IBM DB2 Connect 9.7

Version 9 Release 7

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Installing and Configuring DB2 Connect Personal Edition
Updated September, 2010

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Chapter 1. About this book

The *Installing and Configuring DB2 Connect Personal Edition* provides all the information you need to prepare for and then install the DB2 Connect™ Personal Edition product. Information specific to each supported operating system is included. The relationship between DB2 Connect Personal Edition and the supported database server products is presented including how to configure connections.

Who should use this book?

System administrators, database administrators, communications specialists, and software product installers would all be interested in part or all of this book.

Chapter 2. Introduction to DB2 Connect

About DB2 Connect

DB2 Connect provides connectivity to mainframe and midrange databases from Linux®, UNIX®, and Windows® operating systems.

You can connect to DB2® databases on z/OS®, IBM® i and IBM Power Systems™, VSE, and VM. You can also connect to non-IBM databases that comply with the Distributed Relational Database Architecture™ (DRDA®).

DB2 Connect product offerings

DB2 Connect has several connection solutions, including DB2 Connect Personal Edition, and a number of DB2 Connect server products.

- DB2 Connect Enterprise Edition
- DB2 Connect Application Server Edition
- DB2 Connect Unlimited Edition for System z®
- DB2 Connect Unlimited Edition for System i®

For detailed information about DB2 Connect product offerings, see www.ibm.com/software/data/db2/db2connect/

Common DB2 Connect scenarios

Common ways in which DB2 Connect is used to create working database environments and common ways of completing primary tasks involving DB2 Connect are presented. The scenarios include environments and tasks such as: direct connection between DB2 Connect and IBM mainframe database server; using the Configuration Assistant to manage connections to databases; and IBM data server client support for database application development.

Accessing System z host or IBM i DB2 data using DB2 Connect Personal Edition

A direct connection without intermediate servers is a very convenient and desirable configuration. This is especially true for situations where the IBM mainframe database server supports TCP/IP connectivity. In such situations, each DB2 Connect workstation establishes a direct connection with the IBM mainframe database server.

TCP/IP connectivity requires that the IBM mainframe database support TCP/IP. The following versions support native TCP/IP connections:

- DB2 for z/OS Version 7.1 or later
- DB2 for IBM i Version 5 Release 1 or later, and
- DB2 Server for VM and VSE Version 7 or later

To connect to an IBM mainframe database server, you require a DB2 Connect license which can be added to an IBM data server client.

Figure 1 shows a workstation, with DB2 Connect Personal Edition installed, directly connected to an IBM mainframe database server.
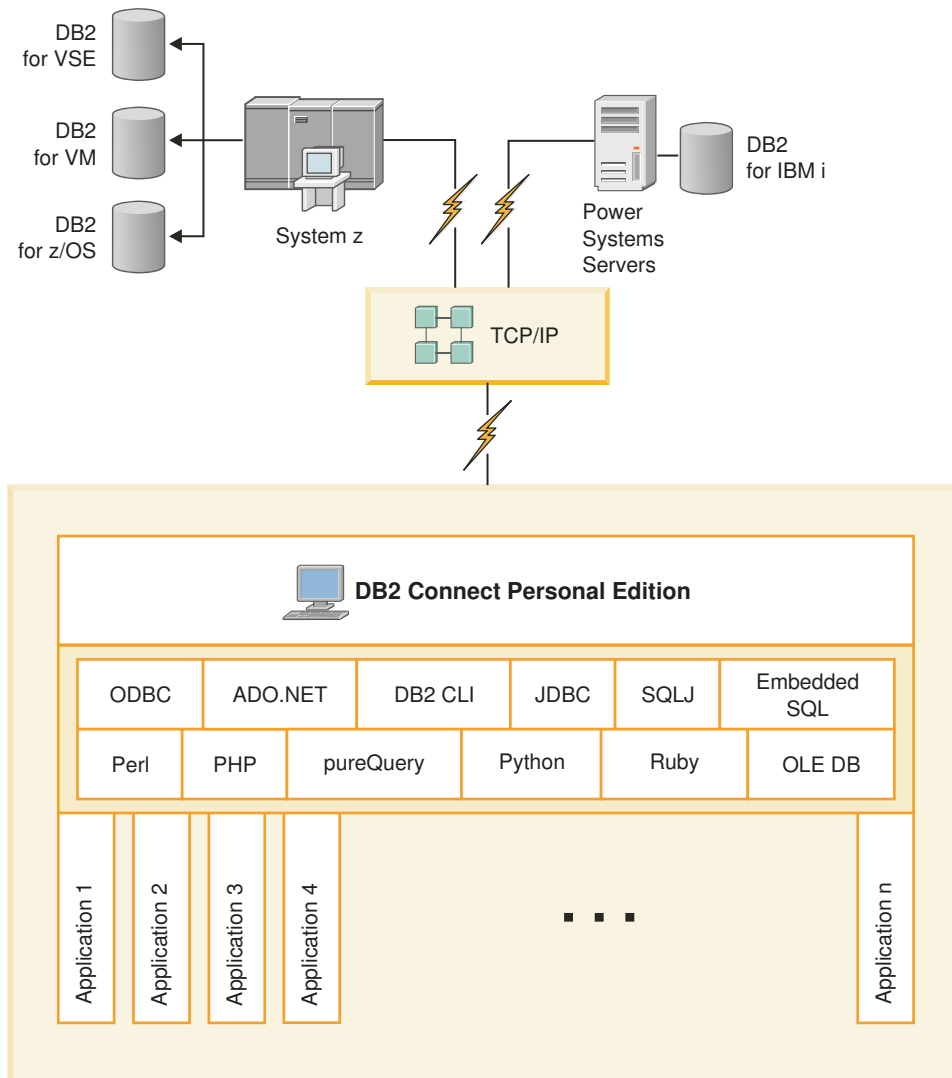
Figure 1. Direct connection between DB2 Connect and an IBM mainframe database server

Managing connections to databases using the Configuration Assistant (Linux and Windows)

The Configuration Assistant (CA) helps you manage your database connections to remote servers. The CA is available as part of the DB2 client. The CA is the preferred method to set up any client to server communications.

Note: In previous releases, the DB2 Administration Tools, such as the CA, were supported on all platforms. As of Version 9, the DB2 Administration Tools are supported only on Windows x86, Windows x64 (AMD64/EM64T), Linux on x86, and Linux on AMD64/EM64T. For all platforms, you can use the DB2 command line processor (CLP) to manage connections.

With the CA, you can:
- Catalog databases so that they can be used by applications. Three methods are available:

- Use a profile provided by a database administrator to automatically define your connections. Client access is automatically set up for that database.
- Search the network for available databases and select one. Client access is automatically set up for those databases defined in the profile. DB2 Connect Personal Edition cannot search for IBM mainframe databases except through a DB2 Connect server that has IBM mainframe databases defined.
- Manually configure a connection to a database by entering the required connection parameters.
- Remove cataloged databases, or change the properties of a cataloged database.
- Export and import client profiles that contain database and configuration information for a client.
- Test connections to local or remote databases identified on your system.
- Bind applications to a database by selecting utilities or bind files from a list.
- Add, change, remove CLI/ODBC data sources, and configure CLI/ODBC configuration settings.
- Tune the client configuration parameters on your system. Parameters are logically grouped and suggested settings are provided on the interface as parameters are selected.
- Update the database server password.

IBM Data Server Client support for database application development

The Data Server Client includes the following:
- **Precompilers for C/C++, COBOL, and Fortran**, (providing the language is supported for that platform).
- **Embedded SQL application support**, including programming libraries, include files and code samples.
- **ODBC and DB2 Call Level Interface (DB2 CLI) application support**, including programming libraries, include files, and code samples for developing applications which are easily ported to ODBC and compiled with an ODBC SDK. An ODBC SDK is available from Microsoft® for Windows operating systems, and from various other vendors for many of the other supported platforms. On Windows operating systems, the ODBC and CLI driver is installed by default with the DB2 Client, supporting applications developed with the Microsoft ODBC Software Developer's Kit. For all other platforms, the ODBC and CLI driver can optionally be installed with the DB2 Client, supporting applications that can be developed with an ODBC SDK for that platform, if one exists.
- **The IBM Data Server Driver for JDBC and SQLJ**, which includes:
  - Support for JDBC 3 and JDBC 4 compliant applications
  - SQLJ support, for developing Java™ applications with static SQL
- **Java 5** environment is embedded in DB2 servers to support server-side Java application artifacts including stored procedures and user-defined functions
- **ActiveX Data Objects (ADO) and Object Linking and Embedding (OLE) automation routines (UDFs and Stored Procedures)** on Windows operating systems, including code samples implemented in Microsoft Visual Basic and Microsoft Visual C++.
- **Object Linking and Embedding Database (OLE DB) table functions** on Windows operating systems.

- **C# and Visual Basic .NET applications and CLR .NET routines** on Windows operating systems.
- **Ruby and Ruby on Rails application support** , including IBM_DB gem for easy install and code samples. Ruby is a fully-integrated object-oriented programming language used to develop web applications. Ruby on Rails (RoR), also known as Rails, is a framework for developing web applications that access databases according to the Model-View-Control architectural framework
- **PHP Hypertext Preprocessor application support** , including programming libraries and code samples. PHP is a scripting language used to develop web applications. It also supports object-oriented programming
- **IBM Data Studio** is a comprehensive suite of integrated Eclipse tools for the database developer and development DBA. IBM Data Studio reduces the time to perform day-to-day administration tasks, create, deploy, and debug SQL and Java stored procedures, deploy data-centric web services, and create queries for relational and XML data using SQL and XQuery for DB2 and Informix® data servers.
- **Interactive SQL** through the Command Editor or Command Line Processor (CLP) to prototype SQL statements or to perform ad hoc queries against the database.
- **A set of documented APIs** to enable other application development tools to implement precompiler support for DB2 directly within their products. For example, IBM COBOL on AIX® uses this interface.

Chapter 3. Installing DB2 Connect Personal Edition

Typical steps required to install and configure DB2 Connect Personal Edition

Setting up DB2 Connect Personal Edition is a multi-step process. This topic discusses the typical steps required to install and configure DB2 Connect Personal Edition.

1. Determine how you want to use DB2 Connect in your network.
2. Verify that you have the correct hardware and software prerequisites on both your workstation and the IBM mainframe database server.
3. Verify that your IBM mainframe database server is configured to accept connections from DB2 Connect.
4. Install your DB2 Connect software. You will use this workstation to configure and verify your IBM mainframe connections.

   Note: If you have a computer with a IBM data server client installed, you can activate DB2 Connect Personal Edition by registering your DB2 Connect Personal Edition licence to that computer.
5. After installation, establish the connection between DB2 Connect and your IBM mainframe database system.

   DB2 Connect can locate and configure all TCP/IP connections for you. You can use the Configuration Assistant (CA) to find the IBM mainframe database.
6. Bind the programs and utilities provided with DB2 Connect to your IBM mainframe database.
7. Test the IBM mainframe connection.
8. You are now ready to use DB2 Connect with all your applications. Workstations that will be used for application development should have the IBM data server client installed.
9. If you want to use this workstation to administer DB2 for z/OS, or DB2 Database for Linux, UNIX, and Windows servers, install the IBM data server client.

Disk and memory requirements
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.

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

On Linux and UNIX operating systems, 2 GB of free space in the /tmp directory is recommended.

Memory requirements

At a minimum, a DB2 database system requires 256 MB of RAM. For a system running just a DB2 product and the DB2 GUI tools, a minimum of 512 MB of RAM is required. However, 1 GB of RAM is recommended for improved performance. These requirements do not include any additional memory requirements for other software that is running on your system.

When determining memory requirements, be aware of the following:
- DB2 products that run on HP-UX Version 11i for Itanium-based systems require 512 MB of RAM at a minimum.
- For IBM data server client support, these memory requirements are for a base of five concurrent client connections. You will need an additional 16 MB of RAM per five client connections.
- Memory requirements are affected by the size and complexity of your database system, and the extent of database activity and the number of clients accessing your system.

   For DB2 server products, the self-tuning memory feature simplifies the task of memory configuration by automatically setting values for several memory configuration parameters. When enabled, the memory tuner dynamically distributes available memory resources among several memory consumers including sort, the package cache, the lock list and buffer pools.
- On Linux and UNIX operating systems, SWAP space at least twice as large as RAM is recommended.

Installing DB2 Connect Personal Edition (Linux)

To define your installation preferences and to install a DB2 Connect Personal Edition product on Linux, use the DB2 Setup wizard.

Before beginning your installation:
- You can install DB2 Connect using either `root` or `non-root` authority. For more information on `non-root` installation, see "Non-root installation overview (Linux and UNIX)".
- Ensure that your system meets:
  – Disk and memory requirements
  – "Installation requirements for DB2 Connect Personal Edition (Linux)" on page 10.
- The DB2 database product DVD must be mounted on your system.
- The DB2 Connect product image must be available. If you are installing a non-English version of a DB2 Connect product, you must also have the appropriate National Language Packages.
- To locate DB2 database products already installed on your system, see the "Listing DB2 products installed on your system (Linux and UNIX)" topic in *Installing DB2 Servers* . The DB2 Setup wizard is a graphical installer. You must have X windows software capable of rendering a graphical user interface for the DB2 Setup wizard to run on your machine. Ensure that the X windows server is running. Ensure that you have properly exported your display. For example, `export DISPLAY=9.26.163.144:0`.
- If security software such as Lightweight Directory Access Protocol (LDAP) is used in your environment, you must manually create required DB2 users before you start the DB2 Setup wizard. Refer to the "Centralized user-management considerations" topic before you begin.

Note: Network Information Services (NIS) and Network Information Services Plus (NIS+) features are deprecated starting with DB2 Version 9.1 Fix Pack 2. Support for these features might be removed in a future release. Lightweight Directory Access Protocol (LDAP) is the recommended solution for centralized user-management services.

The DB2 Setup wizard is a Java-based installation tool that automates the installation and configuration of any DB2 database products. If you prefer not to use this utility, you have two alternatives. You can install a DB2 Connect Personal Edition product:

- Using the response file method
- Manually using the db2_install command. You *cannot* manually install a DB2 database product using the operating system's native installation utility rpm. Any existing scripts containing this native installation utility that you use to interface and query with DB2 installations will need to change.

To install DB2 Connect Personal Edition on Linux using the DB2 Setup wizard:

1. Change to the directory where the DVD is mounted:

   cd /db2dvd

   where *db2dvd* represents mount point of the DVD.
2. If you downloaded the DB2 Connect product image, you must decompress and untar the product file.
   a. Decompress the product file:

      gzip -d product.tar.gz

      where *product* is the name of the database product that you downloaded.
   b. Untar the product file:

      tar xvf product.tar
   c. Change directory:

      cd ./product/disk1

   Note: If you downloaded a National Language Package, untar it into the same directory. This will create the subdirectories (for example ./nlpack/disk2) in the same directory, and allows the installer to automatically find the installation images without prompting
3. Enter the ./db2setup command from the directory where the product image resides to start the DB2 Setup wizard. After a few moments, the IBM DB2 Setup Launchpad opens. For multiple CD installations, issue the db2setup command outside the mounted CD location with either a relative or absolute path name to ensure the DB2 Connect product CD can be unmounted as required. From this window, you can view the installation prerequisites and the release notes or you can proceed directly to the installation.
4. 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 DB2 Setup wizard. Click **Help** to invoke the online help. You can click **Cancel** at any time to exit the installation. DB2 files will only be copied to your system once you have clicked **Finish** on the last DB2 Setup wizard installation panel. Once completed, the DB2 Connect Personal Edition product is installed using the /opt/IBM/db2/V9.7 default installation path.

If you are installing on a system where this directory is already being used, the DB2 Connect product installation path will have _*xx* added to it, where *xx* are digits, starting at 01 and increasing depending on how many DB2 copies you have installed.

You can also specify your own DB2 database product installation path.

National Language Packs can also be installed by running the ./db2setup command from the directory where the National Language Pack resides, after a DB2 Connect product has been installed.

The installation logs, db2setup.log and db2setup.err will be located, by default, in the /tmp directory. You can specify the location of the log files.

If you want your DB2 database product to have access to DB2 documentation either on your local computer or on another computer on your network, then you must install the *DB2 Information Center*. The *DB2 Information Center* contains documentation for the DB2 database and DB2 related products.See "Installing the DB2 Information Center using the DB2 Setup wizard (UNIX)" topic in *Installing DB2 Servers*.

Installation requirements for DB2 Connect Personal Edition (Linux)

Before you install DB2 Connect Personal Edition on Linux operating systems, ensure that the system you choose meets the necessary operating system, hardware, software, and communications requirements.

To install DB2 Connect Personal Edition, the following requirements must be met:

Hardware requirements

Your processor must be one of:
- x86 (Intel® Pentium®, Intel Xeon®, and AMD Athlon)
- x64 (Intel EM64T and AMD64)

Distribution requirements

For the latest information on supported Linux distributions, point your browser to http://www.ibm.com/db2/linux/validate.

You might be required to update your kernel configuration parameters. The kernel configuration parameters are set in /etc/sysctl.conf. Refer to your operating system manual for information on setting and activating these parameters using the sysctl command.

Software requirements

- A browser is required to view online help.
- An X Window System software capable of rendering a graphical user interface is required if you want to use the DB2 Setup wizard to install DB2 Connect or if you want to use any DB2 graphical tools.

Communication requirements

For TCP/IP connectivity, no additional software is required.

Mounting the CD or DVD (Linux)

To mount a CD-ROM on Linux operating systems, issue the mount command.

Depending on your system configuration, you might need root user authority to mount discs.

To mount the CD or DVD on Linux operating systems:

1. Insert the CD or DVD in the drive and enter the following command:

   ```
   mount -t iso9660 -o ro /dev/cdrom /cdrom
   ```

   where /cdrom represents the mount point of the CD or DVD.

2. Log out.

Your CD or DVD file system is now mounted. View the contents of the CD or DVD by placing the disc in the drive and enter the cd /cdrom command where cdrom is the mount point directory.

Installing DB2 Connect Personal Edition (Solaris)

To define installation preferences and to install DB2 Connect Personal Edition, use the DB2 Setup wizard.

Before beginning your installation:
- You can install DB2 Connect using either root or non-root authority. For more information on non-root installation, see "Non-root installation overview (Linux and UNIX)" in *Installing DB2 Servers*.
- Ensure that your system meets the installation, memory and disk requirements.
- The DB2 database product DVD must be mounted on your system.
- The DB2 Connect product image must be available. If you are installing a non-English version of a DB2 Connect product, you must also have the appropriate National Language Packages.
- To locate DB2 database products already installed on your system, see the "Listing DB2 products installed on your system (Linux and UNIX)" topic in *Installing DB2 Servers*.
- The DB2 Setup wizard is a graphical installer. You must have X windows software capable of rendering a graphical user interface for the DB2 Setup wizard to run on your machine. Ensure that the X windows server is running. Ensure that you have properly exported your display. For example, export DISPLAY=9.26.163.144:0.
- If security software such as Lightweight Directory Access Protocol (LDAP) is used in your environment, you must manually create required DB2 users before you start the DB2 Setup wizard. Refer to "Centralized user-management considerations" in *Installing DB2 Servers* before you begin.

  Note: Network Information Services (NIS) and Network Information Services Plus (NIS+) features are deprecated starting with DB2 Version 9.1 Fix Pack 2. Support for these features might be removed in a future release. Lightweight Directory Access Protocol (LDAP) is the recommended solution for centralized user-management services.

The DB2 Setup wizard is a Java-based installation tool that automates the installation and configuration of any DB2 database products. If you prefer not to use this wizard, you have two alternatives. You can install a DB2 Connect Personal Edition product:
- Using the response file method.
- Manually using the db2_install command. You *cannot* manually install a DB2 database product using the operating system's native installation utility pkgadd. Any existing scripts containing this native installation utility that you use to interface and query with DB2 installations will need to change.

To install DB2 Connect Personal Edition on Solaris x64 using the DB2 Setup wizard:

1. Change to the directory where the DVD is mounted:

   ```
   cd /db2dvd
   ```

   where *db2dvd* represents the mount point of the DVD.

2. If you downloaded the DB2 Connect product image, you must decompress and untar the product file.

   a. Decompress the product file:

      ```
      gzip -d product.tar.gz
      ```

      where *product* is the name of the DB2 Connect product that you downloaded.

   b. Untar the product file:

      ```
      tar xvf product.tar
      ```

   c. Change directory:

      ```
      cd ./product/disk1
      ```

   Note: If you downloaded a National Language Package, untar it into the same directory. This will create the subdirectories (for example `./nlpack/disk2`) in the same directory, and allows the installer to automatically find the installation images without prompting

3. Enter the ./db2setup command from the directory where the product image resides to start the DB2 Setup wizard. For multiple CD installations, issue the db2setup command outside the mounted CD location with either a relative or absolute path name to ensure the DB2 Connect product CD can be unmounted as required. After a few moments, the IBM DB2 Setup Launchpad opens. From this window, you can view the installation prerequisites and the release notes or you can proceed directly to the installation.

4. 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 DB2 Setup wizard. Click **Help** to invoke the online help. You can click **Cancel** at any time to end the installation. DB2 files will only be copied to you system once you have clicked **Finish** on the last DB2 Setup wizard installation panel.

   Once completed, DB2 Connect Personal Edition is installed using the `/opt/IBM/db2/V9.7` default installation path.

   If you are installing on a system where this directory is already being used, the DB2 Connect product installation path will have *_xx* added to it, where *xx* are digits, starting at 01 and increasing depending on how many DB2 copies you have installed.

   You can also specify your own DB2 Connect product installation path.

National Language Packs can also be installed by running the ./db2setup command from the directory where the National Language Pack resides, after a DB2 Connect product has been installed.

The installation logs, `db2setup.log` and `db2setup.err` will be located, by default, in the /tmp directory. You can specify the location of the log files.

If you want your DB2 database product to have access to DB2 documentation either on your local computer or on another computer on your network, then you must install the *DB2 Information Center*. The *DB2 Information Center* contains

documentation for the DB2 database and DB2 related products. See the "Installing the DB2 Information Center using the DB2 Setup wizard (UNIX)" topic in *Installing DB2 Servers*.

Installation requirements for DB2 Connect products (Solaris)

Before you install DB2 Connect products on Solaris Operating System, ensure that the system you choose meets the necessary operating system, hardware, software, and communications requirements.

To install a DB2 Connect product on Solaris, the following requirements must be met:

Table 1. Solaris installation requirements

Operating System	Hardware
Solaris 10 Update 5 • 64-bit kernel • Patch 127128-11	Solaris x64 (Intel 64 or AMD64)
Solaris 9 • 64-bit kernel • Patches 111711-12 and 111712-12 • If raw devices are used, patch 122300-11 Solaris 10 Update 5 • 64-bit kernel • If raw devices are used, patch 125100-07	UltraSPARC or SPARC64 processors

1. Support is only for DB2 to be installed on local zones. Installation on the global zone is not supported by DB2 at this time.

Operating system requirements

> "Recommended & Security Patches" can be obtained from the http://sunsolve.sun.com Web site. From the SunSolve Online Web site, click on the "Patches" menu item in the left panel.

> The J2SE Solaris Operating System Patch Clusters are also required. They can be obtained from the http://sunsolve.sun.com Web site.

> For DB2 Connect on 64-bit Fujitsu PRIMEPOWER systems, you also require the following:
> • Solaris 9 Kernel Update Patch 112233-01 or later to get the fix for patch 912041-01.

> The Fujitsu PRIMEPOWER patches for the Solaris operating system can be downloaded from FTSI at: http://download.ftsi.fujitsu.com/.

> For an additional list of issues that can affect DB2 database systems on Solaris, refer to: www.ibm.com/support/docview.wss?&uid=swg21257606

> DB2 database products support Solaris ZFS filesystems and Logical Domains (LDoms).

> For details about virtualization technology supported by DB2 products, see http://www.ibm.com/developerworks/wikis/display/im/DB2+Virtualization+Support.

Software requirements

> • SUNWlibC software is required to install DB2 Connect on Solaris. It can be obtained from the http://sunsolve.sun.com Web site.

- A browser is required to view online help.

Communication requirements

You can use TCP/IP

- For TCP/IP connectivity, no additional software is required.
- DB2 Connect is supported on Sun Cluster 2.2 if:
  - The protocol to the host is TCP/IP
  - Two-phase commit is not used. This restriction is relaxed if the user configures the SPM log to be on a shared disk (this can be done through the **spm_log_path** database manager configuration parameter), and the failover system has an identical TCP/IP configuration (the same host name, IP address, and so on).

Mounting CDs or DVDs (Solaris Operating Environment)

If the CD-ROM is not automatically mounted when you insert it into the drive on Solaris Operating Environment, issue the mount command.

If you are mounting the CD or DVD drive from a remote system using NFS, the CD or DVD file system on the remote computer must be exported with root access. Depending on your local system configuration, you might also need root access on the local computer.

To mount the CD or DVD on Solaris:

1. Insert the CD or DVD into the drive.
2. If the Volume Manager (vold) is running on your system, the disc is automatically mounted as /cdrom/*cd_label* if the CD or DVD has a label or /cdrom/unnamed_cdrom if it is unlabeled.

   If the Volume Manager is not running on your system, complete the following steps to mount the CD or DVD:

   a. Determine the name of the device by entering the following command:

   ```
   ls -al /dev/sr* |awk '{print "/" $11}'
   ```

   This command returns the name of the CD or DVD device. In this example, the command returns the string /dev/dsk/c0t6d0s2.

   b. Enter the following commands to mount the CD or DVD:

   ```
   mkdir -p /cdrom/unnamed_cdrom
   mount -F hsfs -o ro /dev/dsk/c0t6d0s2 /cdrom/unnamed_cdrom
   ```

   where /dev/dsk/c0t6d0s2 represents the name of the device that was returned in the preceding step and /cdrom/unnamed_cdrom represents the CD or DVD mount directory.

3. Log out.

Your CD or DVD file system is now mounted. View the contents of the CD or DVD by placing the disk in the drive and enter the cd /cdrom command where cdrom is the mount point directory.

Installing DB2 Connect Personal Edition (Windows)

This task describes how to install DB2 Connect Personal Edition on Windows operating systems using the DB2 Setup wizard. Alternatively, you can install DB2 Connect Personal Edition using the response file method.

Before you launch the DB2 Setup wizard:

- Ensure that your system meets the following requirements:
  - Hardware and software requirements
  - Disk and memory requirements
- If you are installing on Windows and intend to use Lightweight Directory Access Protocol (LDAP), you must extend the directory schema.
- It is recommended that you use an Administrator account to perform the installation. The Administrator account must belong to the local administrator's group on the Windows computer where you are installing your DB2 database product and should have the following advanced user rights:
  - Act as part of the operating system
  - Create token object
  - Increase quotas
  - Replace a process level token

  You can perform the installation without advanced user rights, but the setup program might be unable to validate accounts.
- If you want to install DB2 Connect with a non-Administrator account, refer to the topic, Non-Administrator installation of DB2 Connect (Windows).
- To install DB2 Connect Personal Edition using the DB2 Setup wizard:
  1. Log on to the system as a user with administrator authority.
  2. Close all programs so the installation program can update files as required.
  3. If you have a computer with a IBM data server client installed, you can activate DB2 Connect Personal Edition by registering your DB2 Connect Personal Edition licence to that computer. To install DB2 Connect Personal Edition by running the setup program, follow the remaining steps.
  4. Insert the DVD into the drive. The auto-run feature automatically starts the DB2 Setup wizard. 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 run the DB2 Setup wizard manually.
  5. The DB2 Launchpad opens. From this window, you can view the installation prerequisites and the release notes, or you can proceed directly to the installation.
  6. 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. Click **Help** to invoke the online help. You can click **Cancel** at any time to end the installation.

  A log file stores general information and error messages resulting from the install and uninstall activities. The file name of the log follows the format `DB2-`*Product Abrreviation-Date Time*`.log`, such as `DB2-CPE-10-06-2006_17_23_42.log`. By default, the log file is located in the `My Documents\DB2LOG` directory.
- To invoke the DB2 Setup wizard manually:
  1. Click **Start** and select the **Run** option.
  2. In the **Open** field, enter the following command:

         `x:`\setup /i *language*

     where:
     - *x:* represents your DVD drive
     - *language* represents the territory code for your language (for example, EN for English).

3. Click **OK**.

If you want your DB2 database product to have access to DB2 documentation either on your local computer or on another computer on your network, then you must install the *DB2 Information Center*. The *DB2 Information Center* contains documentation for DB2 database systems and DB2 related products.

Installation requirements for DB2 Connect Personal Edition (Windows)

Before you install DB2 Connect Personal Edition on Windows operating systems, ensure that the system you choose meets the necessary operating system, hardware, software, and communications requirements.

To install DB2 Connect Personal Edition, the following requirements must be met:

Operating system requirements

One of:
*   Windows XP Professional Edition (32–bit and 64–bit) with Service Pack 2 or later
*   Windows 2003 with Service Pack 2 or later:
    *   Standard Edition (32–bit and 64–bit)
    *   Enterprise Edition (32–bit and 64–bit)
    *   Datacenter Edition (32–bit and 64–bit)
*   Windows Vista
    *   Professional Edition (32-bit and x64)
    *   Enterprise Edition (32-bit and x64)

    All Windows Vista service packs are supported.
*   Windows 7
    *   Business Edition (32-bit and x64)
    *   Enterprise Edition (32-bit and x64)
*   Windows Server 2008
    *   Standard Edition (32–bit and 64–bit)
    *   Enterprise Edition (32–bit and 64–bit)
    *   Datacenter Edition (32–bit and 64–bit)

    All Windows Server 2008 service packs are supported.
*   Windows Server 2008 R2
    *   Standard Edition (64–bit)
    *   Enterprise Edition (64–bit)
    *   Datacenter Edition (64–bit)

    All Windows Server 2008 R2 service packs are supported.

Hardware requirements

*   All Intel and AMD processors capable of running the supported Windows operating systems (32-bit and x64 based systems).

Software requirements

*   MDAC 2.8 is required. The DB2 Setup wizard will install MDAC 2.8 if it is not already installed.
*   A browser is required to view online help.

Communication requirements

- TCP/IP is supported and supplied by the operating system.

Windows (64–bit) considerations

- SQL requests sent by remote 32-bit clients from earlier versions are supported.

Features

This edition of DB2 Connect is intended for personal workstation use and application connectivity. Server or gateway functionality is not available. For complete details about features provided in this edition, visit http://www.ibm.com/software/data/db2/db2connect/edition-pe.html.

This edition of DB2 Connect is not intended to enable application servers and should not be installed on such servers.

Required user accounts for installation of DB2 Connect Personal Edition (Windows)

If you are installing DB2 Connect Personal Edition product on Windows, you require an installation user account.

The installation user account is the account of the user performing the installation. 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 wizard create them for you.

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

If you use an installation user account that contains non-English characters which are not specified in DB2 naming rules, the DB2 installation will fail.

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

Alternatively, a non-Administrator user account can be used. This alternative requires that a member of the Windows Administrators group first configure the Windows elevated privileges settings to allow a non-Administrator user account to perform an installation. For example, on a 64-bit operating system you must manually grant full permission on `HKLM\Software\Wow6432Node` before DB2 Connect Personal Edition can be successfully installed. On Windows Vista, a non-Administrator can perform an installation, but will be prompted for administrative credentials by the DB2 Setup wizard.

The user right "Access this computer from the network" is required for the installation user account.

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

You can also use the built-in Local System account to run the installation for all products.

User rights granted by the DB2 installer

The DB2 installation program does not grant the Debug Programs user right. The DB2 installer grants the following user rights:

- Act as part of the operating system
- Create token object
- Lock pages in memory
- Log on as a service
- Increase quotas
- Replace a process level token

Extended security on Windows

DB2 products offer extended Windows security. You can install DB2 Connect Personal Edition with a user ID, but unless that user ID belongs to either the DB2ADMNS or DB2USERS group, that user ID won't be able to run any DB2 commands.

The DB2 installer creates these two new groups. You can either specify a new name during a custom installation or accept the default names.

To enable this security feature, select the **Enable operating system security** check box on the **Enable operating system security for DB2 objects** panel during the DB2 installation. Accept the default values for the DB2 Administrators Group field, and the DB2 Users Group field. The default group names are DB2ADMNS and DB2USERS. If there is a conflict with existing group names, you will be prompted to change the group names. If required, you can specify your own values.

Extending the Active Directory Schema for LDAP directory services (Windows)

If you plan to use the Lightweight Directory Access Protocol (LDAP) directory server feature with Windows Server 2003, you have to extend the Active Directory schema to contain DB2 object classes and attribute definitions using the db2schex command.

Extending the directory schema prior to installing DB2 products and creating databases provide the following benefits:

- The default DB2 instance, created during the installation, is cataloged as a DB2 node in Active Directory, provided that the installation user ID had sufficient privileges to write to Active Directory.
- Any databases created after installation is automatically cataloged into Active Directory.

To extend the directory schema:

1. Log onto any machine that is part of the Windows domain with a Windows user account that has Schema Administration authority.
2. Run the db2schex command from the installation DVD . You can run this command without logging off and logging on again, as follows:

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

   where x: represents the DVD drive letter.

When db2schex completes, you can proceed with the installation of your DB2 product; or if you have already installed DB2 products or created databases, you have to manually register the node and catalog the databases. For more information, see the "Enabling LDAP support after DB2 installation is complete" topic.

Non-Administrator installation of DB2 Connect (Windows)

For a non-Administrator's installation, the account you are logged on as must belong to Power Users group.

Some information about DB2 Connect that must appear in the registry must be entered in the HKEY_CURRENT_USER folder in the registry. Although many items will be stored under the HKEY_LOCAL_MACHINE folder in the registry for non-Administrator installations of DB2 Connect, the environment settings must be changed in HKEY_CURRENT_USER.

A member of the Windows Administrators group must configure the Windows elevated privileges settings to allow a non-Administrator user account to perform an installation. For example, on a 64-bit operating system you must manually grant full permission on `HKLM\Software\Wow6432Node` before a 32-bit DB2 Connect Personal Edition product can be successfully installed.

Note: If a non-Administrator user account is going to do the product installation, then the VS2005 runtime library must be installed before attempting to install a DB2 product. The VS2005 runtime library is needed on the operating system before the DB2 product can be installed. The VS2005 runtime library is available from the Microsoft runtime library download web site. There are two choices: choose `vcredist_x86.exe` for 32-bit systems or `vcredist_x64.exe` for 64-bit systems.

System shortcuts must be changed to user shortcuts for the non-Administrator install. Moreover, since services are required to install any of the DB2 Connect products, but cannot be created without administrative authority, services that would be automatically started are run as processes when a non-administrator installs.

The following are installation situations you might encounter in an environment where both administrator and non-administrator installations exist:

- A non-Administrator has installed DB2 Connect, and then an Administrator attempts to install DB2 Connect on the same system. The Administrator will get a message that the product is already installed. The Administrator does have the authority to uninstall and reinstall the product to get around this issue.
- A non-administrator has installed DB2 Connect, and then a second non-Administrator attempts to install DB2 Connect on the same system. In this scenario, the installation will fail, and return an error message that the user must be an Administrator to install the product.
- An Administrator has installed DB2 Connect, and then a non-Administrator attempts to install DB2 Connect on the same system. In this scenario, the install will fail, and return an error message that the user must be an Administrator to install the product. An Administrator always has the authority to uninstall or reinstall.
- Non-Administrator users cannot uninstall a DB2 product. Those non-Administrator users on a Windows Vista (and later) operating system **can** uninstall a DB2 product.

DB2 Connect product installation requirements for host and midrange systems

DB2 Connect products enable workstations to connect to databases on supported host and midrange platforms (for example, DB2 on z/OS). In some cases, DB2 Connect customers might need to apply patches to the host or midrange database product to enable this functionality.

See "Installing IBM data server clients (Linux and UNIX)" and "Installing IBM data server clients (Windows)" in *Installing IBM Data Server Clients*.

User identification management

A key task following the installation of DB2 Connect Personal Edition is the adding of users to one of two user groups having the default names of DB2ADMNS and DB2USERS. This task is done as part of the database security policy that you will implement for your database environment.

Adding your user ID to the DB2ADMNS and DB2USERS user groups (Windows)

After successfully completing a DB2 installation, you now have to add users to the DB2ADMNS or the DB2USERS groups for users that need to run local DB2 applications and tools on the machine. The DB2 installer creates two new groups. You can either use a new name or accept the default names. The default group names are DB2ADMNS and DB2USERS.

- You must have installed a DB2 database product.
- You must have selected the **Enable operating system security** check box on the Enable operating system security for DB2 object panel during the installation of your DB2 database product.

To add users to the appropriate group:
1. Click **Start** and select **Run**.
2. Type lusrmgr.msc and click **OK**.
3. Select **Local Users and Groups**.
4. Select **Users**.
5. Select the user you want to add.
6. Click **Properties**.
7. Click the **Member Of** tab.
8. Click **Add**.
9. Select the appropriate group.
10. Click **OK**.

If you did the install and chose not to enable the new security feature you can still do so post-install by running the db2extsec.exe command. Adding a user to a group takes effect the first time the user logs on after the user has been added. For example, if you add you user ID to the DB2ADMNS group, you need to log out and then log in again for this change to take effect.

Non-root installation overview (Linux and UNIX)

Before Version 9.5, you could install products, apply and roll back fix packs, configure instances, add features, or uninstall products only if you had root privileges. Now, if you are a non-root user, you can perform these tasks on Linux and UNIX operating systems.

The DB2 installer automatically creates and configures a non-root instance during a non-root installation. As a non-root user, you can customize the configuration of the non-root instance during the installation. You can also use and maintain the installed DB2 database product without root privileges.

The non-root installation of a DB2 database product has one DB2 instance with most features enabled by default.

A non-root installation can be attractive for many groups, such as the following ones:

- Enterprises that have thousands of workstations and users who want to install a DB2 database product without consuming a system administrator's time
- Application developers who are not typically system administrators but use DB2 database products to develop applications
- Independent Software Vendors (ISVs) who develop software that does not require root user authority yet embeds a DB2 database product

Although non-root installations have most of the function of root installations, there are some differences and limitations. You can lift some of the limitations by having a root user run the db2rfe command.

Differences between root installations and non-root installations

In addition to a few limitations, the directory structure of a non-root installation is slightly different than the directory structure of a root installation.

During a root installation, subdirectories and files for the DB2 database product are created in a directory of the root user's choosing.

Unlike root users, non-root users cannot choose where DB2 database products are installed. Non-root installations are always placed in the *$HOME*/sqllib directory, where *$HOME* represents the non-root user's home directory. The layout of the subdirectories within the sqllib directory of a non-root is similar to that of a root installation.

For root installations, multiple instances can be created. Instance ownership is associated with the user ID under which the instance was created.

Non-root installations can have only one DB2 instance. The non-root installation directory contains all of the DB2 database product files and instance files with no soft links.

The following table summarizes the differences between root installations and non-root installations.

Table 2. Differences between root installations and non-root installations

Criteria	Root installations	Non-root installations
User can select installation directory	Yes	No. DB2 database products are installed under the user's home directory.
Number of DB2 instances allowed	Multiple	One
Files deployed during installation	Program files only. Instances must be created after installation.	Program files and instance files. The DB2 database product is ready for use immediately after installation.
Upgrade version and instance	No	No need to uninstall the old version before installing the new version. Install new version, and upgrade the instance, together.

Limitations of non-root installations

In addition to the differences between root installations and non-root installations, there are several limitations on non-root installations. This topic discusses the limitations to help you decide if you want to use a non-root installation.

Product limitations

Some DB2 database products are not supported in non-root installations:

- DB2 Query Patroller
- DB2 Net Search Extender
- Locally installed *DB2 Information Center*

    Note: The locally installed *DB2 Information Center* is not supported in non-root installations because it requires root user authority to start the daemon. However, a non-root-installation DB2 instance can be configured to use a locally installed *DB2 Information Center* if it is installed on the same computer.

Features and tools limitations

The following features and tools are not available in non-root installations:

- The DB2 Administration Server (DAS) and its associated commands: dascrt, dasdrop, daslist, dasmigr, and dasupdt
- The Configuration Assistant
- The Control Center
- The ability for the db2governor to increase priority is not supported
- In the Work Load Manager (WLM), attempts to set agent priority in a DB2 service class in a non-root DB2 instance are allowed. However, the agent priority will not be respected, and no SQLCODE error is returned.
- Automatic starting of non-root DB2 instances at system reboot is not supported

Health monitor limitations

The following health monitor features are not supported in non-root installations:

- Running script or task actions on alert occurrences

- Sending alert notifications

Partitioned database limitation

Only single-partition databases are supported in non-root installations. You cannot add additional database partitions.

Listing DB2 database products

The output produced by the db2ls command, when run as a non-root user, is different than the output produced when run as a root user. For details, refer to the db2ls command topic.

DB2 copies

Each non-root user can have only one copy of a DB2 database product installed.

DB2 instance limitation

In non-root installations, one DB2 instance is created during installation. Additional instances cannot be created.

DB2 instance actions can be performed only by the instance owner

Root installations and non-root installations can coexist on the same computer in different installation paths. However, a non-root instance can be updated, or dropped (using the db2_deinstall command), only by the non-root user who owns the non-root instance.

A DB2 instance created by a user with root user authority can be updated or dropped only by a user with root user authority.

DB2 instance commands

The following DB2 instance commands are unavailable in non-root installations:

db2icrt

When installing a DB2 database product as a non-root user, a single instance is automatically created and configured. Further instances cannot be created in non-root installations. However, if the automatically created instance needs to be configured, you can use the non-root install configuration command, db2nrcfg.

db2iupdt

The db2iupdt command cannot be used for non-root instances. Instead, use the non-root install configuration command (db2nrupdt) to update the non-root DB2 instance. However, updating the non-root instance is normally not required because it gets updated automatically when updating your DB2 database product.

db2idrop

The instance that gets automatically created during non-root installations cannot be dropped. The DB2 database product must be uninstalled to drop the DB2 instance.

db2iupgrade

Upgrading is not supported for non-root installations. To upgrade a non-root instance, use the db2nrupgrade command.

Upgrading limitation

Root instances cannot be upgraded to a non-root instance.

Post-installation actions can be performed only by the DB2 instance owner

Root installations and non-root installations can coexist on the same

computer. However, only the original non-root user who installed the DB2 database product can perform subsequent actions such as:

- Applying fix packs
- Adding features
- Installing add-on products

Adjusting ulimit values

The ulimit command on UNIX and Linux operating systems sets or reports user resource limits, such as data and stack limits. For root instances, the database server dynamically updates required ulimit settings without changing the permanent settings. However, for non-root instances, the ulimit settings can only be checked during installation. A warning message is displayed if the settings are inadequate. Root user authority is required to change the ulimit settings.

Limitations that can be overcome by running db2rfe

There are further limitations on non-root installations which can be overcome by running the db2rfe command. The following features and abilities are initially unavailable in non-root installations:

- Operating system-based authentication
- High Availability (HA) feature
- The ability to reserve service names in the `/etc/services` file
- The ability to increase user data limits (ulimits). This ability applies only to AIX. On other operating systems, user data limits must be increased manually.

Run the Enable root features for non-root install command (db2rfe) to enable these features and abilities. Running the db2rfe command is optional, and must be run by a user with root user authority.

Authentication type in non-root installations

Operating system-based authentication is the default authentication type for DB2 database products. Since non-root installations do not support operating system-based authentication, if you choose not to run the db2rfe command after installing your DB2 database product as a non-root user, then you must manually set the authentication type. You can do so by updating the following parameters in the database manager configuration (dbm cfg) file:

- **clnt_pw_plugin** (Client userid-password plug-in configuration parameter)
- **group_plugin** (Group plug-in configuration parameter)
- **srvcon_pw_plugin** (Userid-password plug-in for incoming connections at the server configuration parameter)

Installing a DB2 product as a non-root user

Most DB2 database products can be installed as a non-root user.

Before you install any DB2 database product as a non-root user, be aware of the differences between root installations and non-root installations, and the limitations of non-root installations. For more information on `non-root` installation, see "Non-root installation overview (Linux and UNIX)".

Prerequisites for installing a DB2 database product as a non-root user are:

- You must be able to mount the installation DVD, or have it mounted for you.

- You must have a valid user ID that can be used as the owner of a DB2 instance. User IDs have the following restrictions and requirements:
  - Must have a primary group other than guests, admins, users, and local
  - Can include lowercase letters (a–z), numbers (0–9), and the underscore character (_)
  - Cannot be longer than eight characters
  - Cannot begin with IBM, SYS, SQL, or a number
  - Cannot be a DB2 reserved word (USERS, ADMINS, GUESTS, PUBLIC, or LOCAL), or an SQL reserved word
  - Cannot use any User IDs with root privilege for the DB2 instance ID, DAS ID or fenced ID.
  - Cannot include accented characters
  - If existing user IDs are specified instead of creating new user IDs, make sure that the user IDs:
    - Are not locked
    - Do not have expired passwords
- The hardware and software prerequisites that exist for the product you are installing apply to the non-root user just as they do for root users.
- On AIX Version 5.3, Asynchronous I/O (AIO) must be enabled. It is strongly recommended the system has I/O Completion Ports (IOCP) enabled.
- Your home directory must be a valid DB2 path.
  DB2 installation paths have the following rules:
  - Can include lowercase letters (a–z), uppercase letters (A–Z), and the underscore character (_)
  - Cannot exceed 128 characters
  - Cannot contain spaces
  - Cannot contain non-English characters

Installing DB2 database products as a non-root user is transparent to the non-root user. In other words, there is nothing special a non-root user needs to do to install a DB2 database product, other than being logged being logged in as a non-root user.

To perform a non-root installation:
1. Log in as a non-root user
2. Install your DB2 database product using any of the methods available to you. Options include:
   - The DB2 Setup wizard (GUI install)
   - The db2_install command
   - The db2setup command with a response file (silent install)

   Note: Since non-root users cannot choose the directory where DB2 database products are installed, any **FILE** keyword in your response file is ignored.
3. After the DB2 database product is installed, you must open a new login session to use the non-root DB2 instance. Alternatively, you can use the same login session if you set up the DB2 instance environment with *$HOME*/sqllib/db2profile (for Bourne shell and Korn shell users) or *$HOME*/sqllib/db2chsrc (for C shell users), where *$HOME* is the non-root user's home directory.

After the DB2 database product is installed, verify your operating system user process resource limits (ulimits). If the minimum ulimit values are not met, the DB2 engine can encounter unexpected operating resource shortage errors. These errors can lead to a DB2 database system outage.

Enabling root-based features in non-root installations with db2rfe

There are several features and abilities in non-root installations that are initially unavailable but can be enabled by running a the db2rfe command.

This task requires root user authority.

To enable the features and abilities that are initially unavailable in non-root installations:

1. Locate the sample configuration files. Two sample configuration files are provided:
   - `$HOME/sqllib/instance/db2rfe.cfg` is pre-configured with default values for the non-root DB2 instance
   - `$HOME/sqllib/cfg/db2rfe.cfg.sample` is not configured

   where $HOME is the non-root user's home directory.
2. Copy one of the sample configuration files to a different location so the original file remains unaltered.
3. Update the copied configuration file as needed. This configuration file is input to the db2rfe command.

   An example of a configuration file is:
   ```
   INSTANCENAME=db2inst2
   SET_ULIMIT=NO
   ENABLE_HA=NO
   ENABLE_OS_AUTHENTICATION=NO
   RESERVE_REMOTE_CONNECTION=NO
      **SVCENAME=db2c_db2inst2
     **SVCEPORT=48000
   RESERVE_TEXT_SEARCH_CONNECTION=NO
     **SVCENAME_TEXT_SEARCH=db2j_db2inst2
     **SVCEPORT_TEXT_SEARCH=55000
   ```

   Note:
   - The value for the **INSTANCENAME** parameter is filled in automatically by DB2 installer
   - The **SET_ULIMIT** parameter is available only on AIX. On other operating systems, a user with root authority needs to set ulimit values manually.
   - The default value for the other keywords is NO
   - Child parameters (such as **SVCENAME**) are commented out by default. Comments are denoted with **
   - If you set a parameter to YES, and if it has any child parameters, it is recommended that you uncomment the child parameters and provide appropriate values. Any port values that are provided are examples. Ensure the port values you assign are free.

   An example is provided below to show an edited configuration file that will enable the following features and abilities:
   - High availability
   - Operating system-based authentication

- DB2 Text Search, with a service name of db2j_db2inst2 and a port value of 55000

To enable these features and abilities, edit the configuration file as follows:

```
INSTANCENAME=db2inst2
SET_ULIMIT=NO
ENABLE_HA=YES
ENABLE_OS_AUTHENTICATION=YES
RESERVE_REMOTE_CONNECTION=NO
    **SVCENAME=db2c_db2inst2
  **SVCEPORT=48000
RESERVE_TEXT_SEARCH_CONNECTION=YES
    SVCENAME_TEXT_SEARCH=db2j_db2inst2
    SVCEPORT_TEXT_SEARCH=55000
```

4. Log in with root user authority.
5. Navigate to the $HOME/sqllib/instance directory, where $HOME represent's the non-root user's home directory.
6. Run the db2rfe command using the following syntax:

   db2rfe -f *config_file*

   where *config_file* is the configuration file created in Step 3 on page 26.

To keep root-based features enabled on non-root installations, rerun the db2rfe command after applying fix packs or upgrading to a new version.

Applying fix packs to a non-root installation

The task of applying fix packs to a non-root installation is essentially the same as applying fix packs to a root installation, with a few exceptions.

Before applying fix packs to a non-root installation, you must log on with the user ID that was used to install the non-root installation.

If you enabled root features in your non-root installation using the db2rfe command, you should locate the configuration file that was used when running the db2rfe command. That configuration file will be needed to re-enable the root features after you apply the fix pack.

To apply a fix pack to a non-root installation:
1. Apply your fix pack according to the "Applying fix packs" topic.

   Note: The installFixPack command's **-b** option is invalid for non-root installations.
2. Optional: Run the db2rfe command. If you had root-based features enabled in your non-root installation, and if you want to re-enable those features, the db2rfe command must be rerun. Running this command requires root user authority.

   Note: If you edited $HOME/sqllib/instance/db2rfe.cfg when you first enabled root features, that configuration file will not have been overwritten when applying the fix pack, so you can reuse that file when running the db2rfe command. However, you should also check $HOME/sqllib/cfg/db2rfe.cfg.sample. If the fix pack introduced any new root features available to non-root installations, $HOME/sqllib/cfg/db2rfe.cfg.sample shows the new features.

Removing non-root DB2 database products using db2_deinstall (Linux and UNIX)

This task provides steps for removing non-root DB2 database products or components using the db2_deinstall command.

You must stop the non-root instance before running the db2_deinstall command.

- This task applies to DB2 database products that were installed without root user authority. A separate task exists for uninstalling DB2 database products that were installed with root user authority.
- As with root users, non-root users can use the db2_deinstall command to uninstall DB2 database products. The db2_deinstall command for non-root installations has the same options as root installations, and has an extra option: **-f** sqllib.
- It is important to note that running db2_deinstall as a non-root user uninstalls the DB2 database product *and* drops the non-root instance. This is different than root installations, where running db2_deinstall only uninstalls the DB2 database program files.
- You cannot remove DB2 database products using a native operating system utility, such as rpm or SMIT.

To uninstall a DB2 database product that was installed by a non-root user:

1. Log in with the user ID that was used to install the DB2 database product.
2. Navigate to the $HOME/sqllib/install directory, where $HOME is your home directory.
3. Run the db2_deinstall command.

   Note:
   - If you run the db2_deinstall command with the **-a** option, the DB2 database program files are removed, but any configuration files are left behind in a backup directory called sqllib_bk.
   - If you run the db2_deinstall command with the **-a -f sqllib** option, the entire sqllib subdirectory in your home directory will be removed. If you have any files in sqllib you want to keep, be sure to copy them elsewhere before running db2_deinstall -a -f sqllib.
   - As with root installations, running the db2_deinstall command with the **-F** option against a non-root installation allows the non-root user to remove specific DB2 features.

Chapter 4. Preparing for DB2 Connect communications

Preparing DB2 for IBM i for connections from DB2 Connect

DB2 Connect gives remote system applications access to data on your DB2 for IBM i system.

To set up the connection, you need to know the following:

1. The local network name. You can get this information by entering DSPNETA.
2. The local adapter address. You can get this information by entering the WRKLIND command in one of the following ways:

   WRKLIND (*elan)
   Lists Ethernet adapters

   WRKLIND (*trlan)
   Lists token ring adapters

   WRKLIND (*all)
   Lists all adapters

3. The hostname. You can get this information by entering DSPNETA.
4. The TCP/IP port or service name. The default is X'07'6DB (X'07F6C4C2'). The default is always used by DB2 for i. If entering a hexadecimal number is not convenient, an alias is QCNTEDDM.
5. The relational database name. You can get this information by entering DSPRDBDIRE. This will display a list. The line containing *LOCAL in the Remote Location column identifies the RDBNAME which must be defined to the client. If there is no *LOCAL entry, you can add one, or use the system name obtained from the DSPNETA command on the server.

Here is an example:

```
                     Display Relational Database Directory Entries

Position to  . . . . . .

Type options, press Enter.
    5=Display details   6=Print details

                      Relational              Remote

Option               Database                 Location Text


        _            _____

        _            DLHX                     RCHAS2FA

        _            JORMT2FA                 JORMT2FA

        _            JORMT4FD                 JORMT4FD

        _            JOSNAR7B                 RCHASR7B

        _            RCHASR7B                 *LOCAL

        _            RCHASR7C                 RCHASR7C

        _            R7BDH3SNA                RCH2PDH3

        _            RCHASDH3                 RCHASDH3
```

When you have obtained these parameters from your IBM Power Systems server, enter your values into the worksheet that follows:

Table 3. Configuration parameters from IBM Power Systems

Item	Parameter	Example	Your value
A-1	Local network name	SPIFNET	
A-2	Local adapter address	400009451902	
A-4	Hostname	SYD2101A	
A-5	TCP/IP port or service name	X'07F6C4C2' (default)	
A-6	Relational database name	NEW_YORK3	

For more information, refer to the "DRDA Considerations" section of the *DB2 Server for VSE & VM SQL Reference* (SC09-2989).

Preparing DB2 for z/OS for connections from DB2 Connect

This topic provides instructions for establishing TCP/IP network connections between DB2 Connect and DB2 for z/OS.

If you anticipate that DB2 for z/OS will participate in a multisite update transaction (two-phase commit) then refer to "Enabling Multisite Updates using the Control Center" in *DB2 Connect User's Guide*.

To prepare DB2 for z/OS to receive connection requests from DB2 Connect, you need to configure your protocol by:
- "Configuring TCP/IP for DB2 for z/OS" on page 31
- "Configuring DB2 for z/OS" on page 34

Host databases

The term *database* is used throughout this document to describe a relational database management system (RDBMS). Other systems with which DB2 Connect communicates might use the term database to describe a slightly different concept. The DB2 Connect term database can also refer to:

System z
>   DB2 for z/OS. A DB2 for z/OS subsystem identified by its LOCATION NAME. The LOCATION NAME can be determined by logging into TSO and issuing the following SQL query using one of the available query tools:
>
>    ```
>    select current server from sysibm.sysdummy1
>    ```
>
>   LOCATION NAME is also defined in the Boot Strap Data Set (BSDS) as well as the DSNL004I message (LOCATION=location), which is written when the Distributed Data Facility (DDF) is started. LOCATION NAME supports up to 8 alias location names, allowing applications the ability to use different dbalias names to access a Version 8 z/OS server. Use the z/OS -display ddf command to get the DB2 server location name, domain name, IP address and port.

VSE   DB2 for VSE running in a database partition identified by its DBNAME

VM   DB2 for VM running in a CMS virtual machine identified by its DBNAME

IBM Power Systems Servers
>   DB2 for IBM i, an integral part of the IBM i operating system. Only one database can exist on an IBM Power Systems server unless the system is configured to use independent auxiliary storage pools.

Configuring TCP/IP for DB2 for z/OS

This topic describes how to configure TCP/IP communications between your DB2 Connect workstation and DB2 for z/OS Version 7 or later. The instructions assume the following conditions:

- You are connecting to a single host database via TCP/IP. Multiple host connections will be handled in exactly the same way, although the *port number* and *service number* required in each case might be different.
- The target database resides on DB2 for z/OS Version 7 or later.
- All the necessary software prerequisites are installed.
- DB2 clients have been set up as required.
1. Before you can use DB2 Connect over a TCP/IP connection, you must collect information about both the host database server and the DB2 Connect server. For each host server that you are connecting to via TCP/IP, you must have the following information:
   - The location of the TCP/IP `services` and `hosts` files at the DB2 Connect workstation:

      On UNIX and Linux
      >   /etc/

      On Windows XP and Windows Server 2003
      >   Usually *%SystemRoot%*\system32\drivers\etc\, where *%SystemRoot%* represents the Windows install path directory.

You might want to add the host information to a *domain name server* to avoid maintaining this file on multiple systems.
- The locations of the equivalent files at the target DB2 for z/OS host.
- The TCP/IP *port number* defined to DB2 for z/OS.

  Note: The associated *service name* information is not exchanged between the DB2 Connect workstation and DB2 for z/OS.
  Port number 446 has been registered as the default for communication from a DB2 Connect workstation.
- The TCP/IP addresses and host names for both the host and the DB2 Connect workstation.
- The LOCATION NAME of the DB2 for z/OS database server.
- The user ID and password to be used when issuing CONNECT requests to the database at the IBM mainframe server.
2. Refer to your local network administrator and your DB2 for z/OS administrator for help getting this information. Use the tables that follow as a worksheet to plan *each* TCP/IP connection between DB2 Connect and a host database server.

Table 4. User Information

Ref.	Description	Sample Value	Your Value
TCP-1	User name	A.D.B.User	
TCP-2	Contact info	(123)-456-7890	
TCP-5	User ID	ADBUSER	
TCP-6	Database type	db2390	
TCP-7	Connection type (must be TCPIP).	TCPIP	TCPIP

Table 5. Network Elements at the Host

Ref.	Description	Sample Value	Your Value
TCP-8	Host name	MVSHOST	
TCP-9	Host IP address	9.21.152.100	
TCP-10	Service name	db2inst1c	
TCP-11	Port number	446	446
TCP-12	LOCATION NAME	NEW_YORK3	
TCP-13	User ID		
TCP-14	Password		

Note:

a. To obtain the host's IP address TCP-9, enter at the host:
```
TSO NETSTAT HOME
```
b. To obtain the port number TCP-11, look for `DSNL004I` in the DB2 master address space or system log.

Table 6. Network Elements at the DB2 Connect Workstation

Ref.	Description	Sample Value	Your Value
TCP-18	Host name	mcook02	

Table 6. Network Elements at the DB2 Connect Workstation (continued)

Ref.	Description	Sample Value	Your Value
TCP-19	IP address	9.21.27.179	
TCP-20	Service name	db2inst1c	
TCP-21	Port number	446	446

Table 7. DB2 Directory Entries at the DB2 Connect Workstation

Ref.	Description	Sample Value	Your Value
TCP-30	Node name	MVSIPNOD	
TCP-31	Database name	nyc3	
TCP-32	Database alias	mvsipdb1	
TCP-33	DCS database name	nyc3	

3. Complete a copy of the worksheet example for each TCP/IP host:

   a. Fill in the values to be used for the host name and IP address of the DB2 for z/OS host (TCP-8 and TCP-9).

   b. Fill in the values to be used for the host name and IP address of the DB2 Connect workstation (TCP-18 and TCP-19).

   c. Determine the service name or port number to be used for the connection (TCP-10 or TCP-20, or TCP-11 or TCP-21).

   d. Determine the LOCATION NAME of the DB2 for z/OS database server to which you want to connect.

   e. Determine the values to be used for user ID and PASSWORD when connecting to the host database.

4. At your System z server:

   a. Verify the host address or the host name.

   b. Verify the port number or the service name.

   c. Update the services file with the correct port number and service name if necessary.

   d. Update the hosts file (or the Domain Name Server used by the DB2 for z/OS system) with the host name and IP address of the DB2 Connect workstation if necessary.

   e. Ensure the new definitions are active before attempting to test the connection. Refer to your host network administrator or change control staff if necessary.

   f. Check with the DB2 for z/OS administrator that you have a valid user ID, password, and database *LOCATION NAME*.

   g. PING the DB2 Connect server, using the correct port number if that option is supported by TCP/IP on the host system. For example:

   ```
   ping remote_host_name -p port_number
   ```

   Note: DB2 Connect does not support the PING command when issued from a Version 7 client through a Version 9 gateway to the host.

   Support for your System z server is available at http://www.ibm.com/servers/eserver/support/zseries/

Configuring DB2 for z/OS

Before you can use DB2 Connect, your DB2 for z/OS Administrator must configure DB2 for z/OS to permit connections from DB2 Connect workstations. This section indicates the *minimum* updates required to permit a DB2 Connect client to make a connection to the DB2 for z/OS database server. For more detailed examples, refer to the DB2 for z/OS installation documentation:

- Version 7 documentation is available at http://www.ibm.com/software/data/db2/zos/v7books.html
- Version 8 documentation is available at http://www.ibm.com/software/data/db2/zos/v8books.html
- Version 9 documentation is available at http://www.ibm.com/software/data/db2/zos/v9books.html

Recommended maintenance level

For DB2 for z/OS Version 7, apply the fixes for APARs PQ50016, PQ50017 and PK05198.

See also http://www.ibm.com/servers/eserver/zseries/zos/servicetst/ for the latest Consolidated Service Test.

Preparing DB2 for VSE & VM for connections from DB2 Connect

For information about how to set up DB2 Server for VM and VSE as an application server, refer to the "DRDA Considerations" section of the *DB2 Server for VSE & VM SQL Reference* (SC09-2989) .

Configuring connections to mainframe and midrange servers

After DB2 Connect is installed and the database server is configured to accept communications, you need to establish and fine-tune the connection between the two systems. The connections to the remote systems is done using either the Configuration Assistant (CA) or the command line processor (CLP).

Configuring a connection to IBM mainframe database servers using the CA (Linux and Windows)

This task describes how to connect to IBM mainframe database server from your DB2 Connect workstation using the Configuration Assistant (CA). The CA is a DB2 GUI tool that can be used to configure database connections and other database settings.

Note: In previous releases, the DB2 Administration Tools, such as the CA, were supported on all platforms. As of Version 9, the DB2 Administration Tools are supported only on Windows x86, Windows x64 (AMD64/EM64T), Linux on x86, and Linux on AMD64/EM64T. For all platforms, you can use the DB2 command line processor (CLP) to configure a connection to an IBM mainframe database server.

- The Configuration Assistant must be installed on your DB2 Connect workstation. The Configuration Assistant is available as part of the IBM data server client.
- The remote server must be configured to accept inbound client requests. By default, the server installation program detects and configures most protocols on the server for inbound client connections.

Your DB2 Connect workstation can be either:

A IBM data server client
> The IBM data server client can connect indirectly to IBM mainframe databases through a DB2 Connect server product.

DB2 Connect Personal Edition
> You can connect directly to IBM mainframe databases using DB2 Connect Personal Edition. You can also connect through a DB2 Connect server product.

The following methods can be used to configure a connection to a database using the CA:

- Connecting to a database using a client profile.

  See "Configuring database connections using a client profile with the Configuration Assistant" in *Installing IBM Data Server Clients*.

- Connecting to a database manually using the CA.

  See "Configuring database connections using a client profile with the Configuration Assistant" in *Installing IBM Data Server Clients*.

Configuring a connection to IBM mainframe database servers using the CLP

You can manually configure your TCP/IP connection between a DB2 Connect server and a IBM mainframe database using the DB2 command line processor (CLP).

Before you manually configure a TCP/IP connection between DB2 Connect and a IBM mainframe database server, ensure that:

- TCP/IP is functional on the DB2 Connect server and IBM mainframe system.
- You have identified the following parameter values:
  - Hostname (*hostname*) or IP address (*ip_address*)
  - Connection Service name (*svcename*) or Port number/Protocol (*port_number/tcp*)
  - Target database name (*target_dbname*)
  - Local database name (*local_dcsname*)
  - Node name (*node_name*)

To manually configure TCP/IP communications between your DB2 Connect server and an IBM mainframe database:

1. Configure TCP/IP on the DB2 Connect server. Refer to "Configuring TCP/IP for DB2 for z/OS" on page 31.
2. Catalog the TCP/IP node. Refer to the "CATALOG TCPIP/TCPIP4/TCPIP6 NODE command" topic in the *Command Reference*.
3. Catalog the IBM mainframe database as a Database Connection Service (DCS) database. Refer to the "CATALOG DCS DATABASE command" topic in the *Command Reference*.
4. Catalog the IBM mainframe database. Refer to the "CATALOG DATABASE command" topic in the *Command Reference*.
5. Bind utilities and applications to the IBM mainframe database server. Refer to "Binding database utilities on DB2 Connect" on page 44.
6. Refer to the "CONNECT (Type 1) statement" topic in the *SQL Reference, Volume 2* to test the IBM mainframe connection.

Note: Due to the characteristics of the TCP/IP protocol, TCP/IP might not be immediately notified of a partner's failure on another IBM mainframe. As a result, a client application accessing a remote DB2 server using TCP/IP, or the corresponding agent at the server, might sometimes appear to be hung. The TCP/IP SO_KEEPALIVE socket option is used to detect when there has been a failure and the TCP/IP connection has been broken.

Chapter 5. Reference

Configuring access to IBM mainframe databases

After DB2 Connect is installed and the database server is configured to accept communications, you need to establish and fine-tune the connection between the two systems.

This section describes how to use the Configuration Assistant (CA) or the DB2 command line processor (CLP) to find, connect, and bind to a database server.

Configuring a database connection by searching the network using the Configuration Assistant

You can use the Configuration Assistant (CA) to search a network for databases.

Before you configure a database connection by searching the network:
- Ensure that you have a valid DB2 user ID.
- If you are configuring a connection from a system that has a DB2 Server or DB2 Connect server product installed, ensure that you have a user ID with SYSADM or SYSCTRL authority for the instance.

The search method feature might be unable to detect a remote system if:
- It is used in a cluster environment.
- The DB2 Administration Server (DAS) is not running on the remote system.
- The search times out. By default, the search will scan the network for 1 second; this might not be long enough to detect the remote system. You can set the **DB2DISCOVERYTIME** registry variable to specify a longer period of time.
- The network that the search is running on is configured so that the search does not reach the remote system required.

The following points apply to cases where you want to explicitly configure an IPv6 address on a network that supports IPv6:
- The system must be listed under **Known Systems**.
- Only the Configuration Assistant Advanced View supports explicitly configure an IPv6 connection.

To configure a database connection by searching the network:
1. Log on to the system with a valid DB2 user ID.
2. Start the CA. The CA can be started from the Start menu on Windows or using the db2ca command on both Windows and UNIX systems.
3. On the CA menu bar, under **Selected**, choose **Add Database Using Wizard**. The **Add Database** Wizard opens.
4. Select the **Search the network** radio button and click **Next**.
5. Double-click the folder beside **Known Systems** to list all the systems known to your client or double-click the folder beside **Other Systems** to list all the systems on the network. If no systems are listed, you can click **Add System** to specify one. After you add a system, it displays in the **Known Systems** list.
6. Expand the entries for the system you are interested in until you see the database you want to add. Select the database. Click **Next**.

7. Type a local database alias name in the **Database alias** field and optionally type a comment that describes this database in the **Comment** field.

8. If you are planning to use ODBC, register this database as an ODBC data source. ODBC must be installed to perform this operation.

9. Click **Finish**. You can now use the database you added. Click **Close** to exit the CA.

Configuring a database connection manually using the Configuration Assistant

If you have the information for the database you want to connect to and the server upon which it resides, you can manually enter all of the configuration information. This method is analogous to entering commands using the command line processor, however, the parameters are presented graphically.

Before you configure a connection to a database manually using the Configuration Assistant (CA):

- Ensure that you have a valid DB2 user ID for the database you want to connect to.
- If you are configuring a connection from a system that has a DB2 server or DB2 Connect server product installed, ensure that you have a user ID with SYSADM or SYSCTRL authority for the database manager instance.

To configure a connection to a database manually using the CA:

1. Log on to the system with a valid DB2 user ID.

2. Start the CA. The CA can be started from the Start menu on Windows or using the db2ca command.

3. On the CA menu bar, under **Selected**, choose **Add Database Using Wizard**.

4. Select the **Manually configure a connection to a database** radio button and click **Next**.

5. If you are using Lightweight Directory Access Protocol (LDAP), select the radio button that corresponds to the location where you want DB2 directories to be maintained. Click **Next**.

6. Select the radio button that corresponds to the protocol that you want to use from the **Protocol** list. (Note: While APPC, APPN, or NetBIOS might still display as options, they are no longer supported.) If DB2 Connect is installed on your system and you select TCP/IP, you have the option to select **The database physically resides on a host or OS/400 system**. If you select this check box, you have the option of selecting the type of connection that you want to make to the host or OS/400® database:

   - To make a connection through a DB2 Connect gateway, select the **Connect to the server via the gateway** radio button.
   - To make a direct connection, select the **Connect directly to the server** radio button.

   Click **Next**.

7. Type the required communication protocol parameters and click **Next**.

8. Type the database alias name of the remote database that you want to add in the **Database name** field and a local database alias name in the **Database alias** field. If you are adding a host or OS/400 database, type the location name for an OS/390® or z/OS database, the RDB name for an OS/400 database, or the DBNAME for a VSE or VM database in the **Database name** field. Optionally, you can add a comment that describes this database in the **Comment**.

Click **Next**.

9. If you are planning to use ODBC, register this database as an ODBC data source. Ensure that ODBC is installed before performing this operation. Click **Next**.

10. In the **Specify the node options** window, select the operating system, and type the remote instance name for the database system you want to connect to.

11. In the **Specify the system options** window, ensure that system name, host name, and operating system are correct. The information on this panel is used to configure the administration node. You can optionally enter a comment. Click **Next**.

12. In the **Specify the security options** window, specify the security option that will be used for authentication.

13. Click **Finish**. You can now use this database. Select the **Exit** menu action to close the CA.

Testing a database connection using the Configuration Assistant

After configuration, test your database connection in the Configuration Assistant.

To test a database connection:

1. Start the **Configuration Assistant**.

2. Highlight the database in the details view and select **Test Connection** from the **Selected** menu. The Test Connection window opens.

3. Select one or more types of connection that you want to test (**CLI** is the default). You can test more than one type at the same time. Enter a valid user ID and password for the remote database and click **Test Connection**. If the connection is successful, a message confirming the connection appears on the Results page. If the connection test failed, you will receive a help message. To change any settings you might have incorrectly specified, select the database in the details view and select **Change Database** from the **Selected** menu item.

When setting up a server to work with development environments (such as IBM Data Studio), you might encounter error message SQL30081N at the initial DB2 connection. A possible root cause is that the firewall at the remote database server has prevented the connection from being established. In this case, verify the firewall is properly configured to accept connection requests from the client.

Removing a DCS (host database)

Use the DCS page of the Advanced Configuration Assistant notebook to remove a DCS (host database) entry.

1. If you are not in the Advanced view, from the **View** menu, select **Advanced View**.

2. Select the DCS entry that you want to remove.

3. From the **Selected** menu, click **Remove DCS**. A confirmation window opens where you verify your selection.

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 IBM Data Server Runtime 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 the DB2 product with languages supported by the DB2 interface. Languages supported by the DB2 product means the languages in which data can exist. These languages are a superset of languages supported by the DB2 interface.

Displaying the DB2 Setup wizard in your national language (Linux and UNIX)

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 when displaying the DB2 Setup wizard.

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:

bourne (sh), korn (ksh), and bash shells:

```
LANG=<locale>
export LANG
```

C shell:

```
setenv LANG <locale>
```

where *locale* is a locale 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.

On Windows operating systems, you can run setup.exe with the **-i** parameter to specify the two-letter language code of the language the installation is to use.

On Linux and UNIX operating systems, it is recommended that you set the **LANG** environment variable to display the DB2 Setup wizard in your national language.

Table 8. Language identifiers

Language	Language identifier
Arabic (available on Windows platforms only)	ar
Brazilian Portuguese	br
Bulgarian	bg
Chinese, Simplified	cn
Chinese, Traditional	tw
Croatian	hr
Czech	cz
Danish	dk
Dutch	nl
English	en
Finnish	fi
French	fr
German	de
Greek	el
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

Changing the DB2 product interface language (Windows)

The DB2 interface language is the language that appears in messages, help, and graphical tool interfaces. When installing your DB2 product, you have the option of installing support for one or more languages. After installation, you can change the DB2 interface language to one of the other installed interface languages.

Do not confuse languages supported by a DB2 product with languages supported by the DB2 interface. Languages supported by a DB2 product means the languages in which data can exist. These languages are a superset of languages supported by the DB2 interface.

The DB2 interface language you want to use must be installed on your system. The DB2 product interface languages are selected and installed when you install a DB2

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

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

To change the DB2 product interface language on Windows operating systems:

1. Through the Control Panel, select **Regional and Language Options**.
2. On the **Regional Options** tab under **Standards and formats**, select the appropriate language. On Windows 2008 and Windows Vista or higher, use the **Formats** tab for this step.
3. On the **Regional Options** tab under **Location**, select the location that corresponds to the appropriate language.
4. On the **Advanced** tab under **Language for non-Unicode programs** select the appropriate language. On Windows 2008 and Windows Vista or higher, on the **Administrative** tab, under **Language for non-unicode programs**, click **Change system locale** and select the appropriate language. You will then be asked to reboot, click **Cancel**.
5. On the **Advanced** tab under **Default user account settings**, check the **Apply all settings to the current user account and to the default user profile** box. On Windows 2008 and Windows Vista or higher, on the **Administrative** tab under **reserved accounts**, click **Copy to reserved accounts** and check the accounts that you want to copy the language settings to.
6. You will be asked to reboot before these changes come into effect.

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

Changing the DB2 interface language (Linux and UNIX)

The interface language of the DB2 product is the language that appears in messages, help, and graphical tool interfaces. When installing your DB2 product, 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 to one of the other installed interface languages, use the steps outlined in this task.

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

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 the DB2 product to a supported interface language that has not been installed, the DB2 interface language will default to the operating system language. If the operating system language is not supported, English is used as the DB2 interface language.

DB2 interface language support is selected and installed when you install your DB2 product using the DB2 Setup wizard or by using the National Language Package.

To check which public locales are available in your system, run the $ locale -a command.

To change the DB2 interface language, set the LANG environment variable to the locale you want.

For bourne (sh), korn (ksh), and bash shells:

```
LANG=<locale>
export LANG
```

For C shell:

```
setenv LANG <locale>
```

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

Conversion of character data

When character data is transferred between machines, it must be converted to a form that the receiving machine can use.

For example, when data is transferred between a DB2 Connect server and a host or System i database server, it is usually converted from a server code page to a host CCSID, and vice versa. If the two machines use different code pages or CCSIDs, code points are mapped from one code page or CCSID to the other. This conversion is always performed at the receiver.

Character data sent *to* a database consists of SQL statements and input data. Character data sent *from* a database consists of output data. Output data that is interpreted as bit data is not converted. For example, data from a column declared with the FOR BIT DATA clause. Otherwise, all input and output character data is converted if the two machines have different code pages or CCSIDs.

For example, if DB2 Connect is used to access data, the following happens:
1. DB2 Connect sends an SQL statement and input data to System z.
2. DB2 for z/OS converts the SQL statement and data to the host server's code page and then processes the data.
3. DB2 for z/OS sends the result back to the DB2 Connect server.
4. DB2 Connect converts the result to the code page of the user's environment.

For bidirectional languages, a number of special "BiDi CCSIDS" have been defined by IBM and are supported by DB2 Connect.

If the bidirectional attributes of the database server are different from those of the client you can use these special CCSIDS to manage the difference.

Refer to the supported territory codes and code pages topic for the supported conversions between code pages on the DB2 Connect and CCSIDs on the host or System i server.

Developing database applications

Binding and running your applications in an environment that uses DB2 Connect has specific considerations which are presented here.

Binding database utilities on DB2 Connect

You must bind the database utilities (import, export, reorg, the Command Line Processor) and DB2 CLI bind files to each database before they can be used with that database. In a network environment, if you are using multiple clients that run on different operating systems or are at different versions or service levels of DB2, you must bind the utilities once for each operating system and DB2-version combination.

Binding a utility creates a *package*, which is an object that includes all of the information that is needed to process specific SQL statements from a single source file.

The bind files are grouped together in different `.lst` files in the `bnd` directory, under the installation directory (typically `sqllib` for Windows). Each file is specific to a server.

- To bind the utilities and applications to the IBM mainframe database server, connect to the IBM mainframe server and use the following example as a template:

  ```
  connect to dbalias user userid using password
  bind path/bnd/@ddcsmvs.lst blocking all sqlerror continue
        messages mvs.msg grant public
  connect reset
  ```

  where *path* corresponds to the *DB2PATH* registry value.

- To bind database utilities to a DB2 database, use one of the following methods, depending on your workstation's operating system:

  - The Configuration Assistant (CA):
    1. Start the CA.
    2. Select the database to which you want to bind the utilities.
    3. Right click and select **Bind**.
    4. Select the utility or files to bind.
    5. Add any desired bind options.
    6. Enter a user ID and password to connect to the database. The user ID must have the authority to bind new packages against the database. Click **Bind**.

  - The command line processor:
    1. Change to the `bnd` directory, which is `x:\sqllib\bnd`, where x: represents the drive where you installed DB2.
    2. To connect to the database, enter the following commands in the Command Center or the Command Line Processor:

       ```
       connect to database_alias
       ```

       where *database_alias* represents the alias of the database to which you want to connect.
    3. Enter the following commands in the Command Center or the Command Line Processor:

       ```
       "bind @db2ubind.lst messages bind.msg grant public"
       "bind @db2cli.lst messages clibind.msg grant public"
       ```

       In this example, `bind.msg` and `clibind.msg` are the output message files, and EXECUTE and BINDADD privileges are granted to *public*.
    4. Reset the connection to the database by entering the following command:

```
        connect reset
```

Note:

1. The db2ubind.lst file contains the list of bind (.bnd) files required to create the packages for the database utilities. The db2cli.lst file contains the list of bind (.bnd) files required to create packages for the DB2 CLI and the DB2 ODBC driver.
2. Binding might take a few minutes to complete.
3. If you have BINDADD authority, the first time you use the DB2 CLI or ODBC driver, the DB2 CLI packages will be bound automatically. If the applications that you are using require binding to the database, you can use the Configuration Assistant's Bind facility, or the command line processor, to perform the bind action.

Running your own applications

You can build and run DB2 applications with an IBM Data Server Client installed.

Various types of applications can access DB2 databases:
- Applications developed using the IBM data server client that include embedded SQL, APIs, stored procedures, user-defined functions or calls to the DB2 CLI
- ODBC applications
- Java applications using the JDBC or SQLJ interfaces
- PHP applications
- Ruby or Ruby on Rails applications
- Perl applications
- Python applications

On Windows operating systems, the following can also access DB2 databases:
- ActiveX Data Objects (ADO) implemented in Microsoft Visual Basic and Microsoft Visual C++
- Object Linking and Embedding (OLE) Automation Routines (UDFs and Stored Procedures)
- Object Linking and Embedding Database (OLE DB) table functions

To run an application:
1. Ensure the server is configured and running.
2. On the DB2 server, ensure that the database manager is started on the database server to which the application program is connecting. If it is not, you must issue the **db2start** command at the server before starting the application.
3. Ensure that you can connect to the database that the application uses.
4. (Optionally) Bind the necessary files to support the database application driver being used.
5. Run the application program.

Uninstalling DB2 Connect

At some point in the future you may need to remove your DB2 Connect products from your system. The requirements for removing or uninstalling your DB2 Connect products are presented based on the operating system you are using.

Uninstalling your DB2 product (Windows)

This task provides steps for completely removing your DB2 product from your Windows operating system. Only perform this task if you no longer require your existing DB2 instances and databases.

If you are uninstalling the default DB2 copy, and you have other DB2 copies on your system, use the db2swtch command to choose a new default copy before you proceed with the uninstallation. Also, if your DB2 Administration Server (DAS) is running under the copy being removed, move your DAS to a copy that is not being removed. Otherwise, re-create the DAS using the db2admin create command after the uninstall, and you reconfigure the DAS for some function to work.

To remove your DB2 product from Windows:

1. (Optional) Drop all databases using the Control Center or drop database command. Be sure that you no longer need these databases. If you drop your databases, all of your data will be gone.

2. Stop all DB2 processes and services. This can be done through the Windows Services panel or by issuing the db2stop command. If DB2 services and processes are not stopped before attempting to remove your DB2 product, you will receive a warning containing a list of processes and services that are holding DB2 DLLs in memory. If you will use Add/Remove Programs to remove your DB2 product, this step is optional.

3. You have two options for removing your DB2 product:

   Add/Remove Programs
   > Accessible through the Windows Control Panel, use the Add/Remove Programs window to remove your DB2 product. Refer to your operating system's help for more information about removing software products from your Windows operating system.

   db2unins command
   > You can run the db2unins command from the `DB2DIR\bin` directory to remove your DB2 products, features, or languages. Using this command, you can uninstall multiple DB2 products at the same time using the /p parameter. You can use a response file to uninstall DB2 products, features, or languages using /u parameter. For more information, see the db2unins command topic.

Unfortunately, your DB2 product cannot always be removed by using the Control Panel - Add/Remove Programs facility or using the db2unins /p command or the db2unins /u command. The following uninstallation option must ONLY be attempted if the previous method fails.

To forcefully remove all DB2 copies from your Windows system, run the db2unins /f command. This command will perform a brute force uninstallation of ALL DB2 copies on the system. Everything except user data, such as DB2 databases, will be forcefully deleted. Before running this command with the /f parameter, see the db2unins command for details.

Uninstalling your DB2 database product (Linux and UNIX)

This task provides steps for removing a DB2 database product from your Linux or UNIX operating system.

This task is not required to install a new version of a DB2 database product. Each version of a DB2 database product on Linux or UNIX has a different installation path and can therefore coexist on the same computer.

Note: This task applies to DB2 database products that were installed with root user authority. A separate topic explains how to uninstall DB2 database products that were installed as a non-root user.

To remove your DB2 database product:
1. Optional: Drop all databases. You can drop databases using the Control Center or the DROP DATABASE command. Database files remain intact on your file systems when you drop an instance without dropping databases first.
2. Stop the DB2 Administration Server. Refer to the *Installing DB2 Servers* manual.
3. Remove the DB2 Administration Server, or run the dasupdt command to update the DB2 Administration Server to another installation path. To remove the DB2 Administration Server, refer to the *Installing DB2 Servers* manual.
4. Stop all DB2 instances. Refer to the *Installing DB2 Servers* manual.
5. Remove the DB2 instances, or run the db2iupdt command to update the instances to another installation path. To remove the DB2 instances, refer to the *Installing DB2 Servers* manual.
6. Remove the DB2 database products. Refer to the *Installing DB2 Servers* manual.

Appendix A. Overview of the DB2 technical information

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

- DB2 Information Center
  - Topics (Task, concept and reference topics)
  - Help for DB2 tools
  - Sample programs
  - Tutorials
- DB2 books
  - PDF files (downloadable)
  - PDF files (from the DB2 PDF DVD)
  - printed books
- Command line help
  - Command help
  - Message help

Note: The DB2 Information Center topics are updated more frequently than either the PDF or the hardcopy books. To get the most current information, install the documentation updates as they become available, or refer to the DB2 Information Center at ibm.com.

You can access additional DB2 technical information such as technotes, white papers, and IBM Redbooks® publications online at ibm.com. Access the DB2 Information Management software library site at http://www.ibm.com/software/data/sw-library/.

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Do not use this e-mail address to contact DB2 Customer Support. If you have a DB2 technical issue that the documentation does not resolve, contact your local IBM service center for assistance.

DB2 technical library in hardcopy or PDF format

The following tables describe the DB2 library available from the IBM Publications Center at www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss. English and translated DB2 Version 9.7 manuals in PDF format can be downloaded from www.ibm.com/support/docview.wss?rs=71&uid=swg2700947.

Although the tables identify books available in print, the books might not be available in your country or region.

The form number increases each time a manual is updated. Ensure that you are reading the most recent version of the manuals, as listed below.

Note: The *DB2 Information Center* is updated more frequently than either the PDF or the hard-copy books.

Table 9. DB2 technical information

Name	Form Number	Available in print	Last updated
Administrative API Reference	SC27-2435-02	Yes	September, 2010
Administrative Routines and Views	SC27-2436-02	No	September, 2010
Call Level Interface Guide and Reference, Volume 1	SC27-2437-02	Yes	September, 2010
Call Level Interface Guide and Reference, Volume 2	SC27-2438-02	Yes	September, 2010
Command Reference	SC27-2439-02	Yes	September, 2010
Data Movement Utilities Guide and Reference	SC27-2440-00	Yes	August, 2009
Data Recovery and High Availability Guide and Reference	SC27-2441-02	Yes	September, 2010
Database Administration Concepts and Configuration Reference	SC27-2442-02	Yes	September, 2010
Database Monitoring Guide and Reference	SC27-2458-02	Yes	September, 2010
Database Security Guide	SC27-2443-01	Yes	November, 2009
DB2 Text Search Guide	SC27-2459-02	Yes	September, 2010
Developing ADO.NET and OLE DB Applications	SC27-2444-01	Yes	November, 2009
Developing Embedded SQL Applications	SC27-2445-01	Yes	November, 2009
Developing Java Applications	SC27-2446-02	Yes	September, 2010
Developing Perl, PHP, Python, and Ruby on Rails Applications	SC27-2447-01	No	September, 2010
Developing User-defined Routines (SQL and External)	SC27-2448-01	Yes	November, 2009
Getting Started with Database Application Development	GI11-9410-01	Yes	November, 2009
Getting Started with DB2 Installation and Administration on Linux and Windows	GI11-9411-00	Yes	August, 2009

Table 9. DB2 technical information (continued)

Name	Form Number	Available in print	Last updated
Globalization Guide	SC27-2449-00	Yes	August, 2009
Installing DB2 Servers	GC27-2455-02	Yes	September, 2010
Installing IBM Data Server Clients	GC27-2454-01	No	September, 2010
Message Reference Volume 1	SC27-2450-00	No	August, 2009
Message Reference Volume 2	SC27-2451-00	No	August, 2009
Net Search Extender Administration and User's Guide	SC27-2469-02	No	September, 2010
Partitioning and Clustering Guide	SC27-2453-01	Yes	November, 2009
pureXML Guide	SC27-2465-01	Yes	November, 2009
Query Patroller Administration and User's Guide	SC27-2467-00	No	August, 2009
Spatial Extender and Geodetic Data Management Feature User's Guide and Reference	SC27-2468-01	No	September, 2010
SQL Procedural Languages: Application Enablement and Support	SC27-2470-02	Yes	September, 2010
SQL Reference, Volume 1	SC27-2456-02	Yes	September, 2010
SQL Reference, Volume 2	SC27-2457-02	Yes	September, 2010
Troubleshooting and Tuning Database Performance	SC27-2461-02	Yes	September, 2010
Upgrading to DB2 Version 9.7	SC27-2452-02	Yes	September, 2010
Visual Explain Tutorial	SC27-2462-00	No	August, 2009
What's New for DB2 Version 9.7	SC27-2463-02	Yes	September, 2010
Workload Manager Guide and Reference	SC27-2464-02	Yes	September, 2010
XQuery Reference	SC27-2466-01	No	November, 2009

Table 10. DB2 Connect-specific technical information

Name	Form Number	Available in print	Last updated
Installing and Configuring DB2 Connect Personal Edition	SC27-2432-02	Yes	September, 2010
Installing and Configuring DB2 Connect Servers	SC27-2433-02	Yes	September, 2010

Table 10. DB2 Connect-specific technical information (continued)

Name	Form Number	Available in print	Last updated
DB2 Connect User's Guide	SC27-2434-02	Yes	September, 2010

Table 11. Information Integration technical information

Name	Form Number	Available in print	Last updated
Information Integration: Administration Guide for Federated Systems	SC19-1020-02	Yes	August, 2009
Information Integration: ASNCLP Program Reference for Replication and Event Publishing	SC19-1018-04	Yes	August, 2009
Information Integration: Configuration Guide for Federated Data Sources	SC19-1034-02	No	August, 2009
Information Integration: SQL Replication Guide and Reference	SC19-1030-02	Yes	August, 2009
Information Integration: Introduction to Replication and Event Publishing	GC19-1028-02	Yes	August, 2009

Ordering printed DB2 books

If you require printed DB2 books, you can buy them online in many but not all countries or regions. You can always order printed DB2 books from your local IBM representative. Keep in mind that some softcopy books on the *DB2 PDF Documentation* DVD are unavailable in print. For example, neither volume of the *DB2 Message Reference* is available as a printed book.

Printed versions of many of the DB2 books available on the DB2 PDF Documentation DVD can be ordered for a fee from IBM. Depending on where you are placing your order from, you may be able to order books online, from the IBM Publications Center. If online ordering is not available in your country or region, you can always order printed DB2 books from your local IBM representative. Note that not all books on the DB2 PDF Documentation DVD are available in print.

Note: The most up-to-date and complete DB2 documentation is maintained in the DB2 Information Center at http://publib.boulder.ibm.com/infocenter/db2luw/ v9r7.

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2. When you call, specify that you want to order a DB2 publication.
3. Provide your representative with the titles and form numbers of the books that you want to order. For titles and form numbers, see "DB2 technical library in hardcopy or PDF format" on page 49.

Displaying SQL state help from the command line processor

DB2 products return an SQLSTATE value for conditions that can be the result of an SQL statement. SQLSTATE help explains the meanings of SQL states and SQL state class codes.

To start 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.

Accessing different versions of the DB2 Information Center

For DB2 Version 9.8 topics, the *DB2 Information Center* URL is http://publib.boulder.ibm.com/infocenter/db2luw/v9r8/.

For DB2 Version 9.7 topics, the *DB2 Information Center* URL is http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/.

For DB2 Version 9.5 topics, the *DB2 Information Center* URL is http://publib.boulder.ibm.com/infocenter/db2luw/v9r5.

For DB2 Version 9.1 topics, the *DB2 Information Center* URL is http://publib.boulder.ibm.com/infocenter/db2luw/v9/.

For DB2 Version 8 topics, go to the *DB2 Information Center* URL at: http://publib.boulder.ibm.com/infocenter/db2luw/v8/.

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.

- 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 a Firefox or Mozilla browser:
  1. Select the button in the **Languages** section of the **Tools** —> **Options** —> **Advanced** dialog. 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.

On some browser and operating system combinations, you must also change the regional settings of your operating system to the locale and language of your choice.

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

A locally installed DB2 Information Center must be updated periodically.

A DB2 Version 9.7 Information Center must already be installed. For details, see the "Installing the DB2 Information Center using the DB2 Setup wizard" topic in *Installing DB2 Servers*. All prerequisites and restrictions that applied to installing the Information Center also apply to updating the Information Center.

An existing DB2 Information Center can be updated automatically or manually:
- Automatic updates - updates existing Information Center features and languages. An additional benefit of automatic updates is that the Information Center is unavailable for a minimal period of time during the update. In addition, automatic updates can be set to run as part of other batch jobs that run periodically.
- Manual updates - should be used when you want to add features or languages during the update process. For example, a local Information Center was originally installed with both English and French languages, and now you want to also install the German language; a manual update will install German, as well as, update the existing Information Center features and languages. However, a manual update requires you to manually stop, update, and restart the Information Center. The Information Center is unavailable during the entire update process.

This topic details the process for automatic updates. For manual update instructions, see the "Manually updating the DB2 Information Center installed on your computer or intranet server" topic.

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

1. On Linux operating systems,
   a. Navigate to the path where the Information Center is installed. By default, the DB2 Information Center is installed in the `/opt/ibm/db2ic/V9.7` directory.
   b. Navigate from the installation directory to the `doc/bin` directory.
   c. Run the `ic-update` script:

      ```
      ic-update
      ```

2. On Windows operating systems,
   a. Open a command window.
   b. Navigate to the path where the Information Center is installed. By default, the DB2 Information Center is installed in the `<Program Files>\IBM\DB2 Information Center\Version 9.7` directory, where `<Program Files>` represents the location of the Program Files directory.
   c. Navigate from the installation directory to the `doc\bin` directory.
   d. Run the `ic-update.bat` file:

      ```
      ic-update.bat
      ```

The DB2 Information Center restarts automatically. If updates were available, the Information Center displays the new and updated topics. If Information Center updates were not available, a message is added to the log. The log file is located in `doc\eclipse\configuration` directory. The log file name is a randomly generated number. For example, `1239053440785.log`.

Manually updating the DB2 Information Center installed on your computer or intranet server

If you have installed the DB2 Information Center locally, you can obtain and install documentation updates from IBM.

Updating your locally-installed *DB2 Information Center* manually requires that you:

1. Stop the *DB2 Information Center* on your computer, and restart the Information Center in stand-alone mode. Running the Information Center in stand-alone mode prevents other users on your network from accessing the Information Center, and allows you to apply updates. The Workstation version of the DB2 Information Center always runs in stand-alone mode. .

2. Use the Update feature to see what updates are available. If there are updates that you must install, you can use the Update feature to obtain and install them

   Note: If your environment requires installing the *DB2 Information Center* updates on a machine that is not connected to the internet, mirror the update site to a local file system using a machine that is connected to the internet and has the *DB2 Information Center* installed. If many users on your network will be installing the documentation updates, you can reduce the time required for individuals to perform the updates by also mirroring the update site locally and creating a proxy for the update site.

If update packages are available, use the Update feature to get the packages. However, the Update feature is only available in stand-alone mode.

3. Stop the stand-alone Information Center, and restart the *DB2 Information Center* on your computer.

Note: On Windows 2008, Windows Vista (and higher), the commands listed later in this section must be run as an administrator. To open a command prompt or graphical tool with full administrator privileges, right-click the shortcut and then select **Run as administrator**.

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

1. Stop the *DB2 Information Center*.
   - On Windows, click **Start** → **Control Panel** → **Administrative Tools** → **Services**. Then right-click **DB2 Information Center** service and select **Stop**.
   - On Linux, enter the following command:
     ```
     /etc/init.d/db2icdv97 stop
     ```
2. Start the Information Center in stand-alone mode.
   - On Windows:
     a. Open a command window.
     b. Navigate to the path where the Information Center is installed. By default, the *DB2 Information Center* is installed in the `Program_Files\IBM\DB2 Information Center\Version 9.7` directory, where `Program_Files` represents the location of the `Program Files` directory.
     c. Navigate from the installation directory to the `doc\bin` directory.
     d. Run the `help_start.bat` file:
        ```
        help_start.bat
        ```
   - On Linux:
     a. Navigate to the path where the Information Center is installed. By default, the *DB2 Information Center* is installed in the `/opt/ibm/db2ic/V9.7` directory.
     b. Navigate from the installation directory to the `doc/bin` directory.
     c. Run the `help_start` script:
        ```
        help_start
        ```
   The systems default Web browser opens to display the stand-alone Information Center.
3. Click the **Update** button (![update icon]). (JavaScript™ must be enabled in your browser.) On the right panel of the Information Center, click **Find Updates**. A list of updates for existing documentation displays.
4. To initiate the installation process, check the selections you want to install, then click **Install Updates**.
5. After the installation process has completed, click **Finish**.
6. Stop the stand-alone Information Center:
   - On Windows, navigate to the installation directory's `doc\bin` directory, and run the `help_end.bat` file:
     ```
     help_end.bat
     ```

     Note: The `help_end` batch file contains the commands required to safely stop the processes that were started with the `help_start` batch file. Do not use `Ctrl-C` or any other method to stop `help_start.bat`.

- On Linux, navigate to the installation directory's `doc/bin` directory, and run the `help_end` script:

  `help_end`

  Note: The `help_end` script contains the commands required to safely stop the processes that were started with the `help_start` script. Do not use any other method to stop the `help_start` script.

7. Restart the *DB2 Information Center*.
   - On Windows, click **Start → Control Panel → Administrative Tools → Services**. Then right-click **DB2 Information Center** service and select **Start**.
   - On Linux, enter the following command:

     `/etc/init.d/db2icdv97 start`

The updated *DB2 Information Center* displays the new and updated topics.

DB2 tutorials

The DB2 tutorials help you learn about various aspects of DB2 products. Lessons provide step-by-step instructions.

Before you begin

You can view the XHTML version of the tutorial from the Information Center at http://publib.boulder.ibm.com/infocenter/db2help/.

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

DB2 tutorials

To view the tutorial, click the title.

"pureXML®" in *pureXML Guide*
> Set up a DB2 database to store XML data and to perform basic operations with the native XML data store.

"Visual Explain" in *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 database products.

DB2 documentation
> Troubleshooting information can be found in the *Troubleshooting and Tuning Database Performance* or the Database fundamentals section of the *DB2 Information Center*. There you will find information about how to isolate and identify problems using DB2 diagnostic tools and utilities, solutions to some of the most common problems, and other advice on how to solve problems you might encounter with your DB2 database products.

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 or bug fixes), fix packs, 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/support/db2_9/

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