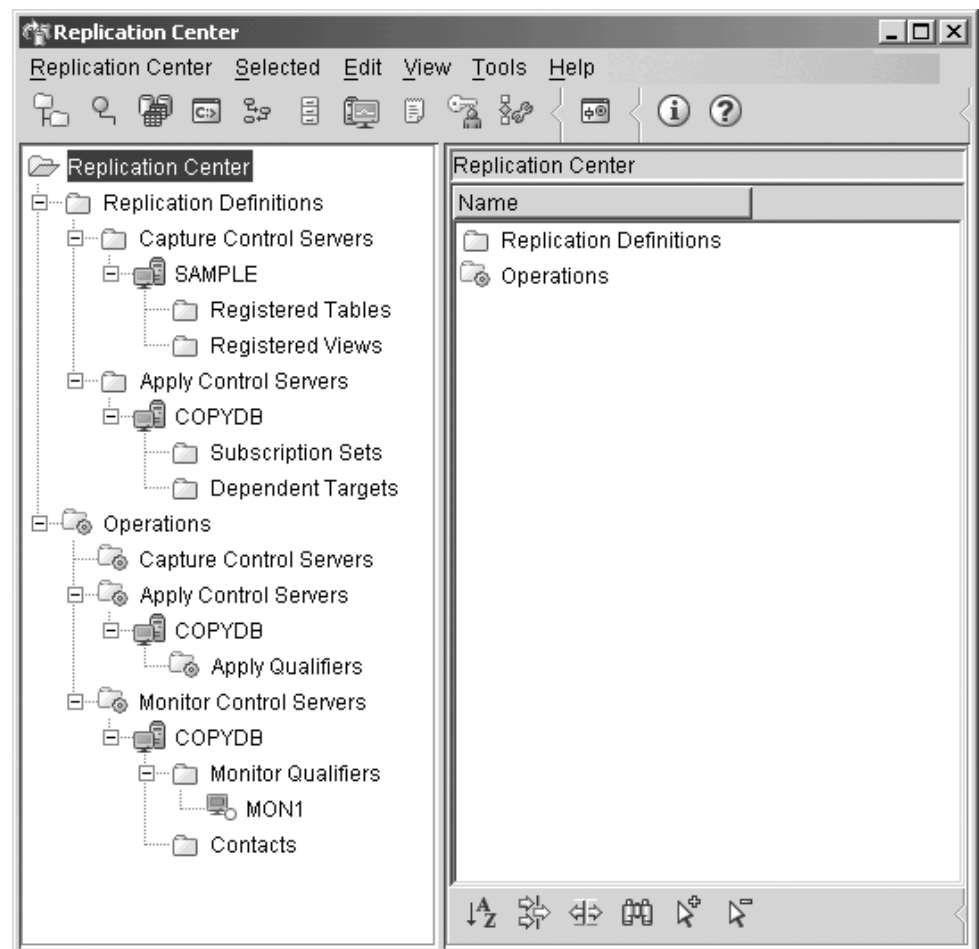


Figure 9. Replication Center window

The Replication Center launchpad guides you through some of the basic replication functions.

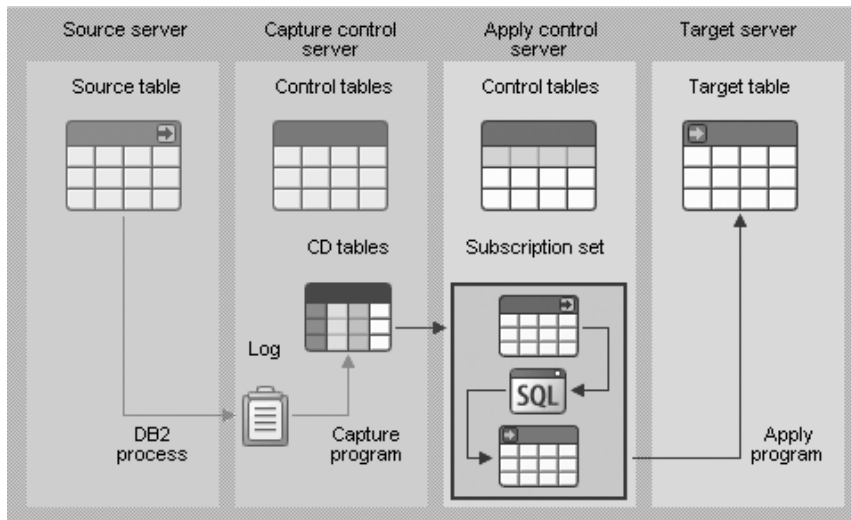


Figure 10. Replication functions

The following are some of the key tasks that you can perform with the Replication Center:

- Create replication control tables
- Register replication sources
- Create subscription sets
- Operate the Capture program
- Operate the Apply program
- Monitor the replication process
- Perform basic troubleshooting for replication

Web tools

The following DB2 Web Tools provide access to the DB2 environment through a secure Web-enabled interface:

- “Web Command Center”
- “Web Health Center” on page 53

Web Command Center

Use the Web version of the Command Center to execute SQL statements, DB2 commands, and OS commands against a remote DB2 server, either interactively or in scripts. This is particularly useful for database administrators and experienced users who need to be able to work with the database at any time, from any place. The Web version of the Command Center includes most of the features of the full Command Center, but it *does not* currently include Visual Explain or SQL Assist.

To access the DB2 server, you use an HTML 4.0-compliant Web browser that runs on any computing device from a desktop computer to a Personal Digital Assistant (PDA). The browser is a client, which communicates with a middle-tier application server. The application server communicates with the DB2 server. Secure Socket Layer (SSL), the same technology that is used for most Internet banking and secure e-commerce transactions, is used for all communication.

The client can be any computing device that supports an HTML 4.0-compliant Web browser. The browser does not need to support Java, JavaScript, or cookies. The

middle tier must have DB2[®] Web Tools installed. DB2 Web Tools requires an application server, such as IBM[®] WebSphere[®] or BEA WebLogic.

If you are the database administrator of a large center, you could use the Web tools as follows:

- While you are away from the office, attending a conference, you receive an urgent message on your PDA about a database problem.
- Using the PDA, you securely log on to a portal where DB2 Web Tools is installed.
- You use the Web versions of the Health Center and the Command Center to investigate the problem.
- You use the Web version of the Command Center to execute SQL, DB2, and OS commands that fix the problem.

Web Health Center

Use the Web version of the Health Center to monitor the health of remote databases. This is particularly useful for database administrators and experienced users who need to be able to work with the database at any time, from any place.

The Web version of the Health Center includes a subset of the features of the full Health Center. You can view the active alerts for an instance, view the details, history, and resolution recommendations for an alert, and apply some recommendations through the Web version of the Command Center.

To access the DB2 server, you use an HTML 4.0-compliant Web browser that runs on any computing device from a desktop computer to a Personal Digital Assistant (PDA). The browser is a client, which communicates with a middle-tier application server. The application server communicates with the DB2 server. Secure Socket Layer (SSL), the same technology that is used for most Internet banking and secure e-commerce transactions, is used for all communication.

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- You use the Web version of the Command Center to execute SQL, DB2, and OS commands that fix the problem.

Automatic maintenance

DB2 Universal Database[™] (UDB) provides automatic maintenance capabilities for performing database backups, keeping statistics current and reorganizing tables and indexes as necessary.

Automatic database backup provides users with a solution to help ensure their database is being backed up both properly and regularly, without either having to worry about when to back up, or having any knowledge of the backup command.

Automatic statistics collection attempts to improve the performance of the database by maintaining up-to-date table statistics. The goal is to allow the optimizer to choose an access plan based on accurate statistics.

Automatic statistics profiling advises when and how to collect table statistics by detecting outdated, missing, and incorrectly specified statistics and by generating statistical profiles based on query feedback.

Automatic reorganization manages offline table and index reorganization without users having to worry about when and how to reorganize their data.

Enablement of the automatic maintenance features is controlled using the automatic maintenance database configuration parameters. These are a hierarchical set of switches to allow for simplicity and flexibility in managing the enablement of these features.

Automatic database backup:

A database may become unusable due to a wide variety of hardware or software failures. Automatic database backup simplifies database backup management tasks for the DBA by always ensuring that a recent full backup of the database is performed as needed. It determines the need to perform a backup operation based on one or more of the following measures:

- You have never completed a full database backup
- The time elapsed since the last full backup is more than a specified number of hours
- The transaction log space consumed since the last backup is more than a specified number of 4 KB pages (in archive logging mode only).

Protect your data by planning and implementing a disaster recovery strategy for your system. If suitable to your needs, you may incorporate the automatic database backup feature as part of your backup and recovery strategy.

If the database is enabled for roll-forward recovery (archive logging), then automatic database backup can be enabled for either online or offline backup. Otherwise, only offline backup is available. Automatic database backup supports disk, tape, Tivoli™ Storage Manager (TSM), and vendor DLL media types.

Through the Configure Automatic Maintenance wizard in the Control Center or Health Center, you can configure:

- The requested time or number of log pages between backups
- The backup media
- Whether it will be an online or offline backup.

If backup to disk is selected, the automatic backup feature will regularly delete backup images from the directory specified in the Configure Automatic Maintenance wizard. Only the most recent backup image is guaranteed to be available at any given time. It is recommended that this directory be kept exclusively for the automatic backup feature and not be used to store other backup images.

The automatic database backup feature can be enabled or disabled by using the **auto_db_backup** and **auto_maint** database configuration parameters. In a multiple database partitioned environment, the automatic database backup runs on each partition if the database configuration parameters are enabled on that partition.

Automatic statistics collection:

When the SQL compiler optimizes SQL query plans, its decisions are heavily influenced by statistical information about the size of the database tables and indexes. The optimizer also uses information about the distribution of data in specific columns of tables and indexes if these columns are used to select rows or join tables. The optimizer uses this information to estimate the costs of alternative access plans for each query. When significant numbers of table rows are added or removed, or if data in columns for which you collect statistics is updated, the RUNSTATS utility needs to be run again to update the statistics.

Automatic statistics collection works by determining the minimum set of statistics that give optimal performance improvement. The decision to collect or update statistics is taken by observing and learning how often tables are modified and how much the table statistics have changed. The automatic statistics collection algorithm learns over time how fast the statistics change on a per table basis and internally schedules RUNSTATS execution accordingly.

Normal database maintenance activities such as when a user performs RUNSTATS, REORG or altering or dropping the table, are not affected by the enablement of this feature.

If you are unsure about how often to collect statistics for the tables in your database, you may incorporate the automatic statistics collection feature as part of your overall database maintenance plan.

The automatic statistics collection feature can be enabled or disabled by using the **auto_runstats**, **auto_tbl_maint**, and **auto_maintdatabase** configuration parameters.

Tables considered for automatic statistics collection are configurable by you using the Automatic Maintenance wizard from the Control Center or Health Center.

Automatic reorganization:

After many changes to table data, logically sequential data may be on non-sequential physical pages so the database manager has to perform additional read operations to access data.

Among other information, the statistical information collected by RUNSTATS show the data distribution within a table. In particular, analysis of these statistics can indicate when and what kind of reorganization is necessary. Automatic reorganization determines the need for reorganization on tables by using the REORGCHK formulas. It periodically evaluates tables that have had their statistics updated to see if reorganization is required. If so, it internally schedules a classic reorganization for the table. This requires that your applications function without write access to the tables being reorganized.

The automatic reorganization feature can be enabled or disabled by using the **auto_reorg**, **auto_tbl_maint**, and **auto_maint** database configuration parameters.

If you are unsure about when and how to reorganize your tables and indexes, you can incorporate automatic reorganization as part of your overall database maintenance plan.

Tables considered for automatic reorganization are configurable by you using the Automatic Maintenance wizard from the Control Center or Health Center.

Maintenance windows for automation:

The automatic maintenance features described above consume resources on your system and may affect the performance of your database when they are run. Automatic reorganization and offline database backup also restrict access to the tables and database when these utilities are run. It is therefore necessary to provide appropriate periods of time when these maintenance activities can be internally scheduled for execution by DB2 UDB. These can be specified as offline and online maintenance time periods using the automatic maintenance wizard from the Control Center or Health Center.

Offline database backups and table and index reorganization are run in the offline maintenance time period. These features run to completion even if they go beyond the time period specified. The internal scheduling mechanism learns over time and estimates job completion times. If the offline time period is too small for a particular database backup or reorganization activity, the scheduler will not start the job the next time around and relies on the health monitor to provide notification of the need to increase the offline maintenance time period.

Automatic statistics collection and profiling as well as online database backups are run in the online maintenance time period. To minimize the impact on the system, they are throttled by the adaptive utility throttling mechanism. The internal scheduling mechanism uses the online maintenance time period to start the online jobs. These features run to completion even if they go beyond the time period specified.

Storage:

The automatic statistics collection and reorganization features store working data in tables in your database. These tables are created in the SYSTOOLSPACE table space. The SYSTOOLSPACE table space is created automatically with default options when the database is activated. Storage requirements for these tables are proportional to the number of tables in the database and should be calculated as approximately 1 KB per table. If this is a significant size for your database, you may want to drop and re-create the table space yourself and allocate storage appropriately. The automatic maintenance and health monitor tables in the table space are automatically re-created. Any history captured in those tables is lost when the table space is dropped.

Monitoring and notification:

The health monitor provides monitoring and notification functionality for the automatic database backup, statistics collection and reorganization features.

Applying the latest FixPak or modification level

A DB2 UDB Express FixPak or modification level contains updates and fixes (Authorized Program Analysis Reports, or "APARs") found during testing at IBM, as well as fixes for customers. Every FixPak or modification level is accompanied by a document, called APARLIST.TXT, that describes the fixes it contains.

FixPaks or modification levels are cumulative unless otherwise noted. This means that the latest FixPak or modification level for any given version of DB2 UDB Express contains all of the updates from previous FixPaks or modification levels for the same version of DB2 UDB Express. It is recommended that you keep your DB2 UDB Express environment running at the latest FixPak or modification level to ensure problem-free operation.

Prerequisites:

Each FixPak or modification level may have specific prerequisites. See the README that accompanies the FixPak or modification level for more information.

Procedure:

1. Download the latest FixPak or modification level from the IBM DB2 Online Support Web site at:
 - <http://www.ibm.com/software/data/db2/udb/winos2unix/support>
2. Each FixPak or modification level contains a set of Release Notes and a README. The README provides instructions for installation.

Part 4. Deploying servers using response file installation

Chapter 9. Response files

Response file installation basics

Unlike the DB2 Setup wizard, a DB2 response file installation lets you install DB2 without any user input. This method is useful not only for large-scale deployments of DB2, but also for embedding the DB2 installation process transparently inside your customized installation and configuration procedure. A response file installation is performed by DB2 setup using user-generated response files.

A *response file* is an ASCII text file that contains setup and configuration information. They can be generated either with DB2 utilities or by manual editing. The setup and configuration data would have to be entered during an interactive installation, but with a response file, the installation can proceed without any intervention.

A response file specifies configuration and setup parameters such as the destination directory and the products and components to install. It can also be used to set up:

- Global DB2[®] registry variables
- Instance variables
- Instance database manager configuration settings

You can create a response file:

- By modifying one of the sample response files that are provided.
- Using the response file generator (Windows[®] only).
- Using the DB2 Setup wizard.

For a complete look at DB2 response file installation, see the DB2 UDB Information Center at <http://publib.boulder.ibm.com/infocenter/db2help/>.

Response file considerations

You should understand the following considerations before proceeding with a response file installation:

- The response file format has changed drastically from DB2 Version 7 to DB2 Version 8. As a result, there are version limitations as to where response files can be used. For example, any response file generated in DB2 Version 8 can only be used to install DB2 Version 8; it cannot be used to install DB2 Version 7. The opposite is also true, where response files generated in DB2 Version 7 cannot be used to install DB2 Version 8.
- You can save your settings in a response file during the installation in the **Select the installation action** panel of the DB2 Setup wizard. This option is only available during a Custom installation.
- You can use a response file generated during an installation only if you allow the installation process to complete. If you cancel the installation, or if the installation fails, the response file will not be created.

- If you use the response file generator (Windows only), you are creating the response file based on an existing installation. This method is recommended when you have a more complex configuration, one that you manually configured.
- If you are using the DB2 Setup wizard, you are creating a response file based on just the installation you are performing. This method is recommended if you have either a fairly simple configuration or if you want to create a response file that you plan to later customize.
- You can use a response file to install an identical configuration across every workstation on your network or to install multiple configurations of a DB2 product. You can then distribute this file to every workstation where you want this product to be installed.

Creating a response file using the DB2 Setup wizard

You can create a response file using the DB2 Setup wizard based on the installation you are performing. This response file will be generated based on your DB2 Setup wizard selections. You can then use the response file to perform an unattended installation using the same settings.

Prerequisites:

You can only create a response file using the DB2 Setup wizard if you are performing a Custom installation.

Procedure:

To create a response file using the DB2 Setup wizard:

1. From the DB2 Launchpad, select **Install Product**.
2. Select the product you want to install and click **Next** to launch the DB2 Setup wizard.
3. Click **Next**.
4. In the **Select the installation type** page, select the **Custom** option.
5. In the **Select the installation action** page, select the **Save your setting in a response file** option.
6. Proceed through the rest of the installation pages selecting the options you want.
7. In the **Start copying files and create response file** page, in the **Response file name** field type the path where you want the DB2 Setup wizard to place the generated response file.
8. Click **Finish** to install.
9. When the installation has completed, the DB2 Setup wizard will have placed the generated response file in the path you specified.

For example, if you installed the DB2 HTML documentation in English, Arabic, Japanese, Russian, and Traditional Chinese, the generated response file will look similar to the following:

```

PROD=DB2_HTML_DOCUMENTATION
LIC_AGREEMENT=ACCEPT
FILE=C:\Program Files\SQLLIB\

COMP=ADMINISTRATION_TOPICS
COMP=APPLICATION_DEVELOPMENT_TOPICS
COMP=BUSINESS_INTELLIGENCE_TOPICS

```

COMP=CONNECT_TOPICS
COMP=CORE_TOPICS
COMP=GETTING_STARTED_TOPICS
COMP=OPTIONAL_COMPONENTS_TOPICS
COMP=TUTORIAL_TOPICS

LANG=EN
LANG=AR
LANG=JP
LANG=RU
LANG=TW

Part 5. Appendixes

Appendix A. Language support

Changing the DB2 interface language (Windows)

The interface language of DB2 is the language that appears in messages, help, and graphical tool interfaces. When installing DB2, you have the option of installing support for one or more languages. If, at some time after installation, you want to change the interface language for DB2 to one of the other installed interface languages, use the steps outlined in this task.

Do not confuse languages supported by DB2 with languages supported by the DB2 interface. Languages supported by DB2, that is, languages that *data* can exist in, are a superset of languages supported by the DB2 interface.

Prerequisites:

The DB2 interface language you want to use must be installed on your system. DB2 interface languages are selected and installed when you install DB2 using the DB2 Setup wizard. If you change the interface language of DB2 to a supported interface language that has not been installed, the DB2 interface language will default to the operating system language first, and if that is not supported, English.

Procedure:

Changing the interface language for DB2 on Windows requires that you change the default language setting for your Windows operating system.

To change the DB2 interface language on Windows:

1. Through the Control Panel on your Windows operating system, select **Regional Options**.
2. In the Regional Options dialog window, change the default language setting for the system to the language in which you want to interface with DB2.

Refer to your operating system help for additional information about changing the default system language.

Changing the DB2 interface language (Linux)

The interface language of DB2 is the language that appears in messages, help, and graphical tool interfaces. When installing DB2, you have the option of installing support for one or more languages. If, at some time after installation, you want to change the interface language for DB2 to one of the other installed interface languages, use the steps outlined in this task.

Do not confuse languages supported by DB2 with languages supported by the DB2 interface. Languages supported by DB2, that is, languages that *data* can exist in, are a superset of languages supported by the DB2 interface.

Prerequisites:

Support for the DB2 interface language you want to use must be installed on your system. DB2 interface language support is selected and installed when you install

DB2 using the DB2 Setup wizard. If you change the interface language of DB2 to a supported interface language that has not been installed, the DB2 interface language will default to the operating system language first, and if that is not supported, English.

Procedure:

To change the DB2 interface language on Linux systems, set the LANG environment variable to the desired locale.

For example, to interface with DB2 in French using DB2 for Linux, you must have French language support installed and you must set the LANG environment variable to a French locale, for example, fr_FR.

Supported DB2 interface languages

DB2 language support for DB2 interfaces can be categorized into server group languages and client group languages. Server group languages will translate most messages, help, and DB2 graphical interface elements. Client group languages will translate the DB2 Run-Time Client component, which will include most messages and certain help documentation.

Server group languages include: Brazilian Portuguese, Czech, Danish, Finnish, French, German, Italian, Japanese, Korean, Norwegian, Polish, Russian, Simplified Chinese, Spanish, Swedish, and Traditional Chinese.

Client group languages include: Arabic, Bulgarian, Croatian, Dutch, Greek, Hebrew, Hungarian, Portuguese, Romanian, Slovak, Slovenian, and Turkish.

Do not confuse languages supported by DB2 with languages supported by the DB2 interface. Languages supported by DB2 that is, languages that *data* can exist in, are a superset of languages supported by the DB2 interface.

Language identifiers for running the DB2 Setup wizard in another language

If you want to run the DB2 Setup wizard in a language different from the default language on your computer, you can start the DB2 Setup wizard manually, specifying a language identifier. The language must be available on the platform where you are running the installation.

Table 2. Language identifiers

Language	Language identifier
Arabic	ar
Brazilian Portuguese	br
Bulgarian	bg
Chinese, Simplified	cn
Chinese, Traditional	tw
Croatian	hr
Czech	cz
Danish	dk
Dutch	nl

Table 2. Language identifiers (continued)

Language	Language identifier
English	en
Finnish	fi
French	fr
German	de
Greek	el
Hebrew	iw
Hungarian	hu
Italian	it
Japanese	jp
Korean	kr
Norwegian	no
Polish	pl
Portuguese	pt
Romanian	ro
Russian	ru
Slovak	sk
Slovenian	sl
Spanish	es
Swedish	se
Turkish	tr

Displaying db2setup in your national language

The **db2setup** command queries the operating system to determine the existing language settings. If the language setting of your operating system is supported by **db2setup**, then that language will be used.

If your system uses the same code pages but different locale names than those supported by the DB2 interface, you can still see the translated **db2setup** by setting your **LANG** environment variable to the appropriate value by entering the following command:

export LANG= <locale> where *locale* is a locale supported by the DB2 interface.

For example, if your Linux machine's default locale is `ja_JP.ujis` and the codepage of `ja_JP.ujis` is 954, you can set your **LANG** environment variable to `ja_JP.sjis` by issuing the following command, assuming you are using Bourne shell (or a variant):

```
export LANG=ja_JP.sjis
```

db2setup will now be displayed in Japanese (in codepage 954).

Note: **db2setup** may be translated into a subset of the languages supported by the DB2 product you are installing.

Appendix B. Uninstalling DB2 UDB Express

Uninstalling DB2 UDB Express (Windows)

This task provides steps for completely removing DB2 UDB Express from your Windows operating system. You should only perform this task if you no longer require existing DB2 instances and databases.

Procedure:

To remove DB2 UDB Express on Windows:

1. Drop all databases. You can drop databases using the Control Center or **drop database** command.
2. Stop all DB2 processes and services. This can be done through the Windows Services panel or by issuing a **db2stop** command. If DB2 services and process are not stopped before attempting to remove DB2 UDB Express, you will receive a warning containing a list of processes and services that are holding DB2 DLLs in memory.
3. Accessible through the Windows Control Panel, use the Add/Remove Programs window to remove DB2 products. Refer to your operating system's help for more information about removing software products from your Windows operating system.

Uninstalling DB2 UDB Express using the msiexec command (Windows)

On Windows, you can also remove DB2 UDB Express using the **msiexec** command.

To uninstall DB2 UDB Express , enter the following command:

```
msiexe /x {58169F10-CA30-4F40-8C6D-C6DA8CE47E16} /qn
```

where `/x {#####}` specifies the product code identifier and `/qn` specifies no user interaction.

Uninstalling DB2 UDB Express (Linux)

This task provides steps for removing DB2 UDB Express from your Linux operating system. This task is not required to install a new version of DB2. Each version of DB2 on Linux has a different installation path and can therefore coexist on the same computer.

Procedure:

To remove DB2 UDB Express for Linux:

1. Optional: Drop all databases. You can drop databases using the Control Center or the **drop database** command.
2. Stop the DB2 Administration Server.
3. Stop DB2 instances.
4. Remove the Administration Server.
5. Remove DB2 instances.
6. Remove DB2 products.

Stopping the DB2 administration server (DAS)

You must stop the DB2 administration server (DAS) before you remove DB2 UDB Express for Linux.

Procedure:

To stop the Administration Server:

1. Log in as the DB2 administration server owner.
2. Stop the DB2 administration server by entering the **db2admin stop** command.

Stopping DB2 instances

You must stop all DB2 instances before you remove DB2.

Procedure:

To stop a DB2 instance:

1. Log in as a user with root authority.
2. To obtain a list of the names of all DB2 instances on your system, enter the **/opt/IBM/db2/V8.1/bin/db2ilist** command.
3. Log out.
4. Log back in as the owner of the instance you want to stop.
5. Run the start up script:

```
. INSTHOME/sql1lib/db2profile      (bash, Bourne, or Korn shells)
source INSTHOME/sql1lib/db2cshrc  (C shell)
```

where *INSTHOME* represents the home directory of the instance.

6. Back up files in the *INSTHOME*/sql1lib directory, if needed, where *INSTHOME* is the home directory of the instance owner.
7. You might want to save the database manager configuration file, *db2system*, the *db2nodes.cfg* file, or user defined function or fenced stored procedure applications in *INSTHOME*/sql1lib/function.
8. Stop all database applications by entering the **db2 force application all** command.
9. Stop the DB2 database manager by entering the **db2stop** command.
10. Confirm that the instance is stopped by entering the **db2 terminate** command.
11. Repeat these steps for each instance.

Removing the DB2 administration server (DAS)

You must remove the DB2 administration server (DAS) before you remove DB2.

Procedure:

To remove the DB2 administration server:

1. Log in as the DB2 administration server owner.
2. Run the start up script:

```
. DASHOME/das/dasprofile (bash, Bourne, or Korn shells)
source DASHOME/das/dascshrc (C shell)
```

where *DASHOME* represents the home directory of the DB2 administration server.

3. Back up the files in the *DASHOME*/das directory.

4. Log off.
5. Log in as root and remove the DB2 administration server by entering the following command: `/opt/IBM/db2/V8.1/instance/dasdrop`

Removing DB2 instances

You can remove some or all of the DB2 UDB Express Version 8 instances on your system. Once an instance is removed, all the DB2 databases owned by the instance, if any, will not be usable. Remove DB2 instances only if you are not planning to use DB2 Version 8 products, or if you do not want to migrate existing instances to a later version of DB2.

Procedure:

To remove an instance:

1. Log in as a user with root authority.
2. Remove the instance by entering the following command:

```
/opt/IBM/db2/V8.1/instance/db2idrop InstName
```

The **db2idrop** command removes the instance entry from the list of instances and removes the `INSTHOME/sql11ib` directory, where `INSTHOME` is the home directory of the instance and where `InstName` is the login name of the instance. If you are storing any files in `/sql11ib` directory, these files will be removed by this action. If you still need these files, you must make a copy of them before dropping the instance

3. Optional: As a user with root authority, remove the instance owner's user ID and group (if used only for that instance). Do not remove these if you are planning to re-create the instance.

This step is optional since the instance owner and the instance owner group may be used for other purposes.

Removing DB2 UDB Express using the `db2_deinstall` command (Linux)

This task provides steps for removing DB2 Version 8 products using the **db2_deinstall** command. The **db2_deinstall** command removes all DB2 products from your system. If you want to remove a subset of DB2 products, use your operating system's native tools to remove DB2 components, packages, or file sets.

Prerequisites:

Before you remove DB2 UDB Express from your Linux system:

- Ensure that you have performed all steps outlined in "Uninstalling DB2 UDB Express (Linux)" on page 71.
- You must have root authority to remove DB2 UDB Express.
- The **db2_deinstall** command is found in the root directory on the DB2 Version 8 product CD-ROM. You will need your product CD-ROM to use the **db2_deinstall** command.

Procedure:

To remove DB2 UDB Express from your Linux system:

1. Log in as user with root authority.
2. Mount the DB2 UDB Express Version 8 product CD-ROM.

3. Run the **db2_deinstall** command from the root directory of your DB2 Version 8 product CD-ROM. This command will remove all DB2 products from your system.

There are alternative methods for removing DB2 UDB Express from your operating system. On Linux systems, you can use the **rpm** command to remove some or all of DB2 UDB Express.

Appendix C. Licensing

DB2 product license files

The following list provides license file names for DB2 products. You must add the license file before using DB2.

db2ese.lic

DB2 Enterprise Server Edition

db2ese_dpf.lic

DB2 database partitioning feature (DPF). The DPF license key and DB2 Enterprise Server Edition (ESE) license key cannot coexist. If you have purchased the DPF option for DB2 ESE, you will have to remove the DB2 ESE license key and then add DPF license key. If DPF license key is installed in addition to the previously installed DB2 ESE key, the DPF license key will not be detected.

Note: DPF is not supported on Linux on zSeries.

db2exp.lic

DB2 UDB Express Server Edition

db2exp_p.lic

DB2 UDB Express Server Edition - CPU option

db2conee.lic

DB2 Connect Enterprise Edition.

Note: For DB2 Connect on Linux on zSeries, DB2 ESE is not support if you've only purchased the licensing for DB2 Connect.

db2conas.lic

DB2 Connect Application Server Edition

db2conpe.lic

DB2 Connect Personal Edition

db2conue.lic

DB2 Connect Unlimited Edition

db2dlm.lic

DB2 Data Links Manager

db2gse.lic

DB2 Spatial Extender. This Spatial Extender license key allows you to use the Spatial functionality only.

db2gse_geo.lic

DB2 Spatial Extender geodetic feature. To enable geodetic functionality, you need to purchase and add the geodetic license to DB2 Spatial Extender. Trial versions of DB2 Spatial Extender will allow the evaluation of the geodetic functionality.

The geodetic feature license key and DB2 Spatial Extender license key cannot co-exist. If you have purchased the geodetic feature and have the DB2 Spatial Extender key added, you will have to remove the DB2 Spatial Extender and then add the geodetic feature license key. If geodetic feature

license key is installed in addition to the previously installed DB2 Spatial Extender key, the geodetic feature key will not be detected.

db2iiae.lic

DB2 Information Integrator Advanced Edition

db2iire.lic

DB2 Information Integrator Replication Edition

db2iise.lic

DB2 Information Integrator Standard Edition

db2nse.lic

Net Search Extender

db2pe.lic

DB2 Personal Edition

db2wm.lic

DB2 Warehouse Manager

db2wse.lic

DB2 Workgroup Server Edition

db2wsue.lic

DB2 Workgroup Server Unlimited Edition

Adding your DB2 license key using the License Center

You can install your license key using the License Center.

Procedure:

To install your license key using the License Center:

1. Start the DB2 Control Center and select **License Center** from the **Tools** menu.
2. Select the system for which you are installing a license. The **Installed Products** field will display the name of the product that you have installed.
3. Select **Add** from the **License** menu.
4. In the Add License window, select the **From a file** radio button and select a license file:
 - On Windows servers: `x:\db2\license\license_filename`
 - On Linux servers: `x:/db2/license/license_filename`

where `x`: represents the CD-ROM drive containing DB2 product CD and `license_filename` for DB2 Universal Database products are as follows:

db2conas.lic

DB2 Connect Application Server Edition

db2conee.lic

DB2 Connect Enterprise Edition

db2conpe.lic

DB2 Connect Personal Edition

db2conue.lic

DB2 Connect Unlimited Edition

db2dlm.lic

DB2 Data Links Manager

- db2ese.lic**
DB2 Enterprise Server Edition
- db2gse.lic**
DB2 Spatial Extender
- db2iiae.lic**
DB2 Information Integrator Advanced Edition
- db2iire.lic**
DB2 Information Integrator Replication Edition
- db2iise.lic**
DB2 Information Integrator Standard Edition
- db2nse.lic**
Net Search Extender
- db2pe.lic**
DB2 Personal Edition
- db2wm.lic**
DB2 Warehouse Manager
- db2wse.lic**
DB2 Workgroup Server Edition
- db2wsue.lic**
DB2 Workgroup Server Unlimited Edition

5. Click **Apply** to add the license key.

Setting the DB2 license policy using the License Center

You can view or set your license policy using the License Center.

Procedure:

To set your license policy, perform the following depending on the type of licenses that you purchased:

1. In the License Center, select **Change** from the **License** menu.
2. In the Change License window, select the type of license that you have purchased:
 - If you purchased a Concurrent Users license, select **Concurrent connect users** and enter the number of user licenses that you have purchased.
 - If you purchased a Registered Users license, select **Concurrent registered users** and click **OK** to close the Change License window and return to the License Center. Click on the **Users** tab and add every user ID for which you purchased a license.

You will also need to modify the number of processor licenses that you have bought.

Appendix D. Password rules and maintenance

When choosing a password, be aware that:

- On Linux, your password can be a maximum of eight (8) characters.
- On Windows, your password can be a maximum of fourteen (14) characters.

You may be required to perform password maintenance tasks. Since such tasks are required at the server, and many users are not able or comfortable working with the server environment, performing these tasks can pose a significant challenge. DB2[®] UDB provides a way to update and verify passwords without having to be at the server.

If an error message SQL1404N “Password expired” is received, use the CONNECT statement to change the password as follows:

```
CONNECT TO <database> USER <userid> USING <password>  
NEW <new_password> CONFIRM <new_password>
```

The “Password change” dialog of the DB2 Configuration Assistant (CA) can also be used to change the password.

Appendix E. DB2 Universal Database technical information

DB2 documentation and help

DB2 technical information is available through the following tools and methods:

- DB2 Information Center
 - Topics
 - Help for DB2 tools
 - Sample programs
 - Tutorials
- Downloadable PDF files, PDF files on CD, and printed books
 - Guides
 - Reference manuals
- Command line help
 - Command help
 - Message help
 - SQL state help
- Installed source code
 - Sample programs

You can access additional DB2 Universal Database technical information such as technotes, white papers, and Redbooks online at ibm.com. Access the DB2 Information Management software library site at www.ibm.com/software/data/pubs/.

DB2 documentation updates

IBM may periodically make documentation FixPaks and other documentation updates to the DB2 Information Center available. If you access the DB2 Information Center at <http://publib.boulder.ibm.com/infocenter/db2help/>, you will always be viewing the most up-to-date information. If you have installed the DB2 Information Center locally, then you need to install any updates manually before you can view them. Documentation updates allow you to update the information that you installed from the *DB2 Information Center CD* when new information becomes available.

The Information Center is updated more frequently than either the PDF or the hardcopy books. To get the most current DB2 technical information, install the documentation updates as they become available or go to the DB2 Information Center at the www.ibm.com site.

DB2 Information Center

The DB2[®] Information Center gives you access to all of the information you need to take full advantage of DB2 family products, including DB2 Universal Database[™], DB2 Connect[™], DB2 Information Integrator[™] and DB2 Query Patroller[™]. The DB2 Information Center also contains information for major DB2 features and components including replication, data warehousing, and the DB2 extenders.

The DB2 Information Center has the following features if you view it in Mozilla 1.0 or later or Microsoft Internet Explorer 5.5 or later. Some features require you to enable support for JavaScript:

Flexible installation options

You can choose to view the DB2 documentation using the option that best meets your needs:

- To effortlessly ensure that your documentation is always up to date, you can access all of your documentation directly from the DB2 Information Center hosted on the IBM Web site at <http://publib.boulder.ibm.com/infocenter/db2help/>
- To minimize your update efforts and keep your network traffic within your intranet, you can install the DB2 documentation on a single server on your intranet
- To maximize your flexibility and reduce your dependence on network connections, you can install the DB2 documentation on your own computer

Search

You can search all of the topics in the DB2 Information Center by entering a search term in the **Search** text field. You can retrieve exact matches by enclosing terms in quotation marks, and you can refine your search with wildcard operators (*, ?) and Boolean operators (AND, NOT, OR).

Task-oriented table of contents

You can locate topics in the DB2 documentation from a single table of contents. The table of contents is organized primarily by the kind of tasks you may want to perform, but also includes entries for product overviews, goals, reference information, an index, and a glossary.

- Product overviews describe the relationship between the available products in the DB2 family, the features offered by each of those products, and up to date release information for each of these products.
- Goal categories such as installing, administering, and developing include topics that enable you to quickly complete tasks and develop a deeper understanding of the background information for completing those tasks.
- Reference topics provide detailed information about a subject, including statement and command syntax, message help, and configuration parameters.

Show current topic in table of contents

You can show where the current topic fits into the table of contents by clicking the **Refresh / Show Current Topic** button in the table of contents frame or by clicking the **Show in Table of Contents** button in the content frame. This feature is helpful if you have followed several links to related topics in several files or arrived at a topic from search results.

Index You can access all of the documentation from the index. The index is organized in alphabetical order by index term.

Glossary

You can use the glossary to look up definitions of terms used in the DB2 documentation. The glossary is organized in alphabetical order by glossary term.

Integrated localized information

The DB2 Information Center displays information in the preferred

language set in your browser preferences. If a topic is not available in your preferred language, the DB2 Information Center displays the English version of that topic.

For iSeries technical information, refer to the IBM eServer iSeries information center at www.ibm.com/eserver/series/infocenter/.

DB2 Information Center installation scenarios

Different working environments can pose different requirements for how to access DB2 information. The DB2 Information Center can be accessed on the IBM Web site, on a server on your organization's network, or on a version installed on your computer. In all three cases, the documentation is contained in the DB2 Information Center, which is an architected web of topic-based information that you view with a browser. By default, DB2 products access the DB2 Information Center on the IBM Web site. However, if you want to access the DB2 Information Center on an intranet server or on your own computer, you must install the DB2 Information Center using the DB2 Information Center CD found in your product Media Pack. Refer to the summary of options for accessing DB2 documentation which follows, along with the three installation scenarios, to help determine which method of accessing the DB2 Information Center works best for you and your work environment, and what installation issues you might need to consider.

Summary of options for accessing DB2 documentation:

The following table provides recommendations on which options are possible in your work environment for accessing the DB2 product documentation in the DB2 Information Center.

Internet access	Intranet access	Recommendation
Yes	Yes	Access the DB2 Information Center on the IBM Web site, or access the DB2 Information Center installed on an intranet server.
Yes	No	Access the DB2 Information Center on the IBM Web site.
No	Yes	Access the DB2 Information Center installed on an intranet server.
No	No	Access the DB2 Information Center on a local computer.

Scenario: Accessing the DB2 Information Center on your computer:

Tsu-Chen owns a factory in a small town that does not have a local ISP to provide him with Internet access. He purchased DB2 Universal Database to manage his inventory, his product orders, his banking account information, and his business expenses. Never having used a DB2 product before, Tsu-Chen needs to learn how to do so from the DB2 product documentation.

After installing DB2 Universal Database on his computer using the typical installation option, Tsu-Chen tries to access the DB2 documentation. However, his browser gives him an error message that the page he tried to open cannot be found. Tsu-Chen checks the installation manual for his DB2 product and discovers that he has to install the DB2 Information Center if he wants to access DB2 documentation on his computer. He finds the *DB2 Information Center CD* in the media pack and installs it.

From the application launcher for his operating system, Tsu-Chen now has access to the DB2 Information Center and can learn how to use his DB2 product to increase the success of his business.

Scenario: Accessing the DB2 Information Center on the IBM Web site:

Colin is an information technology consultant with a training firm. He specializes in database technology and SQL and gives seminars on these subjects to businesses all over North America using DB2 Universal Database. Part of Colin's seminars includes using DB2 documentation as a teaching tool. For example, while teaching courses on SQL, Colin uses the DB2 documentation on SQL as a way to teach basic and advanced syntax for database queries.

Most of the businesses at which Colin teaches have Internet access. This situation influenced Colin's decision to configure his mobile computer to access the DB2 Information Center on the IBM Web site when he installed the latest version of DB2 Universal Database. This configuration allows Colin to have online access to the latest DB2 documentation during his seminars.

However, sometimes while travelling Colin does not have Internet access. This posed a problem for him, especially when he needed to access to DB2 documentation to prepare for seminars. To avoid situations like this, Colin installed a copy of the DB2 Information Center on his mobile computer.

Colin enjoys the flexibility of always having a copy of DB2 documentation at his disposal. Using the **db2set** command, he can easily configure the registry variables on his mobile computer to access the DB2 Information Center on either the IBM Web site, or his mobile computer, depending on his situation.

Scenario: Accessing the DB2 Information Center on an intranet server:

Eva works as a senior database administrator for a life insurance company. Her administration responsibilities include installing and configuring the latest version of DB2 Universal Database on the company's UNIX database servers. Her company recently informed its employees that, for security reasons, it would not provide them with Internet access at work. Because her company has a networked environment, Eva decides to install a copy of the DB2 Information Center on an intranet server so that all employees in the company who use the company's data warehouse on a regular basis (sales representatives, sales managers, and business analysts) have access to DB2 documentation.

Eva instructs her database team to install the latest version of DB2 Universal Database on all of the employee's computers using a response file, to ensure that each computer is configured to access the DB2 Information Center using the host name and the port number of the intranet server.

However, through a misunderstanding Migual, a junior database administrator on Eva's team, installs a copy of the DB2 Information Center on several of the employee computers, rather than configuring DB2 Universal Database to access the DB2 Information Center on the intranet server. To correct this situation Eva tells Migual to use the **db2set** command to change the DB2 Information Center registry variables (DB2_DOCHOST for the host name, and DB2_DOCPORT for the port number) on each of these computers. Now all of the appropriate computers on the network have access to the DB2 Information Center, and employees can find answers to their DB2 questions in the DB2 documentation.

Installing the DB2 Information Center using the DB2 Setup wizard (Linux)

DB2 product documentation can be accessed in three ways: from the IBM Web site, from an intranet server, or from a version installed on your computer. By default, DB2 products access DB2 documentation from the IBM Web site. If you want to access the DB2 documentation from an intranet server or from your own computer, you must install the documentation from the *DB2 Information Center CD*. Using the DB2 Setup wizard, you can define your installation preferences and install the DB2 Information Center on a computer that uses a Linux operating system.

Prerequisites:

This section lists the hardware, operating system, software, and communication requirements for installing the DB2 Information Center on Linux computers.

- **Hardware requirements**

You require:

- Intel 32-bit (Linux)

- **Operating system requirements**

You require:

- Red Hat Linux 8.0 (on Intel 32-bit)
- SuSE Linux 8.1 (on Intel 32-bit)

Note: The DB2 Information Center is not officially supported on all of the Linux operating systems that a DB2 client is supported on. It is therefore recommended that you access the DB2 Information Center either from the IBM Web site, or that you install and access the DB2 Information Center on an internet server.

- **Software requirements**

- The following browser is supported:
 - Mozilla Version 1.0 or greater

- The DB2 Setup wizard is a graphical installer. You must have an implementation of the X Window System software capable of rendering a graphical user interface for the DB2 Setup wizard to run on your computer. Before you can run the DB2 Setup wizard you must ensure that you have properly exported your display. For example, enter the following command at the command prompt:

```
export DISPLAY=9.26.163.144:0.
```

- **Communication requirements**

- TCP/IP

Procedure:

To install the DB2 Information Center using the DB2 Setup wizard:

1. Log on to the system.
2. Insert and mount the DB2 Information Center product CD on your system.
3. Change to the directory where the CD is mounted by entering the following command:

```
cd /cd
```

where */cd* represents the mount point of the CD.

4. Enter the `./db2setup` command to start the DB2 Setup wizard.

5. The IBM DB2 Setup Launchpad opens. To proceed directly to the installation of the DB2 Information Center, click **Install Product**. Online help is available to guide you through the remaining steps. To invoke the online help, click **Help**. You can click **Cancel** at any time to end the installation.
6. On the **Select the product you would like to install** page, click **Next**.
7. Click **Next** on the **Welcome to the DB2 Setup wizard** page. The DB2 Setup wizard will guide you through the program setup process.
8. To proceed with the installation, you must accept the license agreement. On the **License Agreement** page, select **I accept the terms in the license agreement** and click **Next**.
9. Select **Install DB2 Information Center on this computer** on the **Select the installation action** page. If you want to use a response file to install the DB2 Information Center on this or other computers at a later time, select **Save your settings in a response file**. Click **Next**.
10. Select the languages in which the DB2 Information Center will be installed on **Select the languages to install** page. Click **Next**.
11. Configure the DB2 Information Center for incoming communication on the **Specify the DB2 Information Center port** page. Click **Next** to continue the installation.
12. Review the installation choices you have made in the **Start copying files** page. To change any settings, click **Back**. Click **Install** to copy the DB2 Information Center files onto your computer.

You can also install the DB2 Information Center using a response file.

The installation logs `db2setup.his`, `db2setup.log`, and `db2setup.err` are located, by default, in the `/tmp` directory. You can specify the location of log file.

The `db2setup.log` file captures all DB2 product installation information, including errors. The `db2setup.his` file records all DB2 product installations on your computer. DB2 appends the `db2setup.log` file to the `db2setup.his` file. The `db2setup.err` file captures any error output that is returned by Java, for example, exceptions and trap information.

When the installation is complete, the DB2 Information Center will be installed in:

- `/opt/IBM/db2/V8.1`

Installing the DB2 Information Center using the DB2 Setup wizard (Windows)

DB2 product documentation can be accessed in three ways: from the IBM Web site, from an intranet server, or from a version installed on your computer. By default, DB2 products access DB2 documentation from the IBM Web site. If you want to access the DB2 documentation from an intranet server or from your own computer, you must install the DB2 documentation from the *DB2 Information Center CD*. Using the DB2 Setup wizard, you can define your installation preferences and install the DB2 Information Center on a computer that uses a Windows operating system

Prerequisites:

This section lists the hardware, operating system, software, and communication requirements for installing the DB2 Information Center on Windows.

- **Hardware requirements**

You require one of the following processors:

- 32-bit computers: a Pentium or Pentium compatible CPU

- **Operating system requirements**

You require one of the following operating systems:

- Windows 2000
- Windows XP

Note: The DB2 Information Center is not officially supported on all of the Windows operating systems that a DB2 client is supported on. It is therefore recommended that you access the DB2 Information Center either from the IBM Web site, or that you install and access the DB2 Information Center on an internet server.

- **Software requirements**

– The following browsers are supported:

- Mozilla 1.0 or greater
- Internet Explorer Version 5.5 or 6.0 (Version 6.0 for Windows XP)

- **Communication requirements**

- TCP/IP

Procedure:

To install the DB2 Information Center using the DB2 Setup wizard:

1. Log on to the system with the account that you have defined for the DB2 Information Center installation.
2. Insert the CD into the drive. If enabled, the auto-run feature starts the IBM DB2 Setup Launchpad.
3. The DB2 Setup wizard determines the system language and launches the setup program for that language. If you want to run the setup program in a language other than English, or the setup program fails to auto-start, you can start the DB2 Setup wizard manually.

To start the DB2 Setup wizard manually:

- a. Click **Start** and select **Run**.
- b. In the **Open** field, type the following command:

```
x:\setup language
```

where *x*: represents your CD drive, and *language* represents the language in which the setup program will be run.

- c. Click **OK**.
4. The IBM DB2 Setup Launchpad opens. To proceed directly to the installation of the DB2 Information Center, click **Install Product**. Online help is available to guide you through the remaining steps. To invoke the online help, click **Help**. You can click **Cancel** at any time to end the installation.
 5. On the **Select the product you would like to install** page, click **Next**.
 6. Click **Next** on the **Welcome to the DB2 Setup wizard** page. The DB2 Setup wizard will guide you through the program setup process.
 7. To proceed with the installation, you must accept the license agreement. On the **License Agreement** page, select **I accept the terms in the license agreement** and click **Next**.

8. Select **Install DB2 Information Center on this computer** on the **Select the installation action** page. If you want to use a response file to install the DB2 Information Center on this or other computers at a later time, select **Save your settings in a response file**. Click **Next**.
9. Select the languages in which the DB2 Information Center will be installed on **Select the languages to install** page. Click **Next**.
10. Configure the DB2 Information Center for incoming communication on the **Specify the DB2 Information Center port** page. Click **Next** to continue the installation.
11. Review the installation choices you have made in the **Start copying files** page. To change any settings, click **Back**. Click **Install** to copy the DB2 Information Center files onto your computer.

You can install the DB2 Information Center using a response file. You can also use the **db2rspgn** command to generate a response file based on an existing installation.

For information on errors encountered during installation, see the `db2.log` and `db2wi.log` files located in the 'My Documents'\DB2LOG\ directory. The location of the 'My Documents' directory will depend on the settings on your computer.

The `db2wi.log` file captures the most recent DB2 installation information. The `db2.log` captures the history of DB2 product installations.

Invoking the DB2 Information Center

The DB2 Information Center gives you access to all of the information that you need to use DB2 products for Linux, UNIX, and Windows operating systems such as DB2 Universal Database, DB2 Connect, DB2 Information Integrator, and DB2 Query Patroller.

Prerequisites:

Before you invoke the DB2 Information Center:

- *Optional:* Configure your browser to display topics in your preferred language
- *Optional:* Configure your DB2 client to use the DB2 Information Center installed on your computer or intranet server

Procedure:

You can invoke the DB2 Information Center from computers on which a DB2 UDB client or server is installed using the Start menu (Windows operating system) or the command line. You can also invoke the DB2 Information Center installed on an intranet server or local computer, or on the IBM Web site, from a Web browser.

To invoke the DB2 Information Center from the Start menu of a computer on which a DB2 Universal Database client or server is installed:

- Click **Start** → **Programs** → **IBM DB2** → **Information** → **Information Center**

To invoke the DB2 Information Center from the command line of a computer on which a DB2 Universal Database client or server is installed:

- For the Linux and UNIX operating systems, issue the **db2icdocs** command.
- For the Windows operating system, issue the **db2icdocs.exe** command.

To open the DB2 Information Center installed on an intranet server or local computer in a Web browser:

- Open the Web page at `http://<host-name>:<port-number>/`, where `<host-name>` represents the host name and `<port-number>` represents the port number on which the DB2 Information Center is available.

To open the DB2 Information Center on the IBM Web site:

- Open the Web page at `publib.boulder.ibm.com/infocenter/db2help/`.

Updating the DB2 Information Center installed on your computer or intranet server

The DB2 Information Center available from `http://publib.boulder.ibm.com/infocenter/db2help/` will be periodically updated with new or changed documentation. IBM may also make DB2 Information Center updates available to download and install on your computer or intranet server. Updating the DB2 Information Center does not update DB2 client or server products.

Prerequisites:

You must have access to a computer that is connected to the Internet.

Procedure:

To update the DB2 Information Center installed on your computer or intranet server:

1. Open the DB2 Information Center hosted on the IBM Web site at: `http://publib.boulder.ibm.com/infocenter/db2help/`
2. In the Downloads section of the welcome page under the Service and Support heading, click the **DB2 Universal Database documentation** link.
3. Determine if the version of your DB2 Information Center is out of date by comparing the latest refreshed documentation image level to the documentation level you have installed. The documentation level you have installed is listed on the DB2 Information Center welcome page.
4. If a more recent version of the DB2 Information Center is available, download the latest refreshed *DB2 Information Center* image applicable to your operating system.
5. To install the refreshed *DB2 Information Center* image, follow the instructions provided on the Web page.

Displaying topics in your preferred language in the DB2 Information Center

The DB2 Information Center attempts to display topics in the language specified in your browser preferences. If a topic has not been translated into your preferred language, the DB2 Information Center displays the topic in English.

Procedure:

To display topics in your preferred language in the Internet Explorer browser:

1. In Internet Explorer, click the **Tools** —> **Internet Options** —> **Languages...** button. The Language Preferences window opens.

2. Ensure your preferred language is specified as the first entry in the list of languages.

- To add a new language to the list, click the **Add...** button.

Note: Adding a language does not guarantee that the computer has the fonts required to display the topics in the preferred language.

- To move a language to the top of the list, select the language and click the **Move Up** button until the language is first in the list of languages.

3. Refresh the page to display the DB2 Information Center in your preferred language.

To display topics in your preferred language in the Mozilla browser:

1. In Mozilla, select the **Edit** —> **Preferences** —> **Languages** button. The Languages panel is displayed in the Preferences window.
2. Ensure your preferred language is specified as the first entry in the list of languages.
 - To add a new language to the list, click the **Add...** button to select a language from the Add Languages window.
 - To move a language to the top of the list, select the language and click the **Move Up** button until the language is first in the list of languages.
3. Refresh the page to display the DB2 Information Center in your preferred language.

DB2 PDF and printed documentation

The following tables provide official book names, form numbers, and PDF file names. To order hardcopy books, you must know the official book name and the form number. To print a PDF file, you must know the PDF file name. A full description of each DB2 book is available from the IBM Publications Center at the www.ibm.com/shop/publications/order site.

The DB2 documentation is categorized by the following headings:

- Core DB2 information
- Administration information
- Application development information
- Business intelligence information
- DB2 Connect information
- Getting started information
- Tutorial information
- Optional component information
- Release notes

The following tables describe, for each book in the DB2 library, the information needed to order the hard copy, or print or view the PDF for that book. A full description of each of the books in the DB2 library is available from the IBM Publications Center at www.ibm.com/shop/publications/order

Core DB2 information

The information in these books is fundamental to all DB2 users; you will find this information useful whether you are a programmer, a database administrator, or someone who works with DB2 Connect, DB2 Warehouse Manager, or other DB2

products.

Table 3. Core DB2 information

Name	Form Number	PDF File Name
<i>IBM DB2 Universal Database Command Reference</i>	SC09-4828	db2n0x81
<i>IBM DB2 Universal Database Glossary</i>	No form number	db2t0x81
<i>IBM DB2 Universal Database Message Reference, Volume 1</i>	GC09-4840, not available in hardcopy	db2m1x81
<i>IBM DB2 Universal Database Message Reference, Volume 2</i>	GC09-4841, not available in hardcopy	db2m2x81
<i>IBM DB2 Universal Database What's New</i>	SC09-4848	db2q0x81

Administration information

The information in these books covers those topics required to effectively design, implement, and maintain DB2 databases, data warehouses, and federated systems.

Table 4. Administration information

Name	Form number	PDF file name
<i>IBM DB2 Universal Database Administration Guide: Planning</i>	SC09-4822	db2d1x81
<i>IBM DB2 Universal Database Administration Guide: Implementation</i>	SC09-4820	db2d2x81
<i>IBM DB2 Universal Database Administration Guide: Performance</i>	SC09-4821	db2d3x81
<i>IBM DB2 Universal Database Administrative API Reference</i>	SC09-4824	db2b0x81
<i>IBM DB2 Universal Database Data Movement Utilities Guide and Reference</i>	SC09-4830	db2dmx81
<i>IBM DB2 Universal Database Data Recovery and High Availability Guide and Reference</i>	SC09-4831	db2hax81
<i>IBM DB2 Universal Database Data Warehouse Center Administration Guide</i>	SC27-1123	db2ddx81
<i>IBM DB2 Universal Database SQL Reference, Volume 1</i>	SC09-4844	db2s1x81
<i>IBM DB2 Universal Database SQL Reference, Volume 2</i>	SC09-4845	db2s2x81
<i>IBM DB2 Universal Database System Monitor Guide and Reference</i>	SC09-4847	db2f0x81

Application development information

The information in these books is of special interest to application developers or programmers working with DB2 Universal Database (DB2 UDB). You will find information about supported languages and compilers, as well as the documentation required to access DB2 UDB using the various supported programming interfaces, such as embedded SQL, ODBC, JDBC, SQLJ, and CLI. If you are using the DB2 Information Center, you can also access HTML versions of the source code for the sample programs.

Table 5. Application development information

Name	Form number	PDF file name
<i>IBM DB2 Universal Database Application Development Guide: Building and Running Applications</i>	SC09-4825	db2axx81
<i>IBM DB2 Universal Database Application Development Guide: Programming Client Applications</i>	SC09-4826	db2a1x81
<i>IBM DB2 Universal Database Application Development Guide: Programming Server Applications</i>	SC09-4827	db2a2x81
<i>IBM DB2 Universal Database Call Level Interface Guide and Reference, Volume 1</i>	SC09-4849	db2l1x81
<i>IBM DB2 Universal Database Call Level Interface Guide and Reference, Volume 2</i>	SC09-4850	db2l2x81
<i>IBM DB2 Universal Database Data Warehouse Center Application Integration Guide</i>	SC27-1124	db2adx81
<i>IBM DB2 XML Extender Administration and Programming</i>	SC27-1234	db2sxx81

Business intelligence information

The information in these books describes how to use components that enhance the data warehousing and analytical capabilities of DB2 Universal Database.

Table 6. Business intelligence information

Name	Form number	PDF file name
<i>IBM DB2 Warehouse Manager Standard Edition Information Catalog Center Administration Guide</i>	SC27-1125	db2dix81
<i>IBM DB2 Warehouse Manager Standard Edition Installation Guide</i>	GC27-1122	db2idx81
<i>IBM DB2 Warehouse Manager Standard Edition Managing ETI Solution Conversion Programs with DB2 Warehouse Manager</i>	SC18-7727	iwhe1mstx80

DB2 Connect information

The information in this category describes how to access host or iSeries data using DB2 Connect Enterprise Edition or DB2 Connect Personal Edition.

Table 7. DB2 Connect information

Name	Form number	PDF file name
<i>IBM Connectivity Supplement</i>	No form number	db2h1x81
<i>IBM DB2 Connect Quick Beginnings for DB2 Connect Enterprise Edition</i>	GC09-4833	db2c6x81
<i>IBM DB2 Connect Quick Beginnings for DB2 Connect Personal Edition</i>	GC09-4834	db2c1x81
<i>IBM DB2 Connect User's Guide</i>	SC09-4835	db2c0x81

Getting started information

The information in this category is useful when you are installing and configuring servers, clients, and other DB2 products.

Table 8. Getting started information

Name	Form number	PDF file name
<i>IBM DB2 Universal Database Quick Beginnings for DB2 Clients</i>	GC09-4832, not available in hardcopy	db2itx81
<i>IBM DB2 Universal Database Quick Beginnings for DB2 Servers</i>	GC09-4836	db2isx81
<i>IBM DB2 Universal Database Quick Beginnings for DB2 Personal Edition</i>	GC09-4838	db2i1x81
<i>IBM DB2 Universal Database Installation and Configuration Supplement</i>	GC09-4837, not available in hardcopy	db2iyx81
<i>IBM DB2 Universal Database Quick Beginnings for DB2 Data Links Manager</i>	GC09-4829	db2z6x81

Tutorial information

Tutorial information introduces DB2 features and teaches how to perform various tasks.

Table 9. Tutorial information

Name	Form number	PDF file name
<i>Business Intelligence Tutorial: Introduction to the Data Warehouse</i>	No form number	db2tux81
<i>Business Intelligence Tutorial: Extended Lessons in Data Warehousing</i>	No form number	db2tax81

Table 9. Tutorial information (continued)

Name	Form number	PDF file name
<i>Development Center Tutorial for Video Online using Microsoft Visual Basic</i>	No form number	db2tdx81
<i>Information Catalog Center Tutorial</i>	No form number	db2aix81
<i>Video Central for e-business Tutorial</i>	No form number	db2twx81
<i>Visual Explain Tutorial</i>	No form number	db2tvx81

Optional component information

The information in this category describes how to work with optional DB2 components.

Table 10. Optional component information

Name	Form number	PDF file name
<i>IBM DB2 Cube Views Guide and Reference</i>	SC18-7298	db2aax81
<i>IBM DB2 Query Patroller Guide: Installation, Administration and Usage Guide</i>	GC09-7658	db2dwx81
<i>IBM DB2 Spatial Extender and Geodetic Extender User's Guide and Reference</i>	SC27-1226	db2sbx81
<i>IBM DB2 Universal Database Data Links Manager Administration Guide and Reference</i>	SC27-1221	db2z0x82
<i>DB2 Net Search Extender Administration and User's Guide</i>	SH12-6740	N/A
Note: HTML for this document is <i>not</i> installed from the HTML documentation CD.		

Release notes

The release notes provide additional information specific to your product's release and FixPak level. The release notes also provide summaries of the documentation updates incorporated in each release, update, and FixPak.

Table 11. Release notes

Name	Form number	PDF file name
<i>DB2 Release Notes</i>	See note.	See note.
<i>DB2 Installation Notes</i>	Available on product CD-ROM only.	Not available.

Note: The Release Notes are available in:

- XHTML and Text format, on the product CDs

- PDF format, on the PDF Documentation CD

In addition the portions of the Release Notes that discuss *Known Problems and Workarounds* and *Incompatibilities Between Releases* also appear in the DB2 Information Center.

To view the ASCII file of the release notes on UNIX-based platforms, see the Release.Notes file. This file is located in the DB2DIR/Readme/%L directory, where %L represents the locale name and DB2DIR represents:

- For AIX operating systems: /usr/opt/db2_08_01
- For all other UNIX-based operating systems: /opt/IBM/db2/V8.1

Printing DB2 books from PDF files

You can print DB2 books from the PDF files on the *DB2 PDF Documentation CD*. Using Adobe Acrobat Reader, you can print either the entire book or a specific range of pages.

Prerequisites:

Ensure that you have Adobe Acrobat Reader installed. If you need to install Adobe Acrobat Reader, it is available from the Adobe Web site at www.adobe.com

Procedure:

To print a DB2 book from a PDF file:

1. Insert the *DB2 PDF Documentation CD*. On Linux operating systems, mount the DB2 PDF Documentation CD. Refer to your *Quick Beginnings* book for details on how to mount a CD on UNIX operating systems.
2. Open index.htm. The file opens in a browser window.
3. Click on the title of the PDF you want to see. The PDF will open in Acrobat Reader.
4. Select **File** → **Print** to print any portions of the book that you want.

Ordering printed DB2 books

If you prefer to use hardcopy books, you can order them in one of three ways.

Procedure:

Printed books can be ordered in some countries or regions. Check the IBM Publications website for your country or region to see if this service is available in your country or region. When the publications are available for ordering, you can:

- Contact your IBM authorized dealer or marketing representative. To find a local IBM representative, check the IBM Worldwide Directory of Contacts at www.ibm.com/planetwide
- Phone 1-800-879-2755 in the United States or 1-800-IBM-4YOU in Canada.
- Visit the IBM Publications Center at <http://www.ibm.com/shop/publications/order>. The ability to order books from the IBM Publications Center may not be available in all countries.

At the time the DB2 product becomes available, the printed books are the same as those that are available in PDF format on the *DB2 PDF Documentation CD*. Content in the printed books that appears in the *DB2 Information Center CD* is also the

same. However, there is some additional content available in DB2 Information Center CD that does not appear anywhere in the PDF books (for example, SQL Administration routines and HTML samples). Not all books available on the DB2 PDF Documentation CD are available for ordering in hardcopy.

Note: The DB2 Information Center is updated more frequently than either the PDF or the hardcopy books; install documentation updates as they become available or refer to the DB2 Information Center at <http://publib.boulder.ibm.com/infocenter/db2help/> to get the most current information.

Invoking contextual help from a DB2 tool

Contextual help provides information about the tasks or controls that are associated with a particular window, notebook, wizard, or advisor. Contextual help is available from DB2 administration and development tools that have graphical user interfaces. There are two types of contextual help:

- Help accessed through the **Help** button that is located on each window or notebook
- Infopops, which are pop-up information windows displayed when the mouse cursor is placed over a field or control, or when a field or control is selected in a window, notebook, wizard, or advisor and F1 is pressed.

The **Help** button gives you access to overview, prerequisite, and task information. The infopops describe the individual fields and controls.

Procedure:

To invoke contextual help:

- For window and notebook help, start one of the DB2 tools, then open any window or notebook. Click the **Help** button at the bottom right corner of the window or notebook to invoke the contextual help.

You can also access the contextual help from the **Help** menu item at the top of each of the DB2 tools centers.

Within wizards and advisors, click on the Task Overview link on the first page to view contextual help.

- For infopop help about individual controls on a window or notebook, click the control, then click F1. Pop-up information containing details about the control is displayed in a yellow window.

Note: To display infopops simply by holding the mouse cursor over a field or control, select the **Automatically display infopops** check box on the **Documentation** page of the Tool Settings notebook.

Similar to infopops, diagnosis pop-up information is another form of context-sensitive help; they contain data entry rules. Diagnosis pop-up information is displayed in a purple window that appears when data that is not valid or that is insufficient is entered. Diagnosis pop-up information can appear for:

- Compulsory fields.
- Fields whose data follows a precise format, such as a date field.

Invoking message help from the command line processor

Message help describes the cause of a message and describes any action you should take in response to the error.

Procedure:

To invoke message help, open the command line processor and enter:

```
? XXXnnnnn
```

where *XXXnnnnn* represents a valid message identifier.

For example, ? SQL30081 displays help about the SQL30081 message.

Invoking command help from the command line processor

Command help explains the syntax of commands in the command line processor.

Procedure:

To invoke command help, open the command line processor and enter:

```
? command
```

where *command* represents a keyword or the entire command.

For example, ? catalog displays help for all of the CATALOG commands, while ? catalog database displays help only for the CATALOG DATABASE command.

Invoking SQL state help from the command line processor

DB2 Universal Database returns an SQLSTATE value for conditions that could be the result of an SQL statement. SQLSTATE help explains the meanings of SQL states and SQL state class codes.

Procedure:

To invoke SQL state help, open the command line processor and enter:

```
? sqlstate or ? class code
```

where *sqlstate* represents a valid five-digit SQL state and *class code* represents the first two digits of the SQL state.

For example, ? 08003 displays help for the 08003 SQL state, and ? 08 displays help for the 08 class code.

DB2 tutorials

The DB2® tutorials help you learn about various aspects of DB2 Universal Database. The tutorials provide lessons with step-by-step instructions in the areas of developing applications, tuning SQL query performance, working with data warehouses, managing metadata, and developing Web services using DB2.

Before you begin:

You can view the XHTML versions of the tutorials from the Information Center at <http://publib.boulder.ibm.com/infocenter/db2help/>.

Some tutorial lessons use sample data or code. See each tutorial for a description of any prerequisites for its specific tasks.

DB2 Universal Database tutorials:

Click on a tutorial title in the following list to view that tutorial.

Business Intelligence Tutorial: Introduction to the Data Warehouse Center

Perform introductory data warehousing tasks using the Data Warehouse Center.

Business Intelligence Tutorial: Extended Lessons in Data Warehousing

Perform advanced data warehousing tasks using the Data Warehouse Center.

Information Catalog Center Tutorial

Create and manage an information catalog to locate and use metadata using the Information Catalog Center.

Visual Explain Tutorial

Analyze, optimize, and tune SQL statements for better performance using Visual Explain.

DB2 troubleshooting information

A wide variety of troubleshooting and problem determination information is available to assist you in using DB2® products.

DB2 documentation

Troubleshooting information can be found throughout the DB2 Information Center, as well as throughout the PDF books that make up the DB2 library. You can refer to the "Support and troubleshooting" branch of the DB2 Information Center navigation tree (in the left pane of your browser window) to see a complete listing of the DB2 troubleshooting documentation.

DB2 Technical Support Web site

Refer to the DB2 Technical Support Web site if you are experiencing problems and want help finding possible causes and solutions. The Technical Support site has links to the latest DB2 publications, TechNotes, Authorized Program Analysis Reports (APARs), FixPaks and the latest listing of internal DB2 error codes, and other resources. You can search through this knowledge base to find possible solutions to your problems.

Access the DB2 Technical Support Web site at

<http://www.ibm.com/software/data/db2/udb/winos2unix/support>

DB2 Problem Determination Tutorial Series

Refer to the DB2 Problem Determination Tutorial Series Web site to find information on how to quickly identify and resolve problems you might encounter while working with DB2 products. One tutorial introduces you to the DB2 problem determination facilities and tools available, and helps you decide when to use them. Other tutorials deal with related topics, such as "Database Engine Problem Determination", "Performance Problem Determination", and "Application Problem Determination".

See the full set of DB2 problem determination tutorials on the DB2 Technical Support site at <http://www.ibm.com/software/data/support/pdm/db2tutorials.html>

Accessibility

Accessibility features help users with physical disabilities, such as restricted mobility or limited vision, to use software products successfully. The following list specifies the major accessibility features in DB2[®] Version 8 products:

- All DB2 functionality is available using the keyboard for navigation instead of the mouse. For more information, see “Keyboard input and navigation.”
- You can customize the size and color of the fonts on DB2 user interfaces. For more information, see “Accessible display.”
- DB2 products support accessibility applications that use the Java™ Accessibility API. For more information, see “Compatibility with assistive technologies.”
- DB2 documentation is provided in an accessible format. For more information, see “Accessible documentation” on page 100.

Keyboard input and navigation

Keyboard input

You can operate the DB2 tools using only the keyboard. You can use keys or key combinations to perform operations that can also be done using a mouse. Standard operating system keystrokes are used for standard operating system operations.

Keyboard navigation

You can navigate the DB2 tools user interface using keys or key combinations.

Keyboard focus

In UNIX operating systems, the area of the active window where your keystrokes will have an effect is highlighted.

Accessible display

The DB2 tools have features that improve accessibility for users with low vision or other visual impairments. These accessibility enhancements include support for customizable font properties.

Font settings

You can select the color, size, and font for the text in menus and dialog windows, using the Tools Settings notebook.

Non-dependence on color

You do not need to distinguish between colors in order to use any of the functions in this product.

Compatibility with assistive technologies

The DB2 tools interfaces support the Java Accessibility API, which enables you to use screen readers and other assistive technologies with DB2 products.

Accessible documentation

Documentation for DB2 is provided in XHTML 1.0 format, which is viewable in most Web browsers. XHTML allows you to view documentation according to the display preferences set in your browser. It also allows you to use screen readers and other assistive technologies.

Syntax diagrams are provided in dotted decimal format. This format is available only if you are accessing the online documentation using a screen-reader.

Dotted decimal syntax diagrams

Syntax diagrams are provided in dotted decimal format for users accessing the Information Center using a screen reader.

In dotted decimal format, each syntax element is written on a separate line. If two or more syntax elements are always present together (or always absent together), they can appear on the same line, because they can be considered as a single compound syntax element.

Each line starts with a dotted decimal number; for example, 3 or 3.1 or 3.1.1. To hear these numbers correctly, make sure that your screen reader is set to read out punctuation. All the syntax elements that have the same dotted decimal number (for example, all the syntax elements that have the number 3.1) are mutually exclusive alternatives. If you hear the lines 3.1 USERID and 3.1 SYSTEMID, you know that your syntax can include either USERID or SYSTEMID, but not both.

The dotted decimal numbering level denotes the level of nesting. For example, if a syntax element with dotted decimal number 3 is followed by a series of syntax elements with dotted decimal number 3.1, all the syntax elements numbered 3.1 are subordinate to the syntax element numbered 3.

Certain words and symbols are used next to the dotted decimal numbers to add information about the syntax elements. Occasionally, these words and symbols might occur at the beginning of the element itself. For ease of identification, if the word or symbol is a part of the syntax element, it is preceded by the backslash (\) character. The * symbol can be used next to a dotted decimal number to indicate that the syntax element repeats. For example, syntax element *FILE with dotted decimal number 3 is given the format 3 * FILE. Format 3* FILE indicates that syntax element FILE repeats. Format 3* * FILE indicates that syntax element * FILE repeats.

Characters such as commas, which are used to separate a string of syntax elements, are shown in the syntax just before the items they separate. These characters can appear on the same line as each item, or on a separate line with the same dotted decimal number as the relevant items. The line can also show another symbol giving information about the syntax elements. For example, the lines 5.1*, 5.1 LASTRUN, and 5.1 DELETE mean that if you use more than one of the LASTRUN and DELETE syntax elements, the elements must be separated by a comma. If no separator is given, assume that you use a blank to separate each syntax element.

If a syntax element is preceded by the % symbol, this indicates a reference that is defined elsewhere. The string following the % symbol is the name of a syntax fragment rather than a literal. For example, the line 2.1 %OP1 means that you should refer to separate syntax fragment OP1.

The following words and symbols are used next to the dotted decimal numbers:

- ? means an optional syntax element. A dotted decimal number followed by the ? symbol indicates that all the syntax elements with a corresponding dotted decimal number, and any subordinate syntax elements, are optional. If there is only one syntax element with a dotted decimal number, the ? symbol is displayed on the same line as the syntax element, (for example 5? NOTIFY). If there is more than one syntax element with a dotted decimal number, the ? symbol is displayed on a line by itself, followed by the syntax elements that are optional. For example, if you hear the lines 5 ?, 5 NOTIFY, and 5 UPDATE, you know that syntax elements NOTIFY and UPDATE are optional; that is, you can choose one or none of them. The ? symbol is equivalent to a bypass line in a railroad diagram.
- ! means a default syntax element. A dotted decimal number followed by the ! symbol and a syntax element indicates that the syntax element is the default option for all syntax elements that share the same dotted decimal number. Only one of the syntax elements that share the same dotted decimal number can specify a ! symbol. For example, if you hear the lines 2? FILE, 2.1! (KEEP), and 2.1 (DELETE), you know that (KEEP) is the default option for the FILE keyword. In this example, if you include the FILE keyword but do not specify an option, default option KEEP will be applied. A default option also applies to the next higher dotted decimal number. In this example, if the FILE keyword is omitted, default FILE(KEEP) is used. However, if you hear the lines 2? FILE, 2.1, 2.1.1! (KEEP), and 2.1.1 (DELETE), the default option KEEP only applies to the next higher dotted decimal number, 2.1 (which does not have an associated keyword), and does not apply to 2? FILE. Nothing is used if the keyword FILE is omitted.
- * means a syntax element that can be repeated 0 or more times. A dotted decimal number followed by the * symbol indicates that this syntax element can be used zero or more times; that is, it is optional and can be repeated. For example, if you hear the line 5.1* data area, you know that you can include one data area, more than one data area, or no data area. If you hear the lines 3*, 3 HOST, and 3 STATE, you know that you can include HOST, STATE, both together, or nothing.

Notes:

1. If a dotted decimal number has an asterisk (*) next to it and there is only one item with that dotted decimal number, you can repeat that same item more than once.
 2. If a dotted decimal number has an asterisk next to it and several items have that dotted decimal number, you can use more than one item from the list, but you cannot use the items more than once each. In the previous example, you could write HOST STATE, but you could not write HOST HOST.
 3. The * symbol is equivalent to a loop-back line in a railroad syntax diagram.
- + means a syntax element that must be included one or more times. A dotted decimal number followed by the + symbol indicates that this syntax element must be included one or more times; that is, it must be included at least once and can be repeated. For example, if you hear the line 6.1+ data area, you must include at least one data area. If you hear the lines 2+, 2 HOST, and 2 STATE, you know that you must include HOST, STATE, or both. Similar to the * symbol, the + symbol can only repeat a particular item if it is the only item with that dotted decimal number. The + symbol, like the * symbol, is equivalent to a loop-back line in a railroad syntax diagram.

Common Criteria certification of DB2 Universal Database products

DB2 Universal Database is being evaluated for certification under the Common Criteria at evaluation assurance level 4 (EAL4). For more information about Common Criteria, see the Common Criteria web site at: <http://niap.nist.gov/cc-scheme/>.

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